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HRT
HAM RADIO TODAY
VOLUME II NO.2 FEB 1993

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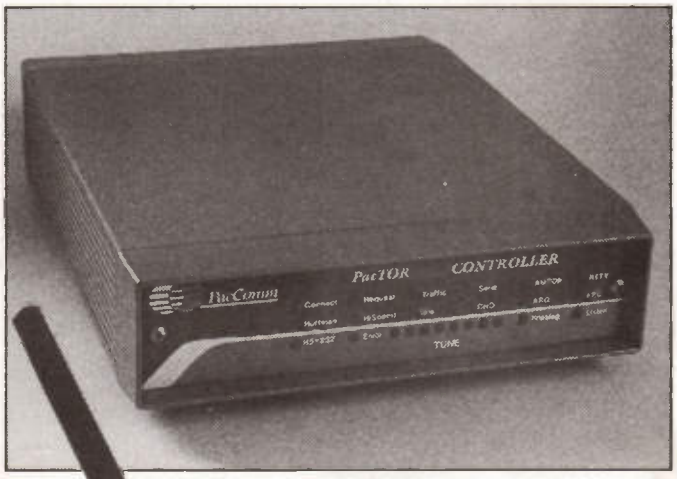

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AMDAT, 4 Northville Road, Northville Bristol. Tel: 0272 699352

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Intronic Ltd, Windsor Hall, Glounthaune, Cork, Eire.
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Tyrone Amateur Electronics, 44 High Street, Omagh, Co Tyrone, Northern Ireland. Tel: 0662 242043

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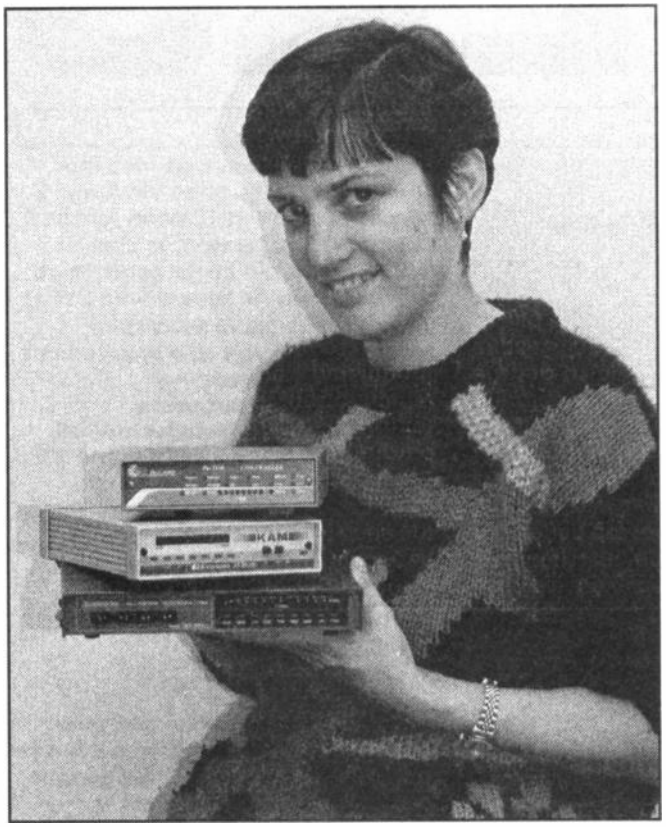
CQ de G8IYA

The Digital Revolution!



Happy New Year! As you read this, 1993 should just about be upon us, indeed the publication date of this issue is the 1st January (HRT is published on the first Friday of each month), and it'll be a day when I'll be glad to put my feet up and get a break from the work of Editing, at least for a few hours.

1993

The start of 1993 brings with it many changes, especially so for amateurs living in European Community member countries. Yes, trade barriers are (supposed to be) coming down! Already, people in France or England think nothing of 'hopping on a ferry' across the Channel for the day, and I'm sure many readers will have done so in the past few weeks to stock up on food and drink for the Christmas season. It's not only the English shopping in French hypermarkets, the French come over here to buy goods as well. I know one amateur radio retailer, located near to a major shipping port, who does a roaring trade in gear for export to France.

Coincidentally, I recently received a letter from G4SWX suggesting an article be published about different amateur equipment sources, and 'where to buy' from. Others confirmed this would be a good idea, and this issue seemed an extremely appropriate time for such to be included. Your wish is my command, you'll see such an article listed in this month's 'contents' page.

More Changes

The changes for UK amateurs at the beginning of 1993 aren't just those of trade barriers. On the 9th of January, Peter Chadwick G3RZP will be formally 'installed' as the new President of the Radio Society of Great Britain. We at HRT wish Peter all the best in his new role for this year, I know from his many planned foreign visits due to his 'full time' occupation he'll be carrying the flag' for the society around the world. HRT will be there at his installation in the shape of Chris G4HCL (he enjoys such get-togethers, and as I don't normally let him out otherwise I'll 'allow' him to go along!), we'll bring you the photos in these pages soon.

Another 'change' that may have just happened as you read this is concerned with the Novice licence, following the RA's planned Novice Licence review in December. As this is being put together, none of us know what the changes are definitely going to be, but no doubt they'll be taking effect soon under the new RA 'boss' Roger Louth who's taken over from Stephen Spivey. Again, HRT will be at the review meeting, and we'll be bringing you a full report in the magazine.

Another change, the 'Digital Revolution'

I've been very aware for some time that many of today's younger newcomers to the hobby, and I don't just mean little kids, are becoming more interested in computer-related aspects of amateur radio than of building their own 'simple' (?) one- valve transmitters and the like. Most people in Europe carry a computer of some form or another around with them throughout their waking life. If you're puzzled, look what's on your wrist. Mine's an 'old fashioned' clockwork one, so is the HRT Technical Editor's, but that's because of 'nostalgia' as opposed to the facilities offered and split-second accurate timekeeping. A computer isn't just something you sit down and compute with, there's not much point in that unless you get a buzz out of writing your own programs, it's what it can be used for that's important. Like keeping the time. Like dragging signals right out of the noise on HF and making them 100% readable.

'What?' you ask? That's right. I was sitting here a few days ago, listening to just receiver noise on 80m. Nothing else was discernable to my ears in the receiver's selected CW (500Hz) bandwidth, but totally *error free* text was coming though on the terminal screen (no, *not* on a computer screen), at over 20WPM. The Tech Ed was showing me how the little box of tricks on this month's HRT front cover would decode error free text, data, or whatever, at an equivalent of around 30WPM in -10dB signal to noise ratio. Or in other words, 10dB noise to signal ratio, even when this was received in a narrow bandwidth of a few hundred Hertz.

It wasn't decoding CW, it wasn't decoding speech, and it didn't need coupling up to a computer to do it. This was 'Pactor', designed and pioneered by European radio amateurs. Not the Japanese, not the commercial lads, by amateurs.

When other modes don't stand a chance

I've been having my 'ears bent' for a while that some data modes will get through regardless, when modes like CW don't stand a chance. I've now seen it with my own eyes and heard it with my own ears, if you don't believe me, then go and try it yourself. Is this the dawn of the 'digital revolution'? We already have microprocessors galore in our rigs, which have been used for some time to give us memory channels, control frequency synthesizers and so on. In the last few years, they've also been used to generate the fundamental signal itself rather than use a 'traditional' analogue frequency synthesizer, in what's called a 'Direct Digital Synthesizer. This is just an IC, you put digital 1s and 0s in, and out comes top band or whatever. Add a 'Digital Signal Processor', yes another IC, and you get superb sounding CW and SSB, shaped exactly as you want it. We already have digital auto-forwarding speech mailboxes, designed by European radio amateurs (see HRT Sept 1992 page 13), and I have no doubts that digital, error-correcting speech over radio, isn't far away.

LETTERS

Letter of the month

Dear HRT,

I have given a lot of thought to your comments on many aspects in your magazine, and I have to admit, they are very well chosen and thoughtful.

Like yourselves, I try to put back into our hobby as much as I get out of it, and to this end, as well as running my own business, with help from my wife, I run an RAE and Morse class, as well as a beginners electronic building class (building projects of any nature to do with similar hobbies etc.). I have been running the building class from my home on a Monday evening, but now with the local evening classes under way again it has all changed. We do enjoy ourselves and the subjects covered are all varied.

I am also doing as much as I can to encourage the Novice side of the hobby, and offering to start a Novice class. I feel sure that if we can encourage this side of the radio and hobby area, we will be getting the numbers back into amateur radio and communicational hobbies. If there are any prospective pupils for this, or anyone who would like any information regarding any of the classes, they can contact me on 021 353 9326.

I am also going on air most evenings soon with Morse on 2m (around 10.00pm till 11.00pm local time), and will be doing all I can for the Morse learning class pupils and listeners.

Having recently acquired the help of having a centre in North Birmingham for all these activities, the following is the information to hand. The evening classes are held at Perry Common School, College Road, Birmingham, and also at The Midland ARC in Birmingham. I have obtained the services of the school for the RAE and Novice exams, I am trying to get the Morse exam done there as well. The classes are well attended, current figures are 35 in the RAE, 8 in the Electronics Building class, and 7 in the Morse class.

My best regards for now, and I will be seeing you around. I do get to talk at clubs from time to time, and this all adds up to putting back into the hobby the enjoyment I get out of it. Many thanks for the articles running in HRT, and keep up the good work.

John Badger, G4YZO.

Editorial comment;
Well, what can we say!

Dear HRT,

On reading the editorial column of the Oct HRT, I had to permit myself a slight smile. You mentioned the increase in licensed amateurs in the UK, suggesting it was one in the eye for the preachers of doom and gloom. In a previous issue of some months ago, you also express doom and gloom and I quote "New blood is needed if our hobby is to survive".

At the time I wrote a letter, but didn't post it, the gist of the letter was as follows. Our hobby is not in the least anaemic, in so much as the last blood count showed an increase internationally of 10% for 1991. The count now stands in excess of 2.5 million according to reliable sources. As I have often said the main problem that we have will be to find air space for all the 'new blood' that is taking up the hobby. We most certainly do not have to pander to all the wingers, IQ0s, and wallies who are trying to get in through the back door.

Ever since the beginning of amateur radio there has been a steady increase of numbers, so there was absolutely no need to change the system of licensing in any way. The standards in practically every walk of life have been systematically eroded, and it would be a great pity to see the standards of amateur radio going the same way. Here in Ireland, I am very glad to say, we have a very conservative Department of Communications, and except for some alignment with international standards, things change very little. We still stick to the good old A and B licences with CW at 12 WPM for HF. If the powers that be want to change anything, it would be far better to go up the way. An A+ licence with CW at 20 to 25 WPM, and a successful construction project as a requirement would be very interesting.

You also suggest some significance in the fact that only 46 novices went for the class A, and 376 for class B. Well like most people today, 376 went for the easy option, and 46 people obviously made of sterner stuff will be very welcome on the HF bands in the near future.

W. Mitchell, EI5GQ.

Editorial comment;
Well I do admit to saying that new blood is needed (June 92 issue) but I don't quite think I expressed doom and gloom! In fact, the exact opposite, I said I'd been swamped with information on the good work in which amateurs, and amateur clubs, were doing to promote the hobby! Some people get off their backsides and promote the hobby, others don't and just sit around, that's where the 'doom and gloom' comes in! Whatever happens and whatever people do, if our hobby is to survive we must move with the times as many of us do. The introduction of the 'Novice' licence in the UK was one move towards this, in getting more prospective amateurs interested in the hobby. Incentive licensing is an interesting idea, providing the requirements to attain one are in line with today's (and more importantly, tomorrow's) communication needs and practices. You'll see in this month's 'CQ de G8IYA' Editorial exactly what direction our hobby is making pioneering advances in. Food for thought?

Dear HRT,

If it is at all possible that any of your readers are as hopeless at maths as I am, then, like myself, they may have had difficulty in arriving at the correct figure to enter in their log

£10 for the Letter of the Month

Do you have something constructive to say on the state of amateur radio today? Perhaps you'd like to put your viewpoint to the readers, get some discussion going, or give an answer to one of the issues raised? We'll pay £10 for the best letter we publish each month. So write in with your views, to Letters Column, P.O. Box 73, Eastleigh, Hants SO5 5WG.

"TONE" BURST

BY G6MEN

under power, as it now has to be put down in dB Watts, yes I say again, in dB Watts!

Now, the problem is that my expensive power meter reads both peak and average Watts, but not dB Watts, and I've yet to see one advertised in the advertisement columns. So, to enable myself to obey the strict letter of the law and perhaps help others, I've drawn up the following table, taking 0dBW to equal 1W as a reference level.

3W = 5 dBW
5W = 7 dBW
8W = 9 dBW
12W = 11 dBW
20W = 13 dBW
30W = 15 dBW
50W = 17 dBW
80W = 19 dBW
100W = 20 dBW
200W = 23 dBW
300W = 25 dBW
400W = 26 dBW

Douglas Byrne, G3KPO/GB3WM.

Editorial comment;
dBW levels are taught to prospective UK licensees and tested in the RAE and NRAE courses, however I'm sure that many amateurs join with you in treating these 'new' power levels as being a little mystifying. Coincidentally, our 'Notebook' columnist Geoff Arnold G3GSR has this month featured these 'mysterious dBs' in his column, is this a classic case of 'great minds thinking alike'?

Dear HRT,

There is much talk on the proposal of allowing the Novice licensees on the 2m band. If this is granted, then I wonder if licence A and B holders would agree, that a Class A or the HF bands should be granted to the B licensee without taking the Morse test.

What incentive is there left, if the Novice is given the freedom of 2m, for he/she to obtain the B licence status? In my view this proposal could lead to the loss of long standing radio amateurs.

M. Marsden, G7NDP.

Editorial comment;
Regarding current requirements for licensing, the RA have told us for publication that (quote) "Nothing lasts forever". Think about it.

Dear HRT,

I am a keen SWL and ex-CBer, but 2m in my area sounds like CB but glorified with a callsign, or is it a callsign, the same with certain stations on HF. What happened to all the licensing rules? How can a foreign station listening on HF possibly grasp the logic of it all? I was seriously thinking of sitting the RAE, but I am afraid to say over the last few months I feel it's too much like CB, the only different I can see is one has a callsign, and can raise their eyebrows when they state they're a radio amateur, but that's about all.

I started on SWLing with the help of CBers, funny when you think I wrote to many amateur stations via the bureau and never got any replies. Why does one get the impression that amateurs are above everyone else, is this one of the reasons why there aren't many wishing to help Novices? I would recommend to all SWLs that they join the ISWL and RSGB, great help there!
John Redmond.

Editorial comment;
We're glad to say that not all radio amateurs feel they're 'above everyone else'! The help of friendly local radio enthusiasts can be very beneficial, that's why we happily publicise dynamic clubs, and make a point of not publicising those who aren't (the 'elite' who don't want to help others or meet other newcomers?). Talking of CB, our sister magazine 'CB Citizens Band', also published by Argus Specialist Publications, goes 'all out' as well to publicise local clubs and their activities. Back to amateur radio, we (the HRT Ed and Consultant Tech Ed) are each members of both the RSGB and the ISWL, and must say that the feeling of 'belonging' is well worthwhile, especially if people don't get any joy from 'local' amateurs.

Dear HRT,

A great new way to test any power amp which may be lying down on the job!

My young friend Sigismund is an instrument mechanic and offered to help with trouble-shooting the PA board on my Corsair. Half a dozen twists of a screwdriver and the entrails were laid bare, matched pair, which one was down? Guess we'll need a transistor tester. I rummaged through the junk room which started life as a junk box back in 2LO.

"There's a quicker way!" carolled Siggy, a scintillating whizz-kid in electronics. "Place one finger on each PA", I did as I was told, he keyed the mike. Just one Corsair PA shines out 100 watts.

You really do say "Arg-gg-h!" did you know? "You've melted my *!**!! finger!". "But which one?" Some mothers...
Trevor G0JOE

Editorial comment;
Most people get an RF burn by mistake, this is the first time I've heard of it being done intentionally!

RADIO TODAY

Goodbye, Stephen Spivey

The name, and indeed face, of Stephen Spivey will be familiar to many HRT readers, as the 'boss man' of the Radiocommunications Agency. As a consequence of recent events on the energy front, Mr. Spivey has written to us to let us know that he has had to leave the RA to take over responsibility for nuclear policy in the DTI's Atomic Energy Division. His successor, Roger Louth, took up residence on 24th November 1992. Mr. Spivey says "I am sure that Roger will want to take things up from where I left off and that, under his stewardship, you can look forward to receiving a quality of service at least as good as that you have enjoyed – hopefully in all senses of the word – over the past two and a half years". We wish you all the best in your new job, and thanks for your help to the radio amateur movement in the past.

70cm Air Force Frequencies

As UK amateurs will know (you should do anyway if you read your licence!), the 430 to 440MHz band is allocated to us on a secondary basis. The primary user has now allocated two spot frequencies for use by units of the Royal Air Force Volunteer Reserve, these being 435.725MHz and 435.750MHz, which are used from RAF and other airfields. So if you hear strange sounding voices on these frequencies, leave them alone, and remember they have priority over us!

BARTG Spring RTTY Contest 1993

The BARTG will be holding an RTTY contest between 0200 GMT on Saturday 20th March and 0200 GMT Monday 22nd March 1993. The amateur bands which will be used are 3.5MHz, 7.0MHz, 14MHz, 21MHz, and 28MHz. For full details of rules etc. contact the Contest Manager, John Barber G4SKA, 32 Wellbrook Street, Tiverton, Devon EX16 5JW England.

Jennie Davies passes a greetings message to the scouts in the USA

Michael Davies passing a message to the USA with his younger sister Jennie at the log.

Matthew Whittle tunes the FT-757 to find a contact

Manx Scouts JOTA 1992

In October each year, members of the Scout movement throughout the world link up through amateur radio for their Jamboree On The Air, JOTA. We're told that 1992, its 35 year, was the best ever for the Manx Scouts.

The Isle Of Man Scout Association advisor on communications, Denys Hall GD4OEL of Jurby I.o.M., assisted by members of the newly formed amateur radio enthusiasts club based at Foxdale, set up an amateur radio special event station GB2MSR (Manx Scout Radio). The scouts also set up their own CB radio station for the event, without any adult help, by the boys who passed their 'communicator' badge earlier in the year.

The scouts linked up with over 35 countries worldwide, with this year's DX conditions being very good, especially to the USA and Canada. For the first time on the I.o.M., a girl scout from the 1st Kirk Michael Scouts, Jennie Davies, together with other scout members, spoke to a number of boy and girl scouts in other countries including no less than 22 states of the USA.

Altogether, 120 amateur radio scouting contacts were made to the UK, Netherlands, France, Hungary, Portugal, Russia, Italy, Finland, Israel, Sweden, Czechoslovakia, Falkland Isles, Ireland, Germany, Norway, Denmark, Brazil, St. Helena, Canada, USA, Spain, and Ukraine. The equipment used was a FT- 757GX, SRW 'Loudenboomer' linear amplifier, Icom 701, and aerials of a maypole and a G5RV.

The 1st Kirk Michael would like to thank Mr. Denys Hall

What it all Means!

Confused with all the abbreviations of 'Ham Speak' – here's a few explanations!

Ham Radio Today is, of course, a magazine for hobby radio users, who in turn have their own abbreviations, sayings, and so on. There are around 4,000,000 licensed radio amateurs in the world, including around 70,000 in the UK, but if you're new to Ham Radio then much of what you read can sound like gobbledegook!

All licensed radio amateurs (as opposed to CB operators in some countries or unlicensed operators), after passing the required technical examination and/or other tests, are issued with an internationally unique callsign by their government. This commonly identifies the country they're in, sometimes also the class of their licence, followed by individually allocated letters. An example of this is the Editor's callsign of G8IYA.

The various wavebands which amateurs use can be shown as either frequency or wavelength, common ones being *160m* (1.8MHz), *80m* (3.5MHz), *40m* (7MHz), *30m* (10MHz), *20m* (14MHz), *17m* (18MHz), *15m* (21MHz), *12m* (24MHz), *10m* (28MHz), *6m* (50MHz), *4m* (70MHz), *2m* (144MHz), *70cm* (432MHz) and *23cm* (1296MHz). *HF* means High Frequency, typically the 160m-10m bands, *VHF* means Very High Frequency typically the 6m, 4m and 2m bands, and UHF means Ultra High Frequency such as the 70cm and 23cm bands. On these, amateurs use a variety of ways of communicating, including Morse telegraphy (often called CW, for 'Continuous Wave'); speech including *SSB* (Single Sideband) and FM (Frequency Modulation); data including *Packet* (error free text communication with a computer and TNC – Terminal Node Controller); *AMTOR* (AMateur Teletype Over Radio), *RTTY* (Radio TeleTYpe); and television including *SSTV* (Slow Scan TV) and *FSTV* (Fast Scan TV). Amateurs have also launched their own satellites (*AMSATs* – AMateur SATellites) which orbit the earth and automatically transpond (receive and re-transmit) CW, SSB, and Packet signals to and from amateurs. Down on the ground amateurs also have automatic repeater stations, commonly operating on FM for voice and Packet to again remotely boost the range of amateur's transmitters, together with Bulletin Board Stations (*BBSs*), a form of 'electronic mailbox' for Packet radio and AMTOR with automatic message forwarding facilities around the world.

In 'amateur speak', a number of other abbreviations are used, for example *TX* for transmitter, *RX* for receiver, and a number of 'Q' codes and other abbreviations originating from way back in time when telegraphy used to be the most common, if not the only, mode of communication. These are still used as a form of 'shorthand', some of the more common ones which you'll come across in these pages are; *CQ* – a general call to all stations, *de* – on-air shorthand for 'from', *QRP* – low power, *QTH* – location of the station, *QSL* – verification of signals, often in the form of a station 'QSL card', *QSO* – on- air conversation, *QRM* – man-made interference, *QRN* – natural interference, *QSB* – signal fading, and *QSY* – a change of frequency. If you take a look at the monthly Editorial in HRT, you'll see this has the heading *CQ de G8IYA*, you'll now know this means a 'General call to all stations from G8IYA'!

In Ham Radio Today, every month we have regular columns entitled HF Happenings, by Don Field G3XTT, VHF/UHF Message by Geoff Brown GJ4ICD, Packet Radio Roundup by Chris Lorek G4HCL, Satellite Rendezvous information complied by Richard Limebear G3RWL, QRP Corner by Dick Pascoe G0BPS, and From my Notebook covering electronic techniques and circuits by Dick Pascoe G0BPS. Equipment reviews, construction and conversion projects, special features, 'Radio Today' covering the latest news, and so on.

To find out more about becoming a licensed amateur, write to your local government department covering radio communication or to your national radio society. In the UK, contact the Radiocommunications Agency, Waterloo Bridge House, Waterloo Road, London, SE1 8UA requesting a copy of their free publication 'How to become a Radio Amateur' and the 'Novice Licence Information Sheet' from their library, or contact the RSGB (Radio Society of Great Britain) whose details are in the 'Club News' section each month. Alternatively, see if you have a local club featured in 'Club News', all those we list are active go-ahead clubs who'll be pleased to welcome beginners.

GD4OEL and members of the ARE club for their radio stations, the Warden of Eary Cushlin Mr. Scarlett, and the I.o.M. Post Office for the HMS Bounty QSL cards for the event.

GB4MSS/VP8 at the South Pole Expedition

As part of the Pentland South Pole Expedition, Morag Howell, GM0MUV/VP8CNE, is accompanying Sir Ranulph Fiennes and Dr Mike Stroud, to handle communications from the expedition base camp in the Patriot Hills region of the British Antarctic Territory. Sir Fiennes and Dr. Stroud will be attempting to walk unsupported across the Antarctic – a distance of some 2000 miles, their only communication being with Morag at the base camp. When she's not communicating with the team, Morag will be able to operate on the amateur bands when time permits, using the callsign GB4MSS/VP8 which has been specially issued by the Radiocommunications Agency. The camp will be located at approximately 80 deg south, 81 deg. west, at around 686m above sea level.

In 1990 as part of a fund raising campaign for the Multiple Sclerosis Society the 'North Pole 90' expedition raised over two million pounds, and they hope to raise the same amount this time. Morag will be trying to contact as many amateurs as possible during her three month stay. She'll be active on SSB only on all HF bands, until around the 10th February 1993. QSLs should be sent to the UK GB series bureaux only.

4 OF THE BEST

TOP HF TRANSCEIVERS...

Kenwood TS-850S

Kenwood's digital technology gives the TS-850S HF transceiver a great specification to match the best of this type of Ham equipment. Features include; a useful built-in preprogrammed automatic antenna tuner option, Kenwood's Advanced Intercept Point system for enhanced dynamic range, 100 memory channels with 3 scan modes, Direct Digital Synthesizer (DDS) and digital PLL system to permit ultra-fine (1Hz) tuning, plus the optional DSP-100 digital signal processor.

The TS-850S has 160m to 10m Amateur band operation with a 100kHz to 30MHz general coverage receiver. Heavy-duty cycle design ensures increased reliability thanks to a large, die-cast aluminium heat sink and high-efficiency cooling fan, especially important for digital mode operation.

Other features include; all-mode RF output power control, RIT/XIT control (10Hz steps), adjustable transmit monitor circuit (SSB, AM and FSK modes), large, multi-function LCD display and digital bar meter, data transfer for master/slave applications, RF type speech processor, High frequency TX boost and 4-step (0, 6, 12, or 18dB) RF attenuator.

Icom IC-735

The IC-735 is just what the Amateur world needs, the most compact and advanced full featured HF transceiver on the market today.

The IC-735's compact size (only 9.5" wide!) makes it suitable for mobile operation in cars, boats and aeroplanes as well as base-station operation.

Features include; All-band operation from 1.8MHz to 28MHz including 10,18 and 24MHz, general coverage receive is from 100kHz to 30MHz. All modes SSB, CW, FM and AM (Tx & Rx) are built-in, the rear panel of the 735 has easy access terminals for AFSK operation. Memory, programmed and mode scanning functions can be activated from the transceiver or the HM-12 fist mic. The IC-735 has too much to mention here so contact your Hamstore now for the full story.

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IC-728

The ICOM IC-728 is equipped with basic features plus additional functions required for HF operation such as passband tuning and a speech compressor. Even though it's specifications are nearly the same as those of larger transceivers, the IC-728 is also compact enough for mobile and portable operations as well as fixed operation. Moreover, with a minimum of switches and controls it is very simple to operate, a point appreciated by both novices and experts alike.

Features include: all-band, all-mode transceiver with general coverage receiver, DDS system for increased scanning speed, 26 memory channels, 3 scanning functions, band stacking register, optional antenna tuners, 10Hz minimum tuning step, dual VFO, CW break-in, RIT, noise blanker, dial-lock, selectable AGC time, built-in preamp and attenuator. There can be no doubt that the IC-728 represents superb value for money, and it could be yours!

Yaesu FT-890

By blending the high performance digital frequency synthesis techniques of the FT-990 and FT-1000, with the convenience and affordabilty of the FT-757GX, the result is the excellent Yaesu FT-890. A built-in automatic antenna tuner option and many other convenient functions make this budget HF transceiver ideal for both base and mobile station operation.

Features include; two DDS's and a magnetic rotary encoder to provide smooth tuning, wide receiver dynamic range between 100kHz and 30MHz, choice of two automatic antenna tuners each with its' own microprocessor and memories, IF shift and IF notch for interference rejection, duct-flow cooling system, 16-bit main CPU, digital voice contesting and the FC-800 antenna tuner remote control.

Options available; FP-800 AC power supply with loudspeaker, MD-1c8 desktop mic and TCXO-3 master reference oscillator, all at your Hamstore now!

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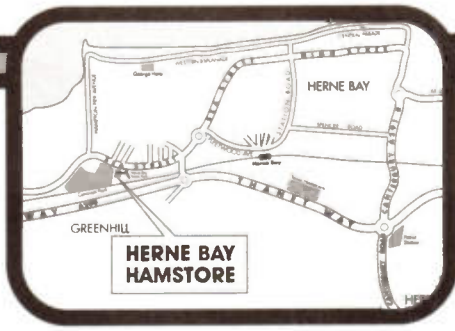
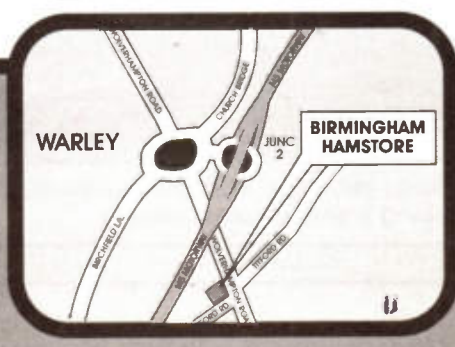




Plenty of goodies on display

Novice Instructor Dennis G4SOT starts them at a young age

Surplus gear for sale at half price

Birmingham 'Radio Hamstore' Open Day

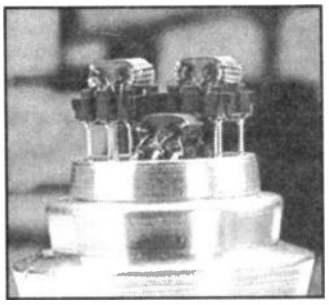
Saturday September 12 saw the official 'opening' of the 'Radio Hamstore' in Warley, near Birmingham. The HRT Ed and Tech Ed went along to meet Gordon Adams G3LEQ and John Baxter G8VIQ who ably man the store. Along with the many visitors present we joined the staff in a glass of 'Bucks Fizz' whilst taking a look at the goodies on offer. These ranged from transceivers and accessories from all the usual 'big name' Japanese manufacturers, right down to surplus one-off 'clearance' goods such as aerials and the like being sold at half price (Gordon said he was also open to alternative offers!). Chairman Paul Nicholson G3VJF together with Dennis Goodwin G4SOT and Matt Gainsford 2E1AWE, from Icom (UK), also came up for the day to chat to visitors, and Dennis (who is a Novice Instructor) was caught in the act of 'starting them off early', see the photo! Sheila G8IYA was even asked to autograph a copy of HRT brought along by an amateur especially for the occasion, and Chris G4HCL answered plenty of queries on the technical performance of the variety of transceivers on show, most of which having been reviewed in HRT. For visitors wishing to check their rigs out, the store had laid on technical measurement facilities including power meters, signal generators and a spectrum analyzer, and we saw their engineer was certainly kept busy for much of the day.

