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Ham Radio T O D A Y

HAM RADIO TODAY
VOLUME 13 NO.12
DECEMBER 1995

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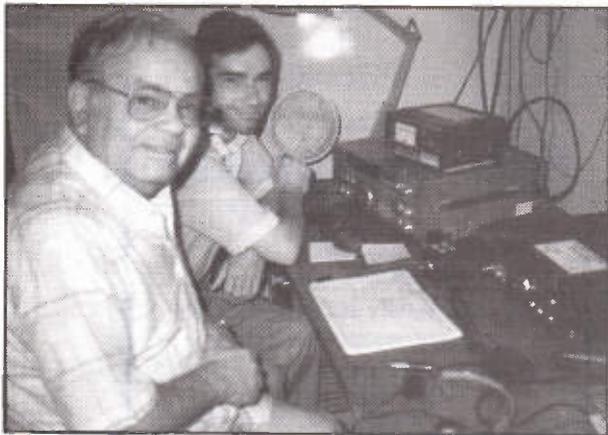
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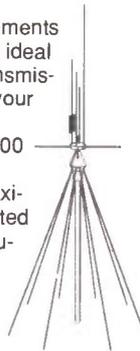
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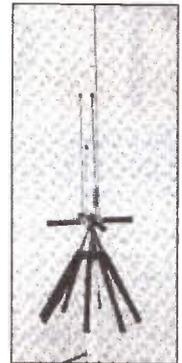


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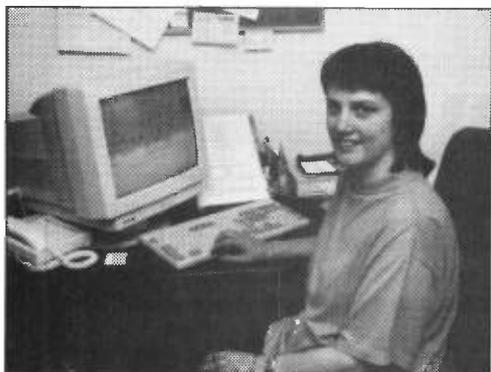
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CQ from G8IYA

Editorial

Is the end nigh, or is the new life ahead?

Well, it had to happen, sooner or later, didn't it? And it's happened now. *The UK's Radiocommunications Agency have announced that the UK have supported the proposal that Radio Regulation 2735 be deleted, saying that the UK sees this as an outdated international requirement.* In case you haven't seen past issues, this regulation is the one saying that you have to manually receive and transmit Morse before you can go on the HF amateur bands.

The question is now, what will become of the current (as I write this) mandatory Morse test for a UK Class 'A' amateur licence? Will it continue, or instead simply become optional, something you'll only need in order to get a reciprocal licence? Or to use HF with your licence in other CEPT countries?

My prediction is that we may well be going more towards 'incentive' licensing. I know the RA (and others?) have been looking closely at another country's form of incentive licensing, where greater knowledge of amateur techniques, including licence conditions, EMC and the like, gives you greater operating privileges. Will we eventually see that an RAE 'pass' gives us a Class 'B' licence, and a 'credit' or 'distinction' in the first part (licence conditions and EMC) gives us a Class 'A'? Maybe a credit or distinction in the second part (amateur techniques) will give us higher power privileges? Who knows? Either way there could be interesting times ahead. In January 1991 the RA gave us the Novice licence (HRT cover date February 1991, the Novice licence being the feature of that cover), is it possible that we'll get another 'new year's gift'? Ironically, it was in that issue my Editorial was on the subject of "To CW or not CW, that is the question"!

A new look for Ham Radio Today

No. I'm not changing sex! You'll no doubt have noticed our new cover logo. No more 'HRT' - and no more will other people at the newsagents'

shelves wonder what HRT has got to do with our hobby of ham radio communication. I hope you like the 'new look'. The inner design has, as you'll see, remained as before, because from readers surveys you've told me you don't want a smaller, or larger, or whatever typeface - it's "just right". Making some of it smaller would of course let us get a lot more in, but it can also make it more difficult to read. My Consultant Technical Editor has already felt the need to wear glasses occasionally, I wouldn't want readers having to squint or use a magnifying glass to read Ham Radio Today!

Software

Last month, I talked about how DSP (Digital Signal Processing) is being used in ham radio. In the FT-1000MP review in this month's issue you'll see just how the built-in DSP filtering improved signal readability even in very heavy off-channel interference conditions.

However, you won't need to 'splash out' a pile of cash if you'd like to add a DSP system to *your* station. This month's software offer has a program that'll do it all for you. If you've a PC with a PCA compatible sound card to run the software on, you'll then also have a fully-fledged DSP filter with noise reduction, automatic notch, and so on. There's also plenty more packed onto the disk. For example, there's a HF propagation program, even an audio spectrum analysis system to let to visually see what you're receiving off air. There's also an SSTV program that uses just three components for the interface (no sound card or similar needed here!) These collections, at just £1.00 to cover costs for the whole suite of software (some being shareware, others being freeware, all are fully working), inclusive of the 1.44Mb disk and UK p/p, are *only* available to Ham Radio Today readers as a 'thank you' for buying the magazine. Take a look at this month's 'software offer' page. We at Ham Radio Today *do* like making things easy, and cheap, for you!

Cover disks

If you're a HF contester, I hope you enjoyed the cover disk on last month's issue, this being the complete and unrestricted 'Super Duper' suite of software by Paul EI5DI, an exclusive deal we at Ham Radio Today were pleased to arranged with the software author. Paul managed, at our request, to compress all of it onto a 720k disk as this makes it compatible with virtually all recent IBM compatible PCs, even XT types without a 1.44Mb drive.

In every other issue, we offer our monthly collection of software, but on 1.44Mb disk (usually with at least some of it compressed) to give you a lot more software for the cost of a single disk. We also try to ensure there's a 'good mix' of software, i.e. for basic machines as well as high-performance multimedia types, for listeners, and amateurs interested in VHF and HF. I've found that many amateurs with a 'basic' PC either also have, or have a friend who has, a PC with a 1.44Mb drive, to provide a 'copy' facility, so the software service I hope is still quite usable.

Christmas review special

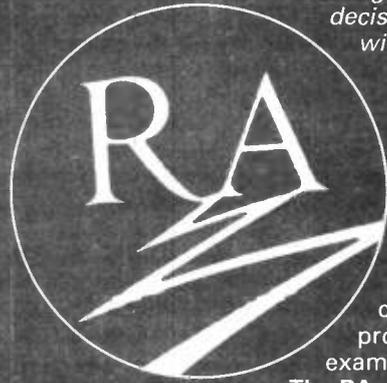
You'll see that, for this month's issue, we've managed a full technical review of what must have been the most talked-about ham radio transceiver this decade, the Icom IC-706.

However, for those without such deep pockets (like myself!), in next month's issue I've a great line-up of 'small' rig reviews, shack accessories, and the like, in my usual 'Christmas Review Special'. Things like a QRP transceiver, a packet radio rig, the latest all-mode handheld scanner, and plenty more. Don't miss it. Or better still, why not place a regular order with your newsagent, or even subscribe to the mag? This way, you'll make sure you won't miss out.

RA say Morse is outdated!

We at HRT asked the RA for a statement, for publication, concerning the RA's view on the widely discussed opinion regarding the possible outdated requirement of the current mandatory Morse code requirement for a Class 'A' amateur radio licence. Following a request for a statement for publication, the Radiocommunications Agency have stated (quote);

"The UK has supported the proposal from New Zealand that Radio Regulation 2735 be deleted. The UK sees this as an outdated international requirement. However, it does not necessarily follow that we will be removing the Morse test for HF operation. No decisions have been made and any proposals will of course be discussed with the RSGB."



Ham Radio Today have been informed that the RSGB are fighting against the proposal, and are seeking for the retention of a mandatory Morse test. In surveys done by both the RA and the RSGB, we're told the results show that the majority of class A amateurs want to retain the mandatory Morse code proficiency test, and that the majority of class B amateurs feel that Morse code proficiency is not a relevant subject to be examined in order to attain a Class 'A' licence.

The RA say that they continue to welcome views

from all amateurs. If you would like to put your views to the RA, you should write to; Roger Louth, Director Mobile Services, Radiocommunications Agency, South Quay Three, 189 Marsh Wall, London E14 9SX

1995 Young Amateur of the Year Award

The Radiocommunications Agency 1995 Young Radio Amateur of the Year Award has been won by 16 year old Leroy Kirby from Cardigan, Dyfed. Leroy was presented with the first prize of £300 by the Radiocommunications Agency's Director of Mobile Services, Roger Louth, at the RSGB's International HF, and IOTA Convention, at Windsor on 10th September. Leroy also received a certificate, signed by President of the Board of Trade Ian Lang, and will be invited to the Agency's Radio Monitoring Centre at Baldock, Herts, for a conducted tour. Leroy also received several other prizes, including a packet radio modem system from Siskin and a Sony portable receiver from the RSGB.

Amateur Radio Licenses - New 'M' Callsign series

Applicants for a full Amateur Radio Licence will receive a new M callsign from 1st April 1996. Full licensees are currently issued with a G callsign whilst Novices, who will be unaffected by this change, are issued with callsigns commencing with 2. The RA say the change needs to be made because the G series is rapidly running out of suitable combinations. Reservations for M callsigns will be accepted from October 2nd while reservations for G callsigns will continue to be accepted until 31st March 1996 (for reservations please contact SSL, details in Club News).

Existing holders of G callsigns are not affected by this change and will continue to use their own G callsigns. Even where a licence has lapsed, the holder of a G callsign can apply for its re-issue at any time. Existing holders of G callsigns will not be able to change their existing callsign to an M callsign. Further details may be obtained from the Agency's Amateur Radio Unit (their contact details are in every issue, following 'Club News').

Flat Holm Island Expedition 1995

On the 26th August 1995, a party of radio hams (seven GWs and five DLs from Passau in Bavaria) went to Flat Holm Island in the Bristol Channel, to commemorate nearly 100 years since Marconi made his first-ever radio transmission across water. The joint expedition with the Barry ARS and Bavarian Radio Club, was also the club's celebration of 50 years of peace with Germany. They tell us the joint DXpedition was a great success and they had a great time working together. The callsign used was GB5FI, and being EU-124 in the IOTA program and the only section of land in ST26 S. Glam for WAB, they aroused considerable interest. The club tell us they worked nearly 4,000 stations in three days, despite losing 24 hours because of bad weather when they were unable to land on the island. They tell us that, with a great team effort, once they had landed at 20.00 on the Saturday evening, all hands set

The RA tell us that Leroy has done much to promote amateur radio, firstly through the Scouts and more recently through the Air Training Corps. They add that he has run a number of special event stations including two for 'Jamboree on the Air'. He is an active member of his local amateur radio emergency service and has successfully revived a local YMCA amateur radio club, of which he is now Vice Chairman. A keen participator in contests, Leroy has won a number of awards for successful contacts. Leroy's main interest is in packet radio, sending computer data by radio, and he has helped to set up a new local Bulletin Board System as well as acting as the remote systems operator for a short time.

His close runner-up was 15 year old Charles Banner from Birmingham. A GB2RS newsreader, the RA tell us Charles has set up a number of special event stations and is currently helping with the running of a Novice

licence training course. He is Assistant Secretary of his school's amateur radio society, and his main interest is in low power operation. Charles received a £50 cheque from the Agency and will also be invited to

visit Baldock Monitoring Station. He also received a number of prizes, including an Icom handheld transceiver donated by Icom (UK). Our thanks go to the RSGB for their kind hospitality to us at the event.



1995 Young amateur of the Year, Leroy Kirby, was presented with his certificate and first prize of £300 by the RA's Director of Mobile Services, Roger Louth



Leroy received a Sony HF receiver from the RSGB, presented here by RSGB President Clive Trotman GW4YKL



Runner-up Charles Banner received a number of prizes, including a handheld transceiver donated by Icom UK, presented to him by Dennis Goodwin of Icom.



The winner and runner up with their certificates and prizes.

about building the station in the middle of the Bristol Channel.

A two element 'mini-beam' was used on HF, which achieved 5/9+20 into California and 5/7 into VK. The LF system used a Butternut vertical for 40/80m with a massive copper ground mat, one that was laid down many years ago for a marine beacon. The top band aerial was a simple half wave dipole made from pure silver wire. The clubs say they managed to work 106 countries in three days.

The Barry Club tell us they like to do something new 'radio wise' from this famous island every year, and this year they made the first ever PacTOR transmission from Flat Holm Island to the USA. So, they add, in the true spirit of Marconi, 'another



Flat Holm DXpedition crew (L-R) DL8RBV, DL9RDZ, DL1RBR Chairman Passau RC, DL8RBL, GW0PUP, DL9RCF, GW4UMX, GW0ANA Chairman Barry RC, and GW4BCB

successful experiment'. As they say it was a German who invented PacTOR, they thought it fit that Alois DL8RBL should be first to transmit, followed by GW0ANA.

QSL information; GB5FI via GW0ANA, Nirvana, Castle Precinct, Llandough, Cowbridge, South Glamorgan CF7 7LX



Chain gang loading the boat for Flat Holm



The Flat Holm crew at a Civic Reception with the Mayor of South Glamorgan and the President of the RSGB

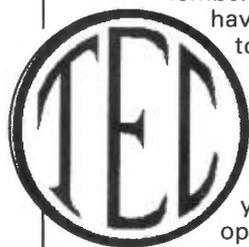
Thanet Electronics Club for Youth

The TEC Youth Group for Ham Radio and Electronics enters its 16th year. They say a new start has been made with some new lads visiting to see if they will like amateur radio and electronics construction.

Meetings are held every Monday evening, 7.30pm onwards, and members and visitors will

have the opportunity to build a wide variety of kits. They will also be organising a trip round Cornwall Youth Hostels next year, visiting and operating from the

Marconi Monument at Poldhu Point. If you'd like to join the club, which is aimed at people of school age (adults and parents - get the kids along!), get in contact with Dr. K. L. Smith at The Quarterdeck, Zion Place, Margate, Kent.



ISWL news



The International Short Wave League have written to say that their new 'Guide to English Language Short Wave Broadcasts to Europe (Winter Schedules 1995/1996)' is now available. The guide, which is in the form of an A4 sized booklet, is available direct from the ISWL HQ, 10 Clyde Crescent, Wharton, Winsford, Cheshire, CW7 3LA United Kingdom, at £2.00 per copy (IRC's or postage stamps to the value of £2.00 are also acceptable). The guide will also be available at ISWL rally stands.

RAIBC appeal



The Radio Amateur Invalid and Blind Club are a registered charity who raise money to help purchase radio/computer equipment, and audio cassette courses for home study, for blind, deaf and disabled amateurs. One way they raise this money is by collecting surplus radio equipment and junk to re-sell at rallies. If you have any equipment you would like to donate, please contact Ian 2E1EGV, Tel. 01274 783583. If you would like more information about the RAIBC, telephone their Helpline on 01953 454920. The club are also in attendance at rallies throughout the year. The Northern Ireland Club raise money by collecting unwanted tokens or vouchers (such as the ones you get when buying petrol, etc.), these can be sent free of charge to; The Charities Appeal Officer, RAIBC NI, Freepost BE 1789, Belfast BT15 3BR.

Raynet helps in Staffordshire fire emergency



David Hicks G6IFA, Raynet Zonal coordinator for Zone 10, tells us; "On 31 July, Raynet was placed on alert by CEPO/Staffordshire Fire & Rescue Service due to the serious fire situation, with calls running at over twice the normal rate. Raynet was to send teams overnight to large fire sites in woods and heathland, to spot recurring fires and radio to the fire crew enabling other crews to rest or be reassigned.

G3USF informed group controllers, organised nightwatch teams and notified ZC G8KW, who briefed neighbouring controllers. Teams were dispatched on 5 August and used on six occasions.

Soon after, Raynet was also asked to undertake fire monitoring and prevention on Cannock Chase, which was at serious risk even though closed to the public. Control was established at the Park Visitor Centre - happily a good a site for communication over undulating terrain; on the succeeding four weekends Raynet operated from afternoon until dusk from Friday to Sunday and the four days of the Bank Holiday weekend. An additional commitment followed, at Highgate Common, 20 miles to the south-west. Between eight and eleven teams were active each day. The Chase is very much 4 wheel drive territory; teams of a radio operator and driver from

Raynet or from Rover Rescue criss-crossed the Chase, spotting fires, guiding firefighters and rangers to fire grounds, keeping fire access points clear and discouraging intruders.

With Staffordshire taking the night calls, Zonal Coordinator G8KVU organised afternoon/evening backup from Warwickshire, West Midlands and Hereford & Worcester; Leicestershire also helped, as did visitors from Lancashire and the Isle of Wight! Several 'outside' operators returned for several shifts, enabling us to meet all requests (and sometimes exceeded them).

At stand down on 4 September the operation had involved some 60 operators for a provisional total of 1,200 hours. Detailed lessons remain to be thrashed out at debrief but there is no doubting the way CEPO staff, Rover Rescue drivers and Raynet operators from several counties welded together in a good-humoured operation carried through in an excellent spirit. Thanks and congratulations were received from all the organisations for which we worked. Raynet took the pressure off weary crews and, by supplementing the small ranger force, helped spare Cannock Chase the ravages it suffered in 1976. The operation also demonstrated well beyond county boundaries that Raynet is efficient, reliable and capable of organising strength in depth. Staffordshire Raynet warmly thanks everyone who turned out, was ready to do so - or simply left us a clear frequency."

Mid Warwickshire ARS Open Evening



Visitors to the Mid-Warwickshire ARS open evening saw Van G0IZZ modifying an ex-PMR rig, in the background Don G8HRI assembles

This successful event took place at the club's meeting rooms on Tuesday 12th September, where a wide range of displays illustrated the varied interests of the membership. Amateur stations were active on air throughout the event, packet radio was demonstrated together with satellites, short wave listening, and Morse code operation. Home construction and the use of computers in radio illustrated the

technical and practical aspects. The Raynet display was popular and aroused considerable interest. Radio literature, magazines, leaflets and posters were freely available to those who wished to take them. The Mayor of Warwick, Councillor Mrs. Christine Hodgetts, who visited the event was met by the club's Chairman, Brian Clulee, and escorted around the exhibits.



Roy G8XDL explains the work of Raynet at the Mid-Warwickshire ARS open evening.

Club of Friendship activity day

This activity day on the air by the Club of Friendship between UK and Russian radio amateurs will be held on the 5th November, between 00.01 and 23.59GMT. During this period, amateurs of the UK and the CIS are invited to participate in bringing the two countries closer together, and the two club stations G4BAS (GX4BAS) and RK3AW will be operating.

An award will be available to radio amateurs and SWLs who make or hear 10 contacts with radio amateurs in Russia, and either a club station or a member of the Club of Friendship (UK or Russia). Contacts may be made on any mode and any frequency, duplicate contacts don't count. The cost of the award is £5.00, and applications in the form of a copy of your log, witnessed by another radio amateur, should be sent to; Howard Ketley, UK Coordinator, Club of friendship between UK and Russian radio Amateurs, 1 Tewksbury Ave, Mansfield Woodhouse, Notts NG19 8LA, prior to the end of November.

RAE Course

Starting in January, at the Lee Valley Leisure Centre, Edmonton, London N9, a 15-week RAE course aimed at the May 1996 exam is being run in association with the Southgate ARC. Further details from the instructor, Steve White, G3ZVW, Tel. 0181 882 5125 (see also 'Club News' for other RAE and Novice courses in your area - Ed).

'Radio Today' deadline

The deadline for news items to be submitted for prospective inclusion in the issue published on 5th January, is 21st November. Many news items are being missed out because they arrive too late! If your club is running a special event station, or has an item of news of interest to fellow amateurs, send us the details early (if possible then preferably at least two months before an event takes place), including photos, club logos, special QSL cards/certificates etc., if available, to; Editor, Ham Radio Today Magazine, Nexus Special Interests Ltd., Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or fax your news direct to the Editor's desk on 01703 263429 (faxed news items only, reader's queries please see the contact information at the rear of the magazine for details).

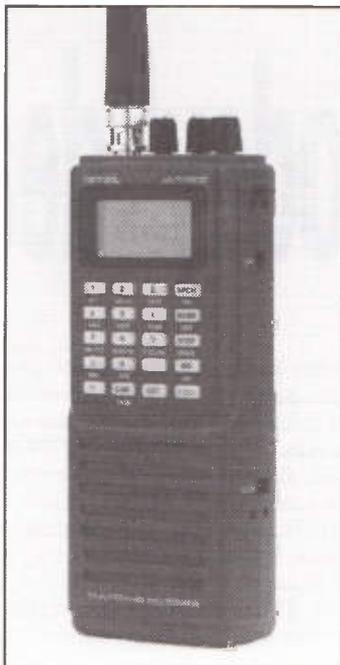
Latest Callbooks on Disk

Pat Smith G7FHY, now G0VNS, tells us his original callbook program has now been available for over 18 months, and during this time it has seen a great many changes and improvements. Due for release as this issue appears is the very latest version, with a database up to September 1995. Together with the callsign look-up facility are many other features, including a logbook, QSL label printing, QTH locator calculation, distance, and bearing details to your contact, beacon and repeater lists, etc. It also has the facility to add your own updates including the ability to create your own international callbook with foreign callsign data input also allowed. The system is supplied on 3.5in HD PC disks, it's priced at just £12.50 inclusive of p/p. Amateur Radio clubs and societies also have the chance to make a bulk purchase, for members, at a substantial discount, a 'restricted sample' of the program for evaluation is available on request to any club. Further details from P. B. Smith, (Tel. 01582 868683)

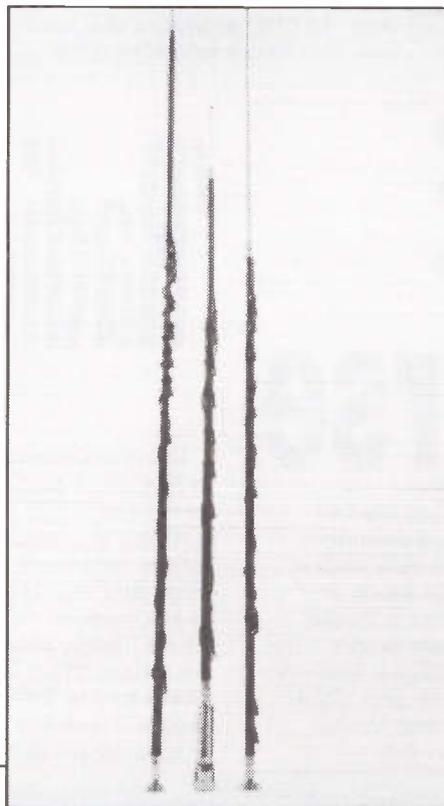
From G0LOV and G4LUE comes their latest 1995 amateur radio callbook on disk. Supplied on three 1.44Mb disks, the callbook is available for Windows or DOS operating systems, at £12.50 plus £1.50 p/p. Further details from Ernie Bailey G4LUE (Tel. 0836 748958).

Yupiteru MVT-7200 handheld scanner

Nevada have told us of, and sent a photo of, the new MVT-7200 handheld scanner from Yupiteru. With a switchable, built-in ferrite rod aerial, high gain flexible aerial it covers 530kHz-1650MHz on wide AM, narrow AM, FM, wide FM, LSB, USB and CW, together with 1000 memory channels. Supplied complete with nicads and charger, they tell us the set is priced at £399. Further details from Nevada in Portsmouth (Tel. 01705 662145).



Outbackers for the DX-70 and IC-706



Also from Nevada come the new series of Outbacker 'plus' mobile whips, covering HF, 6m, and 2m. The Perth Plus and the Junior Plus both handle 100W and cover 80m, 40m, 30m, 17m, 15m, 12m, 10m, 6m and 2m, with 160m optionally available for the Perth Plus, and each just need a change of tip for 6m operation. Priced at £249 for the Perth plus and £225 for the Junior Plus, you can get further details from Nevada in Portsmouth (Tel. 01705 662145).

PDSL launch 'live' library

The Public Domain and Shareware Library tell us they have given their landline BBS membership full access to the entire 'live' library catalogue. They say this will make a big difference to current library members as well as provide an excellent service to new members to its bulletin board services.

There are a number of membership options allowing full access, and a Hypertext version of their new online catalogue is available for free download - 01892 661149/667091 2400-14,00bps, and 01892 667090 2400-9600bps. Further information from the PDSL in

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* Except Thursday 4th January 1996 late night until 8pm, and closes at 5pm on Saturday 6th.

Yaesu FT-1000MP Review

Chris Lorek G4HCL tests the benefits of digitally enhanced transmit and receive on a top-of-the-line rig



If you read DX and HF contest reports, you'll quickly easily see that the FT-1000 has been a favourite choice of many successful DXers and contest groups over past years. So, why have Yaesu brought out another model? For one, it adds features such as a built-in Digital Signal Processor. It also has the more 'usual' output of 100W, this being possibly better matched to popular linear amplifier drive requirements, rather than 200W as with the FT-1000. This could also be one reason why it's cheaper, i.e. within the price bracket of more amateurs, than the FT-1000!

Two power supply versions are available, one with a built-in AC power supply and one which operates from an external 13.8V DC supply. Incidentally, the 'MP' suffix on this new rig is in memory of Yaesu's founder, the late Sako Hasegawa JA1MP.

Features

As you might expect, the set's circuitry and design is based heavily on the FT-1000. However most of the transceiver's features and settings are

now viewed and selected from a menu programming system, which you can recall from the front panel, the display showing you the mode in an alphanumeric readout. This replaces the earlier set's power-on sequences and DIP switch adjustments. The large display also now uses a multi-colour fluorescent discharge display, and a multi-function bargraph meter shows delayed 'peak hold' segments.