The 'rig check' area was very popular

'Radio Hamstore' staff Gordon G3LEQ (left) and John G4VIQ (right) welcome visitors

The 'Buck's Fizz' seemed quite popular!

Product News



Balun Transformers

Cirkit now stock pre-wound Balun transformers from Toko, available double balanced mixer, distributor, and directional coupler configurations. Cirkit say the transformers are wound with bifilar wire to give a good degree of balance. Supplied for either PCB or surface mounting, the core material is chosen for wide band applications, typically 6-600MHz, with individual examples up to 1.3GHz. The range of applications include impedance matching, double balance mixing, signal splitting, wide band transformers, distributing and coupling of RF signals.

For further information contact Cirkit Distribution Ltd., Tel. 0992 441306

Voice Keyer and Audio Memory unit

The US firm of J.Com have announced the availability of their *Ventriloquist* voice keyer and audio memory. It is based on the ISD series of integrated circuits featuring direct storage of analogue signals in non-volatile electrically erasable programmable memory. J. Com tell us this new technology has significant benefits for the storage and retrieval of speech.

Unlike conventional digital voice keyers which convert audio signals to digital representation for storage in conventional memory and then reconstruct them for playback, Ventriloquist records and reproduces analogue signals directly at a rate of 6,400 samples per second, achieving a 2.7kHz signal bandwidth with less than 2% total harmonic distortion.

The unit includes a built-in computer interface which may be connected directly to the printer port of a PC compatible computer, and the interface has been designed to be directly compatible with the *CT* contest program.

The cost of the unit is $124.95 for the assembled PC board without case, and $149.95 with case, not including shipping. For further details contact j.Com, P.O. Box 194, Ben Lomond, CA 95005, Tel. (010 1) 408 335 9120, Fax (010 1) 408 335 9121. Please mention HRT as your source of information.

Receive Converters

MuTek Ltd. announce a range of receive converters for 2, 4, 6, and 10m. They say the converters will be available in both kit and built forms, with optional box kits. MuTek tell us their range will initially comprise of six models, with either 2m or 10m IFs and receive frequencies for 2m, 4m, 6m, and 10m. The first of these models is the RXC 50C, a 6m receive converter with 2m IF, with a conversion gain of 6.5dB, a noise figure of 1.5dB, and an input intercept of 0dBm. The cost of the kit will be £27.50 plus £2.75 p&p, with built models available at £37.50 plus p&p. Details from muTek Ltd., Tel. 0602 729467

CAIRO-8 host rigs

AKD tell us they've launched their first fully converted CAIRO-8 host rigs. Working closely with Dr. Peter Best of Aston University, AKD say they have become the first manufacturer to offer their range of transceivers modified to the CAIRO standard. Of special interest to Raynet members, the rigs are designated the 2801, 4801, and 6801, and are priced at the time of writing at just under £200. Further details from AKD, Tel. 0438 351710.

CYBERSPACE GATEWAY

New Landline BBS

If you're still trying to get to grips with packet radio, you may be interested to hear of a new landline service. The Cyberspace on-line information and entertainment system, accessed via. landline modem, has been designed for both computer/technical professionals and non-technical people. We're told it provides the facilities for downloading the latest public domain and shareware software, set up their own special interest bulletin boards, and chat to others via electronic mail or via real time teleconferencing, even play on-line interactive games. You can even make use of the dating service if you like!

The system is available 24 hours a day, all you need is a PC and a modem, the SysOps who are on line most of the day are a friendly bunch of people (we've chatted to them), they will even give you a guided tour of the system. We've tried the system out ourselves, and we're just waiting to download some of the 6 Gigabits worth of files they have lined up! There is a monthly membership charge of £10, and to gain access all you need to do is dial the system number on 071 580 6433, set your modem to either 300, 1200, or 2400 baud N.8.1. Voice enquiries available from Cyberspace, Tel. 071 323 1552

HamBase database software

The average age of amateur radio licensees in the USA dropped from 51.7 to 50.8 between December 1990 and December 1991. There were 36,570 more licensees in 1991 than in 1990, an increase of 7.3%. 27,347 new amateurs were in the 'Technician Class', reflecting the impact of the USA's long-awaited decision to provide CW-less licensing.

These statistics were obtained from the recently released 'HamBase 1992' database which includes new callsigns issued to the beginning of December 1991. Comparisons are made with the HamBase 1991 data from the same time a year ago. Increases in amateur population were seen in all age categories with the exception of those above 80 years old.

The HamBase 2.00 program, available from the USA firm of j.Com, uses the processing capabilities of your PC to retrieve the name, address, class of license, and birthdate of any of the almost 570,000 licensees in the combined US and Canadian database. A special category for DX stations with stateside QSL managers links the DX callsign to the stateside manager's address, and your QSO information can be used to produce a QSL card label. For further information contact j.Com, Box 194, Ben Lomond, CA 95005, Tel. INT+ 1 408 335 9120 or Fax INT+ 1 408 335 9121.

Zetron Simplex Repeater

Zetron have announced their new Model 19 Simplexor, which they say is small, solid-state audio message repeater. It's designed for installation on a simplex base station or mobile radio, converting this to a 'simplex repeater'. A simplex repeater records and then immediately re-broadcasts any audio message detected on the radio channel. This can expand the coverage area of a system, without needing a costly full-duplex repeater station, duplexer and secondary frequency. Some European amateurs are already using simplex repeaters on the air.

The Model 19 comes equipped with 40 seconds of digital voice storage. As the storage media is digital, a re-broadcast begins immediately, with no rewind time. For further details contact Zetron of Basingstoke, Tel. 0256 880663 please mention HRT as your source of information.

HRT 'Amateur of the Year' Award

Our annual award, this year with a choice of prizes!

The winner will receive their choice of an IC2iE (2m) or IC4iE (70cm) handheld, or an ICR1 wideband receiver as a prize, kindly donated by the London Radio Hamstore

At the 1991 Leicester exhibition, we formally launched the HRT 'Amateur of the Year' Award, the winner last year being Ron Broadbent G3AAJ. Readers of the 'CQ de G8IYA' Editorial in last month's issue will have seen that we're again looking for a suitable 'candidate', and who wins the title is up to you!

The winner will receive an award of an inscribed shield, together with their choice of either an IC2iE 2m handheld transceiver, an IC4iE 70cm handheld transceiver, or an ICR1 handheld wideband receiver. The prize has been kindly donated by the newly opened London Radio Hamstore (who also have Hamstores in Birmingham and Herne Bay), and our thanks go to the *Radio Hamstore* group for their kind provision of the winner's superb prize. We'll also make sure the proposer of the award winner receives a small 'token gift' as a 'thank you'.

Down to the award itself. From original feedback received from our readers, here are the rules for the award which we've kept as simple and open as possible. If you don't wish to deface your magazine by cutting out the nomination header on this page, then just drop an SAE to the address below and we'll be pleased to send you a further header form.

The Award Rules

1) This is an annual award made to the amateur who, from nominations received, has voluntarily helped amateur radio in his/her own way, significantly in the recent past.

2) The award is open to any licensed radio amateur or listener, of any age.

3) Nominations for the award, which must be in writing headed by an official form published in or by the magazine, may be made by any person. In addition, on separate sheet(s) the nomination must give full and complete details on why the nominated amateur should be considered for the award. HRT will at their discretion seek further details from other sources to confirm eligibility.

4) Any commercial or organisational interest in amateur radio does not exclude the nominated amateur, however the award is granted purely on the amateur's voluntary efforts. Regular/non-regular contributors of any publication, including HRT, are eligible in the case of their voluntary work, although direct employees of Argus Specialist Publications are excluded from the award.

5) Nominations for the award should be sent to; HRT Amateur of the Year Award, P. O. Box 73, Eastleigh. Hants. SO5 5WG. These should be sent to arrive prior to 1st March 1993 if possible, although late entries will be accepted until 10th March 1993. The winner will receive an inscribed shield together with the prize of his or her choice of an IC2iE 2m handheld transceiver, an IC4iE 70cm handheld transceiver, or an ICR1 handheld wideband receiver.

HRT Amateur of the Year Award

Official Nomination Header

I wish to nominate; _____
for the HRT 'Amateur of the Year' Award.

My Name; _____

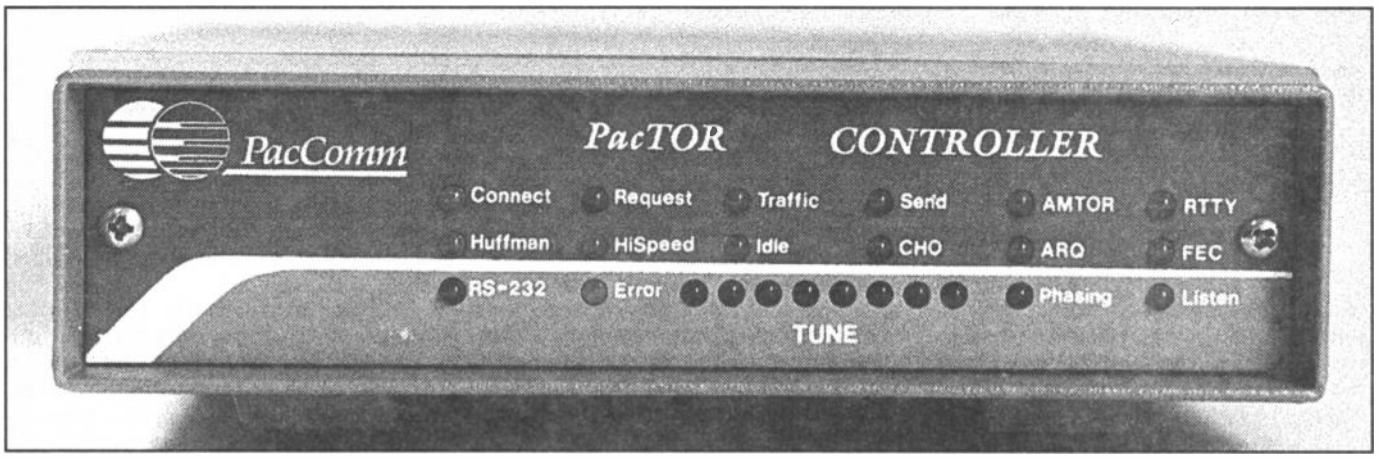
My Address; _____

_____

My Tel. No. _____

Review – PacComm Pactor Controller

Chris Lorek G4HCL decodes HF signals buried in the noise with PacComm's latest offering



Pactor controller kits have been around for a while, and recently fully built and tested units have become available. The mode has now grabbed the attention of the 'big firms' in amateur data communication, and here's the first offering from outside Europe in the way of a commercially built unit for Pactor.

What Is It?

For the uninitiated, Pactor is one of the latest error- free methods of amateur data communication. It's primarily intended for HF use, and was originally designed by a German amateur radio group, particularly DL6MAA and DF4KV (see this month's packet radio Roundup for a brief explanation of the mode's capabilities). The PacComm Pactor controller, reviewed here, is produced under licence from the developers, Special Communications Systems (SCS), and PacComm tell me it's compatible with the German firmware, with all commands and messages being in English.

Pactor is a remarkable data mode, it's possible to have contacts with very little power or simple aerials without the need to be a 'monster signal'. Signals that are right down in the noise can be decoded, the Pactor controller doing all the work in a similar manner to a VHF packet TNC. As such, a simple 'dumb' terminal is all that's needed as an operator interface (but see later). An internal mailbox also allows messages to be stored either by you for other amateurs to read, or for others to leave you messages during times when you're otherwise engaged. Messages are stored in the battery- backed static RAM, the maximum capacity of the mailbox being 21006 bytes, with a maximum of 31 files permitted, which should be plenty for most needs.

Other Modes

As well as Pactor, the controller also supports two other popular HF data modes, AMTOR and RTTY. Indeed, when the unit is in 'standby' will accept a call in either Pactor or AMTOR, and automatically respond in the correct mode. If you'd like to operate on VHF packet as well, the unit comes ready to accept an optional packet modem card to allow this as well as the HF modes. The packet upgrade consists of a pre-assembled and tested packet modem card and a new front panel for the unit. You just need a screwdriver, rather than any soldering iron operations to fit this, and this adds a separate radio connector to the rear panel for the VHF FM packet radio. The resultant packet mailbox is maintained separately from the Pactor personal message system.

CW Keyer

As well as the above data modes, the controller also contains a CW keyer function, compatible with the Curtis 8044A. A unique feature is that AMTOR and RTTY software in the Pactor controller can be completely controlled with the keyer paddle, which therefore makes a keyboard unnecessary! In CW mode the controller decodes and displays the received text, and for transmission either a single lever or a squeeze paddle can be attached, each giving dynamic dot/dash memory facilities with crystal-controlled speed selection.

Indicators

The front panel of the controller appears rather more complicated than most, with 16 LEDs plus a bargraph tuning indicator. Here's what the array of LEDs indicate;

HISpeed; 200 baud speed in use,

Send; You're the 'send' station,

CHO; A 'Changeover' is taking place, the LED goes off after confirmation of the changeover by the other station,

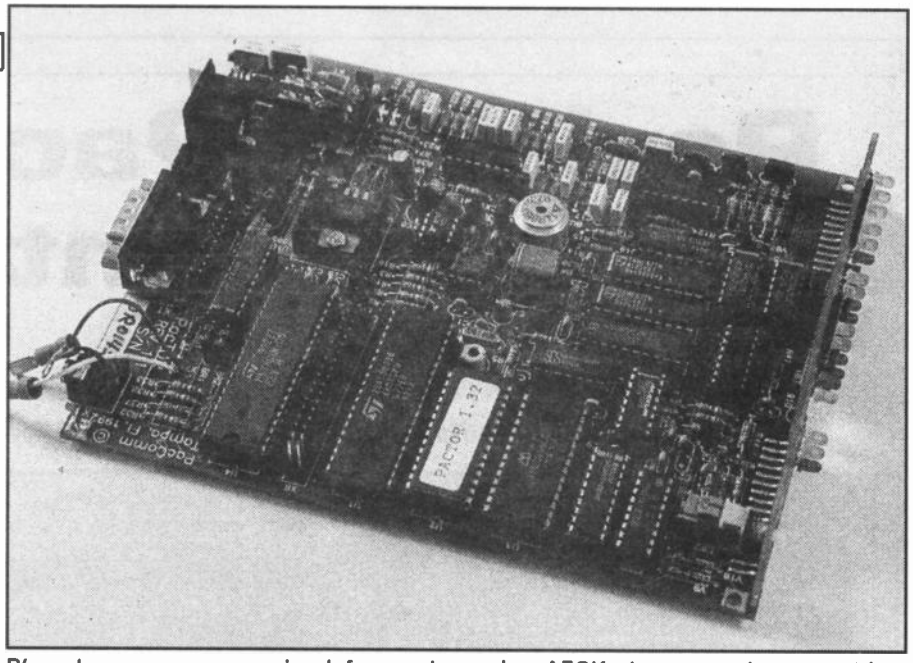
Connect; A link to the other station is established. If a remote station contacted you in your absence, this LED blinks until you issue an RS-232 command, and when there's a message in the unit's internal mailbox the LED flashes at a slower pace,

Traffic; The system is in transmit with no repeat requests pending,

Idle; At least one idle character present in the current data packet,

Request; The other station is requesting a retransmission of the last infor-

mation packet or control character,
Error; A dual colour LED, lighting red when a received packet or control contains bits with errors and can't be decoded properly, and green when a packet was reconstructed by memory ARQ,
ASCII; Packets sent or received with normal ASCII coding,
Huffman; Packets sent or received with Huffman data compression,
RS-232; As well as acting as a 'power on' LED, this flickers slightly with RS-232 activity,
AMTOR; Indicates AMTOR mode,
RTTY; Indicates RTTY mode,
ARQ; Indicates AMTOR Mode 'A',
FEC; Indicates AMTOR Mode 'B',
Phasing; Indicates AMTOR phasing is taking place,
Listen; Indicates AMTOR Mode 'L',



On The Air

To get going, I first needed to make up a lead between my radio, terminal, and 12V DC power (although ready-made leads can be supplied for this by the UK PacComm distributors on request). The radio interface lead, which is normally the trickiest, I found was a straight pin-for-pin connection between pins 1 and 4 of a five pin din plug at each end of a multi-conductor cable to interface to the FT-990 in my shack. This was unbelievably simple, I guess someone, somewhere, in the PacComm design department must have done their homework! Likewise, the RS-232 lead was a pin-for-pin connection between two 9 pin D type connectors to interface with an AT computer.

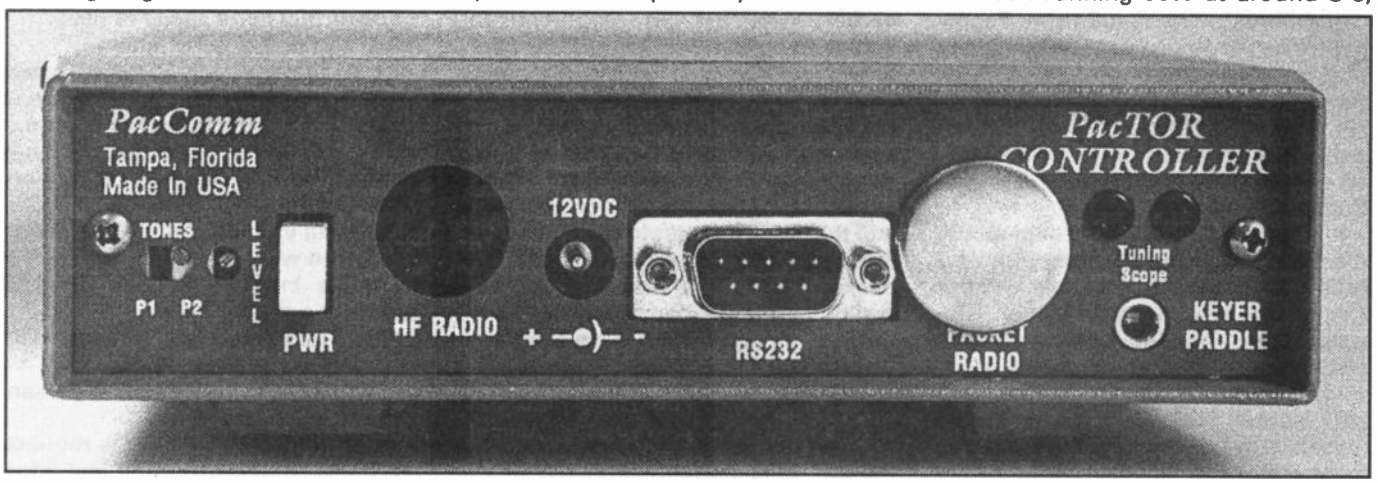
Confident that I'd done everything right, I switched on, and tried it out in Pactor 'listen' mode using a simple terminal emulator program. I quickly found some Pactor signals, but why were all these funny 'face' symbols coming up on the screen? After a while, I found that the unit was shipped with the internal software set for split-screen mode, giving out 'CTRL-A' and 'CTRL-B' codes on every received frame. I should have read the instructions! However I must say that the handbook that came with the unit was not the most helpful I'd seen, conversations with other users confirming this, and I would have had to have read and understood it all end to end to have found this. Likewise when I tried to get the unit to key my transmitter. Despite checking all my wiring, I found I had to open the unit to up change some links, as it came supplied to control an optional internal solder-in relay (which didn't come as standard) for TX/RX switching. Well PacComm, you don't win this month's 'get you up and running quickly' award.

However, after a several hours of reading, checking, and re-linking everything as needed (a couple of days in all), I was finally convinced that all was well. So after tuning to the appropriate frequency and checking that it wasn't in use, I typed the magic words 'CALL DF0THW' on the keyboard to access that BBS. Surprise, surprise, it came straight back, and from then all was well. Switching to 'Packet' mode with LSB on the FT-990 centred the 500Hz passband filter perfectly for the mode using AFSK, the transceiver matching perfectly with the controller without the need for any modifications in either unit.

The controller's LED tuning bargraph I found wasn't just the 'tune for LEDs at either end to be lit' type, which often indicate only one demodulated frequency at any time. Instead, I found it also very usefully displayed the audio frequency of any QRM which came up during QSOs, i.e., the 'inner' LEDs also lit with QRM or noise present. This made it very easy for me to see what was going on, and to tune the IF 'notch' filter or whatever on my rig to compensate.

The unit was well screened with its metal case and metal end pieces, although I found some amount of 'hash' was evident on 20m and above, coming from the unit's screened RS-232 lead, also when I switched in my 3-500Z linear I occasionally saw a 'COMMAND ERROR' displayed on the screen. A few ferrite toroids on the leads from the unit quickly cured both effects.

However with 100W from my rig on 80m and 40m, the unit performed faultlessly. As a 'test' when receiving a mailbox running 50W at around S-3,



i.e., a rather weak signal, I gradually reduced my output down to 10W and found that, although the 'request' LED lit rather more often telling me the other controller was requesting a re-transmission, I still got through without fail. The most significant thing I found was early one morning on 80m, as the band was 'closing' to European propagation. I was downloading a file from the German mailbox DK0MHZ when I found the going was starting to become slow. Turning the receiver volume up showed that *absolutely nothing* except receiver noise was audible, yet every third or fourth (inaudible!) packet frame was resulting in another batch of error-free characters coming up on my screen! I found this QRM-fighting performance to be true throughout the review period, and I spent many happy hours downloading programs, messages, and sending replies to amateur friends both old and new using various continental BBSs, as well as having one-to- one QSOs with amateurs throughout the world.

Insides

The controller operates from a DC source of 11-14V and requires 300-400mA. The transceiver interface connector can be used as a DC supply input with suitable internal linking, if you don't wish to make up more leads than necessary.

For the technical boffins amongst us, the processor is a Z80 CPU running at a clock frequency of 6.144MHz. A 'real time' clock is buffered from the lithium battery, so the external power supply can be removed without risking loss of time information and memory contents, the time and date need only be set once.

In use, receive audio is converted to a frequency dependant DC voltage, which is processed by an ADC (Analogue to Digital Converter). Before this detector, an active 4th order high pass filter with an 1150Hz cutoff frequency is used, plus a switched capacitor 7th order low pass filter. The low pass parameters have been optimized for 200 baud Pactor, additional low pass action is done by software processing of the ADC input samples.

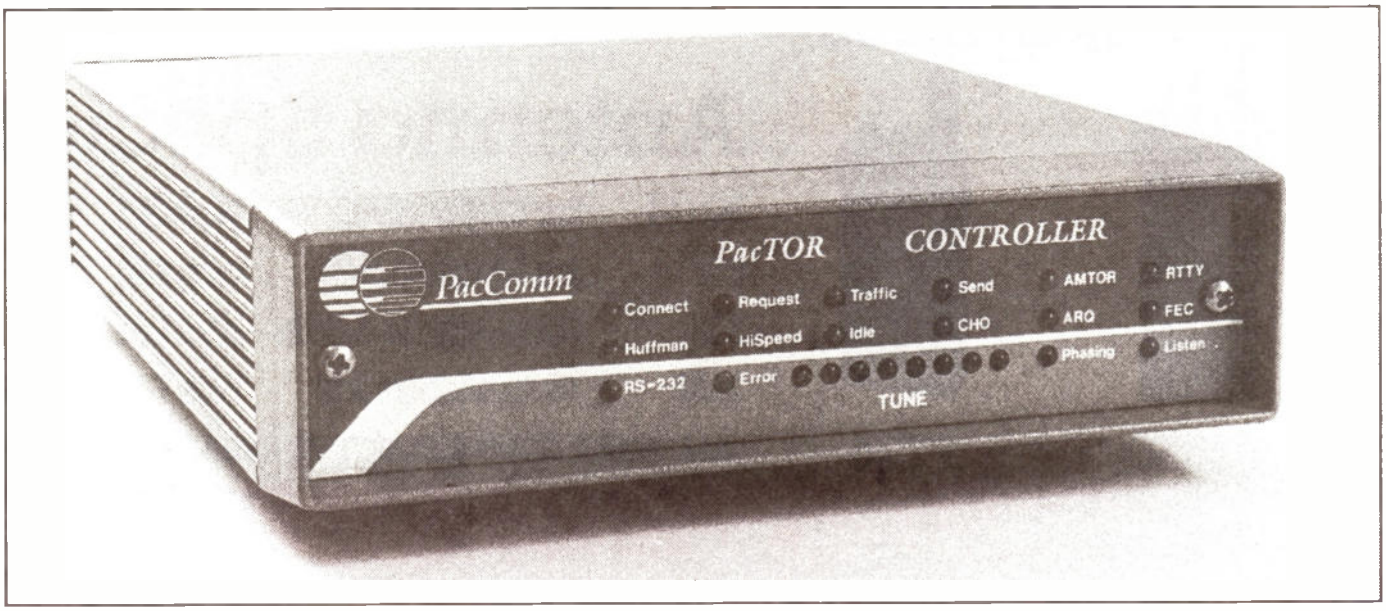
Memory ARQ

The controller performs memory ARQ (see this month's *Packet Radio Roundup*) using an 8 bit ADC as well as a normal 'trigger' stage. The filtered receive signal is converted to 0/1 data as usual, but is also stored as a sequence of 8 bit values. If the 0/1 data doesn't give a correct packet, i.e., from the CRC check, then the stored 8 bit values from subsequent repeats of the packet are combined into a 'sum' packet and then subjected to a 0/1 evaluation and data check. Hence the superb decoding performance I found on-air.

Conclusions

I spent many, many pleasant hours on air with the unit, and after having seen its superb capabilities, I'm now a confirmed Pactor enthusiast. The handbook isn't written for the 'absolute beginner' and could be better I feel. However, used with one of the amateur-written public domain dedicated split-screen programs designed for the unit, it was far, far easier to use, I'd certainly recommend either *PTERM* or *PTCT* which I used with the controller, another being PT. The Pactor controller unit isn't exceptionally cheap at £259 although this equates to other units of similar capabilities, however for this you do also get AMTOR, RTTY, and automatic CW operation, plus the option of VHF Packet as an add-on. I liked it and I was sad to have to return the unit following review, but I'm starting to save up to get going on the mode!

My thanks go to Siskin Electronics, who are the UK PacComm distributors, for the loan of the controller for review.



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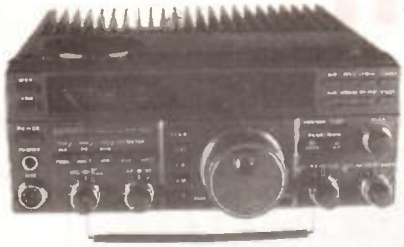

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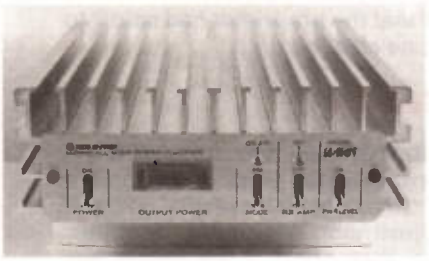

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Where Do You Buy Your Rig From?

Sheila Lorek G8IYA gives a 'buyers guide'

In today's amateur radio marketplace, there are many different places where you can buy your equipment, many ways of paying for it, and of course many different eventual prices for a given piece of gear! The matter of buying a new rig isn't that much different than buying any other relatively major new item for yourself, be it a hi-fi, washing machine, or even a new car. Amateur radio is however a rather more specialised market, resulting in a virtual absence of the 'pile 'em high and sell 'em cheap' discount stores.

Decisions, Decisions

The first thing you need to do is to decide what rig you want to buy in the first place. HRT reviews give a good idea as to the real performance of the latest all-singing all- dancing wonder boxes, and manufacturer's product leaflets and catalogues will give a greater idea of the complete number of functions offered. If you're still undecided though, or maybe if you'd prefer a 'hands on' approach to choosing which rig from a 'short list', then you'll need to pop along to your local (or not so local) amateur radio dealer.

Phoning around will tell you which dealer has the rigs on show that you're interested in, and nowadays it's common practice for even the 'main distributors' of one make or another to freely sell equipment from a number of manufacturers. Not so long ago, you wouldn't see a new Icom or Yaesu rig in a Lowe Electronics shop for example, but times change. Check to see if the shop has facilities for you to try the gear 'on air', including aerials for the bands you're interested in. Larger dealers may even 'leave you to your own devices' for a while to let you have a few QSOs, with just a discreet check from time to time to see all is OK. Play your cards right and they may even bring you a cup of tea or coffee while you're tuning around!

Large or Small Dealer?

There's much to be said for going along to your small 'local independent dealer'. You often get a more friendly personal service, and as these shops are generally staffed by the actual owner, more often than not they like to maintain a good reputation in the marketplace by offering good advice on what's best for you. I know of several such dealers I would certainly recommend, like the one I used to live near to in Lancashire which was manned by the proprietor himself. He had the customer's interests at heart even if it meant him losing a sale occasionally. But I know of one or two I most certainly wouldn't have recommended a while ago. Like the one a 15 year old lad (who's now G4HCL) made a 100 mile bus and train journey to on the 'other side' of the Pennines with hard-saved cash in hand, to buy a receiver he's arranged by phone the day before, only to find that the proprietor had sold it to someone else.

Service

Whoever you buy from, if it's a fairly complicated piece of equipment you'd rather not 'delve inside' yourself for adjustment, alignment, or minor repairs, then check if the dealer has workshop facilities, and the technical knowledge or staff, to do this should the need arise. It's difficult of course for small shops to have arrays of signal generators, spectrum analyzers and the like, and here comes the advantage of an 'authorized dealer' for the make of equipment you're buying. They then have the backing of the importer for major service jobs, and of course for access to the many specialised parts that make up today's rigs.

Mail Order

If you definitely know what you want, then a purchase by mail order can be convenient if you don't live near to a dealer, or if you want to play the 'getting the best deal' game by phoning virtually everyone for the best price. There's one important point, and that is not to take the advertised price as the 'last word'. Phone and talk to the dealers, and ask them. Sometimes, currency

fluctuations may either increase or decrease the actual price you'll need to pay from the advertised price, this can change week by week. Also, many advertised prices are 'recommended', which you can bargain from depending on how you're going to pay. If there are any traders out there bemoaning me suggesting this, then think when was the last time you paid the full 'list' price for a new car?