Tuning

Besides the main tuning knob, there's also an outer concentric 'shuttle jog' ring, which lets you QSY up or down the bands quickly. On the multi-function meter display, there's even a directional tuning meter to help in zeroing-in stations.

Separate keys are provided for changing between bands, and each of these select two sub-band VFO frequency, mode, and filter settings. This means that you can keep separate VFO settings for two different parts of the band, on each band.

The VFO tunes in thirteen different steps, right down to 0.625Hz

increments, and the tension of the main VFO knob can be adjusted to suit your own preferences. Two 10 bit and three 8 bit direct digital synthesizers are used for frequency generation and control, all of these being driven by a single temperature-compensated crystal oscillator.

99 memories are provided, which besides the operating frequency also store mode and IF filter selection, clarifier offset, and scan status. Five 'quick recall' memories are also provided, which store your operational setting with a single button push as you tune around, for quick recall.

The set has a built-in SSB speech processor, plus the usual VOX, RF gain, and switchable RX attenuators. Two switchable noise blankers are fitted, one for narrow pulse type interference, one for wide pulse types, the blanking level of which is continuously variable.

Filtering

You can tailor the receiver's IF passband by switching in individually selected, cascaded second and third crystal filter banks. The review set came supplied 2.4kHz and 500Hz filters in the 8.215MHz IF (plus a 'through' position for wider bandwidths) plus 6.0kHz and 2.4kHz filters in the 455kHz IF, for the main receiver section, the sub receiver being fitted with automatically selected 6kHz (AM) and 2.4kHz (SSB/CW) filter bandwidths.

You can, if you wish, add optional 250Hz, 500Hz and 2.0kHz filters to the main receiver, including optional Collins mechanical 500Hz CW filter types for the sub receiver's second IF and the main receiver's third IF.

The IF 'width' control, when rotated, narrows the filter slope position on each mode (apart from FM, which uses a fixed bandwidth) just on the upper or lower side of the tuned frequency as appropriate, rather than from 'both sides in'. The IF 'shift' control can of



chosen to match your TNC.

There's also a 'user' button on the front panel, which quickly recalls your own preferred configuration, such as mode, bandwidth, and the like - handy for operating modes like FAX or SSTV for the JVFAX users amongst us.

The rig also has a built-in RS-232 connector for CAT (Computer Aided Transceiver) control. There's no external interface needed, so you can connect a lead directly into this from your PC to remotely control the set.

CW

As well as a facility for plugging in a 'straight' key, the set has a built-in lambic keyer, which can also be switched to emulate a mechanical 'bug' key, i.e. with automatic dots and manual dashes. The keyer also has the facility of providing automatic character spacing for you (i.e. to 'clean up' your CW spacing!). This is based on the principle that inter-character spacing should be three times the duration of a 'dot', the set automatically adjusting the spacing your transmitted characters to suit. On receive, the CW pitch can

be set between 300-1050Hz, and a 'spot' switch lets you accurately match your CW frequency to that of the station you're about to call.

For CW contest use, the FT-1000MP also has a built-in contest memory keyer. A remote control jack on the set lets you plug in a remote control panel to control this. You can build a suitable panel yourself using 12 push buttons and 12 resistors, full details are given in the FT-1000MP operating manual. These will then control playback of your callsign, and give four digit contest number plus increment and decrement control, and transmission of three pre-stored user messages.

Enhanced DSP

The built-in Enhanced Digital Signal Processing system lets you add digital audio processing to received signals, plus digital shaping of your transmitted audio with four microphone audio responses which you can choose from. The early-stage transmitted SSB audio

is applied directly to the EDSP circuitry for processing, and on receive the third IF output is also applied directly to the EDSP circuits for demodulation and processing.

On receive, you've a choice of four noise reduction settings, these being digitally optimised to reduce random noise, static, pulse/man-made noise and heterodynes. Together with this, four 'contour' settings are also available, which give bandpass, low-cut, high-cut and mid-cut audio responses. The EDSP system also gives you an automatic multiple audio notch filter for SSB receive, which identifies and attenuates constant heterodynes as soon as they appear in the receiver's audio passband.

With all this processing available, the set usefully also has a 'monitor' mode, where you can continually monitor a demodulated sample of your transmitted audio, to help you set various levels and parameters.

Other facilities

Besides all this, the set has a microprocessor controlled auto-ATU with 39 built-in memories, which automatically stores the aerial matching settings for quick automatic recall later when you change frequency.

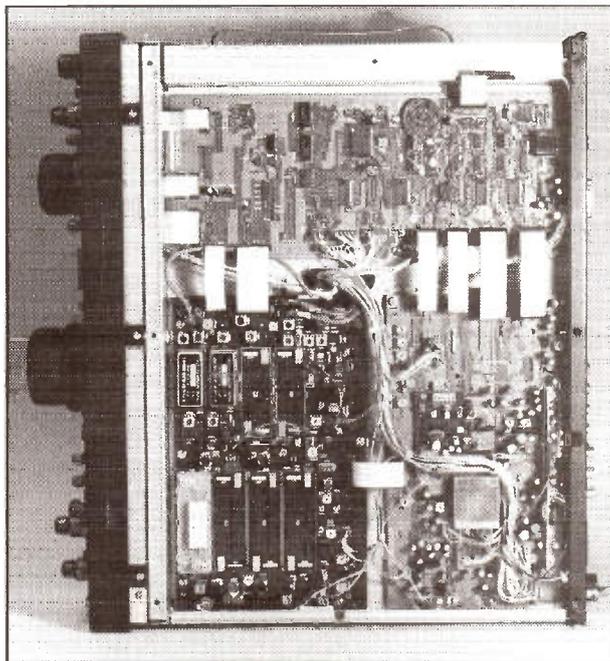
Three aerial sockets are fitted, two for transmit/receive aerials and a further one for a dedicated receive-only aerial, these being selectable from the set's front panel controls as well as automatically from memory.

For VHF/UHF enthusiasts, the set also has a transverter socket, and in this mode the frequency readout can be set to display the transverted 6m, 2m or 70cm frequency.

For shortwave broadcast band reception, synchronous AM receive as well as 'normal' AM receive is provided, to provide better reception in selective fading and interference conditions.

On the air

I unpacked the large and heavy box containing the set, placed the transceiver on my shack table and coupled it to my aerial system, and with some trepidation I started to have a good listen around the bands. My first thought, after I'd been using a 'lower spec' rig for a week or so before trying this set, was "Is the FT-1000MP's receiver a bit deaf?". No, it wasn't 'deaf' at all, the overall noise level was



course be used to move the narrowed bandwidth position up or down as you wish.

Together with the switchable attenuator, for further QRM rejection in strong-signal conditions an 'IPO' (Intercept Point Optimisation) button switches out the RF amplifier (which uses four FETs in a double push-pull configuration in any case), to instead feed the signal directly to the receiver's mixer.

Data modes

The set provides facilities for both 'true' frequency shift keying (FSK, using the 'RTTY' mode) and Audio Frequency Shift Keying (AFSK, using the 'PKT' mode. Rear panel sockets for both are fitted, these also providing fixed-level receive audio outputs for your terminal unit. For each mode, the FSK shift and offset frequencies can be set, and the receive filter centre frequency can be preset depending upon the tone frequencies you've

just that much lower. Received signals were still there, and after several hours of listening on several bands, and playing around with the various filter selections and shift/width controls, I found the only thing missing was usually the QRM! In a word, superb.

It took me a while to 'get through' the manual, in order to fully understand and thus use the set's many operating features, but after I'd done so I found operating the set a real pleasure. I usually find memories a bit of a gimmick, but the set has a number of nice features built-in without me even needing to use these. For example, on switching between bands, or even between VFOs on the same band, the set automatically selected the last used aerial selection, i.e. 'A' or 'B' and any external receive aerial I'd used, on that band and VFO setting. Very nice!

On SSB transmit, throughout the review period I used a number of different microphones, ranging from the Yaesu fist mic which came with the set, my 'usual' desk-top mic, to the new Yaesu MD-100 desk mic which Yaesu UK were also kind enough to loan me with the FT-1000MP. I found I consistently received excellent audio reports, the EDSP and the built-in processor adding to the 'punch' of my signal. One comment I received, in such a case during a ragchew with a Polish station whilst I was using the MD-100 mic, after I'd confessed to the low power level I was deliberately running as a test of the set's capabilities, was "Why are you only running 5W output - I thought you were running the full 200W from your FT-1000" (I hadn't told him I was using the 100W maximum 'MP' version with it's digital enhancements and the like).

On receive, particularly when operating on data modes, I often found the EDSP to be quite useful at bringing out an otherwise 'just unreadable' signal. On other modes, I found the noise reduction facility gave my ears quite a rest on a crowded band, and

the automatic notch facility was superb. As I write this (on a Sunday afternoon, listening to a net on a very crowded 40m), with the set next to me, it's handling such heterodynes with ease. They're just not noticeable apart from the occasional bursts of silence in a narrow audio spectrum when the EDSP notch comes into operation - I'd otherwise be frantically twiddling with operating controls rather than typing this!

Diversity reception

One of my favourite operating modes on HF is that of grey line DXing, spending many hours listening around on the LF bands. Of course, I'm sometimes known to have the odd QSO as well, both ragchew and DX chasing! However in the latter case I found a very useful feature of the set, with its sub-band receiver, was that I could couple my 'main' aerial to the 'A' aerial socket, my secondary aerial to the 'B' socket, and a receive-only aerial to another. By plugging headphones in, I could then select one signal to be reproduced in the left earpiece, another signal in the right earpiece, whether these were different aerials, receivers, or filter settings. This wasn't just something rather novel, but an operating mode which gave me that much more of a chance in hearing what I wanted to hear, for example in very poor conditions during a path 'window' which could also only last a few minutes.

All this would probably be just of use to the very serious DX chaser. But that's just what the set was designed for, and I must say it was very good at doing its job here.

Lab Tests

The tabulated results say it all. The performance of both the transmitter, and particularly the receiver, were

extremely good. The sub-receiver, I found, was only marginally worse in terms of strong signal handling than that of the main receiver, but still very good. The 'IPO' I found slightly improved the receiver sensitivity on 80m rather than reducing this, and in all cases it improved the 3rd order IMD receive performance by a few dB, although the blocking performance, in terms of relative levels, was largely unchanged.

What did rather surprise me were the results I obtained when testing the blocking performance using various settings of the EDSP noise reduction facility. This made a real and significant difference to the overall readability, under carefully controlled laboratory conditions, of the demodulated signal. In fact, it allowed me to increase the interfering signal level by almost 10dB, to achieve the same SINAD ratio (the ratio of the signal to interference, noise, and distortion) of the weak received signal. Switching this in did introduce a degree of hollow 'echo' type audio, which could sometimes be deemed as detrimental to the trained human ear, but it certainly displayed the EDSP's capabilities extremely well.

Conclusions

I already use a fairly modern, and reasonably 'top of the line', rig for my usual HF transceiver, which I chose very carefully. After I'd used the FT-1000MP, I found what the 'next rig up' was capable of in terms of both technical performance, and operating ease, and I liked it. I liked it very much. If I'd have had the cash, it would have remained as a permanent part of my station. I suppose that says it all.

Many thanks go to Yaesu UK for the loan of the review transceiver

LABORATORY RESULTS: RECEIVER;

All measurements carried out in 2.4kHz bandwidth SSB mode, with attenuator and IPO off, unless stated.

3rd Order Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product, measured at 21.4MHz;

	Main RX		Sub RX	
	IPO Off	IPO On	IPO Off	IPO On
10/20kHz spacing;	69.9dB	73.0dB	Bl. lim.	Bl. lim.
20/40kHz spacing;	91.5dB	95.1dB	Bl. lim.	Bl. lim.
50/100kHz spacing;	90.3dB	93.0dB	90.5dB	93.9dB
100/200kHz spacing;	90.7dB	92.5dB	89.7dB	92.7dB

EDSP enhancement;

Measured using same method as 'Blocking', but with EDSP NR selected, main RX, +/-50kHz interfering carrier, IPO on;

EDSP 'A';	107.7dB
EDSP 'B';	111.1dB
EDSP 'C';	113.1dB
EDSP 'D';	113.8dB

IF Notch rejection;

34.6dB

Sensitivity;			
<i>Input level in μV pd required to give 12dB SINAD - figures in bracket measured with IPO on;</i>			
Freq. MHz	SSB/CW	AM	FM
1.8	0.34 (0.44)	0.92 (1.26)	0.41 (0.54)
3.5	0.56 (0.38)	1.39 (0.99)	0.65 (0.44)
7.0	0.32 (0.37)	0.85 (1.02)	0.39 (0.45)
10.1	0.15 (0.36)	0.51 (1.08)	0.24 (0.50)
14.0	0.18 (0.37)	0.56 (1.22)	0.26 (0.54)
18.1	0.12 (0.33)	0.44 (1.03)	0.19 (0.48)
21.0	0.14 (0.34)	0.47 (1.06)	0.22 (0.47)
24.9	0.11 (0.41)	0.37 (1.27)	0.16 (0.57)
28.5	0.10 (0.45)	0.33 (1.45)	0.14 (0.68)
29.5	0.10 (0.43)	0.33 (1.45)	0.15 (0.65)

S-Meter Linearity;		
<i>Measured at 14.25MHz;</i>		
Indication	Sig. Level	Rel. Level
S1	1.51 μV pd	-32.2dB
S2	1.73 μV pd	-31.0dB
S3	2.03 μV pd	-29.6dB
S4	2.39 μV pd	-28.2dB
S5	3.04 μV pd	-26.1dB
S6	4.17 μV pd	-23.4dB
S7	7.33 μV pd	-18.4dB
S8	19.7 μV pd	-9.9dB
S9	61.2 μV pd	0dB ref
S9+20dB	636 μV pd	+20.3dB
S9+40dB	5.86mV pd	+39.6dB
S9+60dB	71.9mV pd	+61.4dB

Image Rejection;				
<i>Increase in level of signal at the first IF image frequency, and the first IF itself, over level of on-channel signal, giving identical 12dB SINAD signal;</i>				
Freq. MHz	Main RX		Sub RX	
	Image Rej.	IF Rej.	Image Rej.	IF Rej.
1.8	>110dB	>110dB	>110dB	>110dB
3.5	>110dB	>110dB	>110dB	>110dB
7.0	>110dB	>110dB	>110dB	>110dB
10.1	>110dB	>110dB	>110dB	>110dB
14.0	>110dB	>110dB	>110dB	>110dB
18.1	>110dB	>110dB	>110dB	>110dB
21.0	>110dB	>110dB	>110dB	>110dB
24.9	>110dB	>110dB	>110dB	>110dB
28.5	>110dB	>110dB	>110dB	>110dB
29.5	>110dB	>110dB	>110dB	>110dB

Selectivity;			
	SSB/CW	AM/FM	Sub RX
-3dB	2.49kHz	3.47kHz	2.27kHz
-6dB	2.59kHz	6.51kHz	2.89kHz
-20dB	2.81kHz	9.31kHz	3.59kHz
-40dB	3.07kHz	11.00kHz	3.99kHz
-60dB	3.47kHz	13.05kHz	5.51kHz

S-Meter S9 Level;	
Freq. MHz	Sig. Level
1.8	108.6 μV pd
3.5	192.0 μV pd
7.0	105.9 μV pd
10.1	67.6 μV pd
14.0	61.2 μV pd
18.1	52.7 μV pd
21.0	57.6 μV pd
24.9	22.4 μV pd
28.5	11.9 μV pd
29.5	15.7 μV pd

Blocking;				
<i>Measured on 21.4MHz as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 6dB degradation in 12dB SINAD on-channel signal;</i>				
	Main RX		Sub RX	
	IPO Off	IPO On	IPO Off	IPO On
+/-50kHz;	104.1dB	104.6dB	94.5dB	93.4dB
+/-100kHz;	106.1dB	106.6dB	100.2dB	99.0dB
+/-200kHz;	106.8dB	106.8dB	105.4dB	104.0dB

Transceiver

Harmonics;						
Freq. MHz	2nd	3rd	4th	5th	6th	7th
1.8	-63dBc	-65dBc	<-80dBc	-71dBc	<-80Bc	-75dBc
3.5	-66dBc	-64dBc	<-80dBc	-73dBc	<-80dBc	-76dBc
7.0	-66dBc	-63dBc	-78dBc	-76dBc	-77dBc	<-80dBc
10.1	-64dBc	-70dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc
14.0	-60dBc	-66dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc
18.1	-53dBc	-69dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc
21.0	-55dBc	-63dBc	<-80dBc	<-80dBc	-74dBc	-77dBc
24.9	-58dBc	-65dBc	-75dBc	-71dBc	-73dBc	<-80dBc
28.5	-52dBc	-71dBc	-73dBc	-67dBc	-75dBc	-78dBc
29.5	-52dBc	-78dBc	-69dBc	-74dBc	-77dBc	-79dBc

TX Power;		
Freq. MHz;	High Power;	Min Power;
1.8	103W	4.0W
3.5	100W	3.8W
7.0	99W	3.8W
10.1	98W	3.7W
14.0	99W	3.7W
18.1	99W	3.7W
21.0	99W	3.7W
24.9	97W	3.7W
28.5	98W	3.7W
29.5	98W	3.7W

SSB IMD Performance;					
<i>Measured on 14.25MHz with a two-tone AF signal, results given as dB below PEP level;</i>					
	3rd Order	5th Order	7th Order	9th Order	11th Order
<i>ALC Onset</i>	-30dB/ -31dB	-46dB/ -45dB	-47dB/ -48dB	-58dB/ -52dB	-58dB/ -57dB
<i>Mid ALC</i>	-30dB/ -31dB	-47dB/ -45dB	-48dB/ -47dB	-51dB/ -52dB	-55dB/ -55dB
<i>Proc On (Mid ALC)</i>	-18dB/ -18dB	-23dB/ -35dB	-28dB/ -52dB	-35dB/ -48dB	-46dB/ -53dB



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APRS - Automatic Packet Reporting System - the latest update (see this month's 'Data Connection')

DisView by Ian Wade G3NRW, an on-line package for Demon Internet users (see *Data Connection Sep 95*)

SUMO - extremely powerful shareware circuit diagram and analogue circuit simulation (see review in *HRT Sep 95*).

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Icom IC-706 Review

Chris Lorek G4HCL reviews the latest Icom rig

The new Icom IC-706 must have been the most talked-about radio for many years. It's been heavily advertised by many dealers, even to the point of saying "We'll have them for sale at such-and-such a rally" (which didn't happen). When the first batch finally did arrive in the UK they were instantly sold - one dealer sold both the sets they received

one morning within minutes of putting each one on the display shelf! As I write this, I'm told there are still several hundred UK amateurs on the 'waiting list', the USA 'waiting list' being 4000 amateurs!

As such, I was very pleased indeed to have been loaned one of the very first of these sets, to review for Ham Radio Today.

Features

Just in case you haven't seen the adverts or listened on the air, it's a tiny set, with all-mode transceive operation on all amateur bands from 160m to 6m with 100W maximum output (yes, HF and 6m), plus 2m transceive with 10W maximum output. Together with this, there's an all-mode receive coverage from 300kHz right up to 200MHz. It also offers wideband FM reception, so if you get fed up with amateur or broadcast band reception (or even airband) then you can even tune into your local Band II broadcast station for some light entertainment.

The small size of the rig, which measures 167mm (W) x 58mm (H) x 200mm (D) certainly makes it very suitable for mobile operation, but if you don't even have that amount of space available then you can remotely mount the front panel away from the body of the set, using an optional control cable.

The accompanying photos show the layout of the controls, from which you



allow a whole lot more, all through the use of the LCD's dot-matrix display providing further sub-menu functions. So *that's* how they control all the bells and whistles fitted!

On the air

Enough said, let's see what it can do in 'real use'. Rather a lot, I found, far more than I'd manage to

describe in these pages. I found that I did have to have a good read of the manual in order to make use of the set's many capabilities, and in practice even after several days of use I had to keep referring to the manual to remind me how to get to such-and-such a function. For example, repeated presses of the 'mode' button would cycle the set through SSB, CW, AM and FM, but I quickly found I could keep the button pressed for a couple of seconds to access further modes, i.e. changing from USB to LSB, FM to WFM, AM to RTTY and so on. As well as this, a front-panel IF shift control gave another degree of help in a crowded band, and one of the menu functions even gave a small graphical display of the signal position in relation to the filter bandwidth - very nice! If an optional 'narrow' IF filter is installed, the displayed bandwidth even

may notice there aren't that many of! Don't let that fool you, the set's *packed* with features - it even has a 'spectrum display' facility available. How do you control all this? Well the set uses a 'menu' system of commands, where repeated presses of the 'menu' button cycles the set through various sub-menus. The "quick" menu facilities allow you to control things like VFO A/B selection, split operation, VFO equalization, transmit frequency check, memory write, transfer, VFO/memory switching, memory clear, narrow filter selection, noise blanker, meter function, VOX, AGC, speech compressor, break-in, FSK shift, sub-tone, memo pad write and read, scan, priority watch, and select scan. Phew! But that was just the "quick" menu, all selected by just using the four front panel buttons beneath the display. Further buttons combined with these

describe in these pages. I found that I did have to have a good read of the manual in order to make use of the set's many capabilities, and in practice even after several days of use I had to keep referring to the manual to remind me how to get to such-and-such a function. For example, repeated presses of the 'mode' button would cycle the set through SSB, CW, AM and FM, but I quickly found I could keep the button pressed for a couple of seconds to access further modes, i.e. changing from USB to LSB, FM to WFM, AM to RTTY and so on.

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graphically reduces when you switch this in. A switchable preamp, attenuator, and an RF gain control (which sometimes isn't found on such small sets!) plus a pulse-type noise blanker add to the QRM-fighting measures. Besides the 2.3kHz, 6kHz (AM) and 8/15kHz (FM) filter bandwidths fitted as standard, optional filters of 1.9kHz and 2.8kHz are available for SSB, RTTY and CW, and 250Hz and 500Hz for CW/RTTY.

There's a built-in electronic CW keyer, and full break-in is also available. One handy feature of the CW mode here was CW 'reverse', where the carrier point could be shifted to either side of the IF filter as a handy QRM-fighting measure. If I really wanted, I could also have remotely controlled the set via it's CI-V computer remote jack.

Spectrum display

A simple form of an LCD bargraph-based spectrum display could also be switched in, with variable step sizes, to give you an idea of what was happening around your tuned frequency. Although I found this little more than a novelty on HF, it was reasonably useful on a quiet band such as 6m.

This spectrum display was accomplished by the set's receiver sweeping across the selected range, either momentarily on a button push command, or continuously sweeping, depending on my preference at any time.

Transmit power

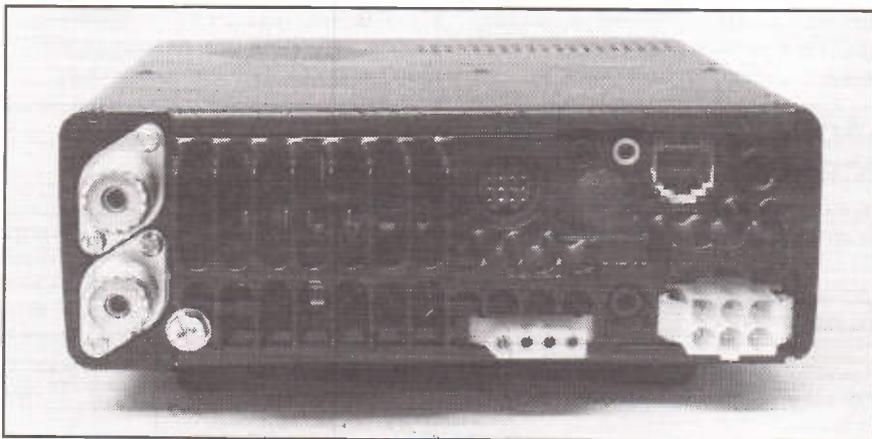
You can preset the transmit power in a total of 11 levels using the 'menu' function, the display indicating 'L', 1 to 9, and 'H' as appropriate, these varying the power between around 5W to 100W (1-10W on 2m, 25% of these levels on AM). A speech processor helps in getting your signal that bit further on SSB, and for either mobile or of course fixed operation on HF, an optional externally located auto-ATU is available as an option, controlled from the IC-706.

Tuning around

Changing between bands, or between sections of a band, is done by a press of the 'TS' (tuning step) button, which then puts one or more small 'arrows' above the MHz or kHz digits. Rotating the tuning knob then let me

change the frequency either between amateur bands (two arrows above the MHz digits), or in 1MHz steps (one arrow above the MHz digit, or in my programmed kHz steps. This latter function was a useful feature, as besides allowing continuous tuning in either 10Hz or 1Hz steps, I could set the 'TS' kHz rate to vary in different rates depending upon the mode I'd selected - either 0.1, 1, 5, 9, 10, 12.5, 15, 20 and 100kHz steps.

Besides the 99 memory channels, and various scanning modes, the set also had a useful one-button touch 'memo pad' facility. When first looking around a band, I found this very handy, as it allowed me to very quickly place up to five QSO frequencies into the set's memo pad using one button, as I tuned around. A press of a further button then cycled through these, frequency by frequency, always recalling the last five frequencies I'd 'stored'.