In the past, some dealers were well known for rigorously sticking to the list price, indeed I bought my first ever 2m rig from one such firm in the Midlands, and very pleased I was with the overall service. They fitted all the crystals I wanted (which of course they took the trouble, and costs, to hold in stock) and aligned them on frequency while I waited, even replacing some of the 'fitted as standard' frequencies which I didn't want with alternatives at no extra cost. I left feeling very happy. Established firms don't become established by offering poor service, high prices, and poor backup.

You Get What You....

The moral to the above is, more often than not, you get what you pay for. If you want good advice, helpful service, and a firm that looks after you when you've gone away with your shiny new rig should you have any questions, then the money for this must come from somewhere. Its morally wrong, very wrong, to 'do the rounds' of dealers in choosing a rig and picking up leaflets and catalogues, which cost the dealer hard cash to give to you, plus the manpower, premises, heating, lighting and so on, and then to buy a rig from someone offering a better price but without these overheads. Human nature being what it is there will be little to stop it, except of course when you need that rig repairing a year or two later, or knowledgeable advice on what add-on filter you need for such-and-such a mode, and 'how do I connect this do-everything data terminal to the rig?'. This is when you're on your own, as shopkeepers have memories, especially when you've taken up a lot of their time in the past and then bought elsewhere simply to get it a fiver cheaper.

With sets being sourced from varied markets to be sold in the UK by different dealers, it would be wise to ensure that you compare 'like with like'. A few years ago, a popular low-cost HF rig was normally sold fitted with CW, SSB, and AM filters 'as standard'. One dealer who was famed for 'doing his own thing' (like others, they went 'down' recently leaving purchasers without any comeback) started advertising the rig at a 'knock down' price. Amateurs

bought them, finding that the CW and AM filters weren't fitted but were 'optional extras', which did rather negate any savings supposedly made in the first place!

Buying within the EC

Notwithstanding the above, now that trade barriers are down for European Community amateurs, the thought of 'shopping abroad' can be quite tempting. However, with most amateur transceivers being made in the Far East, most countries in Europe will have similar costs in importing these, and you'll probably find, as I have done, that there's very little difference in price, often not enough to warrant buying abroad. However if you do buy abroad and bring the rig back through customs yourself, for EC nationals travelling within the EC I'm informed there will normally be no need to pay duty or VAT as long as it's for personal use (but check first!). Instead, customs officers will have a list of 'minimum indicative levels' which you may bring through, and if you're coming into the UK by ferry from the EC, the common 'Red' and 'Green' channels won't exist any more at channel ports. If you're coming in by air, then non-EC citizens will still have to go through the 'Red' or 'Green' channel, but EC citizens will go through a new *'Blue'* channel where customs officers will have the right to make spot checks. Your colour-coded baggage label will show them where you've come from. Don't forget that countries such as Switzerland and Austria aren't members of the EC, this is important to remember if you're buying at the annual Friedrichshafen rally which is near the German/Swiss/Austrian border. Also, even if you're just coming back from across the channel for the day, remember your passport, although France and Germany will virtually abandon frontier checks you'll need it to get back into the UK!

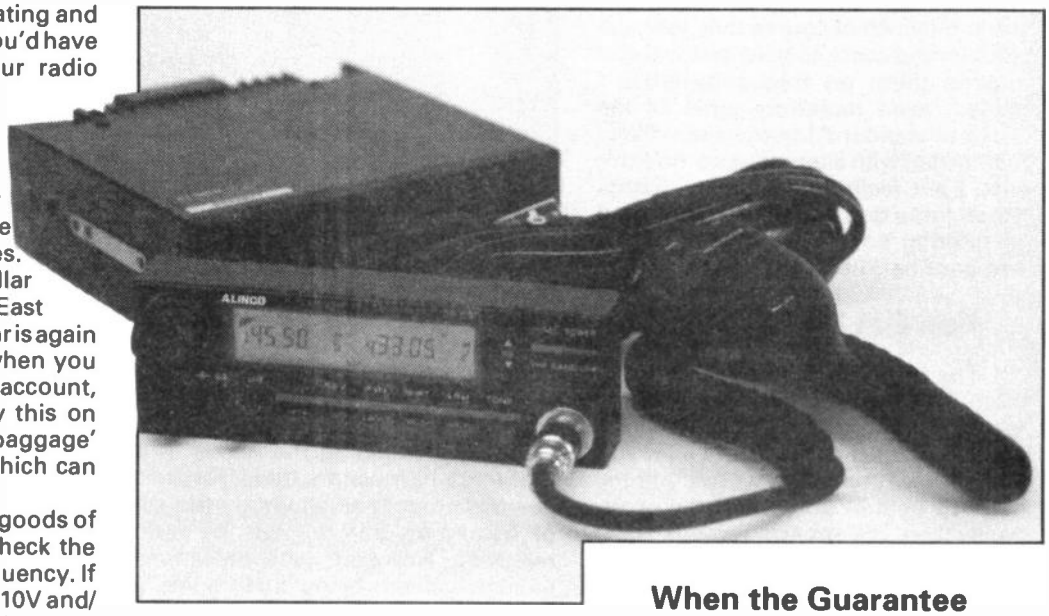
The disadvantages of buying from a different EC country are, to most amateurs, fairly obvious, such as carriage costs or the need to physically carry the gear yourself. Also, the guarantee you get with the set could mean that bit less once you've taken the set home. If you find the rig doesn't work, you have the expense and delay of shipping it back, and you'll be without the rig longer than if you just had to 'nip up the road' with it. You'll probably find with mains operated rigs that they'll operate OK on the UK's 240V supply, again check before purchase, and with VHF/UHF rigs you'll normally find that band coverage, channel steps, 1750Hz repeater access toneburst and the like is the same as the UK. Some handbooks even come in multi-lingual format, but again check that 'normal' accessories such as a handheld nicad pack, charger and so on, are included in the price if you're comparing with the same for the UK. Each dealer in each country can sell what they like, to a certain degree, and what you get 'as standard' in one country may not be the case in another.

From the USA

With the currently very cheap transatlantic air fares, more European families are taking the advantage of going over there for their annual holiday. There have been many stories of the numerous 'bargains' to be had, especially in computer equipment and

clothes, plus the low cost of eating and hotels, compared with what you'd have to pay over here. In amateur radio equipment terms, you'll find that second hand equipment doesn't hold its price at all well in the USA, and real bargains can be had. You may find the same with USA-made amateur gear and accessories. But with the current pound/dollar exchange rate, the cost of Far East sourced new amateur radio gear is again not that much of a bargain when you take UK duty and VAT into account, remember you'll need to pay this on your return, plus any 'extra baggage' airline costs before you fly which can be incredibly high.

If you're buying electrical goods of any description over there, check the operating voltage and the frequency. If it's designed to only work on 110V and/or only 60Hz then it's of little use - putting 50Hz into a large transformer designed only for 60Hz, even if the voltage is correct, tends to make it run rather hot! For VHF and UHF FM rigs, ensure you can get them to tune in the required 12.5kHz/25kHz steps we use over here, rather than 10kHz, 15kHz or 20kHz, and check that it has a 1750Hz toneburst or can be programmed for one - some can't.



Paying For It

Finally, you'll have to decide how to pay for your rig wherever you buy it from. Cash is the 'universal' currency, and you can sometimes strike a good deal that way in the UK because the dealer may be able to save bank charges. But use your common sense, don't start walking around with a suitcase full for example, and beware, of course, the rally stand trader who you don't know and who insists on cash only for that expensive rig he can't demonstrate working! If you don't have the cash, HP can usually be arranged 'on the spot' with some dealers, and if you're paying by cheque then remember to take some additional identification with you for larger purchases.

Credit cards can give you an amount of security for purchases over £100, and are very useful for buying from abroad by mail order. Some cards even give you additional protection such as accidental damage insurance for goods bought with them. But this all has to be paid for somewhere along the line. Dealers must pay a percentage of the value of the purchase to the card company, and are often faced with additional costs in verifying the transaction. Some are now, quite legally, adding a percentage 'premium' to the price for buying with a card, so make quite sure you understand what the final price will be. I once went through the rigmarole of deciding what to buy in a shop, after seeing the various price labels, and at the counter finding the credit card slip was made out for a higher figure. On querying this, the shopkeeper pointed to a small sign on the side of the till indicating a surcharge for card payments, which of course customers only saw when they finally went to pay!

When the Guarantee Runs Out

So you've bought your rig, and for whatever reason it needs fixing and you can't take advantage of what was the guarantee. You'll probably find that most amateur radio dealers with repair facilities, will be happy to repair your rig for you, at a charge. They may or may not have a policy of charging their own customers or those of their authorised dealers a different rate to those who have bought their rigs elsewhere, maybe in the form of a 'tiered guarantee' (I wonder if anyone's thought of that yet?), but I don't know of any recently who have been refused service. We're also now seeing the dawn of the 'specialist repair centre' for amateur gear, which may be worth investigating should your rig need looking at. There sometimes comes a point when it becomes uneconomic to repair down to 'component level', and 'board changing' can be a way of keeping overall costs down. Here, access to such replacement boards can be important as well as technical knowledge and test equipment, so again, check out your intended repairer.

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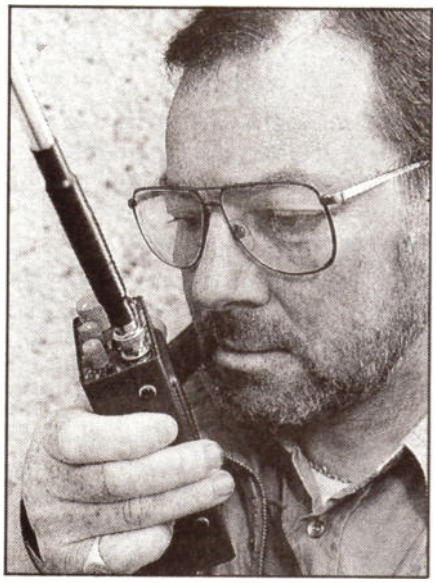
JIM 20m Handheld Mini-Review

Dick Pascoe G0BPS goes on the handheld HF QRP trail



G0BPS tries the set on air

Low power operating has become a way of life for many British Amateurs. Not for them the all singing, all dancing 'black boxes' from the Far East, as many QRPers build their own equipment, often from magazine articles. But every now and then a commercial transceiver reaches the Amateur market. The well known, but sadly missed Heathkit range of transceivers was perhaps the epitome of cheap commercial equipment in kit form.

Most commercial radios on offer today from the 'big guns' of the hobby do offer the facility of reducing the power, but not to our QRP levels. Usually they will go down to just 10 watts or so and not below.

Many readers will remember the earlier Mizuho range of SSB/CW transceivers. Sadly the name has now gone, but recently the radios re-appeared, now badged as 'JIM' transceivers. I had the facility to try one of these following the recent RSGB exhibition at the NEC, these are my thoughts.

First Impressions

There are presently versions available for the 40m and the 20m bands, I selected the 20m version to test as I felt that this band would prove the most popular to prospective purchasers. A couple of other G-QRP club members had also used them, so we could swop stories and comparisons.

For those who are used to the moulded plastic of eastern handhelds, the pressed steel of the JIM may be a disappointment. But it does have its advantages, the screening is good. The paint work also looks as if it will scratch easily, but this model lasted very well. If you're used to a simple 2m handheld the top control panel will seem cluttered, but the more ardent QRPer will be well used to the facilities provided in this very small space of 65mm x 40mm, I found it was quite easy to use. On the top panel are the noise blanker switch, the RIT (Receiver Incremental Tuning), VXO tuning (Variable Crystal Oscillator) and the volume control. Below the switches are the band select, to select one of the crystal ranges, a BNC aerial socket, speaker-mic socket, an 'S' meter and the CW keyer button. On the bottom of the set are further switches and sockets for an external key, external power/nicad charger, SSB/CW mode, and receiver attenuator on/off.

In Operation

Using the optional set-top telescopic aerial I had many pleasant hours listening to various station on the band on both SSB & CW, but I found that to capture a QSO was not that easy. I added an external aerial, a Cushcraft R5 vertical which is a full 1/4 wave on 20m, and the set sprung to life with several contacts being made across Europe in both modes.

With SSB the set is very much like a 'normal' 2m handheld, just tune to the station you want and press the PTT. The audio quality from the speaker was adequate but some form of amplification would have been nice. The optional speaker microphone was pleasant to use, but in common with many such others the speaker quality was lacking in punch. For those who love to use Morse an external key is a must. After just a few moments using the tiny button on the top of the transceiver my finger went numb and I had to give up!

Each of these adverse comments are just niggles though, overall the set performed well. Comments from the G-QRP gang at Birmingham ranged from the "isn't it good", "Wow, UA9 on a little thing like that", the final comment being from a VU2 worked by Lewis G4SDI, "sounds good Lewis".

The other owner 'in the club' was Ty, GM0LNQ, who took great delight in sitting in his garden, swinging in his hammock, working into the USSR (as it was) with his JIM coupled into a 20m dipole. Ty has had contacts, and kept several skeds with one UA operator, all using his JIM.

The top panel, showing the compact control arrangement

Accessories

The power output from the JIM is stated at 2W, an optional 10W amplifier is available but I didn't test this. Other options include a carrying case with strap, the external speaker microphone (see above), a DC-DC converter, mobile mount, CW semi-break-in and sidetone unit, and the extendible aerial.

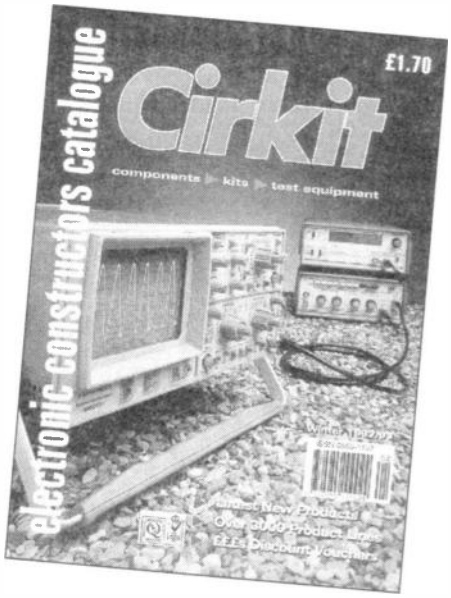
Conclusions

It may seem that I didn't like the JIM, but this is far from the truth, I did like it very much and it is an ideal companion for the traveller. It will easily fit into a jacket pocket and even with several of the accessories will quite easily fit into a small case. The ease of operation with the more 'normal' accessories such as a Morse key coupled to the sidetone unit, and an external aerial ideally cut to a 1/4 wave on 20m, will become obvious.

Many operators will enjoy using this radio, and it will perhaps bring back into the hobby something which may have been missing with other very commercial equipment. It might bring back the fun that is missing in the very serious world we have today. It brought back some of that fun to me as well.

My thanks go to Waters and Stanton Electronics Ltd. for the loan of the JIM 20m transceiver (currently priced at £199 plus p/p) and the associated equipment.

OUT NOW!



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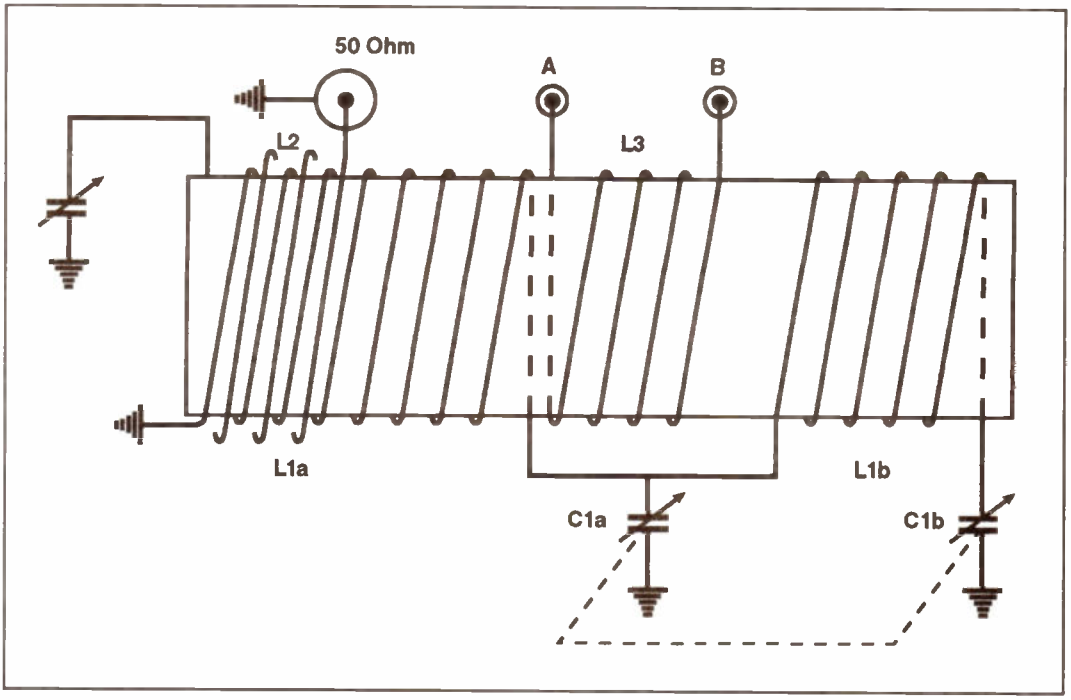
Project – A Versatile Impedance Matcher

Dr. J. A. Share, G3OKA, describes a multipurpose tuner for wideband receivers

The increasing popularity of general coverage receivers has brought to the fore the problem of matching a variety of non- resonant aerials to the universal 50 ohm input impedance required by such units. I carried out a literature search which revealed numerous circuits, all of which doubtlessly perform extremely well but often require either rotary inductors, good quality switches, or expensive toriodal coil formers. But the need to adjust a number of controls on a matching unit to obtain maximum strength of the received signal detracts from the ability of the receiver to cover a wide frequency span in a relatively short time.



Circuitry

I have reconfigured an unusual circuit, developed by the late G2BVN as the output circuitry of a multiband amplifier, as shown in Fig.1. This is an impedance matching unit covering 3 to 30MHz which has no switches, rotary inductors, or toriodal coil formers. There is nothing critical about the circuit providing C1a and C1b in parallel will tune L1a to the lowest frequency required, and L1b will resonate at the highest frequency required at minimum residual capacity of C1b. With the component values given, the unit should cover 3 to 30MHz with some overlap between 10 and 15MHz.

Construction

Both capacitors should be mounted on a grounded metal panel, to avoid hand capacity effects during tuning, reduction drives are not necessary and the values are not critical. In the prototype both capacitors were culled from redundant transistor radios, doubtlessly others would prove equally suitable provided C1a and C1b are greater than 150pF per section, and C2 having a total capacity of 350pF. L1a and L1b should be wound on a 38mm coil former, with a 12.5mm separation between the two windings. L2 is five turns of insulated wire interwound at the earthy end of L1a, and L3 five turns of insulated wire close wound between L1a and L1b.

Aerial Connections

Where the aerial is a random wire then it is connected to 'A' on L3, with 'B' connected to ground. If the aerial is a balanced system using open wire feeders, then one leg is connected to 'A' and the other to 'B'. For use with coax fed aerials such as multiband trap dipoles, G5RV, or parallel dipoles, the coax centre should be connected to point 'A' on L3 and point 'B' connected to ground. The coax braid may be left floating or strapped to the centre, the former method appears to require less critical adjustments of the two controls.

QRP Transmit Use

Given that small variable capacitors can't be expected to withstand high voltages, this unit *will* also match a low power transmitter to a variety of aerials. Using only 12W, I have achieved excellent results on 30, 17, and 12m with a coax fed 7MHz dipole matched using this unit. However, the L/C ratios are *not* optimised over the tuning range and appreciable power losses may be experienced, suggesting that whilst it fully meets its designed purpose, it may not prove to be an exceptional performer in roles for which it was not designed.

Parts List

C1a, C1b	365pF per section two gang variable
L1a	12 turns 18swg (see text)
L1b	4 turns 18swg (see text)
L2	5 turns insulated wire
L3	5 turns insulated wire

S.R.P. TRADING

SANGEAN ATS 803A

(Direct key-in world receiver with quartz alarm clock timer)

unable BFO SSB/CW!

Specifications and features

★ 150-29.999 continuous tuning with no gaps. Phase locked loop-double conversion Superheterodyne ★ Full shortwave/AM/SSB 150-29999kHz no gaps! + FM87.5-108 mono/stereo ★ Five tuning functions: Direct press button frequency input auto scanning, manual scanning memory recall and manual tuning knob

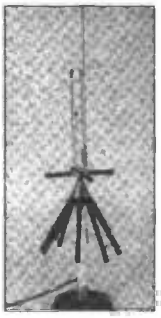
★ Built-in clock and alarm. Radio turns on automatically at preset time and frequency. ★ Large digital frequency display. ★ Fourteen memories – nine memory channels for your favourite station frequencies. Last setting of mode and waveband stored in five memories. ★ Direct press-button access to all 12 shortwave broadcast bands. ★ Two power sources – battery or AC mains adaptor. ★ General coverage of all AM bands in LW/MW/SW (dedicated broadcast band coverage on all versions), plus of course the FM band for quality sound broadcasts in headphone stereo. ★ SLEEP function turns the radio on or off after an adjustable time of 10-90 minutes. ★ Separate BASS and TREBLE controls for maximum listening pleasure. ★ External antenna jack for better reception. ★ Adjustable RF GAIN control to prevent overloading when listening close to other strong stations or if there is interference. ★ New improved wide/narrow filter (6/2.7kHz) ★ BFO control (Beat Frequency Oscillator) enables reception of SSB/USB/LSWB (single side band) and CW (Morse Code) transmissions. ★ Illuminated display to facilitate night-time use. ★ Designed for both portable and desk top use. ★ Five dot LED signal strength indicator.

DIMENSIONS: 29.2cmx16.0cm (11.5inx6.3inx2.36in).
OUTPUT: 1200mW (10%THD) WEIGHT: 1.7kg (3.75lbs) without batteries. Wide/narrow filter switch.

£109.95 + £5 check, test and p&p.

SKY SCAN

Desk Top Antenna Model Desk 1300



Built and designed for use with scanners. Coverge: 25 to 1300MHz. Total height – 36ins – 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted.. Ideal indoor – high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

£49.00 + £3.00 p&p

SKY SCAN

V1300 Antenna

Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

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SKY SCAN

Magmount MKII

For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector. Built and designed for use with scanners.

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YUPITERU

MVT 7000 HANDHELD

PROBABLY THE UK'S MOST POPULAR HANDHELD SCANNER!

★ Receives 8 to 1300 MHz 100kHz-1300MHz (at reduced sensitivity)
★ 200 Memory channels
★ Rotary or keypad freq. control
★ AM/FM/NFM
★ Large display with signal strength ...mete

EACH SET IS SUPPLIED COMPLETE WITH:- Full set of high power NiCads, AC charger, DC power lead and carry strap

January Special Offer - £PHONE

MVT 8000 MOBILE/BASE

This new model is the mobile version of the popular MVT 7000 Handheld above.

★ Receives 8 to 1300MHz, 100kHz to 1300MHz (at reduced sensitivity)

THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with mains power unit

January Special Offer - £PHONE

MVT 6000 MOBILE/BASE

An economy version of the new MVT 8000 above housed in the same case.

★ Receives 25-550MHz, 800-1300MHz
★ 100 Memory channels

January Special Offer - £PHONE

AIRBAND RADIOS

This month we are pleased to introduce **THE WORLDS FIRST DEDICATED CIVIL/MILITARY AIRBAND RECEIVER, THE VT225.**

A powerful pocket scanner that leaves the competition standing. - A super sensitive set designed for optimum performance on the Civil/MilitoryAirbands.

★ Receives 108-142 MHz Civil Airband 222-391MHz Military Airband 149.5-160MHz Marine Band
★ 100 Memory channels
★ AM/FM on VHF
★ Priority channel function

EACH SET IS SUPPLIED COMPLETE WITH:- NiCads, earphone, carrying strap and mains charger

January Special Offer - £PHONE

VT-125 UK CIVIL AIRBAND RECEIVER

Using the same technology as the VT-225, this set covers the full Civil Airband - hearing distant signals that are inaudible on some other scanners.

★ Covers 108-142MHz
★ 30 Direct entry memories
★ Search steps 25, 50, 100kHz SUPPLIED COMPLETE WITH NICADS AND UK CHARGER.

January Special Offer - £PHONE

FAIRMATE

HP2000

STILL ONE OF THE MOST POPULAR HANDHELD SCANNERS ON THE MARKET.

Over the last year the HP2000 has outsold almost all other models.

★ Continuous coverage from 500kHz to 1300MHz
★ 1000 channels of memory
★ Keypad or rotary control
★ AM, FM and WIDE FM modes
★ Search steps from 5 to 995kHz

EVERY SET COMES COMPLETE WITH:-

Full set of high power NiCads, 2 antennas, carrying case, earphone, DC coble, belt clip and strap, UK charger

January Special Offer - £PHONE

MS1000 BASE/MOBILE SCANNER

MOBILE VERSION OF THE HP2000 HANDHELD BUT WITH SEVERAL ADDITIONS:-

★ Switchable audio squelch
★ Tape recorder output socket
★ Automatic - signal operated tape recorder switching
★ All metal case for improved EMC compatibility
★ Receives:- 500kHz - 600MHz, 805 - 1300MHz. Supplied with mains power supply

January Special Offer - £PHONE

AOR SCANNERS

AR1500 HANDHELD

Covers 500kHz to 1300MHz receiving NFM, WFM, AM, and SSB. Supplied with a large selection of accessories including:-

★ Charger
★ Dry cell battery case
★ 5 mtr LW antenna
★ Ear piece
★ Soft case

NOW IN STOCK

January Special Offer - £PHONE

AR2002 BASE/MOBILE

Receives 25 - 550MHz, 800 - 1300MHz, AM, FM, WFM. Super-sensitive receiver

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AR2500 BASE/MOBILE

Receives 5-550MHz, 800-1300MHz AM, NBFM, WFM. 1984 Memory Channels, Fast 36 CH/SEC Scan. Resolves SSB with BFO control

January Special Offer - £PHONE

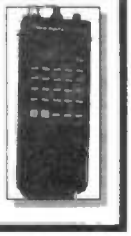
AR2800

★ Receives 500kHz - 600MHz, 800 - 1300MHz AM, FM, WFM. SSB capability with BFO.
★ 1000 Memory

January Special Offer - £PHONE

SCANNERS

ALINCO DJ-X1 HANDHELD SCANNER



★ Covers 500kHz to 130MHz
★ AM/FM/WFM
★ 100 Memories
★ 3 Scanning speeds

January Special Offer - £PHONE

SANGEAN
Portable SW Antenna

ANT 60

- Greatly improve reception power of portable shortwave receiver
- Easy hookup to snap onto telescoping rod antenna or plug into radio's external AM antenna jack extends to 7 metres (23 feet).
- Portable for indoors and outdoors.
- Suitable for all kinds of shortwave radios.

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'ALL mode' ~ ALL the time...

Whether operating from home base, mobile or while out walking,
AOR have all mode receivers to suit... AR3000A - AR2800 - AR1500E

With the **AR3000A** your listening horizons are truly extended providing receive coverage from 100 kHz all the way up to 2036 MHz without any gaps in the range. The AR3000A offers the widest coverage on the market today with a high level of performance and versatility from long wave through shortwave, VHF and onward to the upper limits of UHF and SHF.

Not only will the AR3000A cover this extremely wide range it will allow listening on any mode: NFM, WFM, AM, USB, LSB AND CW. The high level of performance is achieved by using 15 band pass filters before the GaAsFET RF amplifiers unlike other receivers which may rely largely on broad band amplifiers. This ensures high sensitivity through the entire coverage with outstanding dynamic range and freedom form intermodulation effects.

The receiver features comprehensive search & scan facilities providing speeds of up to 50 increments per second. An RS232 port is provided enabling full remote control via most computers. A rear panel switch changes control between the keypad and RS232 port.

The AR3000A is powered from 13.8V DC, a suitable mains power supply is provided with the receiver. Other accessories include a telescopic whip, DC lead and comprehensive operating manual. **RRP £875.00 including VAT.**

Computer control

Two AOR software packages are available - AORSC Spectrum Coordinator and ACEPAC3A. Both software packages offer extensive memory, search and scan facilities plus much more. Note: Scan & search speeds are slower under remote control than offered by the receivers in 'real mode'. ***P&P on software £2.00***

AORSC is a powerful program for the IBM PC (and 100% compatible) computer which allows control of the AR3000A, AR3000 or AR2500 receivers via the computer's RS232 serial port. A text display is used to present information regarding operation of the software. The status of the receiver and software is shown above a list of memory channel contents. The bottom line of the screen contains a menu giving a list of options representing the main facilities which the software offers.

The keyboard of the computer may be used to select the frequency and mode using dual VFOs, it is possible to switch instantaneously between the two VFOs with a single key press. A fixed VFO offset may be entered into the system and the VFOs locked together using the "tracking" facility so that a fixed offset is maintained while tuning across the receiver's spectrum.

Three thousand mode sensitive memory channels are provided in each memory file, each with dual VFOs and a 50 character comment. Multiple memory banks may be used so that the total number of stored channels may be several thousand! A selection of memories are displayed on the computer's screen so that you may easily review memory contents. Of course AORSC features comprehensive programmable search & scan facilities, it is possible to upload and download memory channels to and from an AR3000A/3000. Automatic memory store is also possible.

Activity histograms may be printed (automatically if you wish) and the package has a fully integrated bandplan data-base and logbook. Other facilities include offset simplex reconstruction, detailed single frequency watch, reject frequency list and even a simple spectrum analyser style graphics display... **a detailed 8 page sales booklet is available upon request.** AORSC is supplied on both 3.5 & 5.25 inch media. Although it is possible to run the software on a twin 720k floppy machine, installation is recommended on a hard drive. **RRP £75.00 including VAT.**

ACEPAC3A is available to those with a larger budget. The package is designed to compliment the AR3000A & AR3000 receivers. Facilities are similar to AORSC but the spectrum stye display offers greater facilities. Multiple banks of 400 simplex memory channels are available with character comment. Download of memory channels to the receiver is possible. **RRP £129.90 including VAT.**

Enhanced model - **AR1500E** - the World's first true compact hand-held wide range receiver offering SSB as standard has been made even better. Coverage is from 500 kHz all the way to 1300 MHz without any gaps in the range. Channel steps are programmable in multiples of 5 kHz and 12.5 kHz up to 995 kHz, the BFO will allow tuning between these steps for SSB operation. All popular modes are provided NFM, WFM, AM and SSB (USB, LSB and CW) with the BFO switched on.