CQ DX

Coupled to my HF aerial system at home (a combination of wires, dipoles and beams), the set operated reasonably well, although I found I usually needed to have the RF preamp switched in on 'quiet' bands such as the upper HF bands and VHF. Going down onto 80m and 40m, at night the set did suffer a little and I usually always needed to have the attenuator switched in. It's at times like this that I'd have been tempted to buy an optional narrow filter for the set. Even so, I had a number of successful DX contacts with the transceiver as well as plenty of local 'ragchews', on both HF and VHF. The SSB speech processor did degrade my audio somewhat on 'local copy' signals, although it very effectively punched through the interference when I deliberately used low power during my tests.

Repeater operation

The set has the ability for a 'repeater split' facility, which makes use of the split VFO A/B receive/transmit function. Selecting this quickly offsets the two VFOs, in my case by the 600kHz I'd programmed for 2m repeater operation. This worked quite well, until I tuned from one repeater to another, and then wondered why I wasn't getting in. The reason was, that I was still transmitting on the earlier repeater input frequency (on VFO 'B')! Oh dear - read the instruction manual again Chris!

I subsequently found that, each time after changing frequency, I needed to keep the appropriate button pushed for a couple of seconds (until it gave a double 'bleep') to reset my transmit frequency again to -600kHz. I did however find a better way. As the set had plenty of memory channels, each

capable of split frequency operation, I just used these instead for 2m and 10m repeater frequencies. An even nicer facility was that of being able to program an alphanumeric channel 'name' for each. So I quickly started doing this, with GB3SN, GB3PC, S20, BBC World, and so on.

On the move

During the review period I took the opportunity of giving the set a period of use in the car. Although there was enough audio from the small speaker for stationary operation, I found (as I did from my home station) that, as the volume control was increased, there were a few noticeable 'rattles' from the poor little speaker's cone. I found an external speaker was virtually essential here, it certainly improved the audio quality both on the move and with the set in use in my shack.

When mobile, I tended to use the

memory channels almost continuously. This wasn't as restrictive as it sounds, because every channel acted virtually as a 'separate VFO' - I could simply tune away from each as I wanted with a turn of the tuning knob. This had a small level to alter its tension - either stiff for mobile use, or relatively free-wheeling for shack use - a very useful 'touch'.

Although I didn't have the optional remote cable, this would I feel have been quite handy. The set's 'telephone type' mic connector exits from below the front panel (so there's no extra lead needed) although you will of course still need some form of speaker at your operating position to hear anything - the extension speaker socket being on the set body.

4m coverage as well?

Besides transceiver operation, the set does of course have a very wide coverage receiver, up to 200MHz in

fact, which of course takes in the only 'missing' UK band of 4m. The receiver was indeed very sensitive here, although the transmitter was naturally disabled. Upon enquiring, I've found that Icom UK are looking into the possibility of getting the set to transmit on 4m as well, which sounds rather interesting. Watch out for a possible future 'mod' being available.

Lab tests

These show the set to have quite a reasonable performance, especially considering the set's small size coupled with its very wide transceive coverage. The ultimate filter 'skirt' rejection tended to widen out at the 'bottom' on receive, although this isn't too surprising considering the space available within the set for this filtering. Even so, the image and IF rejection were indeed quite good, and the strong signal handling perfectly acceptable for mobile and home use, as long as you didn't expect £3000 transceiver type

performance!

On transmit, the SSB signal linearity (the 'cleanliness') was very good for such a small and very wide band solid-state PA, only when the speech processor was switched in did it start to 'spread' a little after I'd pushed it to the limits with my test gear.

All in all, quite a reasonable technical performance, no problems at all here.

Conclusions

There have been, and I'm sure when this appears there might still be, many amateurs waiting, or saving up, for this set. If you're one of the first lucky owners, I don't think you'll have been disappointed at all. If you're thinking of buying one, don't think too long. Throughout the time I used the set during my review, I realized all the 'hype' I'd heard and read about the set was indeed true. Icom have a winner here.

My thanks go to Icom UK for the loan of the review set.

LABORATORY RESULTS: RECEIVER;

All measurements carried out in standard bandwidth SSB mode, with attenuator off, unless stated.

Sensitivity;

Input level in μV pd required to give 12dB SINAD, figures in brackets taken with preamp on;

Freq. MHz	SSB/CW	AM	FM
1.8	0.64 (0.16)	1.69 (0.42)	-
3.5	0.68 (0.15)	1.64 (0.35)	-
7.0	0.67 (0.11)	1.78 (0.34)	-
10.1	1.01 (0.17)	2.09 (0.38)	-
14.0	1.11 (0.18)	2.35 (0.35)	-
18.1	1.18 (0.17)	2.26 (0.38)	-
21.0	1.13 (0.18)	2.16 (0.40)	-
24.9	1.07 (0.18)	2.26 (0.39)	-
28.5	1.09 (0.18)	2.02 (0.38)	-
29.5	1.02 (0.19)	2.06 (0.41)	1.88 (0.29)
50.1	0.83 (0.14)	1.68 (0.32)	1.50 (0.22)
145.0	0.20 (0.11)	0.47 (0.26)	0.46 (0.17)

Image Rejection;

Increase in level of signal at the first IF image frequency, and the first IF itself, over level of on-channel signal, giving identical 12dB SINAD signal;

Freq. MHz	Image Rej.	IF Rej.
1.8	88.6dB	93.2dB
3.5	99.6dB	102.3dB
7.0	101.7dB	>110dB
10.1	91.4dB	101.8dB
14.0	92.3dB	98.9dB
18.1	98.7dB	106.4dB
21.0	99.0dB	107.8dB
24.9	96.4dB	106.1dB
28.5	97.1dB	104.6dB
29.5	98.4dB	105.0dB
50.1	>110dB	86.4dB
145.0	>110dB	>110dB

S-Meter Linearity

Measured at 14.25MHz;

Indication	Sig. Level	Rel. Level
S11	9.6 μV pd	-11.5dB
S2	20.5 μV pd	-10.6dB
S3	21.0 μV pd	-10.1dB
S4	22.1 μV pd	-9.0dB
S5	22.9 μV pd	-8.2dB
S6	24.5 μV pd	-6.6dB
S7	26.9 μV pd	-4.2dB
S8	29.0 μV pd	-2.1dB
S9	31.1 μV pd	0dB ref
S9+20dB	212 μV pd	+16.7dB
S9+40dB	1.47mV pd	+33.5dB
S9+60dB	8.27mV pd	+48.5dB

Blocking;

Measured on 21.4MHz as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 6dB degradation in 12dB SINAD on-channel signal;

	Preamp Off	Preamp On
+/-50kHz;	88.0dB	87.9dB
+/-100kHz;	94.6dB	94.5dB
+/-200kHz;	100.2dB	98.7dB

S-Meter S9 Level;

Freq. MHz	Sig. Level
1.8	28.4µV pd
3.5	27.8µV pd
7.0	28.6µV pd
10.1	30.2µV pd
14.0	31.4µV pd
18.1	31.0µV pd
21.0	31.0µV pd
24.9	30.5µV pd
28.5	30.2µV pd
29.5	30.2µV pd
50.1	28.5µV pd
145.0	15.5µV pd

Selectivity;

	CW/SSB	AM	FM
-3dB	2.15kHz	4.36kHz	11.68kHz
-6dB	2.32kHz	6.22kHz	15.92kHz
-20dB	2.72kHz	12.24kHz	19.84kHz
-40dB	3.33kHz	18.14kHz	24.03kHz
-60dB	5.82kHz	24.90kHz	26.53kHz


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3rd Order Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product, measured at 21.4MHz;

	Preamp Off	Preamp On
10/20kHz spacing;	87.2dB	83.6dB
20/40kHz spacing;	83.9dB	82.1dB
50/100kHz spacing;	81.6dB	79.6dB
100/200kHz spacing;	80.8dB	79.2dB

TRANSMITTER;

TX Power/Current Consumption;

Connected to stabilized 13.2V DC using supplied DC lead

Freq. MHz;	High Power;	Low Power;
1.8	106W (18.7A)	2.53W (5.0A)
3.5	106W (16.1A)	2.75W (4.8A)
7.0	105W (16.5A)	2.75W (4.9A)
10.1	104W (15.1A)	2.75W (4.6A)
14.0	104W (17.3A)	2.70W (5.0A)
18.1	101W (15.1A)	2.75W (4.6A)
21.0	102W (17.0A)	2.75W (4.9A)
24.9	101W (17.1A)	2.75W (4.8A)
28.5	100W (17.8A)	2.78W (5.1A)
29.5	100W (17.7A)	2.78W (5.0A)
50.1	101W (19.0A)	2.53W (4.7A)
145.0	10.0W (4.1A)	520mW (2.7A)

Harmonics;

Freq. MHz	2nd	3rd	4th	5th	6th	7th
1.8	-65dBc	-63dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc
3.5	-70dBc	-66dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc
7.0	-67dBc	-74dBc	<-80dBc	-75dBc	<-80dBc	<-80dBc
10.1	-52dBc	-68dBc	<-80dBc	-66dBc	<-80dBc	-78dBc
14.0	-60dBc	-62dBc	<-80dBc	69dBc	-73dBc	<-80dBc
18.1	-65dBc	-64dBc	<-80dBc	-70dBc	<-80dBc	-79dBc
21.0	-55dBc	-67dBc	-75dBc	-77dBc	<-80dBc	<-80dBc
24.9	-62dBc	-61dBc	-66dBc	-70dBc	-77dBc	<-80dBc
28.5	-54dBc	-69dBc	-68dBc	-79dBc	-73dBc	-71dBc
29.5	-53dBc	-63dBc	-64dBc	<-80dBc	-72dBc	-68dBc
50.1	-69dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc
145	-67dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc	<-80dBc

SSB IMD Performance;

Measured on 14.25MHz with a two-tone AF signal, results given as dB below PEP level;

	3rd Order	5th Order	7th Order	9th Order	11th Order
14.25MHz;					
<i>Proc. Off, (ALC Onset)</i>	-31dB/ -31dB	-38dB/ -38dB	-46dB/ -44dB	-48dB/ -48dB	-53dB/ -52dB
<i>Proc On, (20dB Comp.)</i>	-17dB/ -21dB	-24dB/ -34dB	-41dB/ -40dB	-37dB/ -43dB	-37dB/ -43dB
50.10MHz;					
<i>Proc. Off (ALC Onset)</i>	-26dB/ -24dB	-34dB/ -32dB	-35dB/ -36dB	-42dB/ -42dB	-47dB/ -47dB
<i>Proc On (20dB Comp.)</i>	-19dB/ -14dB	-27dB/ -20dB	-29dB/ -28dB	-33dB/ -37dB	-38dB/ -40dB
145MHz;					
<i>Proc. Off (ALC Onset)</i>	-30dB/ -29dB	-40dB/ -37dB	-40dB/ -39dB	-47dB/ -47dB	-57dB/ -56dB
<i>Proc On (20dB Comp.)</i>	-16dB/ -20dB	-21dB/ -31dB	-29dB/ -36dB	-38dB/ -41dB	-44dB/ -49dB

Alinco DX-70 Technical Update

In our exclusive preview of the DX-70, we promised you the full technical results of a



In the shack and on the road

The UK distributors, Waters and Stanton Electronics, also kindly sent me the matching Alinco EDX-1 aerial tuning unit, together with the DX-70 mobile mounting bracket and microphone extension lead. The EDX-1

is a manually-adjusted ATU, rated at 150W, with a built-in electronic SWR meter for accurate measurement without 'calibration setting' being required. An external 13.2V DC supply at 500mA to the ATU is required for this plus the 'straight through' aerial switching facility.

So, as well as having plenty of contacts from home, my combined HF and 6m mobile whip went on the car and G4HCL/M got active.

I tested the new Alinco DX-70 in the June 1995 issue of HRT, where I mentioned that I'd performed a full set of lab measurements. But, with it being a pre-production set (in fact, the *only* DX-70 set in Europe!), I didn't feel right in publishing the technical results. Not that there was anything wrong with them, they were quite good in fact, instead because it would be more appropriate to do this once Alinco had put any possible 'fine tweaks' into place in their factory production and alignment. So, an 'off the shelf' set came my way, and I was again pleased to quickly check it on air, and perform another set of thorough lab measurements.

plugging in a extension speaker I found there was adequate audio for use on the move.

In the shack, I found no difference whatsoever in 'on air' performance from my first tests, so I won't dwell on this here - just see the June 1995 issue text! During the September field day contest weekend, I set the RF output at 'low' (15W), the speech processor 'out', and went on 80m at night to try to give some points away (as long as the other station 'worked' for them!). But every single station I called came back to my first or second call on SSB, one station even said I was the best signal on the band. Enough said!



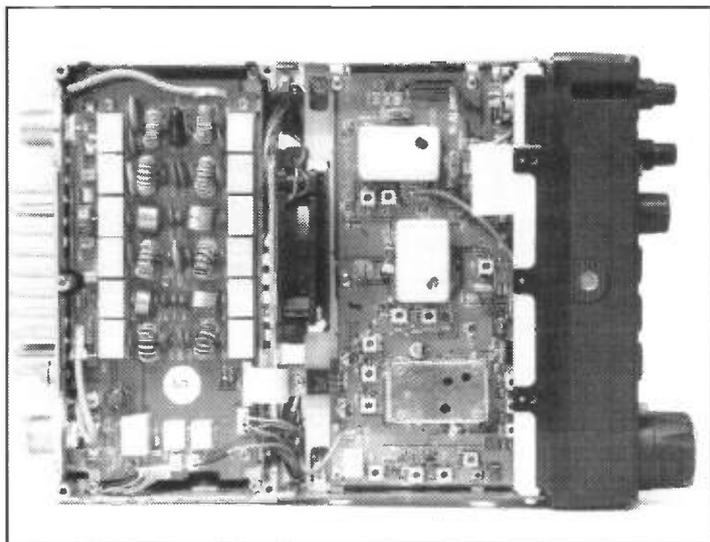
I found the set was quite easy to use on the move, although I had to be careful in using the front panel VFO knob in a moving car - I often 'overshot' on tuning. Instead, using the transceiver's 'set' mode, I set the mic up/down buttons to tune and scan in 100Hz steps, thus making mobile tuning a piece of cake. The set was small enough to fit below my dashboard, and after

Conclusions

The tabulated lab results show the set worked very well indeed considering its size and cost. As found in the first tests, the speech processor degraded the signal's 'cleanliness' somewhat, and the filter selectivity noticeably 'widened out' at the -60dB mark, but otherwise all was well.

Overall, a good all-round performer, one that should be very suitable indeed for the budget-minded 'main station' set or of course as a dedicated mobile set.

My thanks go to Waters and Stanton Electronics for the loan of the review equipment.



LABORATORY RESULTS: RECEIVER;

All measurements carried out in standard bandwidth SSB mode, with attenuator off, unless stated.

Sensitivity;

Input level in μV pd required to give 12dB SINAD, figures in brackets taken with preamp on;

Freq. MHz	SSB/CW	AM	FM
1.8	0.40 (0.15)	1.01 (0.41)	-
3.5	0.41 (0.15)	0.99 (0.39)	-
7.0	0.38 (0.12)	1.06 (0.39)	-
10.1	0.49 (0.18)	1.22 (0.46)	-
14.0	0.46 (0.19)	1.19 (0.49)	-
18.1	0.47 (0.18)	1.20 (0.47)	-
21.0	0.47 (0.18)	1.22 (0.47)	-
24.9	0.54 (0.19)	1.38 (0.50)	-
28.5	0.54 (0.18)	1.39 (0.42)	-
29.5	0.54 (0.17)	1.39 (0.42)	1.09 (0.32)
50.1	0.15 (0.10)	0.39 (0.27)	0.28 (0.16)

3rd Order Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product, measured at 21.4MHz;

	Preamp Off	Preamp On
10/20kHz spacing;	83.5dB	83.0dB
20/40kHz spacing;	83.7dB	83.3dB
50/100kHz spacing;	80.2dB	81.6dB
100/200kHz spacing;	80.5dB	80.8dB

Selectivity;

	CW/SSB Nar	SSB/AM Nar	AM/FM
-3dB	1.32kHz	2.06kHz	6.56kHz
-6dB	1.61kHz	2.51kHz	9.12kHz
-20dB	2.17kHz	3.26kHz	12.78kHz
-40dB	2.48kHz	3.75kHz	15.18kHz

S-Meter S9 Level;

Freq. MHz	Sig. Level
1.8	57.8 μV pd
3.5	56.1 μV pd
7.0	59.2 μV pd
10.1	66.2 μV pd
14.0	58.6 μV pd
18.1	59.9 μV pd
21.0	58.9 μV pd
24.9	64.9 μV pd
28.5	69.8 μV pd
29.5	71.7 μV pd
50.1	19.0 μV pd

Image Rejection;

Increase in level of signal at the first IF image frequency, and the first IF itself, over level of on-channel signal, giving identical 12dB SINAD signal;

Freq. MHz	Image Rej.	IF Rej.
1.8	94.8dB	106.9dB
3.5	95.0dB	>110dB
7.0	96.3dB	>110dB
10.1	92.4dB	>110dB
14.0	94.8dB	103.8dB
18.1	94.0dB	102.2dB
21.0	92.4dB	101.8dB
24.9	91.6dB	100.5dB
28.5	90.3dB	99.8dB
29.5	90.6dB	99.6dB
50.1	>110dB	73.7dB

S-Meter Linearity

Measured at 14.25MHz;

Indication	Sig. Level	Rel. Level
S1	5.03 μV pd	-21.3dB
S2	5.88 μV pd	20.0dB
S3	8.00 μV pd	-17.3dB
S4	10.7 μV pd	-14.8dB
S5	14.9 μV pd	-11.9dB
S6	20.9 μV pd	-9.0dB
S7	28.9 μV pd	-6.1dB
S8	41.5 μV pd	-3.0dB
S9	58.6 μV pd	0dB ref
S9+20dB	404 μV pd	+16.7dB
S9+40dB	2.79mV pd	+33.5dB
S9+60dB	15.7mV pd	+48.5dB

Transmitter

Harmonics;

Freq. MHz	2nd	3rd	4th	5th	6th
1.8	-67dBc	-71dBc	<-80dBc	-74Bc	<-80dBc
3.5	-69dBc	-68dBc	<-80dBc	-66dBc	-75dBc
7.0	-68dBc	-71dBc	<-80dBc	-76dBc	<-80dBc
10.1	-64dBc	-70dBc	<-80dBc	<-80dBc	<-80dBc
14.0	-61dBc	-74dBc	<-80dBc	<-80dBc	<-80dBc
18.1	-60dBc	-64dBc	<-80dBc	<-80dBc	-80dBc
21.0	-63dBc	<-80dBc	<-80dBc	<-80dBc	-80dBc
24.9	-62dBc	<-80dBc	<-80dBc	<-80dBc	-80dBc
28.5	-64dBc	<-80dBc	<-80dBc	<-80dBc	-80dBc
29.5	-63dBc	<-80dBc	<-80dBc	<-80dBc	-80dBc
50.1	-64dBc	-70dBc	<-80dBc	<-80dBc	<-80dBc

Blocking;

Measured on 21.4MHz as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 6dB degradation in 12dB SINAD on-channel signal;

	Preamp Off	Preamp On
+/-50kHz;	95.1dB	94.7dB
+/-100kHz;	101.5dB	100.6dB
+/-200kHz;	105.7dB	104.2dB

SSB IMD Performance;

Measured on 14.25MHz with a two-tone AF signal, results given as dB below PEP level;

	3rd Order	5th Order	7th Order	9th Order	11th Order
14.25MHz:					
Proc. Off, (ALC Onset)	-32dB/ -30dB	-47dB/ -40dB	-52dB/ -57dB	-53dB/ -56dB	-57dB/ -59dB
Proc On, (20dB Comp.)	-19dB/ -25dB	-26dB/ -35dB	-47dB/ -43dB	-51dB/ -54dB	-57dB/ -56dB
50.10MHz;					
Proc. Off (ALC Onset)	-25dB/ -23dB	-38dB/ -38dB	-47dB/ -50dB	-57dB/ -55dB	-62dB/ -67dB
Proc. On (20dB Comp.)	-13dB/ -24dB	-32dB/ -36dB	-33dB/ -31dB	-46dB/ -36dB	-43dB/ -45dB

TX Power/Current Consumption;

Connected to stabilised 13.2V DC using supplied DC lead

Freq. MHz;	High Power;	Low Power;
1.8	101W (16.5A)	15.8W (6.6A)
3.5	100W (13.2A)	16.2W (5.7A)
7.0	101W (17.5A)	16.0W (6.6A)
10.1	99W (14.8A)	14.7W (6.2A)
14.0	99W (15.3A)	14.8W (6.3A)
18.1	101W (17.2A)	16.3W (7.3A)
21.0	104W (16.9A)	17.0W (6.9A)
24.9	102W (18.9A)	16.5W (7.3A)
28.5	97W (18.4A)	16.0W (7.1A)
29.5	95W (18.5A)	15.6W (7.0A)
50.1	11.9W (2.6A)	2.8W (1.7A)

SCANNERS

Bill Robertson gives an introduction to receiving weather satellites on your scanner, and looks at two new handheld scanners

In last month's column I promised to give a few hints and tips on getting started in receiving weather satellites on your scanner. So here goes.

There are two types of weather satellites. The first, operating around 137MHz, are *Polar Orbiters*, which as their name suggests, orbit around the Earth. The second type are *Geostationary* satellites, which, like TV broadcast satellites, appear 'stationary' to us from a given point on Earth. Each type transmits continuously, but in the case of the polar orbiters you'll only be able to receive these when your receiver aerial is in 'line of sight' of the individual satellite as it passes over your horizon.

Polar orbiters

These you can often hear, to some degree, if you're outdoors using just your handheld scanner with its set-top aerial, the signal can usually be quite strong! However, for best results you'll need a suitable outdoor (or even loft-mounted) aerial such as crossed dipoles, possibly with a reflector element, to overcome much of the 'fading' you'll get. J-Beam manufacture these in the UK (complete with reflector elements), Cirkit and Maplin can supply 'do-it-yourself' types. See recent and future 'Scanners' columns for up-to-date frequencies to tap in (e.g. 137.500MHz for NOAA12 and 137.620MHz for NOAA 14). A 'search' between 137.400MHz and 137.900MHz in 5kHz steps with usually bring results.

You can accurately predict the exact time each individual satellite will be 'in view' at your particular location, by using a PC with a satellite tracking program, for example *PC Track* (from the Ham Radio Today software service - see last month's issue), remembering to enter up-to-date Kepler elements (available each month also from the magazine - see 'Satellite Rendezvous'). You'll typically get around three good 'overhead' passes each day.

Geostationary

Here, you'll need a receiver covering up to 1700MHz, plus a high gain aerial



such as a (very) long yagi or a 1m dish, pointing at the satellite. A low-noise preamp, mounted at the aerial end, is also very useful if not essential. From the UK, *Meteosat 5* is virtually directly 'south' above the equator. This transmits a picture every four minutes - using 1691.00MHz for 'Channel 1' and 1694.500MHz for 'Channel 2'. If you don't have a suitable receiver, add-on downconverters are available, these convert the 1690MHz signal from your aerial down to 137MHz to feed to your receiver.

Receivers

Whichever receiver you use, you'll find it needs an IF (Intermediate Frequency) bandwidth rather greater than those typically used for NFM, but less bandwidth than WFM - around +/- 15 to 20kHz is usually ideal. The AOR3000A 'Plus' from AOR (UK) is one set that can be so equipped. Alternatively, if you're competent you can 'dive inside' your scanner and change the 455kHz block ceramic filter to a wider type. If you're a skilled electronic engineer, you could do this yourself (suitable filters are available from Cirkit for example), however, I'd strongly advise this be done by a ham radio dealer with adequate service workshop facilities.

Decoder

After you've successfully received the satellite signal, radio-wise, you will

of course need some form of decoder and display system to view the weather satellite pictures. The readily-available JVFAX program (again from the magazine's software service) has proved to be extremely popular, but note that the very simple 741 interface will not work - you'll need an 'AM' interface as detailed in the

program's documentation files for weather satellite reception. This is because the satellites transmit on FM, but with an audio modulated AM subcarrier. Other more sophisticated, even 'stand-alone' dedicated systems are also available, from companies such as Timestep and ICS.

More information

This brief introduction can't cover everything, but I hope it's answered many of the commonly-asked questions. Please do drop me a line (or fax or email) if you'd like more information on a specific point, I'll be pleased to answer through this column. If you find you are getting interested, then an SAE to the Remote Imaging Group, who are an enthusiast body with a periodical newsletter/magazine, could also prove very worthwhile. You'll find full contact details in the magazine advertisements, Club News, and past columns for all of the above.

JVFAX tape interface

On the subject of JVFAX and weather satellites, a letter from Greg Jameson (you may remember an earlier mention of his AM JVFAX interface in Ham Radio Today) tells us he's been 'at it again'. Greg says a problem with his earlier interface, J030595, is that on decoding a signal from a tape recorder which has some noise on it, the PLL may momentarily

lose its lock with the 2.4kHz carrier and so cause the displayed picture to shift to one side slightly.

The solution to this is to record the satellite signal on one channel of a stereo tape deck, while on the other simultaneously record a stable reference carrier derived from a crystal oscillator. This means there is always a nice clean carrier for the PLL to lock onto on playback, and as a result more consistent results are obtained even with noisy parts of a picture. As before, the circuit will also work with 'live' data. For live decoding you'll need an 8-bit input port (such as the Maplin LP12N) or a bidirectional printer port (e.g. Cirkit 40-04832 Super I/O card at £10.95). To decode taped images you'll need a bidirectional printer port.