The receiver is supplied with a comprehensive selection of accessories: DA900 wide band flexible aerial, NiCad pack, Dry battery case (for use with 4 x AAA alkaline cells), Charger, DC lead fitted with cigar lighter plug, Earphone, Soft case, SW aerial wire terminated in a BNC connector for shortwave reception and Operating manual.

Versatility is excellent. The AR1500E may be powered from it's internal NiCad pack, spare dry batteries may be carried for extended operation and used with the dry battery case, the set may also be plugged directly into the cigar lighter socket of a motor vehicle (external input range 11 - 18V DC). **RRP £299.00 including VAT.**

If you are unable to obtain supplies of AOR products from your local dealer, you may order directly - we have a fast mail order service. We usually have 'nearly new' stock available at attractive prices too! Please send a large S.A.E. (34p) for full details.

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SCANNERS

From the Editor's Desk

Should scanner users unite to change the law?

The law regarding scanners is *stupid*. I've said it before in this magazine, and here it is again. Tune into the Red Arrows at an air display, and you're breaking the law. The frequencies to listen to are even posted up at the air display! But you're breaking the law by tuning in. Stupid. I once watched an air display on TV where the pilot-to-pilot airband transmissions of the display team were being broadcasted on the TV soundtrack. But you're not allowed to listen to them. Stupid. If you're a pleasure boat owner, you *can't* listen into the local coastguard's periodic warnings affecting shipping *before* you take to the water. You've got to wait until you're out there in your boat to be told there's a storm brewing. You're not allowed to listen to these *broadcasts* using your scanner from home before you go out. Stupid.

With the recent 'bad press' in some tabloid newspapers about the way some people break the law using scanners, is it any wonder that certain officials are now trying to get them banned? Totally *banned*. None on sale, anywhere. The only people who'll then use them are the 'bad guys' of course, as you'll never, ever, stop people from using radio gear to 'listen in' to what they're not supposed to. That makes things even more stupid. I've said it all along in these pages, if people want to keep their radio conversations private, they should scramble them. It's good to see that some users, such as the police and cellular operators, have started to do this (see Bill Robertson's report below), maybe, in time, sense will prevail.

I've raised the point of 'little Johnny not being allowed to tune into airband transmissions' in a meeting with the Radiocommunications Agency in the past, the reply being 'wait and see, things may change'. They did, they clarified it in a 'Scanners Information Sheet' saying that it was illegal, as were a number of other things! In the USA, it's quite legal to tune into marine and aeronautical mobile communication, indeed any communication for the general use of the public or relating to ships, aircraft, vehicles or persons in distress and so on (Public Law 99-508). Which sounds sensible to me. In *Scanners*, we've always advocated 'sensible' listening, and our reader's survey indicates the most popular scanner listening interest is airband, followed by marine.

If you want your scanner banned, fine. But if you'd like to tune into airband, marine and the like legally, write into us, and we'll be pleased to 'lobby' the Radiocommunications Agency with your views. Alternatively, if you're interested in setting up either a local or even a national 'Scanner Users Group', let us know – we'll give it publicity, every single month, in these pages. *We must unite!* Write to; Editor, *Scanners*, P. O. Box 73, Eastleigh, Hants. SO5 5WG.

ScanNews

Bill Robertson gives a roundup of what's new

Heathrow changes to Trunked Radio

Following last month's feature on 'Trunked Radio', airband scanner listeners may be interested to know that London's Heathrow Airport have decided to change over to a trunked system for operational duties. You see, *Scanners* keeps you in touch with what's going on even before it happens! This will be used by nearly 600 staff for controlling movement of aircraft on the ground, passenger and ground crew safety, and immediate emergency responses. Five existing channels will be used for the system, and Heathrow Telecom believes this to be the first ever trunked system to be used at a UK international airport.

New Receivers from AOR

The designers at AOR must have been busy! Two HF receivers are in the pipeline, the first is a high-performance budget model, due out very soon. The second is a more 'upmarket' receiver at around £500 to £600, and should be coming along early in 1993. Finally, an 'all-singing all-dancing' HF/VHF/UHF receiver is also in the pipeline, although AOR (UK) tell me this is 'some way off yet'.

What is available right now from AOR to improve your listening is their new WA-7000 active wideband aerial, covering a staggering 30kHz-2GHz. Priced at £129, the top whip has loading coils tuned to around 150MHz and 800MHz for good VHF/UHF performance, and for the lower bands a MOS power FET amplifier comes in to boost signals. There's a review of this already arranged for a forthcoming issue of *Scanners*, but in the meantime you can get further details from AOR (UK), Tel. 0629 825926.

Cellphone Scrambling to come in 1993?

They've finally woken up at last! Cellular telephone system operators Cellnet have worked together with GEC-Marconi Secure Systems and have come up with a scrambler for users to connect to their cellphone. Cellnet say that "Although electronic eavesdropping is a relatively rare occurrence, recent events have highlighted the increasing availability and use of listening equipment". I wonder who they mean? The scramblers will be available from early 1993 onwards, and to start with, only calls originated from cellphones to a 'land' telephone will be capable of being scrambled, with land-mobile and mobile-mobile calls being possible later on. But all this will cost the cellphone user extra, because as well as the additional scrambler unit, a premium cost rate will be charged for scrambled calls. Also they 'hope' that around 60% of modern cellphones can be capable of having this fitted, if the user pays the cost of course. All this means that there will probably be *some* scrambled calls, but not many! Maybe they should have thought of it from day one, like Germany did.

'Not Yet' to Digital Cellular in UK

One way of making cellular phone calls 'private' is *GSM*, the 'Pan-European Digital Cellular' system which *should* have been all up and running in the UK by now. Portugal and Sweden are the latest countries to have got their systems going. But in the UK, Cellnet have said that they will not be committing themselves to GSM in a major way until handset prices and size approached those of analogue phones. I think they'll be waiting a while, and I wonder what rival operator Vodafone are thinking of?

What's this on 1620MHz?

The 1610-1625.5MHz band is allocated to land mobile satellite services, and the *Iridium* service from Motorola plans to use the 1616-1626.5MHz 'chunk' of this for their *global handportable telephone cellular service*. A US$3.37 billion contract has been signed to construct and launch the satellites, for the service to start in a few years time, and they already have an experimental licence for the system which allows them to launch five satellites. They should give you a very strong signal, so don't be surprised if you start hearing things on that 'upper' band on your AR-3000A and the like!

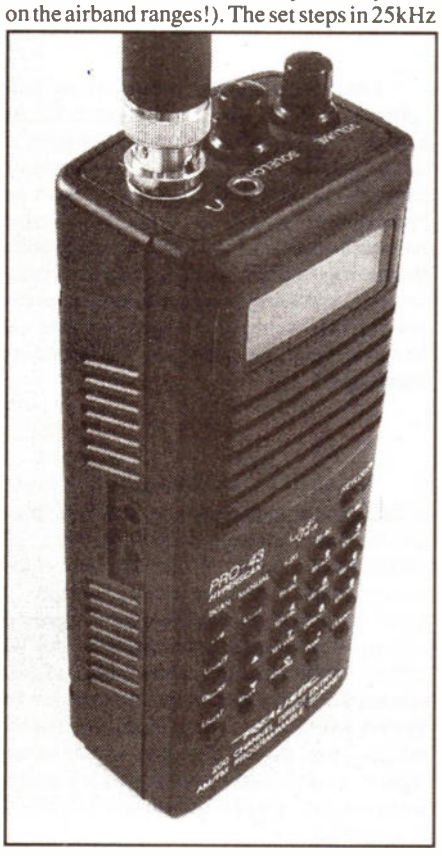
Realistic PRO-43 Review

The latest hyperscan handheld to hit the streets, reviewed by Chris Lorek

The PRO-43 is the very latest scanner to be realised by Realistic, having just become available as I write this. Priced at £229.95, it's a 200 channel handheld, and comes with Realistic's 'Hyperscan' fast-scanning circuitry which gives it a capability of 50 steps a second in 'search' mode and 25 channels a second in memory scan mode. Marketed as a high performance scanner, the PRO-43 comes with a host of new features, even the smartly styled case is a 'new look' for Realistic. The *Scanners* team couldn't resist giving it a test.

AM or FM, anywhere

A 'first' under the Realistic name is the capability for switching to either AM or FM on any of the channels in the set's frequency range, which in the PRO-43 covers 68-88MHz, 118-174MHz, 220-512MHz and 806-999.9875MHz. In the past, you often had to 'put up' with AM being selected only in the aircraft band ranges of the scanner. But in the UK, many terrestrial users of the VHF spectrum also use AM, trying to receive these in FM mode gets you nowhere fast! In use, the PRO-43 automatically selects FM for you on the non-airband ranges, but all you need do is to then press the 'AM/FM' button and you're on AM (and from AM to FM if you *really* want on the airband ranges!). The set steps in 25kHz steps on the 118-136.975MHz VHF airband range, 5kHz increments on 68- 88MHz, 137-174MHz and 220-225MHz, and 12.5kHz increments on the remaining frequency ranges.



Memories

You can actually store up to 210 frequencies in the set's memories, which consist of 200 'permanent' memory channels and 10 temporary 'monitor' channels. To make things easy for you in selecting the channels you want to scan, the 200 permanent memories are arranged in 10 groups of 20 channels each, and as well as individual channels being 'locked out' of scan mode as needed (for example, airband 'Volmet' frequencies), you can select any bank of channels in or out of scan mode with a single button press for each.

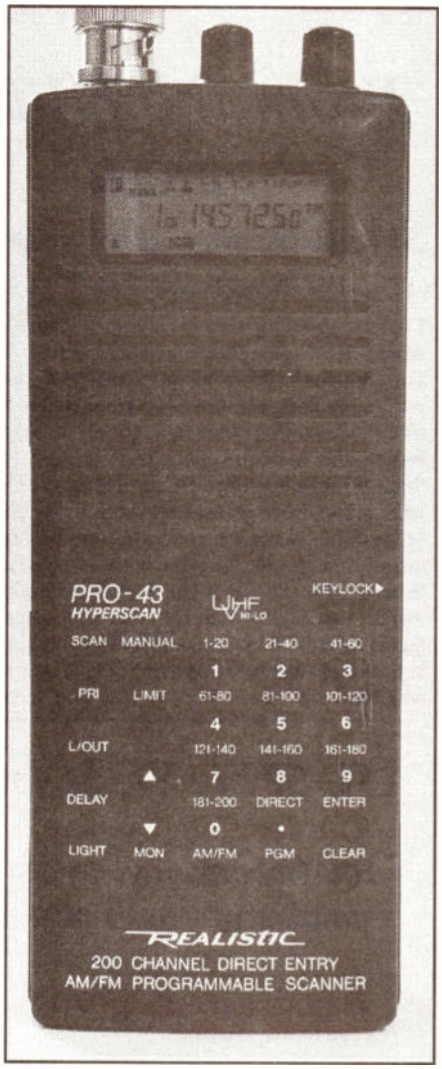
The 10 'monitor' memories can be used while you're in frequency 'search' mode, to usefully store interesting frequencies you find while in this mode without having to 'hard program' them into permanent memories to retrieve later. A bank of ten horizontal bars at the top of the scanner's LCD show which banks are active in memory channel scan mode, and which monitor channels are active if you're in monitor mode. As well as this, the LCD has the usual display of receive frequency, mode, memory channel, lockout on/off, delay on/off and the like.

Controls and Connectors

A set of rubberized keys are used to control the set's function, together with the usual rotary on/off/volume and squelch knobs on the top panel. An unusual feature is that the marking for the knobs are reversed, this way when you're carrying the set using the supplied belt clip, the legends are actually the correct way up - novel thinking!

A BNC aerial socket lets you connect either the supplied wideband rubber helical, or plug in a rooftop or mobile aerial for better performance. A 3.5mm jack is there for either an external speaker, for mobile use for example, or an earphone for 'covert' listening. With this 'dual use', the manual sensibly warns you to check the volume is turned down before you plug an earphone in and deafen yourself!

The set uses six AA batteries for its power, fitting into a removable battery cartridge inside the lower half of the case. You can use either 'normal' dry batteries, or nicads, and to make your batteries last a bit longer when monitoring just one frequency, a 'battery economizer' automatically switches in, which quietly 'cycles' the receiver on and off until a signal appears. A small DC socket on the side of the case lets you recharge the nicads using an external charger if you have one, and a further identical socket above this acts as an external DC input socket, which disconnects the internal batteries when it's used. Each socket uses the outer sleeve of the connector for positive volts, so you'll have to take care in a negative-earth car for example.



On The Air

After I'd programmed some of my favourite frequencies in (I never did manage to fill *all* 200 channels!) I set about seeing what the set was made of. I've used plenty of handheld scanners in the past which just 'fell to pieces' from strong local signals, but not this one. Even with my local fire brigade transmitter, with its very strong signal a couple of MHz away from the 2m amateur band, I could still receive weak amateur band signals without any problems. This is the 'real test' I put many suspected low-performance receivers through, including dedicated 2m trans-

ceivers which sometimes fail miserably! 'Closer in' the set didn't reject strong signals anywhere near as well, such as strong signals on the next channel, but in normal use I found few limitations.

The audio from the internal speaker was very clear and punchy, but I found there was only just enough of it for listening outdoors in quiet situations. Turning it up too much brought forth quite a bit of distortion, likewise into an external speaker when I was using the scanner in the car, but then it is a handheld! I used nicads in the set, which I found would only give me around five hours worth of scanning-type listening. However, the set's 'economizer' did extend this remarkably when I was monitoring just one channel, i.e. not scanning, at the expense of missing the occasional first word of the signal.

While walking out and about, I found the set to be very sensitive indeed, it let me to pick up signals I didn't think I'd be able to receive - the good strong signal handling performance helping here as well. The fast scanning speed let me whiz through the VHF AM airband range very quickly, which I appreciated, likewise with the VHF marine band, and I found I was hardly missing any signals that came up on the band. The set was nice and light, and it fitted nicely in my hand, the side mouldings giving me a good 'grip' to save accidentally dropping it!

Technicalities

The PRO-43 uses a triple conversion receiver to reduce 'images' as much as possible, with a first IF of 608.005-611.2MHz followed by 2nd and 3rd IFs of 48.5MHz and 455kHz respectively. As such, it should give a good immunity from the many unwanted signals which may be found on other, more 'simple', handheld scanners. The instruction book actually gives a short list of the most common internal 'birdie' frequencies, but in use I found very few problems indeed.

Lab Results

The signal generators came out yet again, and I put the set through it's paces. It was very sensitive on most of it's frequency ranges with a few 'bumps' here and there, like around 435MHz and 950MHz, but even so it was quite OK on these as well, better than my 'usual' trusty BC-200XLT. The adjacent channel rejection of 12.5kHz spaced signals was rather poor, and I couldn't measure the close-in intermodulation (two off-channel signals mixing together) because of blocking, but the far-out strong signal handling I suppose 'made up' for this. The maximum audio output from the external speaker socket was quite low, as found on air.

Conclusions

The wide availability of the set will, I'm sure, make it a popular choice for scanner users worldwide. The set looks smart, it's easy to use, it's very sensitive, and has good immunity from out-of-band signals which many sensitive scanners fall down on, their owners then wondering why just a load of noise comes out of the speaker when they connect an external aerial! You won't need a rooftop 'active' aerial with this, it's sensitive enough, and the capability of switchable AM/FM across the range gives it a unique versatility in the Realistic range.

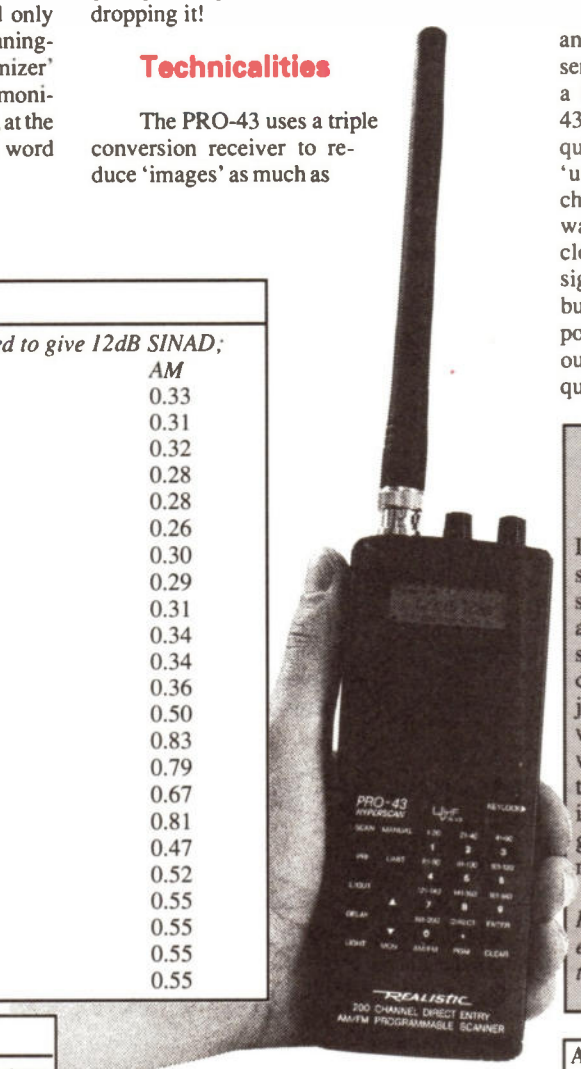
My thanks go to Link Electronics in Peterborough, who are stockists of the entire Realistic range, for the kind loan of the review scanner.

LABORATORY RESULTS:

Sensitivity;

Input signal level in uV pd required to give 12dB SINAD;

Freq.	*FM*	*AM*
68MHz	0.16	0.33
78MHz	0.16	0.31
88MHz	0.15	0.32
118MHz	0.13	0.28
130MHz	0.15	0.28
145MHz	0.13	0.26
160MHz	0.16	0.30
174MHz	0.14	0.29
220MHz	0.17	0.31
250MHz	0.17	0.34
300MHz	0.17	0.34
350MHz	0.18	0.36
400MHz	0.24	0.50
435MHz	0.40	0.83
450MHz	0.38	0.79
500MHz	0.30	0.67
512MHz	0.36	0.81
807MHz	0.24	0.47
850MHz	0.27	0.52
900MHz	0.28	0.55
935MHz	0.28	0.55
950MHz	0.52	0.55
999MHz	0.27	0.55



Blocking;

Measured on 145MHz FM as increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal;

+100kHz;	44.5dB
+1MHz;	71.2dB
+10MHz;	94.0dB

Image Rejection

Difference in level between unwanted and wanted signal levels, each giving 12dB SINAD on-channel 145MHz FM signals;

2nd Image;	84.1dB (+97.0MHz)
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50/100kHz spacing;	49.7dB

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40.4m W RMS

Adjacent Channel Selectivity;

Measured on 145MHz FM as increase in level of interfering signal. modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal;

+12.5kHz;	8.9dB
-12.5kHz;	5.1dB
+25kHz:	33.7dB
-25kHz;	32.9dB

Current Consumption

Scanning, no signal;

84mA Receive, mid volume;	127mA
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AR-2002 Scanner, £220. Dressler Active Aerials, £30.00 each. (Cranfield, Beds). G8FAK, Tel. 0234 751475

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Nevada MS-1000 scanner receiver, home base, 25-1300MHz, £220 ono. Peter Hollis, 68 Kingstone Ave, Deneside, Seaham, Co. Durham. Tel. 091 581 2095

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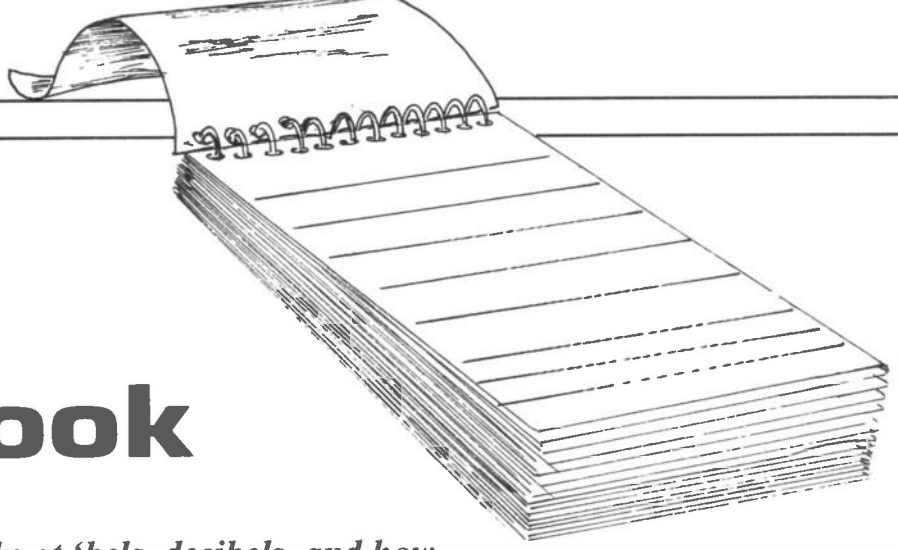

From My Notebook

Geoff Arnold G3GSR looks at 'bels, decibels, and how we measure differences in levels with these

I suppose it has always been the case that a mention of the word 'decibel' to most amateur radio enthusiasts is enough to put their brain into 'shut-down' mode. As the years pass, though, it is becoming more and more essential to have at least a basic understanding of what decibels are, what they mean, and how to manipulate them.

In reviews and advertisements for amateur receivers, decibels are used to specify many things including sensitivity, the rejection of unwanted signals, and bandwidth. For transmitters, decibels are used to specify how well unwanted sidebands, carriers, and any spurious output products are suppressed. Most importantly, they have for some years now been used in the amateur licence to lay down permitted transmitter output powers.

For this last-mentioned application, there is a 'special' sort of decibel, the dBW, meaning 'decibels relative to a watt'. In fact the dBW is just one of a number of 'special' decibels used for various purposes. Some of them are very special indeed, and the amateur is unlikely to come across them, but others crop up quite regularly in equipment specifications and in books used by amateurs, and are well worth knowing about. I shall be coming back to these 'special' decibels later. First of all, let's look at the basic animal.

In at the Deep End

As soon as you look up the subject of decibels in any textbook, you will come across the equation:

$N_{dB} = 10 \log_{10} P2/P1$.

This in itself is enough to put off anyone without a fair grasp of maths, but it's made worse by the fact that you will then find a second equation:

$N_{dB} = 20 \log_{10} V2/V1$

usually with little or no attention devoted to explaining how one relates to the other. I'll be talking about what these equations mean shortly, but before that let's find out where the decibel came from.

It comes from something called the 'bel', which was a unit devised by Alexander Graham Bell for use in talking about changes in sound power levels on telephone circuits. It turned out, though, that the bel was rather too large, so the decibel was adopted for everyday use. 'Deci' is the standard metric multiplier meaning 'a tenth of', so there are ten decibels in a bel.

Just for a moment, let's restate the first equation in bels rather than decibels, as it becomes a little less complicated:

$N_B = \log_{10} P2/P1$.

What is this saying? The letter 'N' is a general mathematical 'shorthand' symbol standing for a number. The subscript (in other words 'little') letter B alongside it tells us that this particular 'N' means a number of bels.

Moving over to the other side of the equation, where the letter 'P' stands for a power (that's an electrical power, rather than a mathematical power), P2/P1 is a ratio of power P2 to power P1. In this case, P1 is 'what power it was before' and P2 is 'what power it was after'.

The 'before' and 'after' figures can take different forms. First, they can be two power levels which are present at the same time, such as at the input and output of an amplifier - in a linear amplifier, for example, you might put 10 watts of drive in and get 50 watts out.

Or they can be two power levels at different times in the same circuit, such as before and after you turned up the gain or volume control on a receiver. Perhaps the kids are making so much noise that you can't hear the dialogue on the TV, so you turn the sound up.

The third one is really a variation of the second, relating a power level which you have in a system now to some standard power level, instead of saying that it has some absolute value in watts. This is exactly what that dBW is doing, the standard power in this case being one watt.

Sorting the Wood from the Trees

Having found the ratio between the two powers, you have to take the logarithm of it - I don't propose to give an explanation of what logarithms are, I'm assuming that you encountered those at school. The '$\log_{10}$' means that we're going to have to take a log of some number, with the subscript '10' meaning that the logs are the old-fashioned schoolbook type 'to the base 10', rather than being the natural or Naperian logs 'to the base e' which are often encountered in radio and electrical engineering.

Why do logs come into it? As is usually the case, there is a very good physical reason, which is that if a sound is suddenly increased in strength, the listener gets an impression of an increase which is proportional to the log of the ratio of the two acoustical powers.

For example, if P2 is 10 times the value of P1, their difference is 1 bel, because the log of 10 is 1. It might be an increase from 1 watt to 10 watts, or from 100 watts to 1 kilowatt; the change will sound the same. (I'm assuming that you are far enough from the sound source not to have your eardrums ruptured by the increased intensity). It is the ratio between the two sound levels which matters, not the difference between them.

Although there are plenty of occasions in radio engineering where the ratio between two powers can be in the hundreds or thousands bracket, there are many others where the changes are

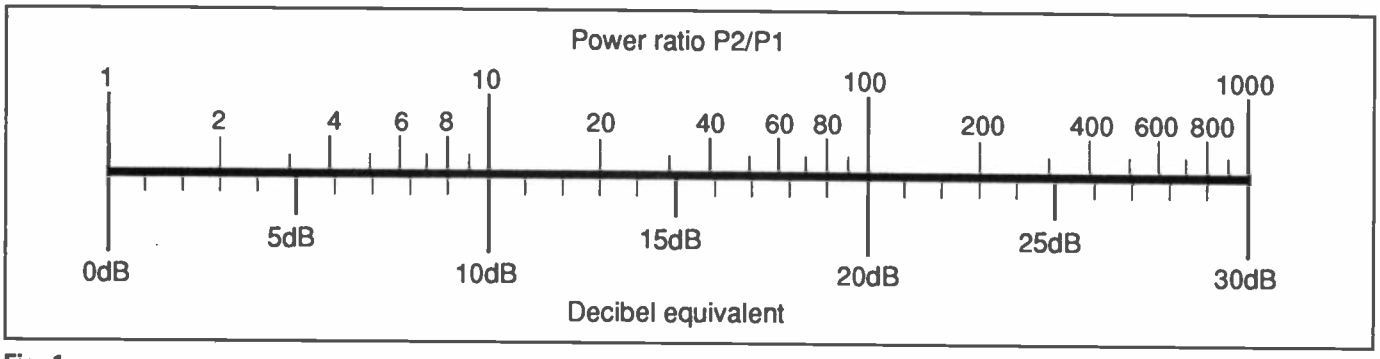

Fig. 1

much smaller, perhaps two-to-one or less. This is why the decibel - one tenth of a bel - was adopted, and luckily it is a unit which is versatile enough to describe all changes in power levels. It is not like lengths, for example, where we have to use different multiplier prefixes - millimetres, metres and kilometres - to avoid the numbers becoming unmanageably long. This is the beauty of a logarithmic unit!

By a fortunate coincidence of nature, the decibel has another relationship to human hearing which is a useful rule of thumb. A sudden change of 1dB is in general the smallest that can be detected by a critical listener.

It's very easy to get confused when thinking about ratios. A common trap people fall into is to say: 'If a bel corresponds to a power ratio of 10 to 1, then a decibel must be 1 to 1'. Not so! A ratio of 1 to 1 means no difference in strength, and this is borne out by the fact that the log of 1 is zero. There is 0dB difference between two signals of the same power level.

Going back to the first equation at the beginning of this month's column, you will see that the figure 10 immediately after the equals sign is there simply because any value in bels must be multiplied by 10 to convert it to decibels.

You will find tables of decibel equivalents of power ratios in most radio engineering reference books, but I feel that a simple chart or nomograph is a better way of getting a feel for these relationships. The scale of Fig. 1 covers a 30dB span, but can be extended to the right if required. From this, you can see immediately that a doubling of power corresponds to a 3dB ratio.

A power ratio of 10 to 1 is equivalent to 10dB, but a power ratio of 20 to 1 is equivalent to 13dB. This illustrates an important property of logs, which is that when numbers are to be multiplied, you *add* their logs. In other words, 20 = 2 x 10 but the corresponding dB value 13 = 10 + 3.

Negative Decibels

In all the discussions so far, I've assumed that P2 is greater than P1, in other words that we were looking at an increase in power each time. This obviously isn't always the case. Instead of power levels at the input and output of an amplifier, we might be concerned with levels at the input and output of an attenuator, or that volume control might have been turned down instead of up, to silence an unpleasant noise on the TV. Perhaps we have a half-watt handheld transceiver and want to quote its output in dBW.

Decibels work just as well for these cases, but the decibel value corresponding to a loss or attenuation has a minus sign in front of it. The scale of Fig. 2 shows a 30dB span of loss from 0dB (a power ratio of 1 to 1) downwards. This confirms visually the fact that half-power (a ratio of P2 to P1 of 0.5) corresponds to -3dB, while quarter-power (P2/P1 = 0.25) corresponds to -6dB.

You may well ask, if negative decibels (loss) have a minus sign in front of them, why don't positive decibels (gain) have a plus sign in front of them. Well, by rights they should, but it is a universal mathematical convention that the plus-sign is omitted from positive numbers unless there is likely to be confusion as a result.

That Other Equation

I think that material such as this, which tends to exercise the brain-cells somewhat, is best dispensed in small portions, so I will conclude this month's offering by explaining very briefly the background to the other equation:
$N_{dB} = 20 \log_{10} V1/V2$.

As you may already have realised, this one refers to the decibel relationships of voltage levels, rather than power levels.