Greg was kind enough to send along technical details together with a complete circuit diagram of his interface design. Unfortunately room doesn't allow it's full reproduction here, but if you'd like a photocopied set just send an SAE marked 'JVFX Interface' to the Ham Radio Today Editor, together with the corner flash from this page, and you'll receive a copy in the post. Many thanks for your work and for sharing this information with us, Greg

Would readers be interested in a construction article on this in a future issue? Please let either myself, or the Editor know.

'Airplot' aircraft tracking

You may have seen my description of this commercially-available program by John Standen, of interest to airband enthusiasts, in last month's *Scanners* column. Well, for the interest of readers there's now a demo version of the program available. You'll find this on the Internet at ftp site; [ftp.demon.co.uk](ftp:demon.co.uk) in the directory <pub/ibmpc/demos/airplot/>, the file is *AIRPLOT.ZIP* with a size of 759,521 bytes. The demo shows the operation of the program in generation and colouring a map, real-time tracking of five selected aircraft, single oceanic route clearance and display, bleep on/off, track on/off, waypoint star on/off, airline and timetable schedule, level change, reporting points towns and grid overlays. If instead you'd like a copy on a 1.44Mb PC disk, I've arranged for this to be available over the next few months via the magazine's software service, for £1.00 to cover the cost of disk and return

p/p. Just request the 'Airplot' disk, ordering details as given in this month's usual software offer.

New handhelds

I've received news of a couple of rather interesting handheld scanners that have just become available

The first is the wideband *Yupiteru MVT-7200*, which follows on from the very successful *MVT-7100*. Enhancements include an AM Narrow mode, built-in ferrite aerial for AM broadcasts, narrow band SSB filters, improved short wave reception, and lower battery consumption.

The other new set is the *Realistic PRO-25*, a stylish handheld scanner covering switched bands of 30-54, 108-174, 406-512 and 806-956MHz. With 100 memory channels plus 10 monitor memories, it scans at up to 50 channels per second. (*Both of these are planned as full reviews in next month's issue - Ed*).

From the mailbag and the 'net

If you're having problems with 'floating birdies' on your AR-8000, I have a modification bulletin here which details the addition of a replacement crystal, to reduce interaction between two PCBs. If you'd like a copy, just drop me an SAE, addressed to myself c/o the Editor.

Mr. Henley writes in to say he's contemplating buying a handheld airband scanner, and asks if a 'best buy' list is available. Yes, the magazine published a 'Guide to *Scanners*' buying guide in the Nov 91 issue plus a 'Which Receiver' feature in the Oct 93 issue. An up-to-date listing of the many scanner and receiver reviews which have been published in the mag is available from the Ham Radio Today 24 hour info line (01703 263429) or in return for an SAE.

Mr. Garrington writes to say he has a Realistic PRO-30, and asks advice on one with a much wider range, adding that 'Scanners 3' which he's read (sensible chap!) gave a good report on the AR-1500EX. Depending upon your budget, this is certainly a very reasonable wide-coverage handheld indeed, one I wouldn't hesitate in recommending at the price. You've obviously done your homework Mr. Garrington, but if your budget

stretches further, more recent models such as the AOR AR-8000 or the *Yupiteru MVT-7100* are *extremely* nice, very wide coverage handhelds, although at rather a higher cost. I'd also advise looking at next month's review on the *MVT-7200*.

A message from Andy Hardy, who lives around 10 miles from Heathrow, says that on monitoring airband activity he's found one particularly active departure frequency, 129.075MHz, that isn't listed in his books. The answer to this is that 129.075 has replaced 123.900MHz for London TMA South West. Indeed London ATCC frequencies throughout the UK have changed quite a bit over the last year, indeed they're still being 'fine tuned' if you'll excuse the pun.

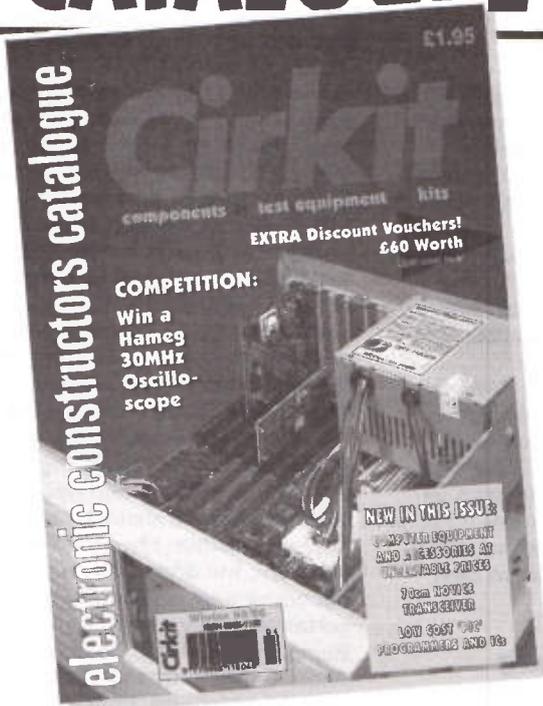
I've also received a couple of enquiries this month asking if it's possible to receive and decode GSM cellular phone transmissions using a normal scanner. I'm afraid that, at the moment, the answer is 'no' to the decoding part, although you can certainly receive them quite strongly. Being TDMA (Time Division Multiple Access) digital transmissions, you usually wideband 'buzz' sounding signals, around the 900MHz GSM and 1800MHz PCN frequency allocations. My PCN phone certainly makes no sense at all on my handheld scanner! However I'm sure it's just a matter of time before suitable add-on circuitry will become available! I'll keep you informed.

Many thanks for your letters and messages - please keep them coming. Next month I'll be detailing wide-area message pager decoding with just a very simple home-made interface, using a shareware program that will also be available through the magazine. Maybe you'll soon be seeing rather interesting text messages received on your scanner (as I have) - the mind bobbles! As always, if you'd like any other specific scanning topics covered in future columns, please do let me know. See you next month.

Bill Robertson is pleased to hear from readers and answer queries through this column - address your letters to: Bill Robertson, c/o HRT Editor, Nexus, Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or by fax or email to the HRT direct Editorial contact points.

Please remember that reception of some services may not be permitted without appropriate authority. The RA's information sheet on 'Scanners' has full information for the UK.

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A Direct Conversion Receiver for 80, 40 and 20m (part 3)

Raymond Haigh details the alignment and operation of his modular receiver construction project for three popular amateur bands

The first and second parts of this article appeared in the October and November '95 issues - if you missed them then back issues are available from the HRT Back Issues Dept., Tel. 01858 435344 (back issues are available for the last 12 months issues only, for articles older than 12 months you can obtain photocopies from the Nexus photocopy service, details at the back of the magazine)

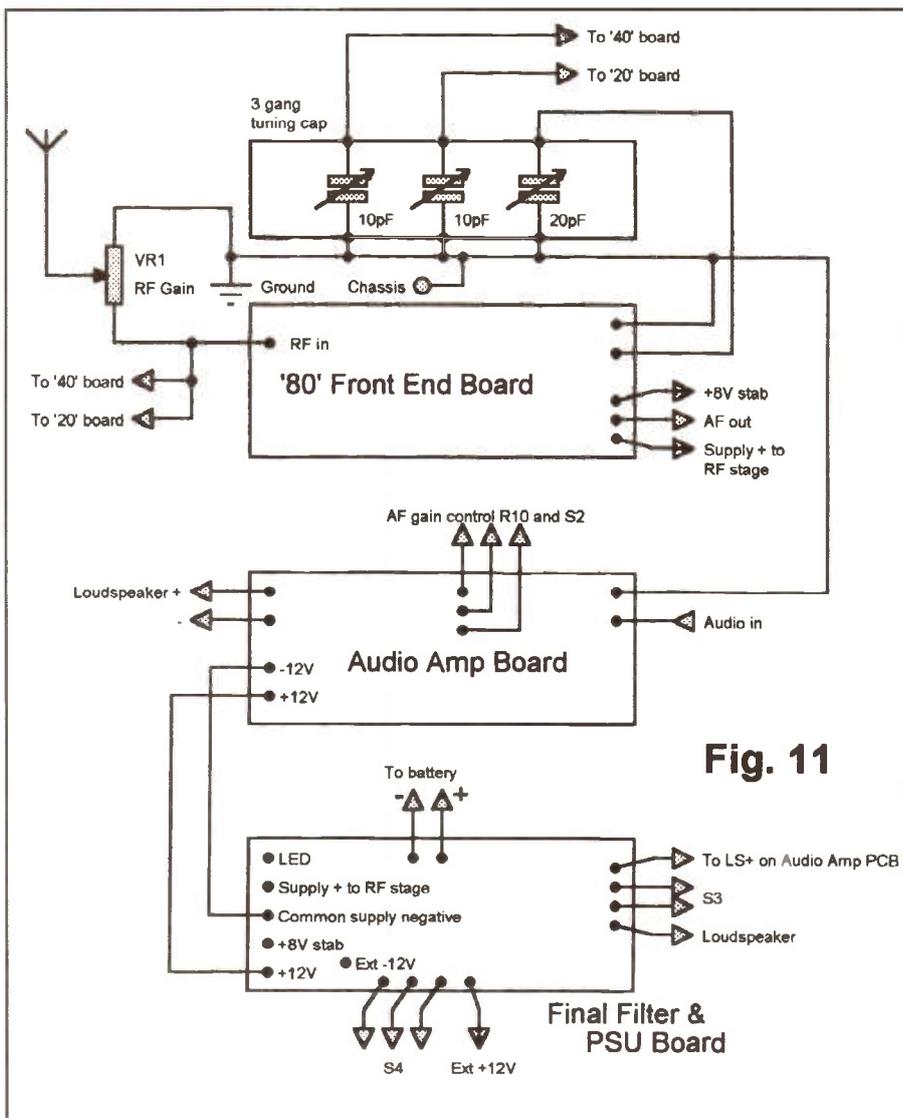
Following on from last month, the alignment procedure for the receiver is as follows;

(1) Locate the receiver to be used for the alignment fairly close to the DC receiver, tune it to the centre of the required amateur band, and switch on the BFO (or advance the regeneration control until the set is oscillating). Connect a short length of wire to the aerial socket and lay the other end of the wire across the NE602 chip in the DC receiver.

(2) With the DC receiver's tuning capacitor set to mid-swing, slowly adjust the core of L4 until a whistle is heard in the speaker of the aligning receiver. Set the core for zero beat (a point of silence between two rising tones). The DC receiver oscillator is now set to mid-band.

(3) Slowly rotate the DC receiver's tuning capacitor to full mesh and track the injected tone on the aligning receiver to ensure that coverage extends beyond the LF end of the band. Repeat this procedure, turning the DC receiver's tuning capacitor fully open to check coverage at the HF end of the band. With the values of swing reducing capacitors, C13 as given in the components list in last month's HRT, the coverage of the specified tuning capacitor will extend well beyond the band edges.

(4) Alternatively, if a transistor portable is being used, tune in a SSB transmission on the required band (in



Block diagram showing earth returns and common supply negative connection. Band switching and associated wiring not shown.

the absence of a BFO this will sound like scrambled speech), connect a short wire to the portable's telescopic aerial, and lay the other end of the

wire over the NE602 chip, as before. When the core of L4 is brought to the correct setting, a strong hissing sound will be heard in the speaker of the

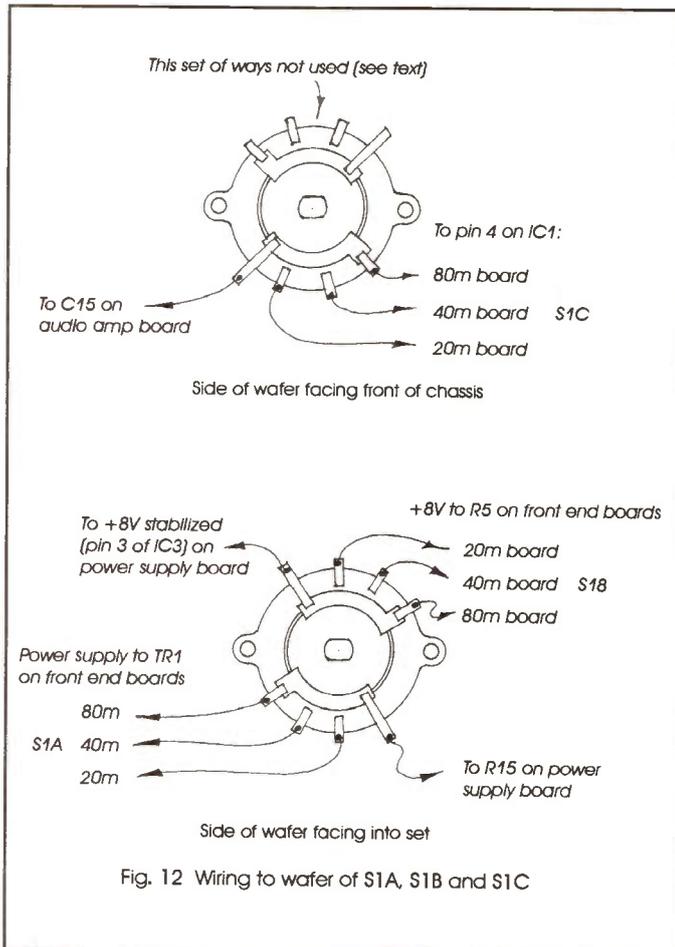


Fig. 12 Wiring to wafer of S1A, S1B and S1C

transistor portable and the SSB transmission may suddenly clarify. (The NE602 chip is, of course, acting as a signal-frequency BFO). If the portable does not cover the 80m band, tune in a SSB signal on 40m (7MHz) and trace the second harmonic of the NE602 chip in order to set the oscillator close to 3.5MHz. Unless the transistor portable is of exceptional quality, it will not be possible to check for band coverage or, indeed, to ensure that the DC receiver's oscillator is tuned to the mid-band position, but at least the working point has been set somewhere within the band.

(5) Tune the aligning receiver to a transmission near the centre of the band and use the DC receiver's tuning capacitor to set the NE602 oscillator to the same frequency, all as described above.

(6) Connect an aerial and earth to the DC receiver and turn up the RF and AF gain controls. Set the cores of L1 and L2/L3 about two turns down from the top of the can, then slowly adjust them until the transmission is heard in the speaker of the DC receiver. Continue the adjustments, reducing the RF and AF gain control settings, as necessary, until response

has peaked. Keep checking with the aligning receiver that the amateur station is still being received. If it disappears, another will have to be tuned in, the DC receiver's oscillator re set, and a fresh attempt made. Adjustment of L1 and L2/L3 is fairly critical, but the procedure is not too difficult, especially if the band is busy. Final adjustments to optimise the response of the filter across the band is best left until the receiver is installed in a cabinet.

(7) The functioning of the RF stage can be checked separately if desired. Disconnect the 8V stabilized supply to disable the NE602 oscillator, then

connect the L3 side of C6 to the aligning receiver's aerial terminal via a 1nF capacitor (after first making sure the receiver is tuned to a transmission within the band). Transfer the aerial to the DC receiver and adjust the cores of L1 and L2 until the now much amplified signal re-appears in the speaker of the aligning receiver. It will be necessary to link the earth terminals of the two sets for this test. This procedure is, of course, using the DC receiver's RF stage as a preselector and, in the process, tuning it to the amateur band.

(8) When the DC receiver has been assembled in its cabinet, adjust the cores of L1 and L2/L3 to optimise response across the entire band. These inductors must be stagger-tuned for best performance. Indeed, if they are brought into exact alignment there is likely to be some instability when L4 is tuned to the same frequency.

Re-check for complete band coverage and, if desired, reduce any excess swing of the tuning capacitor by decreasing the value of series capacitor, C13. The values for C13 quoted deliberately ensure a fairly wide coverage in order to make the

initial setting-up process less critical. Note the reduced value for the UK frequency allocation on the 40m band.

Instability

If the simple guidance given earlier regarding layout is followed, no AF instability will be encountered.

After the receiver had been housed in its cabinet, I did, however, notice a slight tendency to RF instability on the 20m band. This manifested itself as a faint ringing when the oscillator tuning and both of the bandpass tuned circuits came into close alignment.

If further adjustment of the cores of L1 and L2/L3 does not effect a cure (and they should not be staggered to the point where sensitivity is excessively impaired), connect a 1k resistor across L2 to damp the tuned circuit. The resistor can be wired in position without disturbing the PCB by soldering it to the leads of C5.

Connecting the input pins of all three front-end boards together made the RF gain control noisy as it was rotated close to maximum. This problem only arose with the 80 and 20m boards, and was probably caused by unwanted feedback through the network of under-chassis wiring. Connecting the RF gain potentiometer via a 120 ohm resistor soldered to the input pin of the offending board will effect a cure.

Operating the receiver

The receiver is selective, sensitive and has a very acceptable noise factor despite the inclusion of the RF amplifier stage. Although Philips, the manufacturers of the NE602 mixer/oscillator chip, make no claims for its large-signal handling capabilities, it performs well in this circuit and comparatively strong SSB transmissions can be processed without difficulty. Adjustment of the RF and AF gain controls is not critical, and this is very much a 'switch-on, tune-in and listen' receiver. Contacts between amateurs often involve a mix of weak and strong signals, and the switched high/low AF gain control facility avoids the need for repeated adjustment of the gain potentiometers.

Performance is, of course, improved by a good aerial and earth, especially an aerial designed for a particular amateur band. Boosted by the RF stage, the receiver will, however, 'pull

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in' plenty of SSB signals when the bands are active using only a couple of metres of wire.

Breakthrough of powerful broadcast transmissions on adjacent frequencies (a common problem with DC receivers), is not excessively troublesome and can usually be cured by turning down the RF gain control a little. If one particular station persistently breaks through, a slight readjustment of the cores of the bandpass inductors may tune it out. If the offending station is a powerful local one operating on a much lower frequency, the insertion of a wave trap in the aerial lead, close to the receiver, will eliminate the interference. Use one of the coils from the Toko 10EZ range with a close tolerance ceramic capacitor of appropriate value connected across it to form the trap.

Tuning drift, even during the initial warming-up period, is not troublesome, and the 7808 regulator chip holds the critical oscillator supply 'rock steady' over wide variations in input voltage. The regulator requires a voltage 'headroom' (i.e. minimum voltage input - Tech Ed), of 10.5V, this is something to watch for with dry battery power supplies.

Mains supply

Receivers of this kind are often in use for long periods, and a mains power unit makes for more economical running despite the modest current drain. A simple unregulated supply rated at 250mA or more and with an on-load output of 12-13V will be perfectly adequate. For this application the unit must, however, incorporate a generous value of reservoir or smoothing capacitance (at least 4000µF is recommended); and a 10nF (.01µF) 50V working ceramic capacitor must be wired across each rectifier diode, and across the reservoir capacitor, in order to prevent modulation hum.

Listening around

I'd advise newcomers to listening-in on the amateur bands that activity varies widely according to conditions and the time of day. There is usually some activity on the 80m band, and it becomes very busy on Saturday and Sunday mornings, making these good times to choose for aligning and testing the receiver. A similar pattern is evident on 40m, but activity on 20m is

more sporadic and mid-afternoon is, perhaps, as good a time as any to try out this band. Amateur SSB (single side band) transmissions sound like scrambled speech until the product detector restores the missing carrier and clarifies them (the carrier is removed at the transmitter to maximise efficiency and reduce bandwidth). They have to be very precisely tuned in. Even with a good slow motion drive fitted, the tuning control must be operated carefully.

It helps to wear earphones when searching for weak or distant signals, and the RF and AF gain controls will need to be set close to minimum with this mode of listening. The inexpensive, low impedance 'phones used with portable cassette players are ideal. Older, high impedance 'phones will not work with this receiver.

If you have any queries regarding this project, please address them to the author c/o the Editor at the HRT address, enclosing an SAE if a reply is required. Any updates or reported corrections to this constructional feature will be available for the next 12 months on the 24hr HRT automatic Voicebank and Fax-back information line, Tel. 01703 263429 (use with a DTMF, i.e. 'touch-tone', phone/fax keypad - follow the voice menu).

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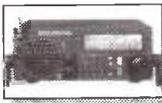
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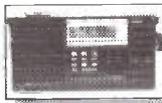
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LETTERS

Letter of the month

Morse - RA and RSGB

May I say how pleased I was to find that the Radiocommunications Agency have realised, and materially acted upon, the fact that the RSGB are not the only 'voice' of the amateur radio movement in the UK. The RA have, quite rightly (and in something which the RSGB cannot disagree with), found that the majority of non-Class A amateurs, i.e. 'newcomers' to the hobby, have stated there is no need or relevance for any mandatory requirement in Morse code proficiency in the hobby of amateur radio. Those requiring further proof should witness the discrepancy in the large number of Novice Class 'B' licensees to the relatively extremely low number of Novice Class 'A' licensees. These facts clearly show that newcomers don't want to be subjected to forcibly learning such a basic form of communication, even if it's only tested at the pitifully low speed of 5 WPM. Governments of other countries, i.e. New Zealand, are also of the same mind. Even the USA have banned the future use of Morse for essential (including 'safety-of-life') radio communications.

The question I ask is, what instead should now be the 'deciding influence' in attaining a Class 'A' amateur licence?

Philip Stokes

Thanks for the software

Dear HRT,

First, thanks for the super software each month. Further on the fact that computing, ham radio, and electronics in general need not be expensive, if you look around you can find some real bargains, especially if you are a little bit adventurous. I saw an IBM386, monitor, no picture, £20. I jumped on it. I was not sure what I was going to get, it could be a piece of junk, I was prepared to take the chance, probably get some usable parts from it. In fact, it was in full working order (except for the monitor). It has a 386 Intel processor installed, 5.5Mb memory plus 3Mb piggyback, double spaced Winchester drive, Windows and Amipro installed, plus Norton utilities. I also got a dual beam working super scope for £20 and a 60MHz tri-beam scope for £75. OK, I may have a nose for a bargain, but if you look and are prepared to take a chance, you can equip your shack for very little, at least it won't cost you a 'packet', excuse the pun.

Dennis Barber G0UFS/KB8GCF

'Communicators' and 'Engineers'

Dear HRT,

With reference to the comments from Ian Brothwell G4EAN and G1USP (HRT Sept '95) regarding my correspondence concerning the Internet versus Amateur Radio (HRT July '95), I feel that I should reply to one or two points raised in their letters.

Now, although I take on board Ian's observation that there's a wide chasm of difference between 'communicators' and 'engineers', at the end of the day of course, it doesn't matter how one decides to communicate be it via the Internet, amateur radio, email or even the dog-and-bone. But, and I believe the following fact to be absolutely essential to the future relevance of amateur radio (and the main point I was actually trying to get at), ever since the 1960's and beyond 'communicators' as opposed to 'engineers' have single-handedly (with the tacit help of the Japanese) kept what is probably the best hobby in the world from slipping inexorably into the abyss of irrelevance.

Yes, we *need* engineers. But, also

like all those talented radio amateurs who've popularized amateur radio by virtue of their original ideas they, not unlike engineers in the wider community, only represent a *tiny* minority of the whole. No, if amateur radio depended only on these experimental/kitchen-table types, I think our hobby would be facing (a) terminal decline or (b), be a fond and distant memory.

The advent of computers and now the 'infamous' Internet, have, over the past decade or so, understandably coerced thousands of what might have been potential amateur radio enthusiasts into what are now apparently, willing converts to the dark forces of DOS and Windows. I do realize that many amateurs also use computers, but of course I refer to those people who are not already radio amateurs. So, unless a global satellite repeater system or some other as yet unknown technical paradigm can continue to awaken the interest in those who may one day join the ranks of our common hobby, I think we all have to be careful that we don't become too sure that amateur radio will always be there no matter what, because it might not!

Ray J. Howes G4OWY

£10 for 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 (normally paid during the month following publication). So write in with your views, to: Letters Column, Ham Radio Today, Nexus, Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or fax your letter direct to the Editor's desk on 01703 263429 (fax letters for publication only, for general readers queries please see the 'Readers queries' section in the 'Who's Who and What's What in HRT' flannel panel at the back of this issue), or email to chris@radshack.demon.co.uk. Please keep your letters short, we reserve the right to shorten them if needed for publication. Letters must be original and not have been sent to any other magazines, and must include names and addresses plus callsign if held. Reader's views published here may not necessarily be those of the magazine

'TONE' BURST by GOMEN



Don't be shy - make friends

Dear HRT,

During a recent three week holiday in Florida I thought it would be interesting to make contact with the local amateurs. The Orlando branch of Amateur Electronic Supply provided details of the Orlando Amateur Radio Club (OARC) and the Lake Monroe Amateur Radio Society (LMARS).

I began by contacting Cindy Radice (KD4NLV) who is president of the OARC and was met with a very pleasant and warm response. Unfortunately, their monthly meeting was to be held that very night and I was unable to attend due to prior arrangements. Cindy encouraged me to get in touch with Al LaPeter (WB4DRF), the president of LMARS, who also gave a very heartening response to call. The LMARS meeting was on the evening following the

OARC meeting and I was able to attend.

LMARS has over 200 members and meets monthly at the Casselberry Senior Centre (OARC has over 300 members). I found the place easily enough (about 45 minutes drive from my base in Kissimmee) and introduced myself to Al LaPeter who made me feel very welcome and announced my presence to the meeting. I sat in and listened to a presentation on the ins and outs of earthing shacks, most important in Florida due to the very regular and powerful thunderstorms.

I was surprised to hear that UK amateur radio enthusiasts *do not* contact the local clubs in Florida. Cindy and Al could not recall a previous visitor dropping by as I had done. The message was quite clear. Visiting amateur radio enthusiasts are very welcome to attend these meetings *and* to take part in their regular nets. I myself took part in a Tuesday evening net operated from Cindy's home in Orlando. I used Cindy's callsign,

supervised. My wife Lynne, listened to the proceedings whilst my two boys were busy in Cindy's pool. A thoroughly enjoyable evening.