In any given circuit, the power dissipated is proportional to the square of the voltage; it should be engraved upon your heart that $P = V^2/R$. To get the square of any number, you multiply its logarithm by two, so instead of a multiplying factor of 10, as in the first equation, we have one of 2 x 10, or 20.

If the two voltages values you are feeding into the equation are measured at different points in the circuit, at the input and output of an amplifier, for example, the square-law relationship between voltage and power ratios does not hold good unless the resistance or impedance of the two circuits is the same - don't forget that 'R' features in the relationship $P = V^2/R$.

I shall talk some more about this point, as applied to real amplifiers, in next month's column, along with some of the 'special' decibel factors and also typical dB ratios that you might encounter in radio systems.

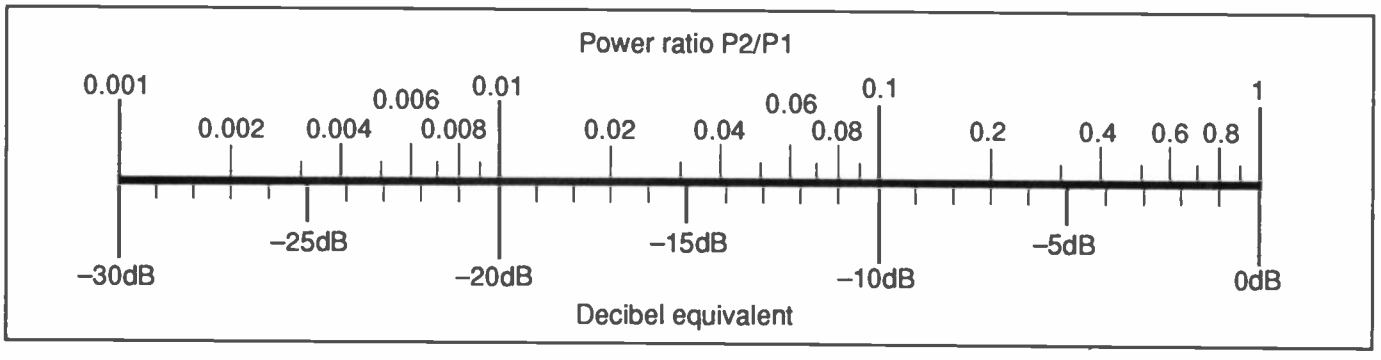

Fig. 2

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'The Metrewave Year'

Jack Hum G5UM takes his customary annual retrospective look at the world above 50MHz

The expression 'Use or Lose' has been around for decades. It was applied first of all to the 70cm band, with its low activity occasioned by the need to build-it-yourself if you wanted to get on to the band at all – and a lot of class B licensees did. They were not permitted initially to use the lower frequency metrewave allocations. Occupancy was low, trepidation high. Sighs of relief when only small chunks of the band were whittled away as the years passed. The effect was minimal on the amateur service, most of its activity took place in the centre of the band.

The picture is wholly different now. Commercial transceivers have brought a vast increase in activity on 70cm, helped by the availability of repeaters, three times as many as there are on 'two'. In the same way a huge increase in 145MHz FM has occurred down the years. For most operators FM is the preferred mode, but sadly not used to best effect simply because omni-directional aerials provide such poor return. On home sites small vertical beams provide greater talk power without the need to button a PA on to the output end of the transceiver.

These developments are evident also on 'four'. Here, few black boxes are to be had, much redundant PMR gear is. How to modify it for 'four' has had several treatments in HRT. On the next band down, 'six', a similar movement is evident, though a slower one. Here mobile activity has been slow to take off: the big aerial needed is the problem on a vehicle. On 'four' the situation is more advanced, for the band enjoyed several years start over 'six', and the aerials are conveniently smaller.

Just as on 145MHz and 433MHz the swing to vertical polarisation on 70MHz and 50MHz continues to be evident. Even on 'six', in spite of the big metal structures that tend to inhibit mobile usage, it is significant that the weekly news bulletins, around 51.53MHz, go out vertically polarised, and you will get a poor signal from the service if you insist on using horizontal. The exclusion of one polarisation by another is very marked on 'six' and 'four', much less so on 145 and 433MHz. Corollary, if you want to chase the DX (horizontal) as well as enjoying 'run of the mill' activity on FM (vertical) you need two aerials, one for each polarisation, or a crossed structure, as has become so popular on the 2m and 70cm bands these last dozen years.

These trends have meant that DX chasing on the metrewaves has become minimal, contest entries are smaller, awards lists shorter. Certainly 'they all come crawling out of the woodwork' (a favoured phrase) when the bands are open or a contest is on. But this is not enough: where is all the long haul activity, SSB and CW, under normal conditions? Which brings us right back to the 'lose or use' theme. Those parts of our metrewave bands that show little activity will be most subject to the covetous eyes of the professionals. There is increasing pressure from point-to-point and broadcast services, to name only two, to obtain more frequency space. They pay for this commodity. Frequency spectrum has a price on it. Regulating bodies take a great interest in how the radio amateurs use their part of it.

Filling up our allocations to prevent them being lopped is one part of the story. Another is, how do we use what we have? If irresponsibility in the way we operate is observed from on high, the amateur movement will earn a reputation as a fun thing instead of a serious scientific pursuit. 'Watch your lip. Think before speaking' is a worthwhile axiom, most particularly through repeaters with their considerable audience. Apart from how we are seen and heard by higher authority there is another consideration: what effect does the overhearing of our operating practices have on our new chums, the Novices? From one's contacts with them since the Novice licence came into being, very few have as yet got into bad habits. Top marks for the 'full call persons' who have got them through the exam, and taught them how to use their frequency allocations to best effect.

Many novices on the 70cm band cut their metrewave teeth on the local repeater, no doubt of great assistance in developing good operating technique and overcoming mike shyness. This tendency was very marked in 1992. Maybe as 1993 rolls along they will learn that repeaters provide no more than proxy contacts and not real QSOs, and that simplex is more rewarding. Is there a novice simplex net on 70cm? Or even on 'six'? There should be. It would be good to know if there is.

Something else which became evident on the Novice scene in 1992 was the overwhelming preference to go for a 2E1 callsign (equivalent to the class B). By now the 2E1 callsigns are well into the 2E1B— series and may have topped the thousand. By contrast, only a few dozen novices have opted for the 2E zero 'with Morse' licence. This is a pity. Telegraphy winkles out the weak signals better than any other mode, and, it might be added, calls for more skill in operating than phone does. The teens are the time of life to learn the code, when the brain enjoys maximum malleability. What was evident among the Novices overheard on 70cm and 6m during 1992 was a failure to identify. This could also be said of the later G7s, who happen not to be in the current callbook. A distant recipient of your signal cannot know where to turn the aerials unless you say where you are. A good resolution for 1993 perhaps?

Any other resolutions? Several are implicit in the foregoing, but why only for a new year? Why not all the time? There is one. It is the paragraph enshrined in The Amateur's Code, drawn up in America by the ARRL some 70 years ago and repeated subsequently in every issue of that august body's handbook, and many others elsewhere. It says that "The amateur is balanced and that no act of his (increasingly hers, these days) either by the operator or by the sender shall cause distress to others". A very good thought for 1993, methinks.

Equipment Reviews in HRT

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Alinco ALR-22E 2m mobile ..... Dec 87
Alinco ALD-24E dual band mobile ..... Feb 88
Alinco DJ-100E portable ..... Dec 88
Alinco DR-110 2m mobile ..... Nov 89
Alinco DR-500 dual band portable ..... Dec 89
Alinco DR-510 dual band mobile ..... Dec 89
Alinco DR-570E dual band mobile ..... Mar 90
Alinco DJ-160E VHF handheld ..... Aug 90
Alinco DJ-460E UHF handheld ..... Aug 90
Alinco DJ-560 dual band portable ..... Feb 91
Alinco DR-112EM 2m mobile ..... Apr 91
Alinco DR-590E dual band mobile ..... Jul 91
Azden PCS 4000 (computer plus 2m FM transceiver) ..... Aug 83
Azden PCS 5000 2m mobile ..... May 87

Belcom LS-20XE 2m handheld ..... Feb 84
Belcom LS-202E 2m handheld ..... Sep 84

Commutech FCR 130 receiver (kit) ..... Oct 84

DCRX 20m direct conversion receiver (Howes Kit) ..... Feb 87
Drake R8E Receiver ..... Feb 92
DVR 2-2 dedicated packet TX ..... Apr 90

Eddystone 1650 receiver ..... Aug 87

FDK M-750XX budget 2m multimode ..... Jun 84

Heathkit HW-9 CW transceiver ..... Jun 90

Icom IC-02E portable ..... Feb 86
Icom IC-12E 1296MHz portable ..... May 87
Icom IC-2SE 2m handheld ..... Sep 89
Icom IC-2E VHF Portable ..... Feb 87
Icom IC-2iE VHF Mini-Portable ..... Jan 93
Icom IC-P2ET 2m hand held ..... Mar 92
Icom IC-W2E 2m/70cm portable ..... Jun 91
Icom IC-4G UHF portable ..... May 88
Icom IC-4SRE handheld ..... Dec 91
Icom IC-25E ..... Mar 83
Icom IC-28E 2m mobile ..... Sep 86
Icom IC-32E dual band portable ..... Oct 88
Icom IC-R72 HF receiver ..... Sep 90
Icom IC-228E 2m mobile ..... Dec 88
Icom IC-251 plus muTek front end ..... Oct 83
Icom IC-271E plus muTek front end ..... Feb 84
Icom IC-275E ..... Apr 87
Icom IC-290E 2m multimode ..... Jan 83
Icom IC-3230H dual band mobile ..... Dec 92
Icom IC-505 6m transceiver ..... May 86
Icom IC-735 HF transceiver ..... Dec 85
Icom IC-745 HF base transceiver ..... Jun 85
Icom IC-781 HF 'super rig' ..... Jul 88
Icom IC-900 multi band mobile ..... Oct 87
Icom IC-970 VHF/UHF transceiver ..... Nov 90
Icom IC-1200 1296MHz mobile ..... Sep 87
Icom IC-3220 dual band mobile ..... Jul 90
Icom ICR-7000 receiver ..... Feb 89

Jandek 20m modular receiver with PSU (kit) ..... Feb 90
JST-125 HF rig ..... Jan 88
JST-135 HF transceiver ..... Nov 88

Kenpro KT-220EE 2m portable ..... Aug 87
Kenpro KT-400EE 70cm portable ..... Mar 86
Kenpro KT-44 low cost 70cm handheld ..... Nov 91
Kenwood TH-25E 2m portable ..... Jun 88
Kenwood TH-26 and TH-46 hand portables ..... Jan 91
Kenwood TH-27E 2m hand protable ..... Dec 90
Kenwood TH-75E dual band portable ..... Oct 89
Kenwood TH-77E dual band portable ..... Apr 91
Kenwood TS-140 budget HF transceiver ..... Apr 88
Kenwood TH-215E VHF portable ..... Jun 87
Kenwood TM-221E 2m mobile ..... Jul 87
Kenwood TS-690S HF/6m rig ..... Nov 91
Kenwood TM-721 dual band mobile ..... Aug 88
Kenwood TM-732E dual band mobile ..... May 92
Kenwood TM-741E tripple bander ..... Sep 91
Kenwood TH-78E dual band portable ..... Sep 92
Kenwood TS-790E base station ..... Apr 89
Kenwood TS-850S HF transceiver ..... Mar 91
Kenwood TS-950S all band TX ..... Feb 90
Kenwood TW-4100 dual band mobile ..... Sep 87

KW/Ten Tec Argosy ..... Aug 83
KW/Ten Tec Century 22 transceiver ..... Jul 86
KW/Ten Tec Corsair ..... Nov 84
KW/Ten Tec Corsair MkII ..... Jan 87
KW/Ten Tec Paragon ..... Jun 89

Lowe HR-125 receiver ..... Apr 87
Maplin reflex receiver kit ..... Aug 91

Mizuho MX-2 2m SSB handheld ..... May 83
Mizuho MX-7S QRP handheld ..... Jan 90
Mizuho SB-2X 2m SSB/CW TX ..... Nov 83

Navico AMR-1000 2m mobile ..... Nov 88

Ramsey 2m transceiver kit ..... Oct 91

Sony ICF-200ID ..... Jan 89
Sony ICF-7600D receiver ..... Jan 87

Standard C58 vs. FT290R ..... May 83
Standard C500 dual band portable ..... Dec 87
Standard C5800 2m multimode ..... Jun 83

Tatung TMR7602 receiver ..... Feb 89
Tokyo Hi-power 80m monobander ..... Feb 88
Tokyo Micro-7 70cm budget handheld ..... Apr 85

Trio TM-201A 2m transceiver ..... Apr 84
Trio TH-205E ..... Mar 87
Trio TS-430S HF transceiver ..... Jun 83
Trio TS-440S HF transceiver ..... Aug 86
Trio TS-520 series update ..... Jun 85
Trio TS-530SP HF transceiver ..... Jul 84
Trio TS-711E 2m transceiver ..... Feb 85
Postscript to TS-711E review ..... Mar 85
Trio TR-751E 2m mobile ..... Nov 86
Trio TS-830S HF transceiver ..... Jan 86
Trio TS-930S HF transceiver ..... Jul 83
Trio TS-940S HF transceiver ..... Mar 86
Trio TM-2550E 2m mobile ..... Sep 86
Trio TR-9000 retro (second hand) ..... Nov 85
Trio TS-9130 2m multimode ..... Jan 83

TX20 CW transmitter kit (Howes) ..... Dec 86

Uniden 580XLT ..... Sep 88
Uniden 2830 10m mobile ..... Aug 88
Uniden UBC-70 ..... Jul 89

Yaesu FT-23R 2m handheld ..... Feb 87
Yaesu FT-26 and FT-76 handhelds ..... Sep 91
Yaesu FT-73R 70cm portable ..... Jan 88
Yaesu FT-101E plus new bands ..... Jun 84
Yaesu FT-102 HF transceiver ..... Feb 83
Yaesu FT-203R 2m handheld ..... Jul 84
Yaesu FT-209R and RH portables ..... Nov 84
Yaesu FT-211 2m mobile ..... Aug 87
Yaesu FT-212 2m mobile ..... May 88
Yaesu FT-270RH 2m transceiver ..... Aug 85
Yaesu FT-290 MkII 2m mobile ..... Jan 87
Yaesu FT-290R Vs C58 ..... May 83
Yaesu FT-411 2m portable ..... May 89
Yaesu FT-415 2m handheld ..... Apr 92
Yaesu FT-470 dual band handheld ..... Aug 89
Yaesu FT-480R 2m multimode ..... Jan 83
Yaesu FT-650 HF transceiver ..... Nov 90
Yaesu FT-690R 6m transceiver ..... May 86
Yaesu FT-690 MkII and PA ..... Nov 87
Yaesu FT-708R 70cm handheld ..... Jun 84
Yaesu FT-711H 70cm mobile ..... Jan 88
Yaesu FT-726R VHF/UHF multimode ..... Dec 83
Yaesu FT730R 70cm mobile ..... Dec 84
Yaesu FT-736 VHF/UHF base station ..... Mar 88
Yaesu FT-747 HF economy rig ..... Jun 88
Yaesu FT-757GX HF multimode ..... May 84
Yaesu FT-767 review plus upgrade ..... Nov 87
Yaesu FT-770RH UHF mobile ..... Sep 86
Yaesu FT-790R UHF mobile ..... Feb 83
Yaesu FT-890 HF transceiver ..... Jun 92
Yaesu FT-980 (computer aided) ..... Sep 83
Yaesu FT-990 HF transceiver ..... Jan 91
Yaesu FT-2311R 23cms mobile ..... Mar 88
Yaesu FT-2400H mobile ..... Apr 92
Yaesu FT-2700RH VHF/UHF mobile ..... Jul 85
Yaesu FT-4700 dual band mobile ..... Oct 88
Yaesu FT-5200 dual band mobile ..... Sep 91
Yaesu FRG-9600 receiver ..... Oct 85
FRG-9600 (updated) a reassessment ..... Dec 86
Yaesu FRG-8800 general coverage receiver ..... May 85

Back issues of the magazine for the last twelve months are available from Argus Subscription Services, Ham Radio Today, Queensway House, 2 Queensway, Redhill, Surrey, Tel. 0737 768611. Please telephone first to ensure the availability and price of the issue you require, as copies of some magazines, and of early issues in particular, have run out due to popularity.

Photocopies of earlier articles are available from the Argus Photocopy Dept., Argus Specialist Publications, Argus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, at a charge of £2.00 each (cheques payable to ASP). State HRT magazine and the article/date you require.

Novice Notes

What Goes On Inside Your Rig?

Chris Lorek G4HCL explains what Transmitter Intermodulation is and what the figures mean

When you tune around the bands on SSB, no doubt you've come across a signal that's rather on the 'wide' side. That is, you can hear 'splitches' of distorted audio up to several kHz above and below the transmitted signal. Operators from one or two countries have indeed been infamous for such signals on the HF DX bands, a real case of 'crank up the mike gain and shout down the microphone' for a 'free' speech processor! A similar effect sometimes can be also heard on VHF and UHF, typically when an amateur overdrives an add-on linear amplifier (it always seems to happen during a contest, doesn't it?). But what causes this, how do I make sure I'm not 'splattering', and which rigs are better than others? What do all these weird *Transmitter Intermodulation* figures in HRT technical reviews of SSB rigs mean anyway?

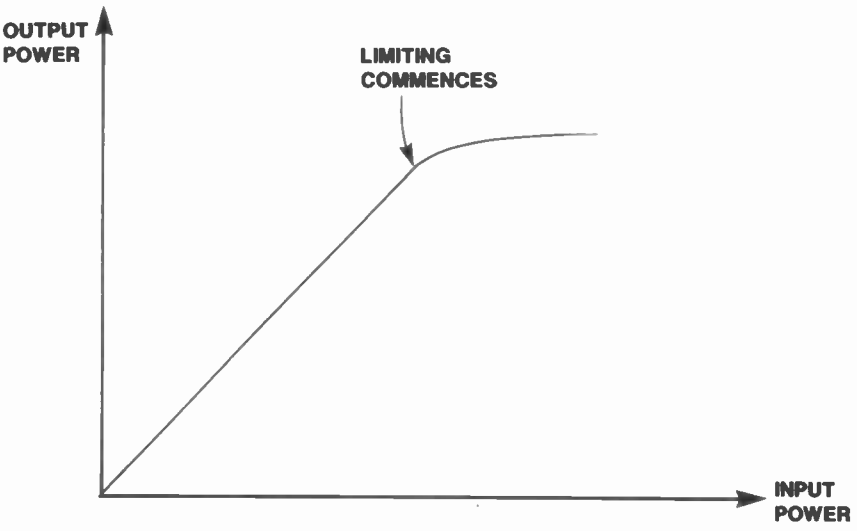


FIG.1 LINEAR AMPLIFIER INPUT/OUTPUT RESPONSE.

Non-Linearity

This is the basic cause of intermodulation (IMD for short), both the 'wide splatter' on transmit and IMD limitations in receivers. Now any circuit showing a non-linear effect (which means virtually any active device we have in our rigs) will act very nicely as a mixer, i.e., mixing different signals together to give other signals.

Have a look at the graph of a typical linear amplifier input/output response shown in Fig. 1. You'll see that, up to a point, the output power increases in proportion to the increase in the input. Up to this point, all is well. But drive the input a bit harder, just to 'squeeze the last watt out' of your amplifier, and the output power starts to limit. The amplifier isn't operating in its linear portion any more. It starts to act as, you've guessed it, a mixer!

Only SSB?

This non-linearity doesn't matter very much on constant- level carrier transmissions, such as FM or CW. Here, if you 'crank the drive up' you'll often just get correspondingly less increase in output. But consider an SSB transmission. As well as the transmitted power level going up and down as you speak, the signal is also made up of any number of individual frequencies across the speech bandwidth. When these multiple frequencies coincide a mixing effect in the PA due to limiting, then we get all the audio frequencies mixing together, in turn causing lots of others, the end result being rather a wide 'splatter'. The worse the non-linearity, the wider the 'splatter'.

Nothing's Perfect

We don't live in a perfect world of course, and *some* non- linearity is inevitable in *all* amplifier stages. It's the *amount* of this, at the power level you want to run, that's important. Some transmitters are 'cleaner' than others, these normally also 'sound' much nicer on the air due to their 'purer' signal.

The 'linear' section is always slightly non-linear to *some* degree, and valves are typically more linear here than semiconductors, thus providing an inherently 'cleaner' close-in transmission. Hence their common use in high-power amplifiers.

It's important to note that circuitry in your receiver can also be the cause of apparent 'splatter' from a received SSB signal having multiple audio frequencies. This is due to signal overload in the receiver, where the level of input signals starts to cause the receiver circuitry to hit it's limiting point also. Have a look at the Oct 91 issue of HRT for an explanation of this effect.

What the figures Mean

So how do we measure the IMD of a transmitter? The normal method is a

two-tone test. Here, two audio frequencies which aren't harmonically related (a typical example would be tones of 1000Hz and 1800Hz) are fed to the microphone input of the transmitter under test. The transmitter mic gain or drive level is then set to either give the required output power, or more usefully (for amateur purposes) when the rig's ALC meter *just* starts to indicate.

The transmitter RF output is monitored on a spectrum analyser over a narrow bandwidth (typically plus and minus 10 or 20kHz), to look at the two tone output, as well as the other intermodulation products 'spreading out' from these two tones. Fig. 2 shows a typical display. You'll see that each tone is actually at -6dB relative to the PEP output, this you'd get if you were to put a single tone into the transmitter, for example a steady whistle. You can see the intermodulation products lower down in level, all of these are spaced by the difference in tone frequency.

Those nearest to one of the two tones are the 3rd order products (2xFa-1xFb), the next ones along are 5th order (3xFa- 2xFb), the next 7th order (4Fa-3Fb) and so on, where Fa is the radio frequency of the one tone, Fb is the radio frequency of the other. Get your calculator out and have a go!

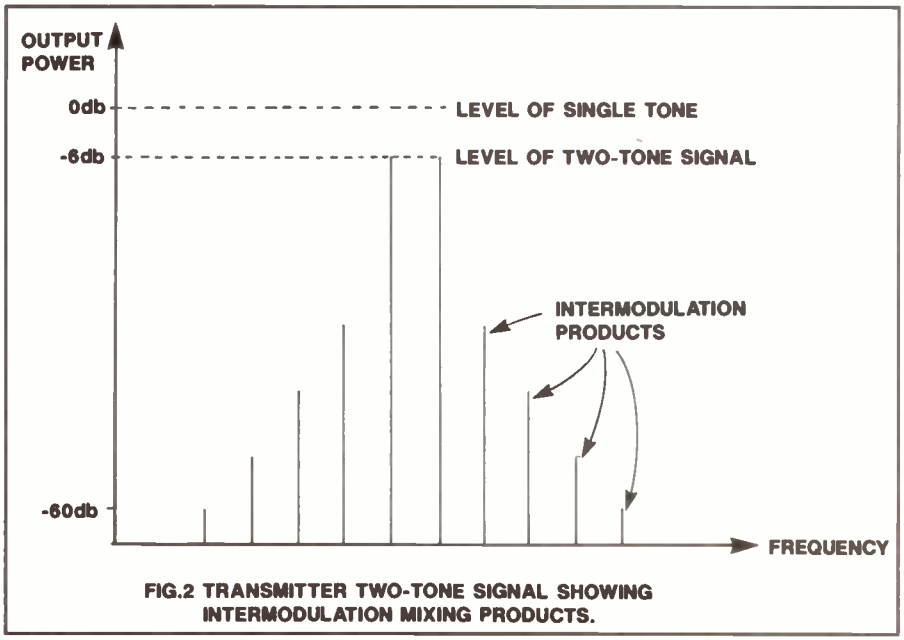


FIG.2 TRANSMITTER TWO-TONE SIGNAL SHOWING INTERMODULATION MIXING PRODUCTS.

In the lab, a note is taken of the levels of these IMD products relative to either the PEP level, or the level of one of the tones. It doesn't really matter which is used, but it's important to check that the figures you see on the specification sheet refer to *what* reference is taken. Impressive-looking transmitter specifications on nice glossy sheets such as '-36dB 3rd order IMD' means *nothing*, just like a '20dB aerial gain' means absolutely nothing unless it's referenced against something. '-36dB 3rd order IMD relative to PEP level' means something sensible!

Now you know what the figures mean, you'll be able to impress your friends down at the club, as well as maybe understand a little more about what TX IMD is about.

Packet Radio —Roundup—

Chris Lorek G4HCL looks at the wonders of Pactor for error-free HF data communication

Exactly two years ago as I write this, an article appeared in the German magazine 'cq-DL' describing *Pactor*, the 'New radioteletype mode with Memory ARQ and data compression'. This was developed as a purely amateur project in the context of the experimental radio service. To this day, the vast majority of European Pactor operators have been German amateurs (from BBS 'user' lists), but its use is, right now, *very* rapidly gaining popularity around the world. It's going to be big, *very* big, I believe it'll soon do for HF what packet did for VHF/UHF in the amateur data communication field. Its name comes from two other popular HF data modes, packet and Amtor, and it combines some of the best features of both to overcome the data-destroying effects of HF propagation and noise. If you take a tune around the sections of the HF bands used for Amtor, you're likely to hear Pactor signals which have a similar 'chirp' sound but longer at just over a second, almost like a short 'packet'. On 80m in Europe for example, the DK0MHZ BBS operates around 3.5869MHz and the DF0THW BBS around 3.5923MHz (depending on your frequency readout offset) and you'll often find these very active as well hearing one-to-one QSOs.

Features

Like Amtor, Pactor uses an 'ARQ' protocol which, unlike packet, doesn't need a callsign overhead with each transmission, so more information can be put through in a given frame. But Pactor improves on Amtor by adding a CRC (Cyclical Redundancy Check) to provide a totally error-free link, even in heavy QRM or noise. Each Pactor data frame consists of a header, a data field, one status byte and a two-byte CRC. It adapts to band conditions, automatically switching between baud rates of 200 bauds (with frames of 20 data bytes) or 100 bauds (with frames of 8 data bytes) as QRM allows. A good signal level, and 200 baud results, if conditions drop, the rate automatically slows down to compensate. Greater data throughput is also achieved by using Huffman data compression, again automatically as conditions allow. So on a clear channel, the data literally 'whizzes' through, much faster than many other data modes.

Memory ARQ

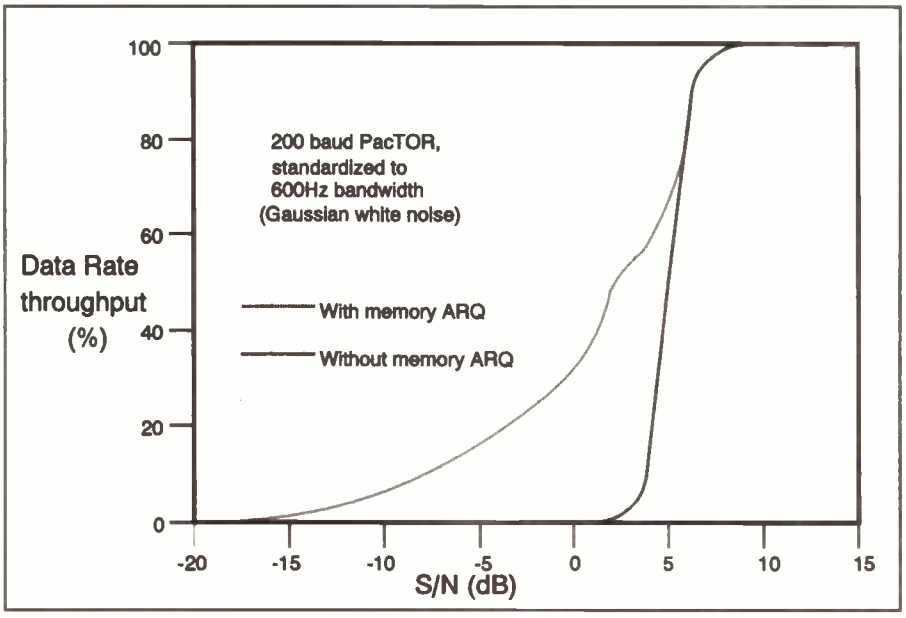
One of the most significant features of Pactor, in my mind at least, is that of its built-in 'Memory ARQ'. Rather than just checking each received frame for data integrity and requesting retransmission if incorrect as with packet and Amtor, a Pactor 'Controller' (ie, the TNC) stores the received data from each concurrent frame into memory, adding this together until valid data results. If you consider weak repeated (ie identical) packets, each with an amount of random noise 'superimposed', then if you add a number of these together you'll realize the 'real' data adds together. However, so does the noise, but this (often being random with time) effectively 'cancels itself out' to zero, the added data signal strengthening each time. So in bad signal conditions, even if *every single* packet *can't* be individually demodulated without errors, after a few additions out pops the required data! You'll see from the review this month that it certainly *does* work.

The accompanying graph shows the difference in data throughput using memory ARQ, in this case using an internal 8-bit A/D converter with analogue values from subsequent frame repeats combined into a 'sum' packet which is then subjected to normal demodulation and CRC check.