Cindy and Al are very pleasant people and my holiday was even more enjoyable due to my contact with them. Next time I go to the USA I will again contact the local club(s) and make personal contact.

By the way, I was advised that it could be arranged for me to sit the US amateur radio examination papers, provided I passed I could expect to get a callsign in about 72 hours! I was unable to put that to the test but it was a very tempting thought.

So, don't be shy, be a friend and make that contact. I am sure that you will be as warmly received as I was. Should anyone want the contact addresses and telephone numbers, I will be pleased to supply these on request.

John Alexander, G7GCK
Chairman, Leicester Radio Society

Amateur 'Converts'

Dear HRT,

Once again the annual debate is in full swing concerning Amateur and CB radio and all the usual accusations on both sides. I feel that the time has now come to lay this issue to rest for good. Both systems have their own good and bad points, however both licensed Amateurs and CBers have one thing in common; they are legal, government approved, systems!

I have been involved in CB since just after it was legalised in 1981 using fully legal setups with UK27/81 type approved equipment. I have been involved with various emergencies, worked DX during Sporadic E, used it for mobile to base communications, control of various events and sponsored walks etc., using legal equipment. I have never used any form of illegal equipment or operated unlicensed since I started CB in 1981.

Prior to the introduction of CB I had a desire to become involved in Amateur Radio. CB gave me the chance to prove to myself that this was not a passing fad; and despite my current G17 callsign, I passed the RAE in 1983. I have heard as much abuse on 2m as on CB, and not all VHF abuse was identified as coming from ex-CBers. We must remember that CB is a low cost communications system available for the general public which offers almost no scope for experimentation, the only exception being propagation. Amateur Radio on the other hand is designed for experimentation and cannot be used for some of the things that CB can. For example, having a base and mobile CB setup, my wife has no real interest in radio but can contact me when I am mobile to give me a message, even my elder children can do this without the need for separate licences or having to do a City and Guilds course.

Over the years, the RSGB have published misinformation to its members and potential members concerning CB. They actively discouraged the use of CB, and still do by refusing to accept adverts in their publication for legal CB equipment. Perhaps now that their recent President admits that CB was instrumental in his becoming a Radio Amateur, he will now attempt to persuade the RSGB that CB has been about in a legal form for over 13 years, is here to stay, and has uses that cannot compare with Amateur Radio but is also used as a low cost, no frills type of hobby for many.

Most of the complaints about CB seem to come from Class A amateurs. I cannot help feeling that perhaps there is some form of resentment that this section of the 27MHz band was allocated for CB and not offered as an extension of the 10m band for amateurs. Both amateur and CB radio have their place and there is no reason why the two forms of radio should not work in harmony in the years to come.

K. A. Connolly G17TVX

From My Notebook

Geoff Arnold G3GSR continues on his theme of "Will it do?"

Continuing on my theme of 'Will it do' - deciding just what liberties you can and cannot take if faced with having to replace a component when one of the identical type and value is not available, this month I shall look at capacitors, both fixed and variable types.

Capacitors

Fixed capacitors, like fixed resistors, generally have just two connections. There are exceptions, of course, where more than one capacitor has been put into a single can. Typical examples are large electrolytic capacitors, of the sort intended for use in power supply reservoir, smoothing and decoupling applications in valved equipment, and those decoupling units containing three 0.1 μ F capacitors used in some communications receivers of the 1930s and '40s era.

So far as I'm aware, all such multiple capacitors had a single common negative connection. Again, so far as I'm aware, the only currently manufactured types are a few intended for replacement purposes in vintage valved equipment, or for use in modern valved hi-fi amplifiers. Usually, there is plenty of space to fit in two or three separate capacitors as replacements for early types, as modern capacitors are so much smaller than the old ones.

When looking for a replacement, the capacitance value is probably the most important feature. Whereas for resistors there are just three methods of marking the value on the component - the old body-end-dot colour code, its modern coloured rings replacement, and printed figures - for capacitors, if you include systems in vogue over the past 50 or 60 years, there are perhaps 10 or 15 variations. Most of these are now of interest only to restorers of vintage equipment, especially that coming from the USA, but even today it seems there are really more systems than are strictly necessary. I don't have room to go into them here, but would refer you to one of the standard radio and electronics data and reference books.

Two or more capacitors can be connected in series or parallel to make up a non-standard value, just as for resistors, which I explained last month. However, there is one very big difference. For capacitors connected in parallel the capacitances add, to produce an overall

value equal to the sum of the individual values. For capacitors connected in series the overall value will be less than the value of either of them; the simple case of two equal-value capacitors in series will yield a value equal to half their individual value.

If you look back to last month's issue of *Ham Radio Today*, you will see that this is the exact opposite of the case for resistors. Providing you change the word 'series' to 'parallel' and vice-versa, everything I said there about calculating effective values applies equally to capacitors.

Tolerance

Just as for resistors, modern capacitors have considerably closer tolerances than their predecessors. The worst type of all for tolerance, electrolytics, typically used to be quoted at -50%, +100%; in other words they might actually be anywhere between half and double the value marked on the can! The worst modern type is now -20%, +50%, and many claim a straight 20%. These are the standard aluminium electrolytics, which have the advantage of giving a high capacitance in a small space, but at the expense of a high leakage current through the capacitor. Apart from choosing a replacement with an adequate working voltage, the most important rating for electrolytics in power supplies is the ripple current rating, which I shall return to in a moment.

For low voltage work (up to about 35 volts), tantalum electrolytics also provide high capacitance in a very small space, and are stable and reliable.

Other capacitor types have tolerances ranging between 1% and 20% depending upon the particular dielectric and construction used. Hand in hand with tolerance goes stability - how well the component retains its nominal value with the passing of time and with variations in working temperature. Tolerance and stability are important for components used in

timing circuits, or in tuned circuits, which after all can be looked upon as basically a particular form of timing circuit.

The closest tolerances and best stabilities are to be found in polystyrene or silvered mica capacitors. Next best are the other types using polymer (plastic) dielectrics - polycarbonate, polyester and polypropylene. If you are replacing paper-dielectric types in older equipment, then any of these will provide equal or superior performance.

Ceramic capacitors come in a variety of types, with properties dependant upon the grade of ceramic used as the dielectric. The so-called 'High-K' ceramics provide fairly large capacitances within a small space but have rather poor stability and considerable losses. They are suitable only for coupling and decoupling purposes. I once tried to use one in a dummy load for a low-power MF/HF transmitter, because it was small and had a high working voltage, but because of the losses it proved most unsuitable!

The 'Medium-K' and 'Low-K' ceramics don't have quite so good a capacitance-size ratio, but their performance is better and they are adequate for use in high-frequency filters and tuned circuits.

To go more deeply into the advantages and disadvantages of the various types and grades of capacitor would take far more space than I have available here, and for further information I would recommend that you consult a reference book, or the helpful tips to be found in some of the mail order suppliers' catalogues.

Ripple and losses

The reader who suggested this theme of 'Will it do' for a *Notebook* article, particularly asked me to include an explanation of ripple current ratings of electrolytic capacitors, so here goes.

Other than having voltages applied in excess of the safe working value, the thing which capacitors like least is heat. Heat can come from the surrounding circuitry, or it can be generated within the capacitor itself.

I spoke earlier of ripple current in electrolytic capacitors used in power supplies, especially in the reservoir position, immediately after the rectifier. The reservoir capacitor is trying to change the pulsating voltage at the output of the rectifier, which will fall to zero either 50 or 100 times a

second (50Hz mains with either half-wave or full-wave rectification), into a smooth and steady DC voltage. As I explained in a 'Notebook' some time ago, there are two ways of looking at the job which a reservoir capacitor does.

That pulsating output from the rectifier is, technically speaking, a DC voltage plus a large superimposed AC voltage. As its name implies, the reservoir capacitor takes power from the supply when the ripple voltage is near its maximum, stores it and feeds it back out again when the ripple voltage falls towards zero. Just like a water reservoir which fills up in the rainy season and gradually empties during a dry summer. The capacitor is

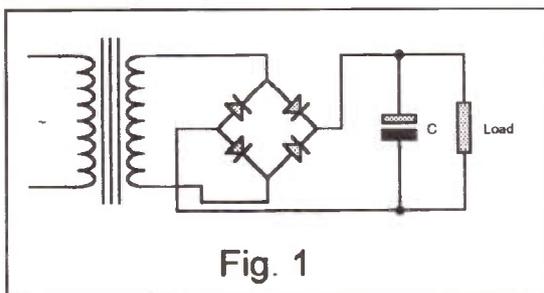


Fig. 1

Fig. 1 - A simplistic view of the action of the reservoir capacitor C in a DC power supply

therefore subject to repeated charging and discharging, and for a capacitor to charge and discharge, current must flow into it and out of it. Because the current flow is constantly reversing in direction, it is an AC current at the ripple frequency - the ripple current.

The other approach is to say that, in simple terms we can consider the reservoir capacitor is a DC open-circuit but an AC short-circuit - it isn't that perfect of course, but that's the general idea. The AC ripple current therefore flows through the capacitor, and the DC current is left to flow through the load (Fig. 1).

Whichever way you prefer to think about it, the result is the same. The reservoir capacitor must pass an AC current, and it is fairly obvious that the larger the current being drawn from the supply by the load, the greater also will be the ripple current through the capacitor as it charges and discharges, working to keep the voltage across its terminals constant.

Most text-books are fairly cagey about stating the sort of ripple current which will flow through a reservoir capacitor in a power supply providing a given current. It seems, though, that a ripple current rating of around twice the maximum DC output current of a supply is a good rule of thumb. In big

supplies, say upwards of 20A rating, that may mean you have to fit two capacitors in parallel to achieve a safe state of affairs.

All this means that if you have to replace a reservoir in a power supply that's providing anything more than around 100mA, you need to consider the ripple current rating carefully, and not slap in a component purely on the basis of capacitance and working voltage.

If the ripple rating is inadequate for the supply current, the capacitor is likely to overheat, and may even explode. Having once had the misfortune to be standing over a chassis in which the reservoir capacitor decided to object violently to the current surge caused by a sudden short circuit on the 350V HT line, exploding electrolytics are a thing I recommend you avoid.

Because the problems are heat-related, you can usually uprate the ripple current rating of an electrolytic if you are running it below its rated operating temperature. Similarly, the cooler you can run an electrolytic, the longer its life expectancy will be.

Any other losses associated with a capacitor, such as leakage, etc., will also cause internal heating, which can cause early failure if an unsuitable type is used.

Variable Capacitors

Replacing variable capacitors is likely to cause far more headaches than fixed ones, principally because the operating shafts have to line up with drive mechanisms, connection terminals frequently have to line up with feed-through holes in the chassis and so on. And we haven't yet considered the electrical characteristics!

Multiple-gang variable capacitors will often have one section of a lower maximum value than the remainder. If you have read and remembered my 'Notebooks' dealing with receiver alignment, you will appreciate why. This factor means that there is a great variety of multi-gang variables around. Any variable component will obviously have a minimum value as well as a maximum, and two capacitors with the same maximum will not necessarily have the same minimum. Depending what facilities the setmaker provided for trimming and padding the various tuned circuits, this may pose a problem when trying to match a replacement tuning capacitor to a calibrated dial.

The range of capacitance between minimum and maximum is known as the 'swing'.

As with variable resistors (see last month), the change of capacitance value with rotation of a variable capacitor can follow a variety of laws. There are the simple semi-circular vane type, still used for things like trimmers connected across the aerial circuit or BFO of a communications receiver. Over most of its rotation, the law of capacitance against rotation is a linear, or 'straight-line' one. If used as a main tuning control, this law would result in a tuning scale with graduations which are cramped at one end and widely spaced at the other.

In the early days of radio, when it was the practice to describe stations in terms of the wavelength, capacitors (or condensers as they were called then) were used which had vanes shaped so as to give equal changes in wavelength with equal amounts in rotation. These were called 'straight-line wavelength' (SLW) capacitors, also known as 'square-law' capacitors. When frequency replaced wavelength, a new vane shape was devised, called (believe it or not) 'straight-line frequency' (SLF), which gave evenly spaced frequency graduations along the tuning scale.

The problem with the straight-line frequency capacitor was that the matching of the associated coils became very critical if good tracking was to be obtained, and a logarithmic-law capacitor vane shape was devised, which gave a law midway between SLW and SLF, so that there was some 'bunching' of stations on the dial, but ganging between the tuned circuits became easier.

All this shows that finding an appropriate replacement for a multi-gang tuning capacitor can be very complicated indeed. Another factor to be considered is safe working voltage, although this is generally only of concern where transmitter circuits are concerned.

Next Month

I had hoped to deal with chokes and transformers this month, but I've run out of space, so they will have to be deferred until the next issue.

If you have any ideas on topics that I might tackle in future Notebooks, I'd like to hear from you. Your suggestions, please, to; Geoff Arnold, 9 Wetherby Close, Broadstone, Dorset BH18 8JB, or come and have a chat with me on the *Radio Bygones* stand at a radio rally.

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QRP corner

Dick Pascoe G0BPS pays a visit to the Emerald Isle and samples plenty of QRP activity



The group attending the first Irish QRP week



Dick G0BPS helps Andy EI4ERB build his 'Sudden' receiver



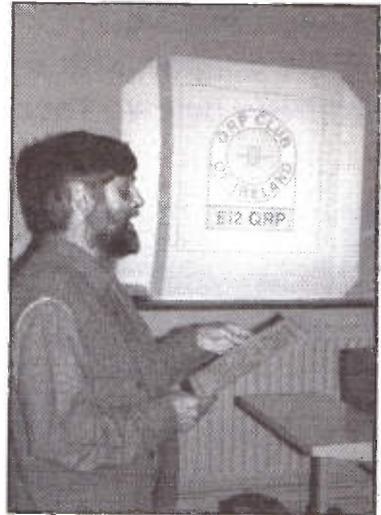
Brother Rory (right) shows Tommy EI4FXB the art of soldering



EI3RJV (L-R); Andy EI4ERB, Paul EI2FXB, Bob WA2MFI, George G3RJV, Donal EI8EIB



George G3RJV receives a barometer from Donal EI8EIB



George G3RJV announcing the new QRP Club of Ireland

Sometime between Dayton and Freiderichshafen, George G3RJV had mentioned to me that there was to be a week of QRP events in Dublin, and would I like to go with him and assist. Never having been to the Emerald Isle, I jumped at the chance. The opportunity to visit and see parts of the country helped to convince my wife that she should come too. So

Dublin Airport saw the arrival of the Dobb's and the Pascoe's on 27th August for a ten day visit.

The Marino Institute of Education may seem an odd place to hold a course for QRP operators, especially when this particular Institute is a school for potential primary teachers run by the Congregation of Christian Brothers. The first impressions was of a large Victorian style building that had been beautifully built, with wide open gardens, huge staircases and wooden panelling providing a great accompaniment to the atmosphere.

Our arrival on the Sunday evening gave us chance to see the station on the air for the week, using the special callsign of EI3RJV. The station made many contacts, a special QSL card being sent to all those worked.

The week of events started with an introduction by Brother Donal EI8DIB, the Director of the Institute, who

welcomed the two of us and the twelve students. Most of which were, of course, from the local area but there was one UK visitor in the form of Ian G4RVG and his wife over for the course (as well as a brief holiday). A single visitor from the USA, Bob WA2MFI, had great fun too.

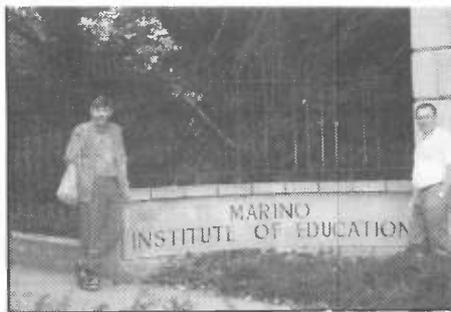
George G3RJV kicked off the day with a talk on the 'History of QRP' and how the G-QRP Club started twenty one years ago. The second period after coffee was held in a well-equipped laboratory run by Brother Rory, who had passed the Irish equivalent of the RAE but had yet to apply for a licence. Called the 'Construction Masterclass, an over the shoulder practical session with George Dobbs and Dick Pascoe'. The lab session covered the PCB design program *BoardMaker* and a practical session building a simple Direct Conversion receiver, together with a simple transmitter, both in kit form.

The afternoon sessions were run by Brother Rory and a local amateur, Ray McCabe, a builder of note (his metalwork was excellent). They covered some theory and some practical circuits.

On Tuesday, the talks covered the differing methods of construction, from building 'ugly style' using 'Blob



Marino Institute of Education



Dick G0BPS and George G3RJV at the entrance

Boards' through to making your own PCBs. A practical session followed, with the students making a PCB from start to finish. The second session, devoted to practical construction saw many of the kits completed and working, to the great delight of all concerned.

The talk on aerial theory and practice by your's truly prompted a lot of interest, with many comments and discussions about what can be built in various situations. Aerials costing hundreds of pounds compared to those costing pence, even a long discussion on the best aerial to erect at the institute.

EI2QRP

It had been intended that the club's callsign would be put on the air, it had been issued but as the licence had not been received it could only be whispered. Listen out for EI2QRP on the QRP frequencies,

it will be heard quite soon.

The highlight of our trip was on the Friday evening, with the gathering in the room where the station was located. Donal asked for everyone's attention and asked George to read out a statement. It was a great pleasure to hear that it was the announcement of the formation of the *QRP club of Ireland* with George G3RJV as Honorary Member No. 1 and myself as No. 2. A great honour for both of us. Application forms were handed out and within a short period they had thirty six members, four more than the G-QRP club had at its inauguration way back in 1974.

We could not have been made more welcome, and I can highly recommend the course for any prospective QRP operator. With a ratio of just three students to one instructor during the practical sessions, the chances of problems was greatly reduced. The

accommodation was good and the food provided can only be described as excellent. I am sure the course will be much better next year but may only be held over a weekend.

Further information about the event for 1996 may be obtained from Gerardine Quinn, Marino Institute of Education, Griffith Avenue, Dublin 9. Information of the QRP Club of Ireland may be obtained from Bill Ryan EI8BC at the same address.

Finale

Comments from readers about this column have been quite complimentary, but I still get very little feedback apart from a few regulars. For any column in any magazine to be successful, *you* the readers have to contribute something too. So please let me have comments about what you have been up to in the world of low power.

Please send your news, views, photos, etc. to; Dick Pascoe G0BPS, Seaview House, Crete Road East, Folkestone, Kent CT18 7EG, via packet @ GB7RMS, or Email to dick@kanga.demon.co.uk

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International Model Show Ticket Prices

Advanced tickets can be purchased over the phone by telephoning 01442 66551 and asking for 'International Model Show Advanced Tickets'. Alternatively, postal requests can also be sent to; International Model Show Advanced Tickets, Nexus Special Interests Ltd., Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, enclosing an SAE with your request. The ticket prices for the show (see page 11) are as follows;

On the door		Advance discount tickets	
Adults	£7.00	Adults	£6.00
Senior Citizens	£5.00	Senior Citizens	£4.50
Children (5-16yrs inc.)	£3.50	Children (5-16yrs)	£3.00
Family Ticket (2 Adults + up to 4 children)	£16.00	Family Ticket	£14.00
Two Day Ticket		Two Day Ticket	
Adults	£12.50	Adult	£11.00
Senior	£9.00	Senior	£8.00
Season Ticket (for the duration of the show)		Season Ticket	
Adults	£30.00	Adults	£28.00
Senior	£22.00	Senior	£20.00
School Bookings (for groups of 10 or more)		Group Bookings (for 10 or more)	
Teachers	£5.50	Adults	£5.50
Pupils	£3.00	Senior Citizens	£4.00
		Children (5-16yrs)	£3.00
NB. One teacher is admitted free per ten pupils			

DATA CONNECTION

Chris Lorek G4HCL finds his computer speaking to him when using packet

As I write this, the packet airwaves (and even more so the rec.radio.amateur.uk messages on Internet) are buzzing with 'Morse' as the title. I never realised (he says, tongue in cheek) that such a mode could cause temporary congestion of such airwaves!

Scottish data rally next month

The SDX (Scottish DX Cluster) Rally takes place in Glasgow on December 3rd, and the organising group say they welcome visitors from far and wide. There are two lecture/forum streams planned, including forums for packet, SSTV, even 6m DX, plus a number of traders in attendance from 'across the spectrum' together with a bring and buy, RSGB bookstall, and light refreshments on hand. Representatives from the Radiocommunications Agency, and various RSGB committees will be at the event.

The venue is the Maryhill Central Halls, Mary Hill Road, Glasgow, which is close to the city centre and motorway (M8 junction 17). The group operate a 23 node system, and any profit from the rally goes straight into the provisions required in operating, maintaining, upgrading and expanding the network, and in helping other data groups whenever possible, including MacPAC and NEPUG. You can get further details from Ray GM4CXM @ GB7SAM or John GM0OPC @ GB7SAM.

WinPack V4.00

Roger G4IDE has updated his superb *WinPack* windows packet program. This is a professionally written program (see last month's column), and Roger has released it as freeware, i.e. no donation, registration, or payment is required.

WinPack V4.00 has all the facilities of version 3.3, but now adds speech if you have a sound card in your computer. It tells you who has connected to you, or what BBS or node you've connected to, even telling you when new mail has arrived for you and who it's from. If you're connected to a DX Cluster, when a DX spot arrives it tells you the callsign and what frequency the station is on. All this even happens when you've 'minimised' the program!

Readers who've requested WinPack from the magazine's software service (thanks for allowing us to distribute

this Roger) will have automatically received V4.00. Alternatively if you missed this and would like a copy, it's available from the software service, no 'corner flash' needed, ordering details as elsewhere in the magazine.

WinPack help

A message from the WinPack software author says that if you are using WinPack and having problems (and you've done all the obvious things (like reading the instructions!)) there is a file on his BBS that might help you. It covers all the common problems that people seem to experience in getting the program going. To obtain it, do the following:-

SP REQFIL @ GB7IDE

WINPACK\PROBHELP.TXT @ 'your-BBS' (this is the message title)

/EX (no message text, just /EX).

(You put your home BBS where it says 'your-BBS').

UltraPak PBBS

Still on the subject of Windows packet software, a bulletin from Tim G4WFT tells me that a number of people who have been trying out the beta version 3.0 of UltraPak have had difficulty in setting up the PBBS (Personal BBS). In particular, many amateurs have tried out the facility by connecting to a node and connecting back to themselves. In all cases, the problems have been due to not having the stream configuration set up properly. A tip here is that you *must* have streams configured properly for this to work, otherwise the outgoing traffic from UltraPak will go out on the same stream as the incoming and severe confusion will result!

APRS V7.2a

I mentioned in the October issue that version 7.1 of APRS (Amateur Packet Reporting System) was available, well I've now just received version 7.2a!

This adds a meteor scatter mode, which could be rather interesting. Also, the SPACE mode resets the beacon timer on hearing a space-based

digipeater (like Mir and the Shuttle). In addition, the program now has better map border display colours and ranges, and there's details on disk of a service from an amateur to make a detailed map of your area for you.

If you've recently requested APRS from the software service, you'll no doubt find you'll have received this updated version, which I've passed onto them for duplication (you'll always receive the latest version I have). If alternatively you'd like a copy, just request the 'APRS disk' from the software service, ordering details as given elsewhere in the magazine, and you'll get the latest version - no 'corner flash' required for this one.

9600 baud down south

I'm told that Paul G7KES has recently moved to the East Cowes area of the Isle of Wight, asking whether there is any 9600 baud activity on 70cm from there. Paul currently monitors 432.675MHz. The good news is that there certainly is 9600 baud activity 'down here', but mostly on 2m. Also, the NEND (North End, Portsmouth) node run by Dave G0OYN is operational on 144.525MHz using 9600 baud, with its links to other bands and frequencies. Dave invites reports of coverage, to G0OYN @ GB7HJP please.

20m DX Cluster

A new DX Cluster has come on the air from France, running on 14.0975MHz using 300 baud HF packet. The call is F6KJO-3, with SysOps of Larry F5IXR and Terry F5MXH, they invite all amateurs to connect. The station runs 150W into a dipole from a Kenwood TS-50, the Packet Cluster software running being version 5.4.48 plus several external databases. You can further details either direct, or via packet from Larry F5IXR@F6KJO.FCEN.FRA.EU.

Spread spectrum

Are you either interested in, or even using, spread spectrum, techniques on

amateur radio? Maybe we should start a 'spread spectrum' bulletin 'to' field on packet? This could certainly be the 'mode of the future' for both digitised voice and data, and there's already plenty of information available on the mode's use in amateur radio. The ARRL 'Spread Spectrum Handbook' for example has been available for a number of years for example.

If you're interested in the mode, or thinking of experimenting, please do send me a message.

Atari software

I read a request for software to run an AEA PK232 on an Atari ST520 system, the owner of which wasn't having much luck. I've found that Martin GW6HVA, the SysOp of GB7OSP, runs a 10 port Atari TC/PIP setup by Rob PE1CH, and his BBS system has several Atari programs available for download. I hope this is of use to Atari-owning readers.

CTRL-Z, end of message

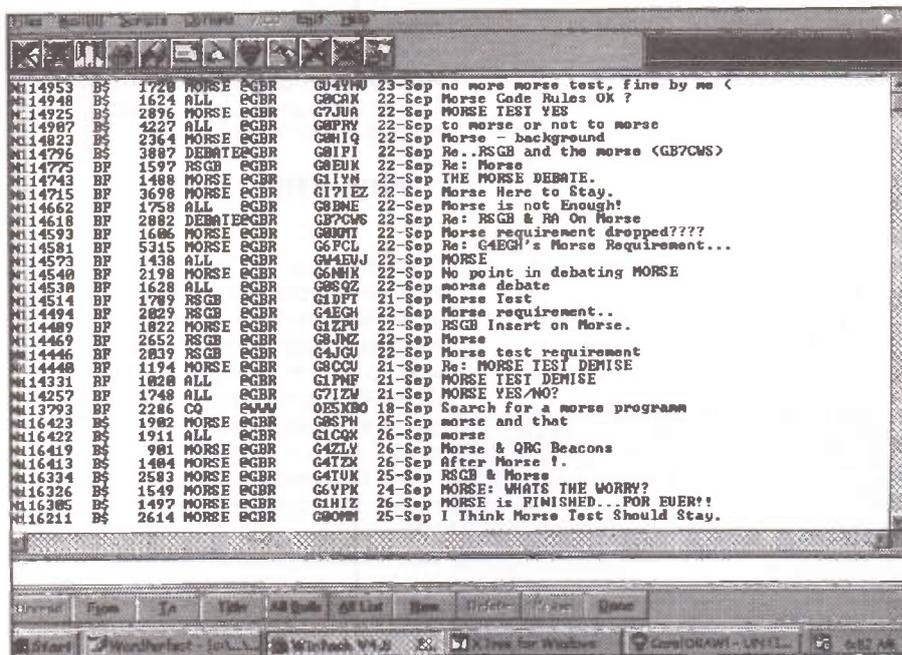
That's all I've room for this month. In next month's column, I plan to give a

brief insight on what TCP/IP is used for, a subject I'm often asked about, and in the magazine I'll be reviewing a new 9600 baud-ready, tiny 2W 70cm packet transceiver.

Please do keep me in touch with what you're doing, and as always if you've any thoughts on data

WinPack V4.00 now has speech capabilities

modes over ham radio that you feel would be of interest to others, do let me know. You can contact me either by packet direct, or via Ham Radio Today Editorial by fax or email. Until next month, it's 73 from Chris G4HCL @ GB7XJZ.#48.GBR.EU.



Radio Books



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VHF/UHF Message

Geoff Brown GJ4ICD with part two of his Cape Verde Islands DXpedition report

June 6th

5T6E passed on information that he had a good opening in the morning, but there was nothing with us 1300km to the southwest. This is where things started to go wrong, Anthony had spent too many hours in the midday sun, he was burnt and feeling very ill, and didn't surface at the station for two days.

Later in the morning, a little weak CW was heard. It got stronger and stronger, and turned out to be Nick

SM, DL, GM, CT, F, 5T, and OZ with many stations being worked and a few more countries added to the score. Best DX was SM3EQY at 6000km. Later that night W4's reported working 5T6E but we heard nothing.

June 7th

Wednesday was a very spotty 'ES' day, we started with PA2VST on SSB at 0840z, then the band was its usual dead self again. Later at 1758z CU1EZ was worked for country No.21 and ZB2VHF was heard at S5. The 'ES' extended itself and in came GB3MCB at S5 but no stations worked.

The keyer/beacon was pounded but no replies could be heard, then at 1950z weak signals were heard, K1TOL was identified and worked for country No.22. Nothing else was heard that day.

June 8th

The morning brought the usual tropo signals from EA E1 TV, but that was all. G2ADR (12W?) and GD0TEP's QSLs arrived and were answered the same day. How's that for service?

It's worth pointing out here that we caused tremendous TVI to Julio's TV and those of his neighbours. This was not our fault (now, where have I heard that before? - Tech Ed) but was due to the TV aerial systems that were in use (wideband with internal amplifiers). In order to keep the peace we were advised not to transmit during the local news program at 1700 to 1800, and 2030 to 2130 local. This we did, and no complaints were received, we still listened however on 6m.

June 9th

Things were going downhill, conditions seemed to have peaked, plus every time I called CQ or went into beacon mode Julio's doorbell or phone went. I was becoming paranoid that we were causing TVI.

On 18MHz things were going great, I'm pleased really as things would have been very boring listening to the

usual 50MHz white noise. There were some interesting comments flying around, like the one from a VE who said "where were you last night when CU1EZ was worked". I said we were monitoring but heard nothing, the VE said "but you are only 400km south of CU". Well, sorry to have to correct that as we were in fact 2500km south of the Azores! The day continued at 49.999MHz with TV being heard and that was all.

June 10th

The morning started with the band opening to ON for country No.23. There was no sign of TV or beacons, but later, CT3FT and CT3EX were worked. I became a little upset when I heard people calling CQ on 50.108, so we tried 50.100, they then followed us there as well. We had to close down for a couple of hours on the afternoon as it was the Portuguese football final and we caused a little TVI to the neighbours. Later that day OZ3ZW was heard for 20 minutes calling 'CQ Contest' on 50.130. No contact emerged, I think the power difference and QRM were to blame, he was the only station on the band!

At 1900z 5T6E was worked at S9+, we then went out with Julio and his wife and family for a typical local meal in the middle of nowhere. We had a fantastic local meal of pork and corn on the cob.

As we sat in the restaurant, my eyes caught the roof which was covered in palm leaves, and not tiles as the norm. A good job really that it doesn't rain!

June 11th

Another early start, we were trying very hard but there was no 'ES' for us. We were up to 23 countries, most of which were over 4000km distant, so the quantity was down but the quality was there. Things were quiet again, so Julio decided to take us both to the east of the island. The problem was that Sleeping Beauty (Anthony) was still in bed - so I rushed back to the hotel and woke him up. Anthony arrived looking like a walking corpse



A few obstacles in the way!



A view to the rear of the 50MHz aerial

G3KOX, great stuff, another 'G' in the log. At 1013z, G3WOS called in, we gave him at least 20 reports but the power difference between us meant that Chris could not copy us. Lost! IK2GSO was logged at 1050z. then things died.

At 1600z, ZB2VHF came romping in again, then at 1615z things went mad. 4N1SIX (S5), CT0WW (S9), GB3MCB (S4), GB3IOJ (S2), CU3URA (S5), this opening between 1615z and 1755z produced G, F, OZ, and SM.

At 1935 the band reopened to G, PA,

and after a quick breakfast made by Julio's wife we set off.

We climbed the steep road through the centre of the island and started to descend towards the eastern side, this was when Julio decided to tell us that his car's brakes had been behaving very strangely!

Eventually we arrived at a fabulous location. The beach was made up of millions of tiny broken shells, and locals were basking in the natural pools where the sea temperature was at least 26 degrees. After a few photos it was back to Julio's house to see what we had missed. Nothing was the answer. Later at 1600z, GB3MCB was in at S3, this beacon was becoming a pain, why is it that you can hear a beacon but no stations answer your calls?

At 1700z things were dead again, but weak CW could be heard at 1730z. F7ECW2P? What's this then? Got it! VP2ECW, swing the aerial west quick, and yes, up came the signal to 599. That was country No.24, followed by V44KAO for No.25. V44K on 50.055, running 3W, was S9+ over 4000km!

At 1800z the YV4AB beacon was in on 50.025MHz and YV4AB was heard to say "QRZ" on our frequency, but we lost him. However we were rewarded with FG5BG for another new one, No.26, and at 1940z things faded out.

What a nice little opening to the northwest, despite having a 1800m mountain on the sister island in the way!

June 12th

We felt a little pleased with our efforts the previous day, so we had to finish off a few jobs for Julio. The two of us carried the Alpha 76 amplifier past the Rottweiler and German Shepherds, hoping they would not decide we were stealing it and bite our legs, which would lead to us dropping the amplifier on our feet and getting a double dose of pain! Nothing was detected on 50MHz that day, we also had to move hotels as our time had expired at the original hotel. The second hotel was only 50m from Julio's house, it was also half the price and better class! QSLs arrived from G3WOS and GM3WOJ and were replied to the same day.

It was time to sit down and enjoy another good meal with Julio and friends. Julio had this friend who was brilliant at barbecuing, and a special treat of tuna was laid on. It was massive, a whole belly of tuna, kilos of it, I just couldn't stop eating and demolished about one and a half kilos!



Pictured L-R; Julio D44BC and Anthony GJ7DTA



Anthony GJ7DTA

Never in my fishing days have I seen or tasted such fine fish.

June 13th

Another dead day, until the afternoon when at 1945z a beacon was heard around 50.039MHz. At first I thought it may be the FY7 beacon, but on closer inspection it was the SV beacon. I had packed up the equipment, the keyer, headphones, in fact everything. I could feel an opening was going to happen, so like lightning I unpacked everything.

Calls were put out on .885 but nobody replied. SV1AHX (KM17) at 5000km was heard working 5T6E at S5, we called and called him but he didn't hear us. At 2010z F1GXV (IN94) was worked on SSB, this was to be our last QSO.

Conclusions and observations

It certainly was an experience of a lifetime. The propagation was also very interesting in that the 4800km distance was maybe going to be the hardest to work. That was proved wrong, with many contacts at that range.

Those of you who did not work the station just think, we needed a double or chordal hop to Spain first (3000km) before we connected with the top European hop. This did happen several times, otherwise we would have worked very little.

Our best DX was with SM3EQY (JP81) at 5995km, that day (June 6th) produced a very selective path clipping southern England, Holland, Northern Germany, Denmark and finally

Sweden. In fact this line of propagation was very narrow indeed, something that I had never experienced before over that vast distance via 'ES' propagation. No TEP was heard but this was not expected in June at this part of the cycle. We did monitor the PY beacon for extensive periods, but nothing was heard.

Sporadic 'E' was not copied to the southwest (PY) or even to the southeast, indicating that we were on the extreme edge of the northern summer 'ES'.

Another interesting observation made were the beacons. The consistency of GB3MCB and ZB2VHF were strange, as they were heard for long periods but no stations were worked. Also many beacons were heard more often if they were close to a sea path, like CU3URA, ZB2VHF, GB3LER, GB3IOJ, ZB2VHF, CT0WW, YV4AB and the SV beacon. But GB3NHQ was never heard, even during the UK openings! So there we have it. Julio's 50MHz DXCC now stands at 46 and I feel sure he will continue his 50MHz operation with the new TS60 and aerial that we left with him. Keep a watch on 50.110MHz.

Thanks

It goes without saying that we must all thank Julio and his family and friends in Mindelo, their hospitality was overwhelming. Thanks also to Carlos D44AC for his kind gifts and hospitality. Travelmaker in Jersey organised an excellent package for us, so a special thanks to them. In my opinion, the tour company Caravella need to get their act together regarding transfers and hotel bookings, but that didn't spoil things.

Where next year? Well my wife, Janet, has said "Your wings have been clipped". However, we'll see what happens!

Firsts from D4

Julio had worked some stations on 50MHz in 1988/89/90, the stations listed below qualify for "firsts" from D4 that 'we' made; GD3AHV, CT3FT, EH1TA/P, EH8BPX, HV3SJ, IK0OKY, 9A2BZ, 5T6E, GU2HML, OZ4VV, DK2PR, CU1EZ, ON4KST, V44KAO, and FG5BG. Congratulations to all. The other eleven countries that we worked had been worked before by Julio in 1988/89/90.

HF Happenings

Don Field G3XTT looks at prefixes, and gives advice on getting started

As I write this, the XR0Y Easter Island, and XR0Z Salas y Gomez DXpeditions are under way (see recent *HF Happenings*). The group has been putting in a big effort, but the promised hi-tech element is not working out entirely to plan. The group has found Internet links from the island slow and unreliable, which have made it impossible to respond to schedule requests via Internet or to update the group's World Wide Web home page. Nevertheless, some aspects *have* been working, including daily updates forwarded from the island and the electronic QSLing (email messages to those who have made contact, confirming they are in the log, sent to stations whose email address is registered on the 'QRZ DX' callsign server on Internet). I suppose these kind of teething troubles were inevitable, as nothing so ambitious had been tried before.

It may well be easier for the V31DX contest group, who were due to be active from Belize in the CQ Worldwide Phone contest at the end of October. They too planned to set up a World Wide Web home page, and to upload expedition photographs, an hourly update of their contest score, and a copy of the contest log. I am sure this type of approach will become more and more common in the coming years. Incidentally, having been abroad for some time, I arrived home the day the XR0Z expedition fired up, and was able to work them very easily on 20 metres SSB. This was one of those situations where, although there were many, many European stations calling, propagation favoured our corner of Europe, and a steady stream of UK stations was getting through, even those with relatively modest set-ups. A similar situation prevailed on the low bands, so that several UK stations were able to work XR0Y on 160 metres through the most enormous pile-up, and 80 metres was very simple indeed.

The special callsign M10OG was aired during September by a number of UK amateurs to celebrate 100 years of radio, to honour Marconi, and to publicise the RSGB's HF Convention. This is only the second time the 'M' prefix has been used (the first was M0RSE in 1991), and there were a number of cries of "Pirate" to be heard. Quite legitimate, though and,

indeed 'M' will soon become the standard prefix for new UK licensees.

DX News Sheet reports that F5SZK and F5IJT will be active from Crozet Island from December 1995 until February 1997. They will use the callsigns FT5WF and FT5WG. This is welcome news, as there has been little activity from Crozet in recent years. ARRL has rejected cards from I2RAO/HK0 (Malpelo Island), and has also disqualified last February's ZL9GD operation because it took place from on board a ship anchored offshore.

Kermadec Island

There are rumours that a big Kermadec Island (ZL8) expedition is in the planning stages for 1996. The problem has always been getting permission from the New Zealand authorities to land and stay on the island. However, the cost of getting there is also prohibitive. Let's hope it can be done, as this one is now very close to the top of the "most wanted" lists. In this respect, I was fascinated to hear the lecture by Barry G4MFW at the RSGB HF Convention. You may recall that Barry operated this year from Kermadec as G4MFW/ZL8, the first operation from the island for some time. Barry was determined to conduct an amateur radio operation from Kermadec if at all possible, and agreed to accept the restrictions imposed by the New Zealand authorities. These were quite onerous and included the necessity to leave the island at night, not an easy task as this involved a 90 minute walk and a Zodiac ride out to the ship. The reason is that the rules for landing on the island require that someone from the 5-strong meteorological team on the island keeps a constant eye on visitors, both to ensure their safety and to ensure that they do not interfere with the flora and fauna in any way. Obviously this can only be done during normal working hours, but effectively limited Barry's operating to 3 hours a day, which didn't necessarily coincide with the best times for propagation. Indeed, the only times Barry was really able to capitalise on the best European openings was when the weather deteriorated and he was allowed to stay overnight on the island

rather than risk going back to his boat. He was also restricted in where to site and point his aerial, as there were some early problems of interference with the weather data collection.

Barry established a good rapport with the team on the island, and was invited back for 1996, albeit with the same restrictions. It is these same restrictions which would apply to the large New Zealand team mentioned above who would like to operate from ZL8, and naturally they do not feel it worthwhile to organise a large effort if it is to be so hidebound once on the island. It seems surprising, having seen Barry's video of Kermadec, that such onerous restrictions should be applied, as there appears to be room enough for tents and generators without coming too close to the met station or, on the other hand, having to go beyond that part of the island which has been cleared for human habitation.

Bhutan

Regular readers may recall that Bhutan is the only country I still need, so I was particularly interested in the presentation given by Jim Smith VK9NS at the RSGB HF Convention. Jim had researched the history of amateur radio in Bhutan from the earliest days, and the story is a fascinating one. Back in the 50's, when the prefix was AC5, there were several operations including what must rank as one of the earliest DXpeditions by a group of Indian military officers (India played a major role in the administration of Bhutan at that time). Perhaps best-known were the various operations by Gus Browning, W4BPD, who operated from a number of spots, and Jim has been able to trace Gus's route. Back in the early 60's, travel within Bhutan was even more difficult than it is now, and the locations on Gus's QSL cards demonstrate how he travelled from administrative centre to administrative centre (usually sited where the monasteries were), setting up his equipment and making some contacts whenever he had the opportunity. In his own visits to Bhutan, Jim Smith has met people



QSLs with a QSL theme! JA6WW obviously likes working stations with the same suffix.



who remember Gus's visits with affection.

Regular amateur radio from Bhutan ceased in the early 70's for political reasons, but Jim himself was able to gain permission to operate on his first visit there a few years ago. Nevertheless, this did not open the door to regular operations, as the Bhutanese are very sensitive to allowing too much western influence. Over 200 applications remain on file from radio amateurs who have asked to be allowed to operate from there. More recently, Jim was able to de-personalise the matter by working to establish a callsign, A51MOC, at the Ministry of Telecommunications, which it was hoped could be used by any visiting amateurs. Apparently, when JH1AJT was there earlier this year, the authorities had asked him to use that callsign. But, due perhaps to a misunderstanding, he signed A51/JH1AJT.

Although the operation, which was classed as a "demonstration", was with the full knowledge of the Bhutanese authorities and has since been accredited by the ARRL, it appears to have caused some ill feelings. The current situation is that no further demonstrations will be allowed. Those of us who still need Bhutan must therefore wait until the re-introduction of amateur radio into the country on a formal basis. The whole saga is a reminder that amateur radio is not necessarily the priority for others that it is for the DX community, and Bhutan certainly has more pressing concerns, surrounded as it is by countries who would like to see it disappear from the face of the earth, together with concerns about the polluting influence of satellite television and other 'intrusive' media. Patience is in order, and respect for the local ways and customs.

Meanwhile, though, it does look like a beautiful and unspoilt place to visit, provided you can manage without the accoutrements of late-20th century western existence.

Getting started

Over the next few months, I thought I'd address some topics of relevance to those who are new to the HF bands, whether because you are newly licensed or because you have moved there from VHF. To start the ball rolling, let's have a look at callsign prefixes.

One of the great excitements of operating on the HF bands is that you might get to contact someone in an unusual part of the world. But when I've watched VHF operators taking a spell at our club's SSB Field Day station, for example, they miss out because they very often have no idea where the station is they are speaking with.

For the most part it is very simple. Callsign prefixes are listed in many places, and most computer logging programs include a comprehensive lookup table. Of course, learning the prefixes for 327 different countries will take a while, but there are some short cuts. For example, many prefixes beginning with V and Z belong to ex-Commonwealth countries. So VE is Canada, VP2 is used in the West Indies (VP2V is the British Virgin Islands, VP2E Anguilla), VR6 is Pitcairn Island, and VK is Australia (and VK9 and VK0 are used in Australian territories, such as VK9N for Norfolk Island). Z2 is Zimbabwe, ZS South Africa, ZL New Zealand (with ZL7,8,9 for New Zealand possessions such as Chatham Island), while ZK1, ZK2 and ZK3 are all used on Pacific Islands with British and New Zealand connections. Similarly, callsigns starting with K, N or W are in the mainland US or its trust territories. KH, NH, WH are used in the Pacific (so KH6 is Hawaii, KH2 is Guam), and KP, NP, WP in the Caribbean (KP2 is the US Virgin Islands, KP4 is Puerto Rico).

This all used to be very easy indeed, except for two things. Some countries ran out of callsigns and had to open up new blocks, and other countries

demanded their own prefixes on achieving independence. In the first category, all Japanese stations used to have callsigns starting with J (JA, JK, JH, etc.) but now you will hear Japanese callsigns starting with a 7 (7N, 7J, etc.). In the latter category examples include C6 (Bahamas, which used to be VP7), S7 (Seychelles, which used to be VQ9) or, more recently, 9A (Croatia, which was part of Yugoslavia, YU). Aeroplane spotters will recognise many of these, as callsign prefixes are issued by the International Telecommunications Union for all forms of radio communication, and aeroplanes take as their registration number their radio callsign. Similarly, all broadcasting stations have callsigns, though many never announce them. But anyone who has listened to radio stations in the US will have heard them use their callsigns, some of which have become very well known (such as WOR and WINS in New York, or KDKA in Pittsburgh).

Many countries have reciprocal licensing for amateur radio, the CEPT common licence arrangements being the best-known example. So that, for example, if I operate from Crete I sign SV9/G3XTT. Of course, nothing is ever so simple. US amateurs can operate from any US possession with their home call and no portable designation, so KH6XYZ could be operating from home on Hawaii, or he could be in Alaska, the mainland US, or perhaps Howland Island. Equally, Canadian amateurs operating from the US can use their Canadian callsigns without indicating that they are in the US. In practice, most would sign portable W6 or wherever they happen to be, just to minimise confusion.

As always, please feel free to drop me a line with news, views and suggestions as to what you would like me to cover in the column (direct to; 105 Shiplake Bottom, Peppard Common, Henley on Thames, Oxon RG9 5HJ, or via the Ham Radio Today Editor).

Satellite Rendezvous



Richard Limebear G3RWL with news on the Oscar-13 re-entry and a new Phase-3D transmitter

Most operators are aware that AO-13 will re-enter during December 1996; this gives us 16 months more operation. The perigee height is reducing at a rate of 1 km/day due to luni-solar forces which are increasing the orbit's eccentricity. When the satellite begins to encounter the atmosphere it will start losing energy in non-trivial amounts (during the last quarter of 1996). At that time, when the orbit is circularising and with mean motion increasing noticeably from its present value of 2.1 rev/day to 16 rev/day at re-entry, the published NORAD elements are always going to be virtually unusable. In addition, since Mean Motion has a direct effect on rise and set times, and if history repeats itself, we can expect the usual plethora of conflicting 'almost' Keplerian element sets lovingly massaged to perfection, that work for no-one else but their creators!

To try and bring some order out of chaos, G3RUH has placed on the Internet a file of some 200 2-line Keplerian element sets that represent Oscar-13 at 50 orbit intervals until 1996 Oct 25, and then every orbit until re-entry. The file, which is about 10K bytes long is available via anonymous FTP as:

<ftp://ftp.amsat.org/amsat/satinfo/ao13/decaykep.zip>

The uncertainty in re-entry analysis is caused by our not knowing the precise magnitude of atmospheric drag. Consequently it will be necessary for Jim G3RUH to compare the predicted Keplerian element sets with genuine NORAD sets regularly, and check for parity. Then he will create a new file of 200 elements and upload them. This will happen approximately monthly until near the end of life, then with increasing frequency.

Continuous up-to-date information about AO-13 operations is always available on the beacons, 145.812MHz and 2400.646MHz in CW, RTTY and 400 bps PSK.

Russian satellites

German Cosmonaut Thomas Reiter, DF4TR, will have been active on air from MIR as *DP0MIR* during the ESA *Euromir '95* mission starting 2nd September, using Mir's 2m rig during the 135 day flight.

Frequencies to be used (preferably in 'split' mode) are 145.800, 145.550, and maybe 145.200MHz (as adopted

for Mir and Shuttle activities at the IARU session of this year's AMSAT-UK Colloquium). QSL info is DP0MIR, and QSLs will be handled via the usual German DARC QSL bureau. The 70cm equipment, called *SAFEX II* (built by DL2MDE) will be installed in Mir permanently in the course of future missions. This will primarily be an FM repeater with a downlink at 437.925, 437.950, and 437.975MHz, and an uplink in the lower part of the 435MHz space band. *SAFEX II* will later be improved adding a 23cm to 13cm transponder, capable of wide bandwidth modes (e.g. ATV).

MIR Astronaut Norm Thagard has returned to Earth, thus ending a very active period of ham activity on Russian space station. QSLs for contacts with Norm are available via the following address: *Dr. Norman Thagard, Mail Code CB, Johnson Space Center, Houston TX 77058 USA.*

Microsats

Dove's voice experiment remains off but the S-Band TX has recently been turned on.

Until further notice *AO-27* will run its weekend schedule even on weekdays because of no commercial experiments that are currently being performed. The uplink frequency is 145.850MHz and the downlink is 436.800MHz, the mode is FM. The schedule is as follows: *AO-27* enters sunlight, transmitter is off 18 minutes after entering sunlight, transmitter is on at 600mW, 20 minutes later, transmitter turns off. *AO-27* is off for the entire eclipse.

WO-18 is again completely operational! The operating system has been reloaded along with the old attic code; and the spacecraft is now sending telemetry, photos, weekly whole orbit data (WOD), and light spectra of the Sun or Earth, on Mondays. The new attic software for the experiments (camera, spectrometer, etc.) continues to be

debugged and will 'patched' in as it becomes available.

The satellite continues to have a weak and relatively steady tone of about 1200Hz in the downlink signal, which can cause reception problems with some modems. If this problem occurs, a ground-based solution is to adjust the IF-shift of the receiver to suppress the carrier into the skirts of the IF filter. Night reception seems to be better than in the daytime.

The satellite's digipeater is now on and can be accessed on 145.900MHz. Using a terminal program connected to your TNC/PSK modem, try connecting to yourself via *WEBER-1*.

User requested WOD for *WeberSat* is now being accepted. If you have an experiment in mind and need specific channels of whole orbit data to be collected from *WeberSat* please let them know by sending a message to KB7KCL or IK3WVJ on the satellites or Internet stating the desired channel numbers, and sampling rate (12 -60 seconds).

The *LO-19* BBS has changed frequency to 435.154MHz because the 435.125MHz CW beacon has been activated. This has resulted in a power reduction of the BBS transmission (the BBS is almost impossible to use now) to accommodate the extra power required for the CW beacon (which is very strong).

Colloquium

This year's Colloquium was attended by 115 people from 24 countries in five continents. The weather was hot, as usual, but about three hours after everyone went home there was a cloudburst with lightning (some accommodation was hit) and heavy rain. The area outside the lecture theatre was under about 140mm of water and there was subsequently almost as much water inside (the roof couldn't stand the strain).