Modes

Like Amtor, Pactor provides both ARQ (Automatic Request for Retransmission) for 'QSO' use, and FEC (Forward Error Correction) modes for 'CQ' calls and the like. A 'Listen' mode is available, so you can 'earwig' on what's around, this gives data on your screen without the headers and resultant disjointed text that we're used to when monitoring packet off-air. Pactor allows the full 8-bit ASCII character set to be used, indeed I've recently downloaded a number of 7+ programs 'off air' from HF BBSs as well as the

Pactor data rate throughput with and without 8-bit A/D Memory ARQ

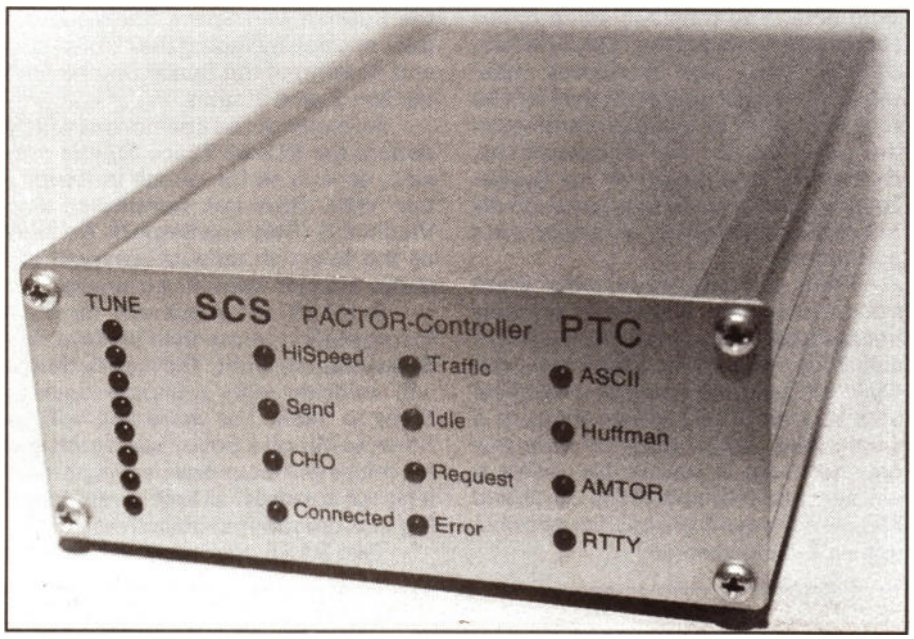


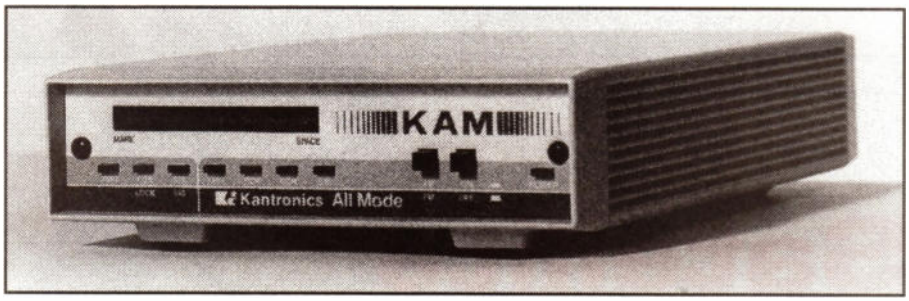
'usual' text messages. Your callsign can, of course, include extensions or whatever for reciprocal country operation, an 8 character identifier being possible. Also, because of the inherent timing, 'long-path' HF links are quiet, and I had no problems in using my 3-500Z HF valve linear amplifier with its heavy 'clunking' relay TX/RX switching.

Controllers

Pactor hardware started off at the beginning of 1991 with controller kits and EPROMs originally available from amateurs in Germany, but commercially made Pactor controllers are nowadays readily available. The 'original' SCS Pactor PTC controllers, ready built and tested, are available in the UK at £245 from the distributors *Abacus*, who I'm told have had close ties with the German development team for some time. I tried for some considerable time to get through to Abacus, and eventually found that their previously advertised office phone number (which I not only double checked but triple checked to make sure) was a public phone box! This of course turned out to be quite a 'comedy of errors', their correct number is 0661 71679 if you'd like to contact them. The PacComm Pactor controller, as reviewed in this month's HRT, is distributed in the UK by *Siskin Electronics*, Tel 0703 207587, priced at £259 including connectors. There is a software 'alternative' method, in a similar manner to the Baycom system for packet, using a 'dumb modem' plus an 'intelligent computer' (rather than the other way around). This is the BMK-Multy system for the IBM PC family, with 'modules' to support Pactor as well as Amtor, CW and RTTY, plus options of HF Fax and b/w SSTV at extra cost. You'll need a 286 PC or faster plus

The SCS PTC





Pactor for the KAM with a plug-in upgrade

the BARTG Multyterm modem to use this for Pactor, an 'add on' 1kHz clock is also recommended for simpler timing. The Pactor/Amtor/RTTY software and modem combination costs £129 plus £12 for a 1kHz clock unless you fancy building one yourself, and you can get details of the BMK-Multy from Grosvenor Software on 0323 893378.

Pactor should of course lend itself well for incorporation in DSP controllers and I've no doubt this will come soon, contact Amdat (0272 899352) for information. I've heard conflicting 'rumours' of the possibility of Pactor for the PK-232, you can get the latest from the UK distributors ICS Electronics (0903 731101). In the meantime, for all-mode use...

Pactor for the KAM

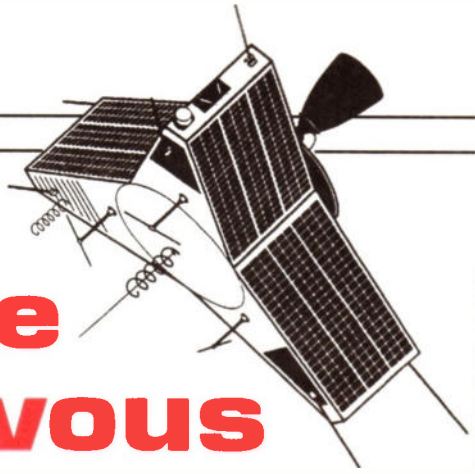
'Just around the corner' is something I'm personally quite excited about. A plug-in Pactor EPROM upgrade should be available for the Kantronics KAM by the time this appears in print, adding this mode to all the others such as WEFAX, RTTY, Amtor, CW, HF and VHF packet and so on without the need for extra hardware. I've already been sent a 'beta test' Pactor EPROM for the KAM to try out, which adds commands of PACTOR, MYPTCALL, PTLISTEN, PTFECSPD, PTHUFF, PTERRS, PTRPT, PTDOWN, PTUP, PTTRIES, PTSI, PTSUM to the lineup, and allows simultaneous Pactor HF operation and VHF/UHF packet operation. Since the KAM has programmable mark and space filters, no hardware changes were necessary in order to accommodate Pactor, and since the low pass filter within the HF demodulator is programmable, its bandwidth is reduced during 100 baud use, gaining noise margin. It uses 'digital memory ARQ' storing 1s and 0s, and the EPROM has a trace function where you can see several frames being combined to make a good one when the S/N goes down. At the time of writing a UK price hadn't been set for the Pactor upgrade, you can the latest information from the UK Kantronics distributors who are Lowe Electronics (0629 580800).

Software

A normal 'terminal emulator' program is quite OK, nothing fancy is needed for use with Pactor controllers (apart from the BMK system of course). No doubt the 'Hostmaster II' software (which I use here with relish) will be popular for use with the KAM. However, a number of 'Pactor dedicated' software programs are available for use with the SCS and PacComm controllers, such as the easy-to-use *PTERM* (in German, from DL6MAA who is one of the original Pactor developers), *PTCT* (available in English, written by PA0NC, I use version 13 here), and the comprehensive *PT* by DJ2HZ which is also available in English. All these provide on-screen displays of controller state such as idle, error received, changeover and so on, almost like a 'host mode'.

CTRL-Z, End of Message

That's it for a short introduction to Pactor, but speaking of software I've recently been testing the G7JJF suite of PC programs for 'intelligent' packet. There are versions available for use with a 'normal' TNC (plus WEFAX and SSTV for Kantronics TNCs), for use with a BPQ node system running on your computer, and for the Baycom system. After testing an earlier software issue I received as 'shareware', I recently received the latest registered versions of these (thanks Jon) and space permitting I hope to provide a review of this superb system next month. Until then, 73 from G4HCL @ GB7XJZ, or by post c/o HRT Editorial, P. O. Box 73, Eastleigh, Hants SO5 5WG, Tel 0702 262105.



Satellite Rendezvous

Richard Limebear G3RWL with this month's AMSAT-UK news

In the past couple of weeks both the Amsat-NA Board of Directors, and the controllers of Project Oscar (who own the copyright of the *OSCAR* name) have affirmed that they do not recognise SARA as worthy of the *OSCAR* designation because it does not *fit* the internationally agreed definitions of an amateur radio satellite. The debate as to whether or not Kitsat is Oscar 23 or 24 is therefore legally settled - it is Kitsat-Oscar-23.

KitSat

KAIST have apologized that the test phase is not yet complete, so that they haven't been able to open the uplink to everyone. They recently changed the schedule for the last DSPE experiment, CPE data collection, and Tx0 test (currently malfunctioning). Their guess is it will take another couple of weeks from the time this was put together before the BBS is generally opened, although it could even be a month or so. In the meantime they are scheduling as many CCD images as possible for folks to download.

They acknowledge that they still have a lot to learn, and are grateful for folk's forbearance while they get their act going.

Arsene

Arianespace have announced some future launch dates including the V58 flight in April/May 1993 carrying Astra 1C and Arsene. The very next flight (V59) in September 1993 will be the Spot-3 mission carrying lots of microsats viz: Healthsat, Kitsat-B, Posat-1, Eyesat and Itamsat.

Oscar 13

The ZRO Memorial Technical Achievement Award Program, or just 'ZRO Test' is back again on OSCAR-13. This activity is a test of operating skill and equipment performance. The 'B' tests can be heard on 145.840MHz and the 'JL' test on 435.945MHz. N5EM will run the 'JL' tests while WA5ZIB will continue with 'B' runs. More info available on request.

Oscar 10

It's currently available for Mode B operation when it is view. Please *do not* attempt to use it if you hear the beacon or the transponder signals FMing.

MicroSats

AO-16's software crashed on 27th July and they've been playing with it ever since, checking things out and optimising the configuration. They recently completed the checks and reloaded it with a new version of the software and opened it to everyone. It now runs with the same groundstation software as used on UO-22. It is no longer necessary to get a directory in connected mode.

The upgraded version of the housekeeping software allows them to tune the power control and other functions by command rather than reloading the software and they have been doing some of this in order to tweak things for the maximum possible transmitter power for the longest possible time. You may see some differences in the timing of the TLM, STATUS, BCRXMT and 'text broadcast' messages. In normal operation they will be sent less often to leave more time on the downlink for file transmissions. *Neither the new file server nor housekeeping software has been extensively exercised, so complete reliability is not guaranteed.*

They will also be running WOD from time to time. The format remains unchanged, except the entire WOD collection will only be about one orbit worth of data and you will usually be able to capture the whole thing in a single pass. When they are sure this new software is reasonably stable it will be made available to the LO-19 and WO-18 command groups for possible use on their spacecraft.

STS QSL Distribution

The Dayton Amateur Radio Association (DARA) has agreed to distribute the QSL cards for the STS-50 mission. Their address is: DARA, Box 44, Dayton, OH 45401. Frank Bauer, KA3HDO, has compiled the addresses of the QSL distributors for the STS-35, 37, 45 and 47 missions. These are shown in Table 1, and the status of various cards and their distribution in Table 2.

To receive a QSL, SAREX participants must include the QSO information (e.g. date, time in UTC, frequency, mode) which documents the contact or listener report. In addition, a large, business sized SASE is required for those who wish to receive a card. No cards will be distributed without the proper postage affixed or sufficient IRCs included.

Russian Satellites

At the time of writing, AO-21 is still operating with nine minutes of FM repeater and one minute of 400 baud PSK telemetry. This ten minute cycle repeats continuously. Currently, new software is being written to investigate other modulation techniques, and so this extended FM repeater operation may change soon.

NASA/Russian Cooperation

NASA and the Russian Space Agency have signed two cooperative agreements in Moscow; in the areas of human space flight and Mars exploration.

The Human Space Flight Agreement outlines the flight details of a Russian cosmonaut on the U.S. Space Shuttle, the flight of a U. S. astronaut on the Russian MIR Space Station and a joint mission including the rendezvous and docking of the Space Shuttle with the Mir Space Station.

An experienced cosmonaut will fly aboard the STS-60 Space Shuttle mission, scheduled for launch in November 1993. RSA has nominated Col. Vladimir G. Titov and Sergei K. Krikalev as the two cosmonauts who will undergo mission specialist training.

A NASA astronaut will fly on a long-duration (more than 90 days) Mir Space Station flight. The flight's timing will coincide with a Shuttle docking flight in 1995. The astronaut will be flown to Mir on a Soyuz spacecraft and his duties will focus on science, particularly life sciences, as well as engineering and operational objectives.

Two NASA astronauts will receive

full cosmonaut training with their cosmonaut crewmates at the Cosmonaut Training Facility near Moscow. One astronaut will be selected as the prime crewmember and the other will be designated as backup.

NASA will transport two cosmonauts in the Space Shuttle to replace the two cosmonauts on board Mir. Life sciences experiments, involving the NASA astronaut and the two cosmonauts on board the Mir, will be conducted while the Shuttle and Mir are docked. The NASA astronaut and the two cosmonauts who have been on the Mir will be returned in the Shuttle to the United States for continued post-flight life sciences experiments.

The primary objective of the joint Mars mission is to carry out further joint exploration of planet Mars in conjunction with the Russian Mars '94 mission. This may provide the opportunity for U.S. scientific instruments to be carried aboard the Russian spacecraft.

Phase-3D Update

At the ARRL Space Symposium in October, Dick Jansson WD4FAB announced that all of the engineering drawings for the Phase-3D mechanical design of the spacecraft structure have been released to begin the fabrication process. To prove it, during the Symposium, Dick had the drawings hung on the walls outside of the meeting room for interested enthusiasts to peruse. He even pointed out that there have now been several revisions to some of the drawings, but the design had been essentially frozen. Of particular importance in the drawings was the conical adaptor in which the Phase-3D satellite is built around. The preliminary work to build the adaptor rings which attach Phase-3D to the launcher and to the other satellites also flying with Phase-3D is under way in Germany and is being supervised by the AMSAT-DL group. Later, the adaptor rings will be shipped to Weber State University (WSU) where students have built a frame that will be used to perform the final assembly of the cone, making sure that it meets all the tight tolerances required for the Phase-3D satellite.

Another interesting aspect of the Phase-3D satellite drawings were the 'patch' aerials which will be located on the top surface of Phase-3D, and will cover 70cm, 23cm and S-band frequencies. The chief investigators for the 'patch' aerial designs have been Stan Wood WA4NFY and Jack Colson W3TMZ, and several students at John Hopkins University. Because of space restrictions between Phase-3D and the other satellites which will fly with it on the ARIANE V launch vehicle, 'patch' aerials provide the best solution to a very difficult problem. Stan has been deeply involved in the testing of these in his 'back-yard' aerial test range. He has even used one of his 'patch' aerial designs to work AO-13! Further refinement continues on the Phase-3D aerial design but as Stan puts it, the top surface of Phase-3D will look like an aerial farm!

Dick concluded his discussion at the Symposium stating that a great deal of work has been completed and actual 'tin-bending' and machining of the spacecraft structure had begun on Phase-3D.

KEPLERS

SAT:	OSCAR 10	UoSat 2	AO-13	PACSAT	DO-17	WO-18	LO-19	FO-20
EPOC:	92296.15802389	92290.56143146	92295.11992519	92292.22303485	92295.73373979	92288.21299437	92290.39908529	92292.23831044
INCL:	26.8938	97.8409	57.3200	98.6387	98.6386	98.6389	98.6390	99.0667
RAAN:	58.0181	321.4565	354.6107	13.6698	17.2979	9.8787	12.1783	187.8553
ECCN:	0.6019883	0.0013057	0.7288312	0.0010962	0.0011258	0.0011530	0.0011805	0.0539951
ARGP:	26.8563	53.6764	299.1715	168.4024	157.4238	180.6293	173.7316	274.5380
MA:	354.3347	306.5647	7.8490	191.7413	202.7441	179.4877	186.4016	79.4258
MM:	2.05878292	14.68690672	2.09720524	14.29746003	14.29875717	14.29861691	14.29947936	12.83214378
DECY:	-8.5E-07	5.41E-06	-1.22E-06	1.57E-06	1.64E-06	1.38E-06	1.63E-06	-4E-08
REVN:	4239	46095	184	14286	14337	14230	14262	12628

SAT:	INFORMTR-1	UO-22	KO-23	RS-10/11	Cosmos 2123	Mir	STS 52
EPOC:	92296.59357343	92297.12021199	92287.95740341	92296.46663218	92296.94477613	92296.51961136	92297.00668981
INCL:	82.9447	98.5001	66.0778	82.9266	82.9236	51.6246	28.4620
RAAN:	228.6297	10.7648	119.6937	54.3146	98.0541	331.4180	118.5056
ECCN:	0.0034977	0.0007651	0.0014442	0.0010280	0.0030172	0.0002181	0.0001713
ARGP:	326.2840	292.0432	257.8062	258.2113	346.4084	344.7963	183.9257
MA:	33.6111	67.9939	97.1059	101.7853	13.6256	15.3076	118.7827
MM:	13.74496313	14.36711603	12.86276309	13.72297345	13.74003115	15.55107723	15.89809643
DECY:	4.9E-07	2.01E-06	8.22E-06	1.76E-06	5.1E-07	1.5301E-04	8.1155E-04
REVN:	8680	6662	824	26724	8594	38208	4

Table 1. STS QSL Distributors

STS-35 Frank Bauer, KA3HDO, 9609 Tuckerman Ct, Seabrook, MD 20706
STS-37 as above
STS-45 Sterling Park ARC, P.O. Box 599, Sterling, VA 22170
STS-47 Jay Apt, N5QWL, 806 Shorewood Drive, Seabrook, Texas 77586

Table 2. STS QSL Status

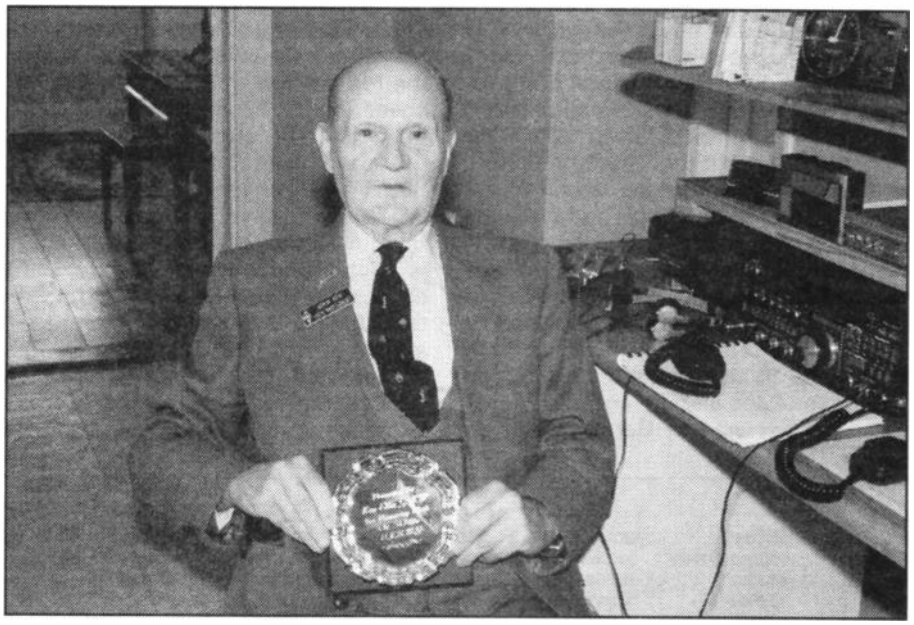
Mission	*Launch Date*	*QSL Distribution Status*
STS-35	December 1990	QSL distribution complete.
STS-37	April 1991	All who included SASE's for STS-37 should have received their QSL by now. 1-3 QSL requests are still being received per day.
STS-45	March 1992	QSL distribution just beginning.
STS-50	June 1992	QSL currently being printed, QSL distribution expected to start in approximately 4-6 weeks.
STS-47	September 1992	QSL layout should be starting soon.

AMSAT-UK News

If you're an AMSAT-UK member and you haven't yet renewed your subscription for next year, then here's a reminder! If you're not a member, then why not contact; AMSAT-UK, c/o Ron Broadbent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets you full membership info, and SWLs are welcome.

VHF/UHF Message

Geoff Brown GJ4ICD finds the bands 'interesting', and welcomes a prominent 6m personality to his island QTH



Ken G5KW proudly receives his award

It was very nice to meet many *VHF/UHF Message* readers at the Leicester Radio show, which despite the current recession, over six thousand visitors attended.

October radio conditions on the VHF/UHF side were interesting. Early in the month there were odd sporadic 'E' openings around Europe on 6m, and on the 4th T.E.P. to South America with ZP5, PY5, and LU being worked on 50MHz at around 1900 - 2000z, CE also being heard. There were a few African openings on 50MHz, and towards the end of the month VK TV was heard on 46.2495MHz.

Conditions for the UHF/SHF contest were dreadful with force eight gales down in the south, I couldn't hear a single station down here in GJ on 70 or 23cm. The massive anti-cyclone situated off Ireland in October failed to bring the much needed tropo on the bands, instead it just produced gale force eight winds down in the south of the UK for nearly ten days. We all hoped as it moved (around the 14th) that somebody, somewhere, may benefit. Did you?

G5KW's Visit to Jersey

As promised last month, I'll take a look at the visit Ken G5KW made to Jersey in late 1992. What did he find and what did he think of the island's radio magnetic properties?

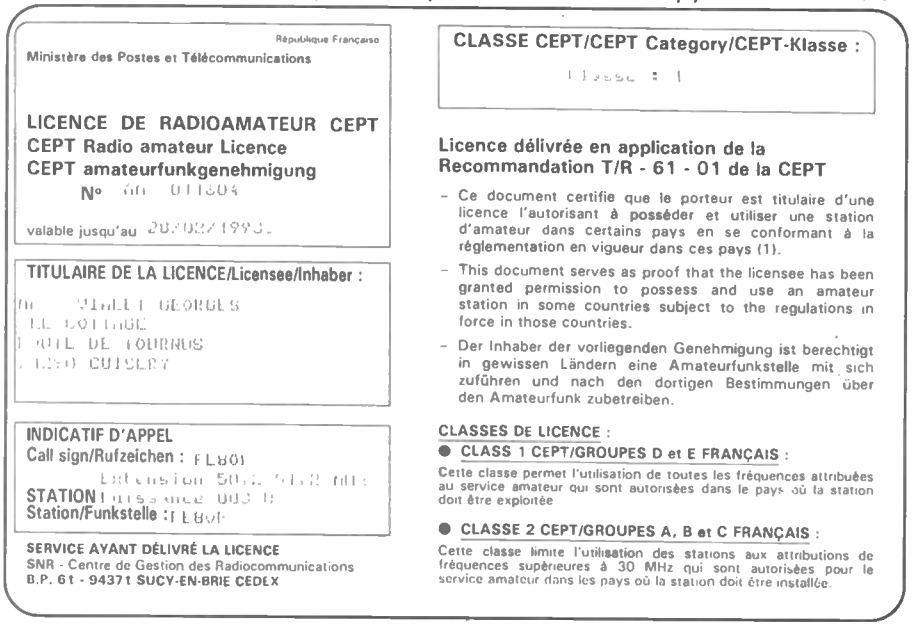
It was quite a surprise to hear that Ken (who was your previous 'VHF/UHF Message' columnist) was going to pay a visit to the island, so I thought we had better take some time off work and show him and his XYL around the place. On meeting Ken and Rita at the quay, I quickly chauffeured them to their hotel, after all they *had* spent some 14 hours in travelling to the island from Kent!

The next evening, both Ken and Rita were collected from the hotel and taken back to my work premises for a little surprise. Some readers out there may recall that Ken had spent many months on the Scilly Isles in the late 70's and early 80's researching 50MHz propagation. So, after a glass or two of wine, Ken was presented by the UK Six Metre Group with a silver salver for his pioneering and dedication work to 50MHz. Also present at the event was the Jersey Amateur Radio Society's new President, Mike Turner GJ0PDJ.

The following day it was time to let the 'big white chief' see the station, so off we went. I explained that a few hundred metres to the north of my QTH there was a drop of some 130m into the sea, also the curvature of land was shaped like a parabolic dish and my aerials were *just* in the right place! Ken was very impressed and most intrigued at the location, time for a few photos! After Ken's inspection of the station (and there was even an 'ES' opening to Poland) we made our way back to my works premises and said our goodbye's. Ken's final words to me were "I should be around for the next cycle"; well Ken, at your present age of nearly 85 we all hope you will.

The French Connection

George F8OP wrote in with news of French 50MHz stations. It seems that award managers are refusing some French 50MHz operators QSL cards (especially his!) because their callsigns do not appear on the original permit holders list for France. Well, we have some good news on that front, these stations who are QRV on 6m *do* have regional permits and nobody can seem to get a complete list of who they are. So the UK Six Metre Group have appealed to any French operators on 6m to send them a copy of their extension



République Française
Ministère des Postes et Télécommunications

LICENCE DE RADIOAMATEUR CEPT
CEPT Radio amateur Licence
CEPT amateurfunkgenehmigung
N° 611804
valable jusqu'au 20/02/1993

TITULAIRE DE LA LICENCE/Licensee/Inhaber :
M. VINCENT GEORGES
LE COTTAGE
HOUEL DE TOURNUS
78550 CUISERY

INDICATIF D'APPEL
Call sign/Rufzeichen : FL8GI
Extension 50MHz 144MHz
STATION Puissance 003 W
Station/Funkstelle : FL8GI

SERVICE AYANT DÉLIVRÉ LA LICENCE
SNR - Centre de Gestion des Radiocommunications
B.P. 61 - 94371 SUCY-EN-BRIE CEDEX

CLASSE CEPT/CEPT Category/CEPT-Klasse :
Classe : 1

Licence délivrée en application de la Recommandation T/R - 61 - 01 de la CEPT

- Ce document certifie que le porteur est titulaire d'une licence l'autorisant à posséder et utiliser une station d'amateur dans certains pays en se conformant à la réglementation en vigueur dans ces pays (1).
- This document serves as proof that the licensee has been granted permission to possess and use an amateur station in some countries subject to the regulations in force in those countries.
- Der Inhaber der vorliegenden Genehmigung ist berechtigt in gewissen Ländern eine Amateurfunkstelle mit sich zuführen und nach den dortigen Bestimmungen über den Amateurfunk zubetreiben.

CLASSES DE LICENCE :
● CLASS 1 CEPT/GROUPES D et E FRANÇAIS :
Cette classe permet l'utilisation de toutes les fréquences attribuées au service amateur qui sont autorisées dans le pays où la station doit être exploitée

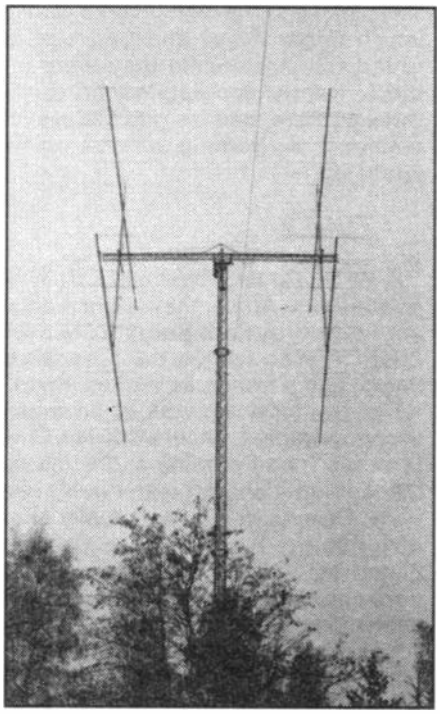
● CLASSE 2 CEPT/GROUPES A, B et C FRANÇAIS :
Cette classe limite l'utilisation des stations aux attributions de fréquences supérieures à 30 MHz qui sont autorisées pour le service amateur dans les pays où la station doit être installée.

to the licence. In the meantime enclosed on the last page is the first one, which will be passed along to award managers around the world. I sincerely hope that this will be of help to those of you that keep getting QSLs rejected!

F2 Halts at 46MHz?

Sporadic 'E' still frequented us during early October. There were a few openings on 50MHz to Spain which then linked up the T.E.P. path to South America. Ralph 4X1IF reports a good opening to YU and Italy on the 9th at around 1630z, and also the same day ZS6WB reported the 5B4CY beacon coming in very strong, showing a slow but positive return of Trans-equatorial propagation.

Late in the afternoon on the 11th, a good T.E.P. opening occurred to the southern UK from ZS6, A22, and 7Q7, all with very strong signals. The 12th



No, these aerials are not for 432 nor 144MHz! They're for 50MHz EME and belong to Karri OH2BC in Finland, who has already had 6m EME QSOs.

produced a good 'ES' opening with Spain, and Nigel GJ7LJJ reported working EH7. Later in the evening the 'ES' linked up the more common 'Spain to South America T.E.P. path', stations heard being PY5, LU, CX, and a report of a CE in Chile!

The following day at around 1700z, strong 'ES' was again reported from southern England, this time to the Italy 7 and 8 regions plus YU3, also heard at this end was a very weak 3D?? station, but signals were just too weak to identify who it really was. On the 15th more 'ES' was reported to SP and EH9, and Brian G3SYC (Yorks) reported that the week had been very active in terms of sporadic 'E', even in Yorkshire!

The 18th brought more 'ES', this time to Morocco (CN8), and on the 25th Steve, G4JCC (Hants) reported a very strong opening to ZS6 at lunch time. The solar flux continued to rise into the 170's ,and on the 28th at 1130z the first VK4 video of the season was heard on 46.2495MHz.

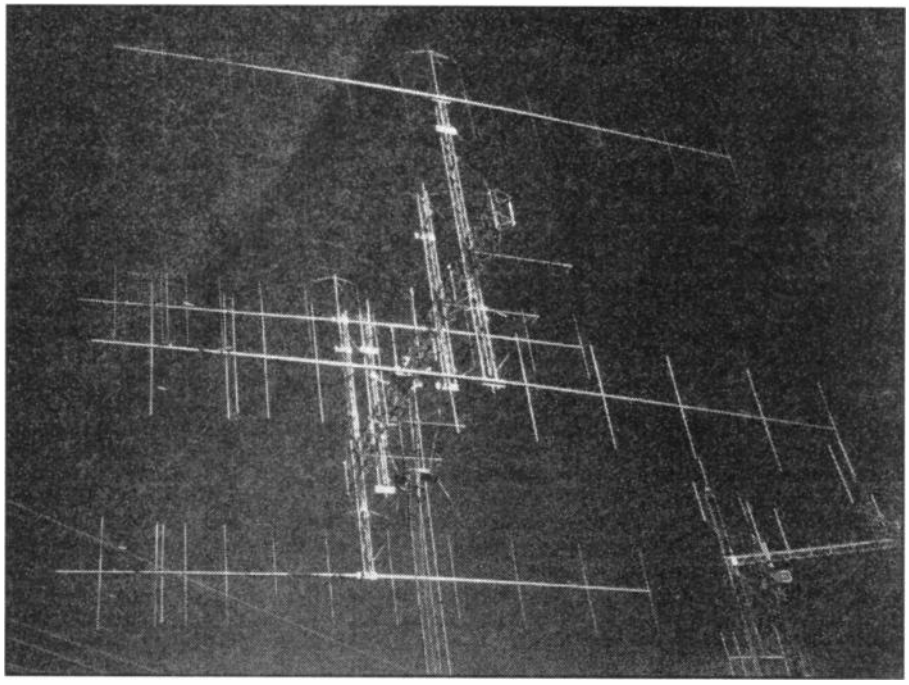
Maureen GW8ZCP and Alan GW3LDH who were on holiday in Malta were disappointed that there had been no short or long path openings to JA or VK as in previous years, thus showing a decline in the solar cycle. However as seen earlier, solar flux levels were quite high, so maybe there is another factor in producing F2 propagation at 50MHz. I wonder how the 'ES' and F2 season is going 'down under' in VK?