The event did not provide as much in the way of 'hot news' as in the past, but the lectures were all well received and very informative. Here are the main items of news which emerged: UoS plans for mini-sats (a new class of about 200kg with onboard propulsion) are well advanced. This type of spacecraft will be compatible not only with Ariane but also Russian and Chinese launch vehicles, the first launch is hoped to be in 1996. There are some plans for a topside sounder mission amongst other commercial uses.

The Amsat-UK Committee were re-elected with the exception of Doug Loughmiller who was unavailable for re-election; there were no new members (but we would like to attract some).

Geoff Perry reported that, with launch costs being high, it appears that the Russians are bringing old satellites back into use rather than launching new ones. In the past they were switched off after a period following their 'sell-by date' but several of these have now been re-activated. Geoff won the prize for best lecture.

Phase-3D will have a KA band transmitter on 24.048GHz, the bandwidth will be 25kHz. The link budget (1W TX power to a horn aerial) is good for a single user but will be weaker due to power sharing if many folks use the system. We also learned that Ariane-5 delivers a GTO launch with a perigee of 500km instead of the Ariane-4 figure of 200km.

4X1AS brought a video of the integration and launch of *Techsat* and *Unamsat*. Even though the launch vehicle failed later on in the flight, everyone was impressed by the actual launch where the rocket raised from horizontal to vertical in a matter of a second or two, was expelled from the launcher tube, and then appeared to hover momentarily before the motor ignited.

An event such as this needs a lot of organising. Amsat-UK thank Doug Loughmiller G0SYX/KO5I for his efforts without which the Colloquium would have failed.

EME for small stations

The Toronto VHF Society plans to use the 46m dish at the Algonquin Radio Observatory during the 1995 ARRL International EME Competition. They will operate both weekends of the contest and hope to activate the 50, 144, 222, 432, and 1296MHz bands during this time.

VE3ONT will attempt to be on the air at moonrise prior to the start of both the October and November weekends. They encourage only those who have not yet worked an EME station to try working them at that time. Experienced EME operators, please wait until the start of the contest. Anyone who works VE3ONT before the contest is encouraged to work them again during the contest.

Please avoid multiple QSOs during the contest. They only detract from the opportunity of first-time EME stations. If you wish to work VE3ONT on SSB, wait until they switch; don't work them first on CW and then repeat on SSB, please. Also, please avoid duplicate 144MHz QSOs between the two weekends.

The 50MHz and 1296MHz operation will be simultaneous on both bands, barring unforeseen difficulties.

As always, VE3ONT's operation is subject to last-minute cancellation for commercial users of the site.

In order to maximize your chances of making a QSO, make use of the entire receive window. Their best weak-signal successes in previous years have been well away from the TX frequency. They tune the window constantly.

50MHz will use horizontal polarization. 144, 222, and 432MHz will be RHCP on both TX & RX in order to minimize Faraday/spatial polarization effects. Your linearly polarized or circularly polarized Oscar aerial will work fine. 1296 will be switchable RHCP/LHCP for both TX & RX; the default is RHCP. VE3ONT will transmit maximum legal power on 50, 144, 222, and 432MHz, the 1296MHz power will be at least 150W. All operation will be 'random',

that is, without prearranged skeds.

QSLs go to Dennis Mungham, VE3ASO, RR #3, Mountain, Ontario, Canada, K0E 1S0. Enquiries to Peter Shilton, VE3VD, 215 Windecker Rd. R.R. #1, Cayuga, Ontario, Canada N0A 1E0 or call INT+1 905 772 8938 (EDT/EST evenings).

Web pictures

KITSAT and UOSAT pictures are now on the Web. Good NOAA 14 pictures of Europe, along with pictures of some of your favorite AMSAT personalities can now be found on:

<http://gndstn.sp.nps.navy.mil/>

Latest Keplers

Amsat-UK Keplers are put out on packet fortnightly, sent to **KEPLER @ GBR**. The latest satellite Keplers as supplied by Amsat-UK are also available by fax from the Ham Radio Today fax-back line, 01703 263429 (use with a DTMF, i.e. 'touch-tone', phone/fax keypad - follow the voice menu), request fax document 32 from the satellite menu for this month's. You can also get a copy in the post by sending an SAE together with the corner flash from this page to the HRT Editor, marking your envelope 'Keplers' and stating whether you want *all amateur* satellites (one A4 page) or *all* satellites (10-15 A4 pages).

For further information about Amsat-UK contact: AMSAT-UK, c/o Ron Broadbent MBE, G3AAJ, 94 Herongate Rd., London, E12 5EQ. Big SAE gets membership info. SWL's are welcome. All new joiners get the USAT-P tracking program on 5 1/4 in disk.

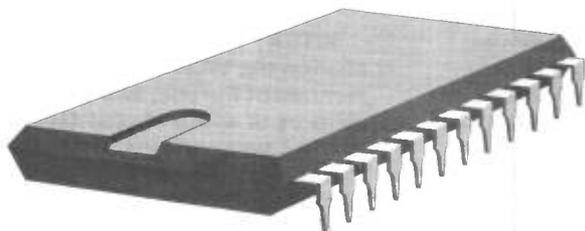
Phase 3D launch

The launch of Ariane 502, the mission on which Phase 3D is manifested, is now set for May 29, 1996 rather than April 3, 1996 as it had been. This follows a re-schedule of the first in the Ariane 5 series, Ariane 501, from November of this year to mid-January 96.

VE3ONT operation during the November ARRL EME Competition weekend

Band	Date (UTC)	Time (UTC)	VE3ONT TX frequency	VE3ONT RX freq. window
432MHz	Nov3/4th	0000-0805	432.050	432.050-432.060
144MHz	Nov4/5th	2135-0910	144.100	144.100-144.110
144MHz	Nov5th	2205-2400	144.100	144.100-144.110

Reader Offer - EX-PMR Conversion EPROMs



Ready-programmed EPROMs are available for the MX290 series ex-PMR transceiver conversions featured in HRT. These are available for the MX294 (2m or 4m, published HRT Mar 94), MX295 (for conversion to 2m, planned for a forthcoming issue of HRT), and MX296 (70cm, published HRT Dec 94). The 2m EPROMs are programmed with all simplex, repeater, and reverse repeater channels, plus 144.500-144.8875MHz in 12.5kHz steps. The 4m EPROMs are programmed with all channels between 70.1000-70.4875MHz in 12.5kHz steps. The 70cm EPROMs are programmed with all channels between 430.000-439.975MHz in 25kHz steps, including repeater, reverse repeater, simplex and packet channels for use with 16 channel or BCD switches.

Each EPROM comes supplied with connection information and a channel list, the price includes UK p/p.

CREDIT CARD HOTLINE; 01442 66551 (24hrs)

Please supply

.....	HRT/6	MX294 (2m)	@ £9.99
.....	HRT/6A	MX294 (4m)	@ £9.99
.....	HRT/7	MX295 (2m)	@ £9.99
.....	HRT/8	MX296 (70cm)	@ £9.99

I enclose my cheque/P.O for £..... made payable to Nexus, or please debit my Access/Visa card No.

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Send coupon to; Nexus Reader Offers, Nexus House, Boundary Way, Hemel Hempstead, Herts. HP2 7ST.
Please allow up to 28 days for delivery. UK only - Overseas upon request.

Data protection; Occasionally we may make names and addresses available to carefully vetted companies who sell goods and services by mail that we believe to be of interest to our readers, if you would prefer not to receive such mailings please tick this box.



Club News

Appledore & District ARC meet on the third Monday each month, 7.30pm, at Appledore Football Clubroom, Devon. Club CW net; 8pm - 8.30pm every Wednesday on 28.200MHz, 8.30pm - 9pm SSB. Morse speed adjusted to the slowest sender. Planned club events/talks;
Nov 20th - Club quiz
For further details contact Dave Brierley G3YJG, Tel. 01237 476124

Aylesbury Vale RS meet on Wednesday evenings in the Village Hall in Hardwick, located off the A413 between Aylesbury and Buckingham. Club diary;
Nov 15th - Optimising Receiver Front-end design
Dec 6th - G6NB construction contest
Jan 3rd - Discussion evening and CW session
For further details and meeting times, contact Ivan Eamus G3KLT, Tel. 01296 437720

Barnsley and District ARC meet every Monday (inc. Bank Holidays) at the Three Horseshoes, Brierley, near Barnsley (midway between Barnsley and Pontefract) at 7.30pm for 8.00pm. The club run a Novice Course. They would like us to inform readers that they are planning to run trips to the Dayton Hamvention and Friedrichshafen during 1996. For further details contact Ernie G4LUE, Tel. 01226 716339 (home), or 0836 748958 (mobile).

Basingstoke ARC meet on the first Monday of each month, 7.30pm, at the Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke, Hants. Planned club diary;
Dec 4th - Christmas social
For further details, Tel. 01256 25517

Blackmore Vale ARS meet on the second and fourth Tuesday each month, 8.00pm, at Shaftesbury School, Dorset. The club run a Novice RAE course which meets every Tuesday evening. A club net is held every Sunday on 145.550MHz at 7.00pm local time. Planned club events/talks;
Nov 14th - Well known mystery guest lecture!
Nov 28th - Project and on air night
Dec 12th - Malcolm's annual quiz night
For further information contact Stuart G7JIF, Tel. 01935 814055, or by packet to G7JIF @ G3VXX.GB7SIG.#45.GBR.EU

Bristol (South) ARC meet every Wednesday at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol. Club diary of events/talks;
Nov 8th - Club Forum 'members suggestions'
Nov 15th - AGM
Nov 22nd - Christmas raffle commences
Nov 29th - QSL card evening
Dec 6th - Club annual darts match
Dec 13th - Christmas social
Dec 20th - 'Hair of the dog'
Dec 27th - Greetings calls on GB4WAW
For more information and meeting times, Tel. 01275 834282 24hr. Answerphone.

City of Bristol Group meet on the last Tuesday in the month, 7.00pm for 7.30pm, at New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. Club diary of events/talks;
Nov 28th - Construction contest

Dec 19th - Christmas party
Further details can be obtained from Dave Bailey G4NKT, Tel. 0117 9672124

Bromley and District ARC meet on the third Tuesday of each month, 7.30pm for 8.00pm at the Victory Social Club, Kechill Gardens, Hayes, Kent. Club net; Sundays 11.00am on 145.350MHz FM. Planned events/talks;
Nov 21st - Slide show
Dec 12th - Christmas social
Jan 16th - AGM
Further details from Alan Messenger G0TLK, Tel. 0181 777 0420

Bromsgrove ARC meet on the second and fourth Tuesday of the month at Lickey End Working Men's Club, Burcot, Bromsgrove. Club diary of events/talks;
Nov 14th - Night on the air
Nov 28th - Club Christmas dinner
Dec 12th - Technical topics
Further details from Barry Taylor G0TPG, Tel. 01527 542266

Bury St. Edmunds ARS meet at Culford School, 7.30 for 8.00pm, on the third Tuesday each month. At the moment the club are discussing a programme to attract new members, if you have any ideas etc., please get in touch. Planned club events/talks;
Nov 21st - Weather Satellites, by Mark G3CQL
Dec 19th - Christmas social
Jan 16th - AGM
For further details contact Kevin Waterson G1VGI, 20 Cadogan Road, Bury St Edmunds, Suffolk IP33 3QJ, Tel. 01284 764804

Buxton ARC meet at the Lee Wood Hotel, Buxton, at 8.00pm on the second and fourth Tuesdays each month. Club diary of events/talks;
Nov 14th - AGM
Dec 12th - Social night
For further information contact Derek Carson G4IHO, Tel. 01298 25506

Conwy Valley ARC meet on the first Wednesday each month, in The Studio, Penrhos Road, Colwyn Bay, Clwyd. Planned club events/talks;
Nov 1st - Effect of lightning on aerial installations
Dec 6th - Control by DTMF
Jan 3rd - Interclub quiz with Rhyl ARC
Further details are available from Club Secretary Wynne Evans GW6PMC, Tel. 01745 855068, Ans/Fax. 01745 856406

Cornish RAC meet on the first Thursday each month, 7.30pm, at Perranwell Village Hall, Nr. Truro. Planned club events/talks;
Nov 3rd - Bring and buy sale
Dec 7th - Christmas party
For further details contact Robin G0MYR, Tel. 01209 820118

Cray Valley RS meet on the first and third Thursday of each month, 8.00pm at the Progress Hall, Admiral Seymour Road, Eltham SE9, club net 3.720MHz 8.00pm every Monday. Planned club diary;
Nov 16th - Natter night
Dec 7th - Optical communications re-visited, G0FDZ
Dec 21st - Club Christmas dinner
Jan 4th - No meeting

Jan 18th - Donated surplus equipment sale
For further details contact Tony G4WIF, Tel. 0171 739 5057 office hours only.

Denby Dale and District ARS meet at the Pie Hall, Wakefield Road, Denby Dale, W. Yorks, every Wednesday at 8.30pm. Talks are arranged for alternate meetings. The club also run RAE, Morse and NRAE courses, and is an accredited City & Guilds Examination Centre (non-profit making), at Shelley High School, Tel. 01484 424776 for details and application form. Planned club talks/events;
Nov 15th - Constructor's Trophy
Dec 6th - Sky update, Phil G4FSQ
Dec 20th - Christmas party
Further details from the secretary, Malcolm McKenzie, Tel. 01484 861782

Dragon ARC meet on the first and third Mondays of each month at the Four Crosses Hotel, Petraeth Road, Menai Bridge, at 7.30pm for 8.00pm. Visitors and new members are welcome. The club run several special event stations throughout the year. Club diary of events/talks;
Nov 6th - Talk by Dr Gwyn Roberts
Nov 20th - Talk by Mr C. Latham
Dec 4th - Surplus sale
Dec 18th - Christmas party
Jan 1st - Social evening to greet the new year
Further details from the Secretary Tony Rees GW0FMQ, Tel. 01248 600963

Dundee ARC meet at 7.00pm every Tuesday at the College of Further Education, Graham Street, Dundee. Construction nights are alternate Tuesdays. Morse tuition is every Tuesday evening, the technical library and radio shack are also available to members. Club net is on 7.070MHz at 14.00Hrs GMT daily. Planned club diary;
Nov 14th - Oscilloscopes and how to use them
Nov 28th - Packet radio, by GM1JTK
For further details contact Allan Martin GM7ONJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP

Halifax and District ARS meet at 7.30pm on the first Tuesday each month. at The Tap and Spile Pub (formally Royal Oak), Clare Road, Halifax, for committee and Morse tuition. On the second and fourth Tuesdays they meet, 7.00pm, at Queens Road (note Queens Road is closed for some periods at school holidays). Planned club events/talks;
Nov 21st - In the beginning, Ron G6RO
Dec 19th - Christmas social
Further details can be obtained from Mr. D. Moss GODLM, Beechwood Lodge, Lightcliffe, Halifax HX3 8NU, Tel. 01422 202306

Hastings Electronics and RC meet every third Wednesday of each month for their main meeting, at West Hill Community Centre, Croft Road, Hastings, and every Friday for a social evening, at the Sea Anglers Club, 16 Grand Parade, St. Leonards. The club is a registered City and Guilds examination centre, and also run RAE, Novice and Morse courses. Planned club events/talks;
Nov 15th - 100 years of Xrays and Radiation, Dr. Craig
Dec 22nd - Christmas dinner
For further details contact Reg Kemp G3YYF, Tel. 01424 830454



Hoddesdon Radio Club meet alternate Thursdays at the Conservative Club, Rye Road, Hoddesdon from 8.00pm. Visitors very welcome. The club run Morse training classes. Club diary of talks/events;
Nov 9th - Night on the air
Nov 23rd - RAYNET, by County Controller, G4KUJ
For more information contact Dave G1CAY, Tel. 01992 460841



Hordean and District ARC now meet on the first and fourth Tuesday of each month, 7.30pm, at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. The first Tuesday is usually a 'Natter Night'. Club nets are Sundays 1955kHz 0900hrs CW, 0930hrs SSB, and Wednesdays 145.350MHz at 1930hrs. Planned Club events/talks;
Nov 28th - Digital TV, by Bruce Randall NTL
Further details can be obtained from Stuart Swain, Tel. 01705 472846



Isle of Man ARS meet on Mondays, 8.30pm, at The Royal Naval Association, Regent Street, Douglas. The 1st Monday of the month is supplemented with a 30-60 mins talk of general interest to members, held at the TGWU building in Fort Street, Douglas. On Thursdays they have an informal get together, 9.00pm, in The Manx Legion, Douglas Street, Peel. Planned club events/talks;
Nov 6th - A Hi-Tek electronics company on the IoM
Nov 11th - Annual Dinner
Dec 11th - AGM
For further information contact Club Secretary Chris Wood GD6TWF, 2 Lyndale Ave, Peel, IM5 1JY, Tel. 842786



Itchen Valley ARC meet on the second and fourth Fridays each month, at the Scout Hut, Brickfield Lane, Chandler's Ford, Hants (just up the road from SMC), 7.30pm for 8.00pm. Planned club events/talks;
Nov 10th - M PEG-2, by Tony Harrison
Nov 24th - Visit to Videotron
Further details from Sheila G0VNI, Tel. 01703 813827

Keighley ARS meet at the Cricket Club, Ingrow, near Keighley every Thursday at 8.00pm. Many club meetings are 'Natter nights' and 'nights on the air', other events/talks include;
Nov 9th - Horse racing at the Cricket Club
Nov 30th - Films
Dec 21st - Christmas buffet
Further details from Kathy Conlon G1IGH on 01274 496222

Kings Lynn ARC meet every Thursday, 7.30pm, at the Scout HQ, Chequers Lane, North Runcton, Nr. Kings Lynn. All visitors welcome. Planned club talk;
Feb 15th - Sporadic 'E', by Jim Bacon G3YLA
For further details contact Club Secretary Ian Cooper, Tel. 01553 765614

Leicester RS meet every Monday, 7.30pm, at The Chantry, Gilroes Cottage, Groby Road, Leicester. The HF and VHF shacks are available at each meeting, and have regular HF/VHF nights on the air combined with a general natter evenings. The club also run RAE, NRAE and Morse courses. Planned club events/talks;
Dec 4th - Forensic Science, by O. Elmhurst
Dec 16th - Annual dinner
Dec 18th - Mince pie and social evening

For further details contact Stan Hay G3HYH, Tel. 0116 239 4367

Lincoln Short Wave Club meets every Wednesday night at the City Engineer's Club, Waterside South, Lincoln at 8.00pm, all are welcome. Their forthcoming diary of activities includes;
Nov 22nd - Construction contest
Dec 13th - Christmas meal
Further details from Pam G4STO, Tel. 01427 788356.

Liverpool and District ARS meet at 8.00pm every Tuesday evening at The Churchill Club, Church Rd., Wavertree, Liverpool. They run RAE, Novice RAE and Morse courses. Planned club events/talks;
Nov 7th - Oscilloscope demonstration, G8FHD
Nov 14th - Club on the air
Nov 21st - Talk by G4GEB
Nov 28th - Surplus sale
For further details contact Ian Mant G4WWX, Tel. 0151 722 1178.

Medway ARTS meet 7.30pm on Fridays at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Morse practice, construction and Novice help available. Club diary;
Nov 10th - Magnetism caused by rotation, L. Harstad
Nov 24th - Fish and chip supper
Further details from Gloria G3VUN, 40 Linwood Ave, Strood, Rochester, Kent ME2 3TR, Tel. 01634 710023

Newbury and District ARS meet on the fourth Wednesday each month at the Bucklebury Memorial Hall, Bucklebury near Thatcham, at 7.30pm. They also hold regular pub natter nights at Donnington Valley. Planned club events/talks;
Nov 22nd - Amateur satellites, by Richard G3RWL
For further details contact R. Jolliffe, Tel. 01635 46241

Norfolk ARS meet every Wednesday at The Norman Centre, Bignold Road, off Drayton Road, Norwich, 7.30 for 8.00pm start. Informal meetings are usually held on alternate Wednesdays, where it is a night on the air, construction QRP and Morse practice evening. Club diary of events/talks;
Nov 1st - Surplus equipment sale
Nov 15th - Video of NARC events 1995, by G3NJQ
Nov 29th - SWR Measurements, G3XYO
Dec 6th - Christmas dinner
Dec 13th - A club member's view in Russia, G0IRQ
Further details can be obtained from Mike G4EOL, Tel. 01603 789792.

Reading and District ARC meet on the second and fourth Thursdays, 8.00pm, at The Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading, Berks. They run RAE and NRAE courses and are a registered C&G examination centre. They have a club library with a wide range of books on all aspects of Amateur Radio and related disciplines, a cross section of books are available at club meetings. Diary of events/talks;
Nov 9th - Construction contest
Nov 23rd - Low power telemerety (radio modems)
Dec 14th - Club AGM with cheese and wine
Further details can be obtained from secretary Tony Canning G0OPB, Tel. 01734 698274 evenings.

Salop Amateur Radio Society meet at the Oak Hotel,

The Mount, Shrewsbury every Thursday. They run regular RAE tuition and workshop evenings. Planned club diary of events/talks;
Nov 9th - Quiz night bring family and friends, general knowledge plus many other topics
Nov 23rd - Contesting with Bob G4UJS
Dec 14th - Christmas dinner
For further details contact Ian G7SBD, 56 Roselyn, Harlescott, Shrewsbury SY1 4LP or via packet @ GB7PMB

Shefford and District ARS meet every Thursday, 7.45pm, at The Church Hall, Ampthill Road, Shefford, Beds. They have regular activity nights. All newcomers are welcome. Planned club events/talks;
Nov 9th - Steam models, Jim G4BHO
Nov 23rd - Quiz night, G4PSO
Dec 7th - The G1GSN challenge, build a RX in one hour!
Dec 14th - Chairmans mince pie night, all welcome
Further details contact Paul Bradfield, Tel. 01462 700618

Silverthorn RC meet every Friday, 7.30pm, at the Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. A warm welcome is given to everyone. They have a fully equipped shack with packet radio facility for members to use, and have regular on air and social evenings. Visitors very welcome. Planned club diary of events/talks;
Nov 10th - Construction contest
Dec 1st - Junk sale
Dec 22nd - Christmas party
For further details contact Andrew Mowbray, GOLWS/G1NPT, at above address, or from Dave G0KHC, Tel. 0181 505 1871, or packet to G1NPT @ GB7HSN.

West Somerset ARC meet on the first Tuesday each month, at the West Somerset School 6th Form Block, Minehead, Somerset. Planned club events/talks;
Nov 7th - Oscilloscope evening - demo of it's use
Dec 5th - Quiz evening
For further details contact Alan. C. Elliott, Tel. 01643 707207

Southdown ARS meet on the first Monday each month (second Monday if first Monday is a Bank Holiday), 7.30pm, at Chaseley Home For Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne, Sussex. Please enquire about RAE and Morse classes. Club net every Thursday, 9pm on 145.250MHz. Planned club talks/events;
Nov 6th - 100 years of X Rays and Radiation, G3SGR
Further details from John Vaughan G3DQY, Tel. 01323 485704, or Vic Robins G0THX, Tel. 01323 846774

Southgate ARC meet on the second and last Thursdays of each month at the Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. Meetings are held each 2nd and 4th Thursdays of the month, between 19.30 and 22.00. The club also runs Novice licence courses and have regular 'on air nights'. Planned club diary of events/talks;
Nov 9th - G6QM Competition and Brains Trust
Nov 23rd - G6QM demo night
Dec 14th - AGM
Dec 28th - No meeting

For further details contact M. E. Viney G0ANN, 20 Auckland Road, Potters Bar EN6 3ES, Tel. 01707 850146.

Stratford upon Avon & District RS meet on the second and fourth Mondays, at the Home Guard Club, Main Road, Tiddington, Stratford upon Avon, at 7.30pm. The club also run an RAE course (write to Mr. J. Harris, 57 Evesham Road, Stratford upon Avon CV31 2PB, enclosing an SAE, or Tel. 01789 295257 for details). Club events/talks include;
Nov 13th - A DXpedition, Vincent G0MLX
Nov 27th - Baluns and matching, David G3PDQ
Dec 11th - Open evening
Dec 25th - Christmas greetings on the air, 11am, on 145.275MHz
Further details from Secretary J. Porter G4OHJ, Tel. 01789 773286

Mid Sussex ARS meet on the first and third Fridays each month, 7.45pm, at Marle Place Further Education Centre, Leylands Road, Burgess Hill, West Sussex. Club shack open all other Friday evenings. The club also run RAE and NRAE courses (contact John G0OIO, Tel. 01444 450957 for details). Club net; Sundays 8.00am 3.740MHz (+/- QRM), 11.00am 145.350MHz FM, 8.00pm 70cm Novice net on GB3HY, Mon & Fri 9.00pm 28.400MHz SSB. Planned club events/talks;
Nov 3rd - BBC World Service, by G3TDL
Nov 17th - Mince pies and Christmas quiz
Nov 24th - Children In Need special event station GBOKIN
Dec 15th - Grand Christmas dinner
Further details from Chris G0GMC, Tel. 01273 842937

Sutton and Cheam RS meet on the first Thursday (natter night) and third Thursday (formal meeting) each month, 7.30pm for 8.00pm at the Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Club 'natter freq' 70.3875MHz, Club nets; 20.30 Mon starting on 145.500MHz then QSY, Tue at 10.30 on 3.760MHz. Club talks/events;
Nov 2nd - Natter night
Nov 16th - Junk sale
Dec 21st - Christmas buffet and get-together
For further details, Tel. 0181 644 9945

Swindon and District ARC meet every Thursday evening, 7pm, at the Eastcott Community Centre, Savernake Street, Old Town, Swindon. The club hold regular 'natter and operating' evenings on the 2nd and 4th Thursdays. Visitors and new members always welcome. We're told that those considering preparing for the RAE and Morse tests, will always find experienced operators and skilled technicians to provide support and advice. Planned club events/talks;
Nov 2nd - Life in Broadcast Radio
Nov 9th - GODMZ memorial, WAM Award
Nov 16th - Automotive Electronic Systems, G7ORG
Dec 7th - Members' and partners' Christmas dinner
Dec 21st - Chairman's treasure hunt
For further details contact Ian G3YBY, Tel. 01793 770838, or Den G7PDV, Tel. 01793 822705

Three Counties ARC meet at the Railway Hotel, Liphook, Hampshire on alternate Wednesdays. Planned club events/talks;

Nov 8th - Grey-Lining - HF Propagation, G4ZEJ
Nov 22nd - Bee keeping
Dec 6th - Skittles evening
Dec 15th - Club Christmas dinner
For further details contact Tom Milne G4CMG, Tel. 01428 606298

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;
Nov 17th - Use of Amateur and Commercial satellites
Dec 15th - Christmas party
Further details can be obtained from Walt G3HTX, Tel. 01803 526762, or Peter G4VTO, Tel. 01803 864528 (Day Works no.)