Higher Up

From Ela G6HKM comes news of her standings on VHF/UHF/SHF. Ela's current listings for 50MHz is 416 squares and 90 countries confirmed, on 144MHz she has 237 squares, on 432MHz 118 squares, and on 1296MHz 57 squares. Ela points out "It is interesting to note how 1296 is nearly half of 432, and 432 is nearly half of 144 etc.".

October the 7/8th seemed to be quite good on the higher bands from selected locations (Essex again!). On 70cm, Ela logged DJ9BV, DF2LH both in JO43, DD7LF (JO54) and DC7MH (JO62), the next day DK0TU (JO62), DL0NF (JN59), DL5KVD (JO64), OE3EFS/P3 (JN78) and SP6MLK/P in JO80 for a new one.

On 23cm, G0FCD was heard working OK1VEI, and that was the only report this month of real DX.



The 6m EME aerial system of Bob K6QXY in San Francisco (CM88), consisting of four 17m boom length yagis, each having horizontal and vertical elements which allows polarity steering in 45 degree increments. Total system gain is 18dBd. Bob has recently worked Karri OH2BC on 6m EME (and I'm told has now added G to his 6m EME collection - Ed

Other News

The final construction of the Z23SIX 50MHz beacon is delayed due to pressure of work at my end, but things should be completed as soon as possible, more news later. A short note from Rick, K1JRW is that the K1NFE beacon on Six has gone QRT.

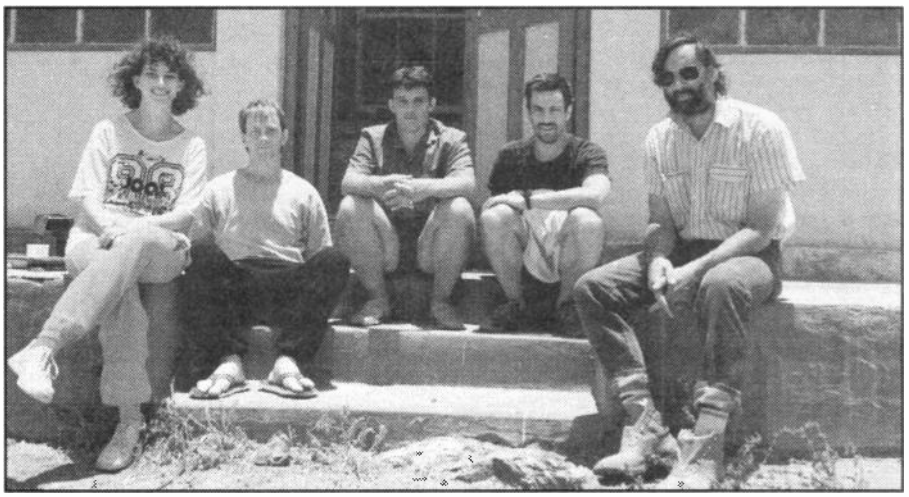
In November's HRT you may remember I mentioned the building of 'A dual band TX/RX for 50/70MHz'. Still no PCBs had arrived by mid October, however at Leicester I was presented with a bunch of the PCBs, so more on that one later.

Thanks again to all who sent bits for the electronic 'Food Parcels' for Rumania, it appears that the last few have not got through the system, so for the moment I will suspend the plan! My grateful thanks also go to the UK Six Metre Group for information supplied through 'Six News'.

So that's it for another month, any news please to: Geoff Brown, GJ4ICD, TV Shop, Belmont Rd., St. Helier, Jersey, C.I. or phone 0534-77067 day switched to fax at night (when I remember!)

HF Happenings

Don Field G3XTT says that high technology isn't everything in a contest location



L-R Ilze, ZS6NW, ZS4TX, ZS6EZ, ZS6RAD (ZS6NW photo)

Despite my dire predictions, propagation bounced back in the most remarkable way for the CQWW Phone Contest at the end of October. The solar flux shot up to about 150 while the 'A' and 'K' indices declined, with the result that all bands were lively. I was operating at G0KPW in Suffolk, and in our multi-multi effort (in which category you can run stations simultaneously on all six bands) we ended up with over 12,000 contacts during the contest weekend. This total included over 150 countries on each of 10, 15 and 20m, almost 140 countries on 40m, about 90 countries on 80m, and 56 countries on 160m. Indeed, in the first 24 hours of the contest we made DXCC (100 countries) on each of 10, 15, 20 and 40m! Of course, we had put together a very potent station for the occasion, but it just shows the level of activity and the kind of propagation that was about.

Talking about the potency of the station, I have finally discovered the benefit of the second receiver fitted to the more upmarket HF transceivers. All our transceivers at G0KPW had this facility (five FT-1000's and an IC-781) and we used it to the full. On each of the high bands (10, 15 and 20m) we had two towers per band, with a separate monoband Yagi on each. Thus it was possible, for example, to be running a US pile-up on one aerial, see a 'spot' for a needed African multiplier pop on the PacketCluster system, turn the second aerial on Africa, line up the multiplier on the second receiver, when he called QRZ swap VFOs and work him, then straight back to the US pileup with barely a pause! In fact, it takes longer to describe than to do in practice. On 160 and 80m the second aerial in each case was a Beverage. This is a long (preferably at least two wavelengths, which on 160m makes it about 320m!) low (we supported them from 1.2m garden canes) wire pointed in the direction of interest. A Beverage aerial is unsuitable for transmitting, but is an excellent low-noise receiving aerial which discriminates against high-angle (i.e., local) signals in favour of low-angle (DX) signals. It was great to be able to listen simultaneously on both the Beverage and the main transmitting aerial, and that way not miss any stations who were calling.

Although the above sounds very high-tech (which it is) we didn't have *every* aspect of the technology cracked. We had major problems this year in networking the computers on which we were logging but, more importantly, we almost froze to death in the barn where we had set up five of the six stations! It's a bit like being able to conquer space but not fix a hole in the road (or whatever). Oh well, it just shows that there is always room for improvement. It's the same in our shacks at home, of course. All too often we spend ages getting the aerials and rig set up the way we want them, but then pay little or no attention to the needs of the operator (yourself!). It doesn't matter too much if your operating sessions are short, but if you plan any all night vigils on the LF bands, or some contest operating, then ensuring a comfortable operating position is at least as important as making sure all the technical side is working properly.

Swaziland

Prior to the CQWW Phone Contest, G3SXW, G3TXF and G4FAM were active on CW from Swaziland, signing 3DA followed by their UK calls. This eight-day operation netted over 17,000 contacts and was a textbook example of how to put on an excellent DXpedition. I'm delighted to say that I was able to work them on 9 bands and, perhaps even more remarkable, had them in the log on 5 bands within 2 hours of their commencement of operations! This is no particular tribute to my operating skills, more to the high level of activity which Roger, Nigel and Cris kept up round the clock while they were out there. Hearty congratulations to the three of them, and it's good to see UK amateurs performing so well on the world stage.

ZS6EZ

While Roger, Nigel and Cris were in southern Africa they were helped enormously by Chris Burger ZS6EZ (ex-ZS6BCR) who loaned them aerials, a linear, and a trailer, as well as doing a lot of the local legwork in arranging accommodation, paperwork, etc. Chris is an old friend of mine and a veteran DXpeditioner and contester in his own right. Despite being perpetually short of funds (he has only recently completed his studies and taken up full-time employment) Chris has operated from many of the countries in southern Africa. One of his most ambitious operations was from the Penguin Islands off the coast of Namibia just before Christmas 1991. Chris has kindly written up this operation and sent me some photos, so I am devoting space this month to his write-up. Personally, I always find it interesting to hear the story from the 'other side' of a DXpedition operation. I hope you do too.

"Towards the end of 1991 it started looking as if an agreement might be reached between South Africa and Namibia on the issue of joint administration of Walvis Bay and the Penguin Islands. I had been looking for a DXpedition location for some months, and this indicated that both the Penguin Islands and Walvis Bay might be deleted. So, a return to Penguin Island

became the choice. Our team consisted of myself (ZS6EZ), ZS4TX, ZS6RAD and ZS6BUV (now ZS6NW), as well as ZS6BUV's wife Ilze.

Penguin Island was still very high on the DX Magazine's 'Most Wanted' countries survey in both Europe and Japan, so we decided to place major emphasis on those areas of the world. Also, a lot of time and effort would be spent on the low bands, and the WARC bands, because the previous operations had not been very active there. We also had a secret weapon to try out, the 'Battle Creek Special' aerial which was made available by W0CD, W8UVZ and K8GG. It is a very efficient aerial, and fitted in a custom made crate, complete with all the guys, radials and other accessories.

We got to Penguin Island on the yacht *Sagitta*. The equipment was unloaded by dinghy, and three stations were set up. There were four rotatable aerials, as well as two wire aerials and the Battle Creek Special. All three stations could be run at once, and we often had two of them on 10m at the same time.

The island consists of bare rock, with very few plants. We erected our big tribander at the apex of the island, to give us a clear shot all around. There are some old buildings on the eastern side, from guano mining activities some years ago. The island is about 1200 x 500m, and only a few kilometres from the Namibian coast. The weather was terrible, the island is part of the Namib desert and during our stay the wind exceeded 50 knots.

We tried to work Japan whenever the band was open. Some others got very impatient (especially stations from southern and eastern Europe), but the path to Japan is very difficult, and most Japanese DXers still needed Penguin Island.

Cushcraft supplied an A3WS aerial for the WARC bands, this worked very well and almost 4000 contacts were made on these bands. Although December is usually a very bad time for the low bands (in the Southern Hemisphere), we made over 160 DX contacts on 160m, and we also worked several hundred stations on RTTY. 10m was our primary band, and we made about

PENGUIN ISLAND

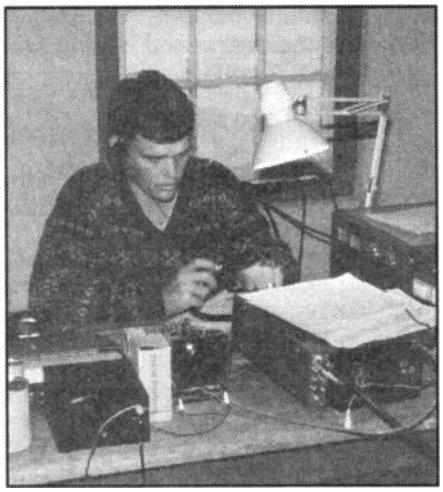
ZONE 38 **AFRICA**

ZSØZ

Another ZS6EZ operation supported by the NCDXF

STN	DATE YY MM DD	UTC	MHz	RST	2 WAY
Sample	91.12.			59(9)	☐ CW ☐ RTTY ☐ SSB

QSL via: Chris R Burger ZS6EZ (ex ZS6BCR)
P O Box 4485
Pretoria
0001 Republic of South Africa



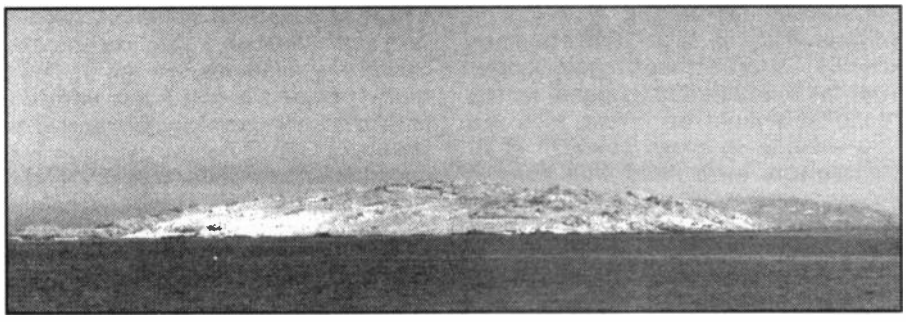
ZS4TX at the CW/RTTY position (ZS6RAD photo)

10,000 contacts on it. About 2,000 Japanese stations were worked, and around 600 contacts were made with UK stations. This included all bands from 10 to 160m but, for some strange reason, no G stations were worked on RTTY. Six G stations were worked on 160m (G3PQA, G3RBP, G3XWZ, G3SZA, G4BWP, G4GIR).

The following G stations worked us on three or more bands; 6 bands (both modes), G3KMA; 5 bands (CW), G4GIR; 4 bands (both modes), G3JXN G3UHU G3XTT G4ZYQ GW3AHN; 4 bands (CW), G3KDB G4BWP; 3 bands (both modes), G3GIQ G3OUF G3TXF G3VJP G4ELZ G4LJF G4WXT; 3 bands (CW), G3JAG G3WGV; and 3 bands (SSB), G3IUW G3MCS G3PJT G3YJI GW3ARS.

ZS0Z was the first ever ZS0 callsign. The Penguin Islands are still officially ZS1, and I (ZS6EZ, ex-ZS6BCR) am QSL manager.

Penguin Island (ZS6RAD photo)



Lesotho

After the Penguin Islands I made a brief solo DXpedition to Lesotho. Bernie ZS4TX went there to help me set up the station, and Hans 7P8EG was very helpful, I also met Ray 7P8SR and Ed 7P8DX while in the country. I didn't operate on 15 and 20m from there as the country is not very rare, and most of my time was spent on the WARC and the LF bands. Low band conditions were terrible, but I managed to work several dozen stations on 160m. The RTTY terminal broke, so no contacts were made on that mode. The QSL manager for 7P8EN is, as always, Bernie ZS4TX.

And Now?

After getting back I had to answer about 7,000 direct QSL cards. This was a major job, especially as I was working and studying at the same time. The last cards went out during August. Many individuals helped with this expedition, the NCDXF contributed financially as always. 7P8EG, K1GW, K1MM, K8GG, TI2HP, W0CD, W0ZV, W1JR, W8UVZ, ZS5NK, ZS6BDD, ZS6P, ZS6VIP, ZS6WB, LTC and SAPT were very helpful.

It looks like both the Penguin Islands and Walvis Bay will be deleted when the joint administration is implemented. So, work any ZS9 you need before it's too late, and let me know if you go to Penguin Island - I still need the place for my own DXCC!"

QRP CORNER

Dick Pascoe G0BPS introduces 'Reverse Squelch' for QRP stations

First, a quick reminder about the HRT's *QRP competition* and the G-QRP club's *Winter Sports*. These take place over the period between Boxing Day and New Year's Eve inclusive, so you may just about be able to catch the 'last' of these. Details in last month's HRT.

QRP Convention

The annual G-QRP convention took place at St. Aiden's Church Rochdale on the 17th October. Over 250 members made the effort to attend and all appeared to thoroughly enjoy the day. A series of lectures in the church ended with the, now annual, 'Question and Answer' session with David GM4ZNX, who has an almost photographic memory and appears to be able to answer any question on the hobby that anyone could pose. It is often an education to listen to him as he has the sometimes discouraging habit of almost always being right and can put the most difficult things into layman's language. Sometimes he needs prompting for this but everyone attending his talk learnt something.

At the convention there were of course the usual small number of traders with a special interest in the club and the hobby in general. The club stand was very well supported with several bargains also being found in the bring and buy. This annual pilgrimage for me 'ooop north' is always a highlight, meeting old friends from home and abroad. This year we lacked some of the usual gang from the USA but were pleased to see the return of Petre OK1CZ, the Chairman/Secretary of the Czechoslovakian QRP club. Petre speaks good English so few problems were encountered except when he offered some Polish army morse keys for sale, the fight to get them was fun! He promised some other very special ones for members soon.

The two representatives from the Dutch 'Dragon Slayers' QRP club as usual brought a large selection of great Dutch beer for the natives, and Luke W9HKA from Texas rode in with a nice book on collectible cameras (another hobby of mine). From the north, Johnny came over from Sweden alone with a small backpack, but said that as he enjoyed himself so much he promises a gang next time.

The best thing of all about this event is the large space in the middle of the hall for people to sit and chat. I was very glad on occasions to get away from the stand and spend a little time there and enjoy the company before departing for the hustle and bustle of Leicester. I was amazed to get many of the visitors asking if the club had a stand at the Leicester show. The club has not in recent years been to the Granby Halls, but perhaps might consider it in the future. A small sign offering membership to the club brought in a few new members, and a long chat with several others.

Reverse Squelch Control

A wonderful idea appeared in the 'Quarterly', the magazine of the ARCI. I loved this article and offer it to you for comments. Jim Griffin, W9NJP wrote;

"Negative squelch is the answer to high power transmitters used by today's amateurs. Most modern transceivers have the facility of a squelch control. This is activated when an incoming signal is a above a certain level. If you don't want to be bothered with low level signals, adjust the squelch so that only strong signals are heard".

"With reverse squelch the opposite will apply, only signals below a certain level will be heard! With this system someone calling CQ and not getting an answer will attempt to turn down the power level to get under the threshold! This would tend to reverse today's trend where some operators tend to increase power levels when they do not get a reply to a call".

"Commercial manufacturers are the ones who actually control power levels. Did they do a poll of users and find that most amateurs wanted 100W output?. This seems to be the standard nowadays. Imagine the QRM levels if all commercial rigs were 50W, or even just 10W. On most, if not all of these commercial radios, the 'S' meter is calibrated in +10, +20, +40dB etc. steps over S9. So rather than bragging about how far over this 'S9' a signal is, the response should be, 'Wow, why are you wasting so much power?". If all transceivers were fitted with reverse squelch, operators would tend to turn down the wick so as to be heard. Yes there would be problems, but just imagine the consequences if it did really happen".

Quality Control

Most amateurs looking at having a go at operating with low power levels will be put off at the lack of success, the lack of answers to CQ calls, etc. To this end, the station should be approached as though it were a full contest station, trying for every gramme of signal. The very best aerial, good quality feeder and of course the aerial as high as possible.

The only difference between a good contest station, and the successful low power operator, is the power level. Most successful QRP men spend hours tuning their stations. Yes, a 20m high (or more) tower is a blessing, especially if there is a good multi-element, single band beam, on the top. A single band beam of course will restrict you to that one band. Much better to have a compromise and go for a tribander, but even these are a concession to space. How much better to have three single band beams than one tribander. For the operator who wishes to make full use of the various bands available today, a multiband aerial is a must. Remember almost all modern commercial transceivers will put out a clean signal on the bands, it is the aerial that gets that signal out into the ether.

For many years, I used the 'standard' G5RV aerial with a modicum of success. A change to a simple doublet helped, as this was simply two wires of equal length running the full length of my grounds, fed by a 4:1 balun and 300Ï feeder. This was also successful, and a later addition of a full loop on 80m made the lower bands spring into life. Each of these above aerials cost me virtually nothing, and they worked, after a fashion. None had any 'gain' as such, and although the centre of the doublet was at 15m, the ends drooped to about 4m. Not a good omen for great DX. The addition of a small tower and a Cushcraft R5 vertical helped enormously, previously weak signals crept above the noise floor and became workable. Oh to be able to put up a beam!

The point of this is to offer the reasoning behind good aerials. We are always telling newcomers, if you have £1000 to spend on a station, get the best aerial you can, as high as you can. Spend the remainder on the rig. How many people do you know with the latest multi-thousand pound transceiver fed into a G5RV? Remember, power is no substitute for skill.

That's it for this month, ideas and comments to me please, either via HRT editorial at P. O. Box 73, Eastleigh, Hants SO5 5WG, packet via GB7SEK, or to 3, Limes Road Folkestone, CT19 4AU

Club News

Acton, Brentford & Chiswick RC meet at 7.30pm on the third Tuesday of each month, at the Chiswick Town Hall, Turnham Green, Chiswick, London W4. New members welcome. Club event;
Jan 19th AGM and club quiz.
Further details from Colm Mulvany G0JRY, Tel. 081 749 9972.

Aylesbury Vale RS meet on Wednesday evenings in the Village Hall in Hardwick, located off the A413 between Aylesbury and Buckingham. Club events;
Jan 13th Annual dinner and presentations.
Jan 20th AVRS v Chesham ARS quiz.
For more details and meeting times, contact Martin G4XZJ, Tel. 0296 81097

Bangor and District ARC meet on the first Friday of each month, 8pm, at the Winston Hotel, Queens Parade, Bangor, Co. Down. Visitors very welcome. Planned club events/talks;
Jan. 8th Quiz, followed by mini talk on curing TVI.
Feb. 5th Visit to Bangor Technical College for practical demo on curing TVI.
For further details contact R. Buckley GI3HCP, 56 Gransha Rd, Bangor, BT20 4TL, Tel. 0247 460251

Barnsley and District ARC was formed in 1913, and meets every Monday night in the radio shack at the rear of the Darton Hotel, Station Road, Darton, Barnsley. Anyone interested in radio or the Novice licence is most welcome to attend.
Forthcoming club events/talks;
Jan 25th Rig check night.
For further details contact Ernie G4LUE, Tel. 0226 716339 between 6.00pm and 8.00pm.

Braintree and District ARS meet on the first and third Monday of the month (except bank holidays), 8.00pm, at the Community Centre, Victoria St., Braintree. There is a club net on 2m on the second and fourth Mondays at 20.00 GMT on 145.375MHz. Planned club events/talks;
Jan 4th Work of the Trinity House lighthouse tenders, talk/video by G7EIG.
Jan 18th PMR conversion theory, G3PEN and G0DEC.
Feb 15th PMR conversion practical. For further details please contact Derek Mayes G3MMA, Tel. 0787 474312

Bridlington and District ARS meet every other Thursday, 7.30pm, in the Combined Cadet Building, Bridlington Upper School, Yorkshire, all visitors welcome. Planned club events/talks;
Jan 7th Low profile DX, John G3EZZ.
Jan 21st Packet nodes, Chris G6KIA.
Feb 4th CW and Raynet, Brian G4XBU.
Feb 19th Computer programming, Keith Goodyear.
Further details can be obtained from Norman G4NJP, 44 Hilderthorpe Rd, Bridlington, Yorks YO15 3BG.

Bristol ARC meet at the 159th Scout Headquarters, Firtree Lane, St. George, Bristol. Planned diary of events/talks;
Jan 6th CW night.
Jan 13th Simple computer programming.
Jan 20th Darts evening, club match.
Jan 27th Bring and buy junk sale.
Further details an meeting times can be obtained from Lance Whitelegg G0CCU, Tel. 0272 721744.

Bromley and District ARC meet on the 3rd Tuesday of each month, 7.30pm for 8.00pm at the Victory Social Club, Kechill Gardens, Hayes, Kent. Club events/talks;
Jan 19th AGM.
Feb 16th Introduction to fibre optics, Alan Ogden.
Further details from Mr. Geoffrey Milne G3UMI, 142 Hayes Lane, Hayes, Kent, BR2 9EL, Tel. 081 462 2689.

Bromsgrove and District ARC meet every Friday night for on- air, construction, and natter nights. On the second Friday of each month at 8.00pm they have a talk/ lecture at Waselly Country Park. Planned club talks/events;
Jan 8th Morse keys.
Feb 12th Photography.
For further details contact Joe Poolle G3MRC, Waselley Country Park, Gannow Green Lane, Rubery B45 9AT, Tel. 0562 710010

Dacorum AR and TS meet on the first (informal) and third (formal) Tuesdays, 8.00pm, at the Heath Park, Cotterells, Hemel Hempstead. Club talk/event;
Jan 19th Computers in amateur radio.
For further details contact Dennis Boast G1AKX, Tel. 0442 259620

Dengie Hundred Amateur Radio Society tell us they've just reformed after a three year absence. They've already arranged activities over the Christmas period which we received details of too late for inclusion, but they meet on the first and third mondays of the month at the Henry Samuel Hall, Steeple Road, Mayland, Essex. We're told there's plenty in the pipeline, so for more details, contact the Secretary Tracey on 0621 783629 after 6.00pm

Dereham ARC meet at the St. Johns Ambulance Hall, Yaxham Road, Dereham, at 8.00pm. Planned club talks;
Feb 11th SSTV, by Robert G4TUK.
For further details contact Mark Taylor G0LGJ, Tel. 0362 691099 or G0LGJ @ GB7TLH packet.

Edgware and District RS meet, at 8.00pm, at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak. They have Morse practice sessions, and run club nets on Mondays and the last Sunday of each month. Visitors always welcome. Planned club talks/events;
Jan 14th AGM.
Further details can be obtained from Howard Drury G4HMD, Tel. 0923 822776, or Steve Slater G0PQB, Tel. 081 953 2164

Grantham Radio Club meet on the first and third Tuesdays of each month at the Kontak sports and social club, Barrowby Road, Grantham, starting at 8.00pm. Planned club talks/events;
Jan 5th HF Aerials, by John G3VSX.
Jan 19th Natter and noggin
Further details from John Kirton G8WWJ, Tel. 0476 65743

Halifax and District ARS meet at 7.30pm on the first and third Tuesdays each month, at the Running Man Public House, Pellon Lane, Halifax. The first Tuesdays are informal 'Noggin and Natter' nights, other planned club events/talks;
Jan 19th Jandek, Derek G3ZOM.
Feb 16th Junk sale, Queens Rd. Neighbourhood Centre.
Further details can be obtained from Mr. D. Moss G0DLM, Beechwood Lodge, Lightcliffe, Halifax HX3 8NU, Tel. 0422 202306

Hastings Electronics and RC meet every Friday, 7.30pm at Ashdown Farm C.C., Downey Close, Hastings, for a social evening, and every third Wednesday of each month for their main meeting, at West Hill Community Centre. They run RAE and Novice courses. Planned club talk;
Jan 20th Packet from scratch
For further details contact Reg Kemp G3YYF, Tel Crowhurst 83454

Hesketh ARC is a small but active club based in Southport, Lancashire. They tell us they ran a successful Novice course with nine students last year who all passed, and are currectly running another course for Hesketh Bank ATC. They meet every other Tuesday in Birkdale, Southport. Planned club talks/events;
Jan 5th Open evening, for everyone interested in communications.
Jan 19th AGM.
For further details contact Bernie G7DEM, Tel. 0704 63344 or via packet @ GB7NWI.

Hoddesdon Radio Club meet alternate Thursdays at the Conservative Club, Rye Road, Hoddesdon from 8.00pm. Club diary of talks/events;
Jan 7th Social evening.
Jan 21st My radio collection, by Brooke Verral.
For more information contact Roy G4UNL, Tel. 081 804 5643.

Horndean and District ARC meet on the first Thursday of each month at Horndean Community School, Barton Cross (off Catherington Lane), Horndean, Hants. Club diary;
Jan 7th The Portsmouth repeater, John G3MYI.
Feb 4th Junk sale.
Further details can be obtained from Stuart Swain, Tel. 0705 472846

Keighley ARS meet at the Cricket Club, Ingrow, near Keighley every Thursday at 8.00pm. Most club meetings are 'Natter nights', other events/talks include;
Jan 14th Mountain Rescue – search dogs.
Jan 25th AGM.
Further details from Kathy Conlon G1IGH on 0274 496222

South East Kent ARC meet at the Dover YMCA in Leybourne Road, Dover every Wednesday from 7.45pm. The club runs a successful Novice class at the same venue on Wednesdays from 6.30pm. Club events/talks;
Jan. 20th VSWR, by Dick G0BPS.
Jan. 27th Talk by Kent Repeater Group.
Feb. 3rd Evening for Novices.
Feb. 10th The role and workings of Raynet, by G0FAK.
Feb. 24th Introduction to packet, by G7IXL.
For further details contact Eileen G7HXJ, Tel. 0304 372656

Kettering ARS meet every Tuesday at 7.30pm at The Electricity Sports and Social Club, Eksdale St, Kettering. Club diary of events/talks;
Jan 26th Radio communication, by F/O Rose from RAF Wyton.
Feb 23rd Gas distribution and radio links.
Further details from Len G0RDV (was G7EHM), Tel. 0536 514544

Liverpool and District ARS meet at 8.00pm every Tuesday evening at The Churchill Club, Church Rd, Wavertree, Liverpool. Planned club events/talks;
Jan 5th History of the club.
Jan 12th Activity night.
Jan 19th Construction techniques, G0IFK.
Jan 26th Surplus sale.
Feb 2nd Homebrew test gear.
Feb 9th Activity night.
Feb 16th Weather satellites, G3PDC.
Feb 23rd Surplus sale.
For further details contact Ian Mant G4WWX, Tel. 051 722 1178.

Maidenhead and District ARC meet, 7.30pm, at The Red Cross Hall, The Crescent, Maidenhead. Planned club events/talks;
Jan 19th Moonbounce (EME), Ian G3SEK.
Feb 4th The history of GB2SM (Science Museum).
For further details contact Neil G8XYN, Tel. 0628 25952

Maidstone YMCA ARS meet every Friday at 8.00pm, at the YMCA Sports Centre, Melrose Close, Maidstone, Kent ME15 6BD. RAE classes are held every other week, lectures and events in alternate weeks. Planned club events/talks;
Jan 17th RSGB Morse tests.
For further details contact Club Secretary Colin Roberts, Tel. 0622 670936.

Mansfield ARC meet on the first Thursday every month, 7.30pm, at The Polish Catholic Club, Off Windmill Lane, Woodhouse Road, Mansfield. Planned club diary of events/talks;
Jan 7th Chairman's evening, G8EHX on Equidor.
Feb 4th RSGB video evening, and DXpedition to VU.
For further details contact Mary G0NZA, Tel. 0623 755288

Norfolk ARC meet every Wednesday at 'The Norfolk Dumpling', The Livestock Market, Harford, Norwich, 7.30 for 8.00pm start. Club diary of events/talks;
Jan 10th 80m AFS.
Jan 13th 'Real radio' evening.
Feb 17th Science for all, Arnold G3PTB.
Further details can be obtained from Jack Simpson G3NJQ, Tel. 0603 747992

Northern Heights ARS meet on the first and third Wednesdays every month, 8.00pm, at the Broadshaw Tavern, near Queensbury, between Bradford and Halifax. Forthcoming club events/talks;
Jan 6th Videos.
Jan 20th Annual dinner.
Feb 3rd Geoff G8NWK.
Feb 17th Mr. Dougherty's lecture.
Further details can be obtained from Stan Catton G1HYR/G0IYR, Tel. 0274 673116.

Nottingham ARC meet every Thursday, 7.30pm. in the Sherwood Community Centre, Mansfield Road, Nottingham. Visitors interested in amateur radio, whether as a transmitting amateur or SWL, are most welcome. Forthcoming events/talks include; Jan 7th How to deal with electrical emergencies.
Jan 14th Morse and the Morse test.
Jan 21st Construction/activity/on the air evening.
Jan 28th Junk sale.
Further details from Ian Miller G4JAE, Tel. 0602 232604

South Notts ARC meet every Friday, 7.00pm, at Highbank Community Centre, Farnborough Road, Clifton Estate, Nottingham, and have regular construction nights at Fairham Community College, other planned club events/talks;
Jan 8th AGM.
Jan 15th Junk sale.
Feb 19th The Secret War, Henry G4MHB.
For further details contact Julian G0LXX, Tel. 0602 211069, or Ray G7ENK, Tel. 0602 841940.

Preston ARS have a full and varied calender for 1992, they meet at the Lonsdale Club, off Fulwood Hall Lane, Preston, fortnightly at 8.00pm. Planned club talks/events for the near future;
Jan 7th Paddle keys – international, by G4ZPY.
Jan 21st AGM.
For more details contact Eric Eastwood G1WCQ, Tel. 0772 686708.

Silverthorn RC meet every Friday, 7.30pm. at the Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Planned club diary of events/talks;
Jan. 29th The Worked All Britain Award, by G4OBE.
For further details contact Andrew Mowbray G0LWS/G1NPT, Tel. 081 529 4489 (evenings and weekends only).

Stockport ARS meet on the second and fourth Wednesdays each month, for details of their meeting place contact Club Secretary Jim G3KAF, Tel. 061 439 4952. Planned club events/talks;
Jan 13th Metrology, by G4GRU.
Jan 27th Oldham Blue Coates School, by G0GDN.

Stratford upon Avon & District RS meet at the Home Guard Club, Main Road, Tiddington, Stratford upon Avon, at 7.30pm. Club events/talks include;
Jan 11th New year social.
Jan 25th Contesting and IOTA.
Feb 8th Trials and tribulations of an OWL, Stan G4AXW.
Feb 22nd Test equipment evening, Terry G3MXH.
Details from A. Beasley G0CXJ, Tel. 060 882 495.

Sudbury and District RA (SAnDRA) meet on the first Tuesday of each month, 8.00pm, at The Five Bells Inn, Great Cornard, Sudbury, Suffolk. Forthcoming talks;
Jan 5th Natter and noggin night
Feb 2nd Weather Satellites, talk by Mark Clark G3CQL
Further details can be obtained from Colin Muddimer G0PAO, Tel. 0787 77004.

Surrey Radio Contact Club meet on the first Monday of each month at TS 'Terra Nova', The Waldrons, Waddon, Croydon, Surrey. Planned club talks;
Jan 4th 'I followed Rommel'
Feb 1st Adjacent signal interference.
For further details contact Bernard Wynn G8TB, Tel. 081 660 7517

Sutton and Cheam RS meet on the 3rd Thursdays each month, 7.30pm for 8.00pm at Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter nights are on the first Thursday of each month, and they have a club net on Monday at 20.30 on 70.3875MHz, and Tuesday at 10.30 on 3.760MHz. Club talks;
Jan 10th 3.5MHz AFS contest (CW).
Jan 16th 3.5MHz AFS contest (SSB).
Jan 21st 'Siberian Adventure' by G0BXC.
Feb 18th Constructional contest.
For further details, Tel. 081 644 9945

Taunton and District ARC meet every Friday at The Basement, County Hall, Taunton, Devon. Most Fridays are informal meetings when there will be various activites such as operating the station, Morse classes, and general discussion etc., all visitors very welcome. Other planned talks/events;
Jan 8th Early days of airbourne radar, by Doug G5JJ.
Jan 22nd Weather satellites, meet at Queens College.
For further details contact the Club Secretary W. A. Lindsay- Smith G3WNI, Tel. 0823 680778

Torbay ARS meet every Friday at the ECC Social Club, Highweek, Newton Abbot at 7.30pm. They have informal meetings most Fridays with a talk/event once a month, details as follows;
Jan 22nd Contest and construction night.
Feb 19th AGM.
Further details can be obtained from Walt G3HTX, Tel. 0803 526762 or Andy G4VPM, Tel. 0803 329055

Trowbridge and District ARC meet at Southwick Village Hall, Southwick, Trowbridge, Wiltshire for a main meeting every 1st Wednesday of the month, and a natter night every 3rd Wednesday. Planned club events/talks;

Jan 6th AGM.
Feb 3rd Surplus equipment sale.
For further information please contact Ian G0GRI, Tel. 0225 864698 evenings.

Winchester ARC meet on the third Friday of the month, 7.30pm, at the British Red Cross Centre, Durngate House, Winchester (adjacent to North Walls Police Station). Club diary;
Jan 15th AGM.
For further details contact Malcolm Butler G0LMD, Tel. 0962 89550.

Wirral and District ARC meet at 8.00pm, at the Irby Cricket Club, Mill Hill Road, Irby, Wirral. Planned club events/talks;
Jan 6th D&W The Greave Dunning, Greasby.
Jan 13th AGM – make your feelings known.
Jan 20th D&W Black Horse, Lower Heswall.
Jan 27th Surplus equipment sale.
For further details contact Paul G0JZP, Tel. 051 648 5892

Wrexham ARS meet at Maesgwyn Road Community Centre, Wrexham (behind thr Wrexham Maelor Hospital Maternity Unit). Forthcoming events/talks;
Jan 5th No meeting
Jan 19th Visit to British telecom, Oswestry
Feb 2nd Projects night, bring your latest project
Feb 16th Video night – amateur television
Mar 2nd Talk
For further details and meeting times contact D. Ian Wright GW1MVL, Tel. 0978 845858

Yeovil ARC meet every Thursday, at the Red Cross Centre, Grove Avenue, Yeovil, Somerset. Club events/talks;
Jan 7th Club's 2m linear, G3FQO.
Jan 14th Club project transmitter board, G3MYM.
Jan 21st 80/20m project – circuit theory by G3PCJ.
Jan 28th Completion of club project, G3MYM and G3PCJ.
Further details can be obtained from Mike Woodford G0JVG, Holm Wood, 5 Orchard Close, South Petherton, Somerset TA13 5DX.

Rallies

January 24th
The Lancastrian Rally, is to be held at the University of Lancaster, admission £1. Doors open at 10.30am for disabled visitors. For further details contact Sue G1OHH, Tel. 0524 64239.

February 7th
South Essex ARS Radio Rally, will be held at The Paddocks, Long Road (A130), Canvey Island, Essex. Doors open at 10.00am, with trade stands, bring and buy, home made refreshments, free parking plus parking outside the main door for disabled visitors. 2m talk-in on S22 (G4RSE). Further details contact Ken Hendry G0BBN, Tel. 0268 755350.

February 14th
2nd Northern Cross Rally, will be held at Rodillian School, near the junction of M1/M62,. For further details contact Dave Gray, Tel. 0532 827883.

February 21st
East Coast Amateur Radio and Computer Rally will be at Clacton Leisure Centre. For further details Tel. 0255 474292

February 27th
Tyneside ARS 5th Annual Rally will take place at the Temple Park Leisure Centre, South Shields. Doors open at 11.00am (10.30am for disabled visitors). We are told all their usual visiting trade stands will be in attendance, and those visitors not wishing to partake in the rally have all the amenities of the leisure centre available. For further details contact Jack Pickersgill G0DZG, Tel. 091 265 1718

March 13/14th
London Amateur Radio and Computer Show, will be held at Picketts Lock Centre, Picketts Lock Lane, Edmonton, London. We're told there will be a large trade presence, free parking, lectures, disabled facilities, bring and buy, and a special interest group section. Talk-in will be on 2m and 70cm. For further details, telephone 0923 678770

March 14th
Wythall Radio Club are holding their annual rally at Wythall Park, Silver Street, Wythall (near Birmingham on the A435, two miles from junction 3 on the M42). They've told us there will be the usual traders in three halls, a bring and buy stall, and a bar and refreshment facilities available. Talk-in will be on S22 and admission 50p, doors open at 11am. Further details can be obtained from Chris G0EYO, Tel. 021 430 7267

National and International
British Amateur Radio Teledata Group (BARTG) have a quarterly magazine, hold two contests and a rally each year. The membership officer is Peter Adams, G6LZB, Tel. 0923 220774 for details of joining the BARTG, for other information the group's Secretary and Publications Manager is Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ, Tel. 0602 262360, or via packet G4EAN @ GB7BAD.

G-QRP Club publish a quarterly magazine devoted to low power communication, and hold regular get-togethers. Their secretary is Rev. G. Dobbs, St. Aiden's Vicarage, 498 Manchester Road, Rochdale. Lancs. OL11 3HE. Tel. 0706 31812.

International Short Wave League who as well as running an International QSL bureau for amateurs and SWLs, have a monthly newsletter and regular get-togethers at their rally stands. See their feature in the June 92 issue of HRT. For more details send an A4 sized SAE to; ISWL HQ, 10 Clyde Crescent, Wharton, Winsford, Cheshire. CW7 3LA

The Irish Radio Transmitters Society send out regular newsletters giving details of local activities, the contact man for this is Dave Moore EI4BZ, 12 Castle Ave, Carrigtwohill, Co Cork. Tel. (Eire) 021 883555

Radio Society of Great Britain are based at Lambda House, Cranbourne Road, Potters Bar, Herts. EN6 3JE, Tel. 0707 59015. They have a unique blend of full-time staff at Potters Bar coupled with many volunteer officials around the country. See their 'open day' feature in the July 92 issue of HRT.

Royal Naval Amateur Radio Society have a large number of on- air nets, and meet together at rallies and events throughout the UK. They publish a regular newsletter, and offer a wide variety of member's supplies. Information from their Secretary Mick Puttick G3LIK, 21 Sandfield Cres, Cowplain, Waterlooville PO8 8SQ, Tel. 0705 255880.

To include your club, or rally, in this feature, make sure you send us your events details early. We only list active clubs, i.e., those who send us their diary of planned talks/events, so if they're not listed here they're obviously not very dynamic! Is your club listed – if not then either give your Secretary a boot or get some activities going! Dates to be included in the issue published on the first Friday in March must reach us by the 15th January, addressed to 'HRT Club News', P. O. Box 73, Eastleigh, Hants SO5 5WG.

Free Readers Ads!

HELPLINES

***Do you need** local help getting that PMR rig going, or with the repair of your rig, do you need a circuit diagram, or do you have time on your hands and you'd like to offer help? Maybe you have some old gear or even radio books and magazines going spare that you'd like to offer 'free to a good home' rather than throw away. Do you need that elusive small part for your radio repair? Then be our guest, advertise free in this new section of 'Free Readers Ads' (Amateur Radio related ads only please). Post your coupon, marked 'Helplines' to us, or Fax it direct to 0703 263429.*

Help needed with final tuning of a PF2UB on 70cm, all working but needs that final tweak. Please contact Mr. Minchin, 122 Mildenhall Road, Great Barr, Birmingham B42 2PQ, Tel. 021 360 4600 after 7.00pm.

Service manual and operating manual for Motorola S1333A solid state digital tone generator, all costs etc. reimbursed, any help on this 'box' gratefully received. Contact Mark G7HUN (Portishead), Tel. 0275 818566 after 6.00pm.

Help wanted to find frequency lists on USB Lo, USB Hi, LSB Lo, LSB Hi, will pay for chart with channel numbers. Write to; Mark Drury, 94 Bryn-Y-Gog, Machynlleth, Powys SY20 8HN.

Info on Taylor valve tester model 45D2 and Furzehill scope type 0.100. Please contact Douglas Byrne, 52 West Hill Rd, Ryde, IoW. Tel. 0983 567665

FOR SALE

Trio R-1000 communications receiver, brand new condition, with instruction book and schematic, still in box, £200 no offers. Contact M. Simpson (Doncaster), Tel. 0405 817440

FT-736R, 2m and 70cm, boxed and in excellent condition, £925 no time wasters please. Capco SPC100 ATU, mint and unused, £70. G400 rotator and Kenwood bearing, 12m cable, £95. J. Kershaw (Bolton, Lancs), Tel. 0204 852786

23cm module FT-736R, £250. FT-290R Mkl plus linear, mobile mount, and charger, £250. 2m linear MML/144/100, £65. 70cm linear MML/432/100, £150. **AR2002 scanner**, £220. Dressler masthead preamp, 70cm, £40. Dressler active aerials, £30 each. Elevation rotator, £50. Emotator rotator, £40. Contact S. Sherratt G8FAK (Beds), Tel. 0234 751475

Due to ill health, complete 70cm TV station, includes transmitter, linear, mono camera, aerial, preamps, monitors, all cables and electronic test card, £500. Also 40ft Strumech tiltover tower, groundpost mounted, buyer removes and collects, £275. Dave (Birmingham), Tel. 021 552 7560

Racal RA17L HF receiver with handbook and spares, £130. Racal RA98 SSB adaptor with handbook, £30. PSU suitable for valve TX, 1kV (heavy), £12. (Ipswich). Tel. 0473 689982

Ranger RCI2950 10m mobile transceiver, easily converted for wider coverage, brand new, £300 no offers, or part exchange for Yaesu home base. Contact Robert (Cheltenham), Tel. 0242 573092

Yaesu FT200 HF transceiver, no PSU, £70 ono, cash only. (Weynouth). Tel. 0305 773240

Realistic PRO41 handheld scanner, covers 66-88, 137-174, 406 512MHz, 10 channels, programmable, boxed, only 6 months old, £65 ono, carriage extra. Steve (Edinburgh), Tel. 031 336 4430.

Yaesu FRG-8800 receiver with VHF converter, mint condition, £480 ono. (Halifax, Yorks), Tel. 0422 363856

Trio TS940S plus internal ATU and Lowe mods, in mint condition, with original carton, manual, hand microphone, £1250. Tony G4KHT (Hull), Tel. 0482 843457

2m mobile, Dymar Lynx 100 channel synthesized, modified for 2m FM and programmed for popular frequencies, with toneburst and reverse repeater facilities. Complete with mic and mounting cradle, £50, p/p extra or collect. Alan (Sutton Coldfield), Tel. 021 355 1466

PMR Handhelds, 6 channel VHF, Yaesu, UHF HX507, battery and aerial, tested working, need crystals for ham bands, £15 each plus p/p £2.50. (Manchester). Tel. 061 723 3461

Amiga A500, 1.3 ROM, 1Meg upgrade, second drive, colour monitor, printer, modem, 200 disks, replay cartridge, loads of software, books, mags, £550 no splits. Oscilloscope 20MHz dual trace, Hameg 203-6, £200 ovno. Phone Keith for more info (Washington), Tel. 091 415 1550

AR88LF with paperwork, 75kHz-30MHz. Communications receiver by Philips Lamps Ltd. (valves) with SSB. Professional marine receiver type 66T (not valve), long, meduim, marine navigation bands, AM/SSB. All good working order, sell or exchange. (Tyneside), tel. 091 284 7614

Realistic PRO-35 scanner, 100 memories, 66-88, 108-137, 137-144, 144-148, 148-174, 406-512MHz, VHF/AM, charger and instructions, 9 months old, £120. (Ferryhill). Tel. 0388 720442 evenings.

Kenwood 3-way aerial switch, £20. Modem IBM compatible for packet, £30. SWR field strength meter, £10. Two way aerial switch, £10. Colin (Wirral), Tel. 051 678 6052.

Kenwood TS140S with 500Hz CW filter, good condition, all band transceiver/general coverage receiver, BNOS 12-20E power supply, £550 the pair. T. George G4AMT (Penzance), Tel. 0736 871560

Realistic PRO-35 100 channel handheld scanner, mint condition, boxed, 66-88, 108-137 AM, 137-174, 406-512MHz, £105 including postage. 128 Llanrwst Road, Colwyn Bay, Clwyd, LL28 5UT

Drake R4C RX, speaker, 250Hz filter, manual. Trio HF amp TL120, 100W 10-80m. BNOS 2m amplifier 10-180W output. G3LIV multicom data controller, BBC compatible. Commodore C64 computer, tape deck, power supply and approx £200 software. All above in vgc, complete with manuals and boxes. Offers, or exchange for WHY? R. Adam, 1 Woodlands Crescent, Elgin, Morayside, Tel. 0343 545842 after 6.00pm.

Uniden 2830 as new. 240V transformer to 110V, cost £24, £12. (Derbys). tel. 0283 221870

Yaesu FT-480R **2m** multimode, 1-10W, CW, SSB, FM, 7/8th mobile, 5 ele yagi and coax. Also Trio TR3500 70cm FM handy, nicads, mobile charger, plug charger, 3 x 5/8ths mobile, all for only £350. John (Chesterfield), Tel. 0246 205388.

Icom IC-R72 HF receiver, plus PRO-204 scanner, mint condition, both for £550 cash. Contact William Bannister (Liverpool), Tel. 051 207 2602

Codar CR66 in good working order, £60 or exchange for FV50 VFO for FT-75 with ATU, or for Belcom Liner 2 (preferably) or similar 2m SSB/CW rig. Contact Lee Greaves G0RSZ (Northampton), Tel. 0604 582551

Yaesu FT-726R VHF/UHF all mode tribander, 2m fitted, very good condition, little used on transmit, owned by a non-smoker, £450 ono plus carriage. Contact Mr. Peacock (Yorkshire), Tel. 0377 87342

Laptop computer, 4 programs built in including excellent word processor, battery or mains, perhaps exchange for desktop. Also magnetic loop, 80/160, also on 40 with vac/cap which is available. Monitor scope S/B 610.FV 101DM Ex/VFO complements 101ZD. For sale or part exchange, WHY? Contact John Barber (Lancs), Tel. 0704 880345

Icom IC-R7000 HF receiver, boxed with manual and remote control, £700 or exchange for NRD-525, will consider NRD-535 or Drake R8E with cash adjustment. Contact Dennis Newby (Hull, N. Humberside), Tel. 0482 813439 anytime.

Kenwood TM-732E dual band 2m/70cm transceiver, 5, 10, and 50W, only two months old, little use, as new in box, £500. Contact S. Apps (Sussex), Tel. 0243 65326 evenings or weekends.

144MHz QRO linear amplifier with two 4CX250B, professionally built to ARRL handbook design, complete amplifier chassis with fitted valves, you provide the PSU. £95 plus carriage. Chris G4HCL (Southampton), Tel. 0703 262105, Fax. 0703 263429.

Antique cast iron base Morse speed key, manufactured by Theodore R. McElroy, USA, serial number 5338, sale or swap for good receiver. Contact J. Carney (Holywell), Tel. 0352 710426

BBC-B micro, twin disk drive, double sided, 40/80 64k ROM/RAM, Worldwise mini office 2 spellmaster, £250. Contact S. Oliver (Kent), Tel. 0622 744659

Kenwood R600 communications receiver, 150kHz to 30MHz, hardly used, immaculate condition, with instruction manual and original box, £195. Contact Mark Whiteside (Ilford, Essex), Tel. 081 599 7138

Receiver, 0 to 30MHz, £150. Programmable scanner, 25 to 1300MHz, boxed, £200. 3 to 5A power supply, £10. Contact S. Willis (Essex), Tel. 0268 680360

Icom BC-35 battery charger, brand new and boxed, charges BP2, 3, 5, 7, and 8 packs, £30. Pye Reporter MF6AM, 6 channel, E band, £10. Pye Europa MF5FM 3 channel mobile, aligned on 2m,

£20. Pye PF9 transceiver with batteries, and crystal modules, VGC, £15. Pye PF8 crystalled on RB9, with batteries, £25. All plus P&P at cost. Contact Mark G7HVN (Bristol), Tel. 0275 818566 after 6pm.

Alinco DJ-120E 2m handheld with extended transceive, complete with charger, boxed as new, £130. Also Uniden Bearcat 200XLT hand held scanner, with charger and case, boxed as new, £155. Contact A. Hawkins (Nuneaton), Tel. 0203 397209

Yaesu FT-757 and Kenwood TS-430S, £575 each ovno. Bearcat 100XL scanner, 16 channel, £120. Hi-mound twin paddle key, £25. Nevada tuner, £100. Adonis desk mike, £30. ERA CW/RTTY microreader decoder, £130. 4 band vertical cushcraft aerial, offers. All prices ovno. Contact John G0MYI (Catford), Tel. 081 698 7684

Yaesu YS-60 SWR and power meter, 1.6 to 60MHz, brand new, unused, £75. Will exchange for 2m mobile linear. Contact Clive Harrison 28 Brynau Wood, Cimla Neath, West Glamorgan SA11 3YQ, Tel. 638339

Standard C528 dual band 2m/70cm handheld transceiver, extended coverage to 980MHz, 5W output, dual receive, comes with dual CTCSS toneboard, speaker mike, base charger, mobile and base power leads, 3 battery packs and charger, base plate, all boxed and excellent condition, cost over £620 new, will accept £375 ono. Contact Steve Powell (Bracknell), Tel. 0344 486281

Icom W2E, many extras, 10 months warranty - the dual band handheld with extended receive, £325, or exchange for 2m mobile and 70cm mobile/handheld. Contact John G0HQK (Telford, Salop), Tel. 0952 200280 anytime.

Ex-Navy receiver, 0 to 30MHz, B40, good condition, £80 ono or exchange for 70cm handheld or mobile, or 2m transceiver, or WHY ham radio gear. Contact V. Lowe (Doncaster), Tel. 0302 531927.

Yaesu FT-290R muTek front end, built-in 20W linear, excellent condition, £250 ono. Contact John Collins (W. Midlands), Tel. 0562 886121

Tono 9100E multimode communications terminal, AMTOR, RTTY, ASCII, CW, stand alone unit, full autotrack on CW receive just hook up to audio, TTL or RS232, comes with screened monitor, all leads, and comprehensive instruction and service manuals, cost £1000+ will accept £375 ono. Contact Steve Powell (Bracknell), Tel. 0344 486281

Wireless set 19 MkIII, with power unit, variometer, control box, headphones, and mic, £80 buyer collects. Also Midget communications receiver MCR1, with mains power pack, all 4 coils, and manual, offers. Peter Howlett, 122 Victoria Avenue, Princes Avenue, Hull, HU5 3DT, Tel. 0482 441255

FRG7, mint condition with manual, 0 to 30MHz, £120. Also Grundig Satellite 3400 professional communications receiver, mint condition, FM, MW, LW, SW, 0 to 30MHz. Mr. Cossey (Clacton on Sea), Tel. 0255 422051

Yaesu FT-1 all mode HF transceiver, one owner from new, all options fitted, keyer filters etc., set extender boards, service manual, original boxes, desk mike YM38, £750 or exchange for FT 736R, WHY. Please contact Kevin G4FNI (Bournemouth), Tel. 0202 554848 after 6.00pm.

Philips D2935 radio, wonderful world reception, immaculate condition, very little used, £75. Mr. McNally (Northampton), Tel. 0327 842285 anytime.

Workshop clearout; copper loop, 1.2m diameter, made from 22mm domestic copper pipe, £15. Also two 25ft telescopic masts, sorry no guys masts only, £15 each. Also huge heatsink, 9in x 14in, 3in fins with x2 BLX15 transistors fitted, with PC board, £40. Mr. C. Regan (Worcs), Tel. 0684 560068

Eddystone 840C, working but needs setting up or servicing, offers for cash or exchange. T. Bartlett (Norfolk), Tel. 0508 20657

WANTED

Speaker mic for Pye PF5000 UHF 70cm handheld, also workshop manual for same. Peter G7LNH (Ashford, Kent), Tel. 0233 840562 after 6.00pm.

Pre-war wireless books and magazines, 'Wireless World', 'Radio Times', 'World Radio' etc. Douglas Byrne, 52 West Hill Rd, Ryde, IoW. Tel. 0983 567665

813 valves and/or bases, variable capacitors 3kV, 500pF - 15H, or WHY ceramic choke formers or similar junk. Give me a ring and haggle a price. David White (Sheffield), Tel. 0742 520177 days, or 0246 414995 evenings and weekends.

Dragon 32 or 64 software on disk, disk controller, and printer for Dragon. V. Lowe (Doncaster), Tel. 0302 531927

Eddystone receivers 870, 870A, EC10 MkI and MkII, EB35, EM34, speakers Cat No. 688, 697, 698, any condition considered, cash waiting, will collect reasonable distance. Peter Lepino (Surrey), Tel. 037 245 4381.

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Ex-PMR set crystalled to 70cm on 433.675 packet radio, for Novice beginner, appreciate any info on how to set up and run. Roy Moss (Hatfield, Herts), Tel. 07072 75920

High powered dual or triband mobile transceiver, must have 2m and 70cm, wideband receive preferred but not essential, will collect 100 miles radius. Mr. B. Williams (Bradford, W. Yorks), Tel. 0274 880895

48k ZX Spectrum computer, 2m multimode rig, or any 2m rig. HF linear amplifier, HF quad aerial, digital voice recorder, Yaesu FT-726 transceiver, PK232 TNC, memory Morse keyer, and HF radio receiver, WHY? contact Edward Kelly EI5DR, Creggan-avar, Breaffy, Castlebar, Co. Mayo, Eire.

EXCHANGE

For 12V power supply and 5W 2m mobile unit, preferably with LCD display, I will exchange my Hitachi DA-7000 CD player, 3 spot pickup, 2 speed manual search, in good condition. Mark Coote G7MTE (Lincs), Tel. 0205 350179 after 6.00pm please.

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Subscription rates:
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Tel: 0442 66551
Fax: 0442 66998

Editorial Queries:
Tel: 0703 262105
Fax: 0703 263429 (24 hrs)

Printed in Great Britain by Wiltshire Ltd, Bristol

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Kantronics **the digital leader**

announces the availability of **Pactor** for the KAM (Kantronics All Mode). Maintaining its "state-of-the-art" status, Kantronics, in cooperation with the German developers of **Pactor**, has made the newest digital mode available as an option for KAM owners.

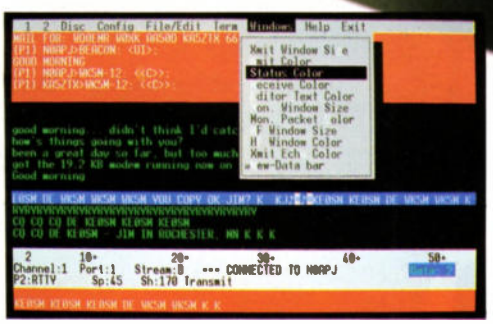
Pactor combines the best features of packet radio and AMTOR to provide robust digital communication for HF data transfer. Like packet, **Pactor** uses a 16-bit code (CRC) to insure error-free data transfer between stations. Features unique to **Pactor** include:

- automatic baud rate selection at initiation of link, 200 or 100 baud, depending upon band conditions, with automatic speed adjustment to compensate for changing link conditions.
- Memory-ARQ and optional Huffman data compression for increased throughput.
- optional long path contacts using extended timing

With the Kantronics KAM, **Pactor**, HostMaster software and just a few keystrokes, the operator can do Pactor, CW, RTTY, ASCII or any other HF mode while operating UHF/VHF packet at the same time! HostMaster is now available in versions for PC-compatibles, the Commodore 64 and Macintosh.

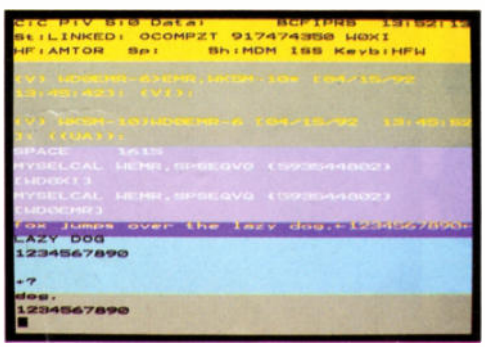
The standard KAM is version 5.0. The new **Pactor** option (version 6.0) is available now for all KAMs, with or without version 5.0 firmware. Contact your favorite dealer or Kantronics today and join users world-wide who are enjoying **Pactor**.

Kantronics KAM . . . the leader in all-mode digital communications.



Hostmaster on the PC

Hostmaster on the Mac



Hostmaster on the Commodore 64

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FT-5200/FT-6200

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- ✔ **FT-5200**: 2m and 70cms. **FT-6200**: 70cms and 23cms.
- ✔ **32 Memories:** 16 tunable memory channels for each band.
- ✔ **Channel Steps:** 5, 10, 12.5, 15, 20, 25kHz.
- ✔ **Removable Front Panels For Quick and Easy Installation.**
- ✔ **CTCSS Encode Built-In:** 38 sub-tones selectable from the front panel.
- ✔ **Full Duplex Cross Band Operation:** Independant squelch and mixing balance, for simultaneous listening or transmitting.
- ✔ **Independent TX/RX Frequencies:** Odd splits ok on any memory channel.
- ✔ **Programmable Sub-band Limits:** For band scanning.
- ✔ **Selectable Scan Skip:** For busy channels.
- ✔ **Backlit DTMF Microphone.**
- ✔ **One-Touch Instant Recall:** Recall of CALL channels for each band.
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- ✔ **Dual External Speaker Jacks:** One for each band.
- ✔ **Built-In Antenna Duplexers:** Standard feature.
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- ✔ **8 Level Automatic Display/ Key Lighting Dimmer.**
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