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 third Wednesday. They run a Morse class on Wednesday evenings at the club HQ. Planned club events/talks;
Nov 1st - Judging of construction projects
Dec 6th - Christmas party, skittles and presentation night.
For further information contact Ian G0GRI, Tel. 01225 864698 evenings and weekends.

Verulam ARC meet, 7.30pm, on the second and fourth Tuesdays each month, at the RAF Association Headquarters, New Kent Road (off Malborough Road), St Albans. On the second Tuesday they have an activity evening and on the fourth Tuesday the monthly meeting. Visitors welcome at all meetings. Planned events/talks;
Nov 14th - Informal evening
Nov 28th - RAYNET, by G4KUJ
For further details available from Walter Craine G3PMF, 5 The Crescent, Abbots Langley, Watford, Herts WD5 0DR

Wakefield and District RS meet every Tuesday, 8.00pm, in the first floor rooms, Ossett Community Centre, Prospect Road, Ossett, W. Yorks. We're told the club has a well equipped station and run both Morse and Novice classes. The club net is on 2m FM on Mondays. Club diary;
Nov 7th - Pie and pea supper
Nov 14th - Desk top dithering, by G4BLT
Nov 16th - New Novice course begins
Nov 21st - World Scout Jamboree, 2E1DGD
Nov 28th - On the air
Dec 5th - Game for a laugh, 2E1DML
For further details contact Bob Firth G3WWF, 6 Eastfield Drive, Woodlesford, Leeds LS26 8SQ, Tel. 0113 2825519, or via packet @ GB7WRG

Welwyn and Hatfield ARC meet on the First and Third Mondays each month, 8.00pm, at The Hyde Community Association Hall, Holly Bush Lane, Welwyn Garden City, Herts. Visitors most welcome. Planned club events/talks;
Nov 4th - WARC constructors open challenge
Nov 5th - Fireworks - Ware Round Table
Nov 6th - Adrians ATV repeaters
Nov 20th - Spies and radios, by Pat G3VA
Dec 4th - AGM
Dec 18th - Christmas social

For further details Tel. 01920 462241 (evenings) or 0181 982 7298 (day)

Wimbledon and District ARS meet on the second and last Friday each month, at St Andrew's Chrich Hall, Herbert Road, Wimbledon SW19. Planned club events/talks;
Nov 10th - GA mini lecture, meet the new committee
Nov 24th - A day trip to Mars, Dr. Chris Welsh
Dec 8th - Christmas social
For further details contact Michael McCarthy G0AWQ, 32 Hillside, Banstead, Surrey SM7 1HF, Tel. 01737 351313

Wincanton ARC meet on the first and third Mondays (except bank holidays - then second and fourth) in the Community Lounge, King Arthur's Community School, Wincanton, Somerset BA9 9BX at 7.30pm. They run an RAE course. Club net and general listening channel is SU22. The first Monday is usually a formal lecture and the third Monday is an open evening. Planned club talks;
Nov 6th - Direction finding, by Bert G2FIX
Dec 4th - HF DXing, by Ian G3KZR
Jan 8th - 'Aerials 2' the sequel, by Dave G3ZXX
Jan 22nd - AGM
For further details contact Dave G3ZXX, Tel. 01963 34360

Winchester ARC meet on the third Friday of the month, 7.30pm, at the British Red Cross Centre, Durgate House, Winchester (adjacent to North Walls Police Station). Club diary;
Nov 17th - Homebrew, Gerry G2DBT
Dec 15th - Christmas party
For further details contact Peter Simpkins G3MCL, Tel. 01962 865814

Wirral and District ARC meet at 8.00pm, at the Irby Cricket Club, Mill Hill Road, Irby, Wirral every second and fourth Wednesday each month, and have regular D&W evenings every first and third Wednesdays at various other locations. Planned club events/talks;
Nov 8th - Train driving, by Brian G4ZQP
Nov 22nd - Home construction judging, social evening
Nov 29th - Christmas dinner
Dec 13th - Chairman's night
Jan 11th - AGM
Jan 25th - Surplus equipment sale
For further details contact Bob Smith G4NCI, Tel. 0151 677 0210

National and International

British Amateur Radio Teledata Group (BARTG) have a quarterly magazine, and hold a rally plus two contests each year. For details of joining the BARTG, their membership officer is Peter Adams, G6LZB, Tel. 01923 220774, for other information the group's Secretary is Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ, Tel. 0115 926 2360, or via packet G4EAN @ GB7BAD.

G-QRP Club publish a quarterly journal devoted to low power communication, and hold regular get-togethers at their rally stands throughout the country. For membership details, contact their Secretary Rev. G.



Dobbs, St. Aiden's Vicarage, 498 Manchester Road, Rochdale. Lancs. OL11 3HE. Tel. 01706 31812.

International Short Wave League who as well as running an International QSL bureau for amateurs and SWLs, have a monthly magazine and regular get-togethers at their rally stands plus several on-air nets on HF and VHF. 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, and publish the yearly IRTS callbook, they also have a video lending library. The contact man is Dave Moore EI4BZ, 12 Castle Ave, Carrigwohill, Co Cork. Tel. (Eire) 021 883555.

Radio Amateurs' Emergency Network (RAYNET) can be contacted at Hunters Moon, Newton le Willows, Bedale, N. Yorks DL8 1SX. 24hr national emergency contact line; 0141 621 2121. RAYNET supplies and order forms available from Peter Enfield, 26 Edendale Ave, Blyth, Northumberland NE24 5QE, Tel. 01670 540359. The RAYNET Training Team can be contacted at P. O. Box 2, Chinnor, Oxon OX9 4JY, they produce a quarterly newsletter for people interested in the National Training Scheme.

The Radio Amateur Invalid and Blind Club are a registered charity who raise money to help purchase amateur radio equipment, and audio cassette courses for home study, for blind, deaf and disabled amateurs. If you would like more information about the RAIBC, telephone the club helpline on 01953 454920. The club are in attendance at rallies throughout the year, and collect surplus radio equipment and junk for re-sale at rallies. If you have any equipment you would like to donate, contact Ian 2E1EGV, Tel. 01274 783583. The Northern Ireland Club raise money by collecting unwanted tokens or vouchers (such as the ones you get when buying petrol, etc.), these can be sent free of charge to; The Charities Appeal Officer, RAIBC NI, Freepost BE 1789, Belfast BT15 3BR.

Radiocommunications Agency are the radio licensing authority for the UK. They have a large number of free publications, including the booklet 'How to Become a Radio Amateur', and their 'Novice Licence Information Sheet', and can offer advice on general aspects of licensing. They are based at; South Quay Three, 189 Marsh Wall, London E14 9SX, Tel. 0171 211 0211

Radio Society of Great Britain are based at Lambda House, Cranbourne Road, Potters Bar, Herts. EN6 3JE, Tel. 01707 659015. They have a unique blend of full-time staff at Potters Bar coupled with many volunteer officials around the country, and can help members with many aspects of amateur radio.

Remote Imaging Group, are a user group catering for many weather satellite needs. They produce a quarterly magazine which gives satellite predictions, constructional projects, news, views and information on available equipment. Contact; John Tellick, 34 Ellerton Road, Surbiton, Surrey KT6 7TX, Tel. 0181 390 3315, or Membership Secretary Ray Godden, PO Box 142, Rickmansworth, Herts WD3 4RQ.

Subscription Services Ltd. handle the issuing of amateur licenses in the UK, on behalf of the Radiocommunications Agency. They can help regarding enquiries concerning

individual licences rather than general licensing matters (which the RA handle, see above). Contact details; The Radio Licensing Centre, SSL, P. O. Box 884, Bristol BS99 5LF, Tel. (manned 8.30am - 10.00pm, Mon-Sat inclusive) 0117 9258333.

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, (due to space restrictions we can only include clubs who send us details of events and talks, not natter nights for every meeting) 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! If your club also has a regular 'net', let us know, we'll let your prospective members know! **Dates to be included in the issue published on the 5th January must reach us by the 17th November** (unfortunately we cannot guarantee to include details received after this date, a lot of clubs are being missed out because their details arrive too late), addressed to; **The Editor, Ham Radio Today (Club News), Nexus, Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST**, or you can fax your club's details direct to the Editor's desk on 01703 263429.

Rallies

If you're travelling a long distance to attend rallies, we recommend you contact the organisers of the events first, before travelling, to check if there has been any changes since this magazine went to press. If the magazine is informed of any changes, the information will be available on the HRT Voicebank line.

November 11th

All Micro Show, Stafford Show Centre, Stafford. For further details Tel. 01473 272002, Fax. 01473 272008

November 12th

The 5th Great Northern Hamfest, will be held at the Metrodome Leisure complex in Barnsley town centre (less than 2 miles from junction 37 M1, 5 minutes walk from the train and bus station). The rally is run by the Barnsley & District ARC and has two halls, both on one level, featuring traders, club and repeater group stands, novice and special interest groups and large bring and buy. Flee market tables are available for you to sell your own personal gear. Morse tests on demand (please bring the appropriate documentation). A wide variety of refreshments are available. Excellent disabled facilities. Doors open 11.00am, admission £1.50. Talk-in on S22, Disabled car parking in the leisure complex, all other parking in surrounding car parks. For further information contact Ernie G4LUE, Tel. 01226 716339, or 0836 748398 (mobile).

November 26th

The Red Rose Rally, is now being held at Horwich Leisure Centre, Church Street, Horwich, Bolton, instead of Silverwell Street Leisure Centre, as this venue closed it's doors to the public in October. For further details contact Albert Davies G7RZW, Tel. 01204 62980

1996

February 4th

South Essex ARS Radio Rally, The Paddocks, Long Road, Canvey Island, Essex (situated at the end of the A130). Doors open 10.30am, featuring traders, bring and buy, RSGB Morse testing on demand (two passport photos required), home made refreshments, free car parking with space outside main doors for disabled visitors. Admission £1. For further details contact David G4UVJ, Tel. 01268 697978

February 11th

The Northern Cross Rally, is now at a new and better venue - Thornes Park Sports Centre, Wakefield. Easy access from M1 junctions 39 and 40 - well signposted and with talk-in on 2m and 70cm. One large hall, doors open 11am (10.30am for disabled visitors and bring and buy). For further details Tel. 0113 238 3622

March 24th

Pontefract & District Amateur Radio Rally and Components Fair. Further details available from B. Wilkinson G0NQE, Tel. 01977 677006

April 28th

The Marske-by-the-Sea Radio Rally, will be held in the Marske Leisure Centre, High Street, Marske-by-the-Sea, near Redcar. Doors open 11.00am, featuring traders, bring and buy and refreshments. Talk-in will be on S22. For further details contact Alistair G4OLK, Tel. 01642 475671

May 12th

Drayton Manor Radio and Computer Rally, will be held as usual at Drayton Manor Park, Staffs (a great day out for all the family, the kids will love the rollercoasters! - Ed). Further details available from Norman G8BHE, Tel. 0121 422 9787

June 30th

Longleat Amateur Radio and Electronics Rally, Longleat Park, near Warminster Wilts. Six large marquees are planned to house a total of over two hundred different traders. A major feature of the rally will be the bring and buy section. For those not interested in computers or electronics, one marquee is devoted to a major craft fair exhibition and another to refreshments. There is also the Safari Park, House and beautiful lake and grounds to see. For further information contact Gordon G0KGL, Tel. 0117 9402950

Club, Rally and Special Event Station dates and details to be included in the issue published on the 5th January must reach us by the 17th November

Free Readers Ads

Readers; Please note our revised conditions for free private ads, see the coupon section accompanying these ads.

HELPLINES

Help please! information on replacing the telescopic aerial assembly with a BNC socket on my FT-290 Mk1, any costs reimbursed. Contact Eric Robinson (Worcs), Tel. 01684 562052 (home), 01684 275648 (work), or Fax. 01684 275649

Key 450H radio, can anyone help with 70cm conversion, service manual etc. (can photocopy and return), all costs reimbursed. Also any DIY packet info/construction details, thank you. D. Jackson G7PKF (Herts), Tel. 0973 560649, Fax. 01707 334141

Anyone got any software for the Amstrad PC164ODD, anything to help with RAE, or anything to make SWL more interesting (OAP), must be cheap. J. Redmond, 38 Ochilview, Devonside, Tillicoultry, Clacks, Scotland FK13 6JD

Urgently wanted; User manual for the Commodore VIC 1525 printer, loan to photocopy or buy. Peter Davies G1XCB, 91 Station Road, Hadfield, Hyde, Cheshire SK14 7AR, Tel. 01457 853397

Any info/advice required on how to decode Morse, RTTY, Slow scan etc. on my BBC Master computer. I have all the relevant programs etc., but no information on connections to radio (FRG-100). Craig Harrison, 67 Kinross Street, Burnley, Lancs BB11 4DP. All letters answered.

Circuit diagram and workshop manual required for Teledquipment D75 scope. J. Powell (Gwent), Tel. 01633 896512, I will call you back.

FOR SALE

B40 Admiralty general coverage receiver, good condition, £50. R1155 receiver, £60. Ex-army No.88 set and control unit, £25. 500 valves, mostly boxed, SAE for list please. Various Pye

Westminsters at £15 each. J. Haslip (Sussex), Tel. 01444 471448

Amateur Radio books, many subjects. Radio descrambler, encode, decode suits scanner, phone, 64 channels, rolling codes, £55. HP 10-500MHz Osc 3200B, £100. Peter Turner (Suffolk), Tel. 01473 785203 any time.

Redifon R-500HF receiver, mint, current model, cost £12,500, bargain £550, swap professional receiver. Collins 390A, VGC, £350. 390A, first class, £450. Eddystone 680X, VGC, £90. Eddystone digital 1837/2, 5 filters, £300. Racal 17 MkII, VGC, £175. R. Rai (Middx), Tel. 0181 813 9193

Microwave Modules Amateur Television transmitter model MTV 435, in good condition, £85. Microwave Modules receive converter to domestic television, £15. Microwave Modules frequency counter model MMD050/500, up to 500MHz, good condition, £40. John Crawshaw (Blackpool), Tel. 01253 594381

Yaesu FP-707 20A power supply, will power any 12V rig as well, £70. Packet TNC2 TNC, £70, or PX for Navico 2m rig. Also wanted Kenwood SM220 and handbook or copy for Amstrad 9600AT Fax. Dave Biddle (Norwich), Tel. 01603 745512

AR-88D general coverage receiver, good condition, £50 ono, buyer to collect. J. Corben (S. E. London), Tel. 0181 856 4595

FT-101 80-10m with 160m WARC bands modifications and other extras, manuals etc. KV107 ATU/dummy load, 80-10m HF vertical aerial, spare traps, £425 ono, may split. PDK750E 2m multimode, £125. Two 30W linear amps, £25/£40. G7TGY (Sussex), Tel. 01273 477998

Trio R-1000, mint condition, with manual, £250 cash, buyer to collect. Might swap for Eddystone 960 with plinth speaker and preselector. A. Lexton (Hemel Hempstead), Tel. 01442 393577 evenings.

Icom IC-W21ET 2m/70cm dual band handheld, boxed, as new condition, six months old, cost £450 sell for £350. A. King (Warrington), Tel. 01925 232326

Mini-Pax packet system, 9 pin PC connector cable for Yaesu,

manual, BayCom software with PMS, £35 inc. P/P. G3DSV (Exeter), Tel. 01647 61753

JRC NRD 535 HF receiver, new Jan 1994, original and immaculate condition, £875 ono, prefer buyer to inspect and collect. D. Kearton (Wensleydale), Tel. 01969 663313

Jaybeam 70cm double slot yagi (D8/70cm), 12.3dB gain, only 1.35m long and weighs 2.6kg, complete with approx 10m cable, £25. Brian GW7BOY (near Chester), Tel. 01244 541633

Yaesu FT-101Z HF transceiver, handbook, VGC. Icom R7000 25-2000MHz scanner, mint condition. Realistic 2005 scanner, mint condition 25-1300MHz, owner deceased, sell or would take HF receiver, or handheld scanner with SSB in part exchange. J. Parker (Burton on Trent), Tel. 01283 568439

Datong DF unit with aerials, boxed as new, £150. WW2 RAF wavemeter W1191A, working OK, £15. Kingshill professional PSU, 13.2V, 15A, £35. Creed 75 teleprinter in transit case, £15. Possible delivery M25 area. W. Crisp (London), Tel. 01375 674092 after 6.00pm and weekends

Yaesu FT-901DM 100W HF, fitted with memory FM board, DC to AC converter, mic and manual, good working order, £350. Kenwood TH-78E dual bander with softcase and CTCSS, VGC, £295. Wanted - FT-767GX 2m, 6m, 70cm modules. Joe GM0PLH (Cumbernauld), Tel. 01236 720204

Kenwood TS-530S HF transceiver, boxed with manuals, mint, £425 ono. Also FT-790R, carry case, manual, mic etc., £245 ono. Also PC with JVFAX interface and slow scan software installed and Pakratt 232 TNC, offers. May split. John Solman (Coventry), Tel. 01203 450476

Packet radio ex GB7ABC mailbox. Pye 30W base on 144.650, fitted MuTek front end, £50. Pye 30W base on 70.4875 fitted Garex front end, £50. Pye base on 432.675MHz, £50. DRSD card, £50. GW3TMH (Rhyl), Tel. 0860 164354 (mobile)

MTV435 70cm 20W ATV MWM transmitter plus MMC435/600 70cm ATV converter, £160 ono. Fluke 75 DVM, never used, £70. Avo 8, £120 ono. Teledquipment

D32 mains/battery portable oscilloscope, £50. Daiwa PS300 DC power supply, 9-15V, 30A, £80 ono. K. Baum (Surrey), Tel. 01737 770120

Nevada MS1000 mobile/base scanner, 500kHz-1300MHz, AM, FM, WFM, ScanKing base aerial, power pack, ex-spk, frequency book, £300 worth, all as new, £200. E. Caines (Bristol), Tel. 0117 939 3043

Standard AX700 wide band receiver, 50-905MHz, boxed as new with manual, £300 ono. Will consider exchange for ex-army equipment. Small 2m valve power amp QQV0640, 1/5W in 100W out, info and spare valves, £120 ono. D. Hunter (London), Tel. 0181 858 1448

Datong FL3 multimode filter, £80. ERA Microreader Mk2, version 4.1, £75. Dedicated CW-RTTY filter by G3PPD, designer built, £50. All include instructions, leads, postage. Possibly exchange small s/trace scope, 10-15MHz, for one of the above. W. Allen (Cornwall), Tel. 01726 882990

Yaesu FT-767GX all mode transceiver with 2m, 70cm modules, mint condition, manual and schematic diagrams, brand new front, unused, new tuning knob, £1200 ono. Wanted - lattice tower or Tenna Mast, 60ft, wind up. Michael Hardy (S. Yorks), Tel. 01226 742971 after 6.00pm

Avo valve tester, universal. Avo 8 multimeter. Assorted radio service boxes, assorted pre transistor, ex-WD valves plus equivalent, Mullard valve equivalent. D. Carter (Birmingham), Tel. 0121 415 4847

Toshiba T1100 laptop, LCD screen, old model, runs from floppies but OK, complete with Venus DataPack modem and HamCom software, £150 inc. postage, or sell laptop separate. Kenwood TS-530S transceiver, good condition, £450 inc. carriage. L. Norton (Hebrides), Tel. 01851 810899

Silent key sale; Icom RM3, £47. Icom IC-211E, £200. IC-2E, boxed, £100. ICF receiver, offers. Yaesu FT-102 HF, £475. Yaesu linear FLDX2000, £300. Tono 2m linear, £50. IC-735, boxed, £650. FT-480R, £250. C. Fenton (E. Sussex), Tel. 01435 862498, or 01892 770638

Daiwa automatic ATU, 3.5/28 WARC, 500W, works with any rig, £175. FT-411 2m handheld, £150. PK232 with software and cables, £150. All immaculate, no offers. FT-22E 2m multimode (MuTek), GWO, £200. J. Share (Wirral), Tel. 0151 632 2638 evenings

Eddystone EC10 receiver, just been realigned, excellent condition, £85. Alinco DJX1 handheld, mint, boxed, £140. Lowe SRX30 HF receiver, nice to use, £125 ovno. Three volumes of American Worldwide, all services frequencies, £15. W. Johnstone (Bournemouth), Tel. 01202 422273

FDK multi 725X 2m mobile, 144-148MHz FM, variable output 1-25W, ideal for packet, RTTY etc., bargain at £50. Ian G0BGH (Croydon), Tel. 0181 668 4990, or 0956 280654 (mobile)

Kenwood TS-50 HF mobile, 100W, 160-10m, modded for general coverage TX&RX, never used mobile, mint condition with box and handbook, £625. Wanted - Microwave Modules BNOS or similar 4m mobile amp with 1-3W I/P, 100W O/P. Phil De Cadenet (Milton Keynes), Tel. 01908 646593

Printer, serial terminal, wired for direct connection to ERA Microreader to give hard copy, with approx 10 rolls thermal paper, only £25, or exchange for Fax, RTTY decoding software, WHY? A. Pawley (Cheshire), Tel. 01606 550913

MX295 ready for conversion, excellent condition, £40 plus P/P. Gary G6NYH (Northants), Tel. 01604 882067

Kenwood TS-50S, excellent condition, 10 months old, boxed, £750 ono. J. Glencross (Ayrshire), Tel. 01290 422987

Kenpro KT-44 70cm handheld, last thumbwheel switch broken, so rig only gets alternate channels, i.e. RU0, RU2, RU4, SU16, SU18, SU20 etc., otherwise as new, hence £90. T. Raybould (Sheffield), Tel. 0114 2582137

FT-101Z, excellent condition, mic, manual, no mods, £300, or exchange for good general coverage receiver, similar condition. FT-470 2m/70cm handheld, boxed, soft case, manual, battery case, £200. Prices plus carriage etc. Brian G4UJL (Wilts), Tel. 01249 817757 evenings, 444270

daytime

Amstrad PC3086 computer, 32MB hard drive, 3.5in and 5.25in disk drives, colour monitor, Amstrad DMP4000 printer, all in good condition, £220. Mick Watkins (Whitstable), Tel. 01227 266460

PRO-2035 scanner, 1,000 channels, brand new Feb '95, with outside aerial, cost £400, will accept £250 for both. J. Hemsworth (Northants), Tel. 01604 769658

Scanner; Black Jaguar BJ-200 MkIII, 26 to 520MHz, AM, FM, any band, VGC, £70 ono. M. Oakley (Kent), Tel. 01732 364009

JRC NRD-515 general coverage receiver, with NDH 25 memory unit and JRC speaker, receiver boxed, all units excellent condition, £450. J. Allen (Somerset), Tel. 01458 447019

Trio TR-751E 2m multimode, mobile mount, original packing, never used mobile, £400 ono. Dave Barton (Tywyn, Gwynedd), Tel. 01654 711403

Kenwood TS-850SAT, original boxes, manuals etc., all as new, including Kenwood mic, £1,000 ovno. S. Brown (Manchester), Tel. 0161 766 5265

FT-101ZD, mint with Yaesu base mic and FM, £400. Mains converted 19 set, VGC with variometer, £250 ono, or swap Lincoln or Uniden 28-30. Andy G7UAD (Derbys), Tel. 0115 930 8096

Trio TS-130S HF transceiver, 100W, 80-10m, as new condition, fully filtered, £380 ono. Also TR-9130, 30W, 2m multimode, as new condition, £285 ono. K. Brookes (Cheshire), Tel. 01625 421398 evenings

Yaesu FRG-9600 receiver, 100kHz-950MHz, video board fitted, plus power supply, £280. Dressler active aerial, 200kHz-40MHz, £35. Icom 735, fitted 500kHz CW filter, excellent condition, £580. Carriage extra. M. Faulkner (Farnborough, Hants), Tel. 01252 548561

Yaesu FT-901D HF transceiver with matching ATU and speaker, complete station, mint condition, £650. Bob Jenkins (Coventry), Tel. 01203 221810 anytime

Yaesu FT-101ZD, VGC, £400 ovno. J. Morgan (Liverpool), Tel. 0151 733 7752

Kenwood MC50 mic, £45. Welz ATU AC38M, £58 ovno. Wanted - magnetic loop covering 3.5

upwards, or Hustler 6BTV base, or AVT18 80, 40, 20, 15, 10m. MC60A mic. Yaesu 920 automatic ATU. John Tarleton (Derbys), Tel. 01283 221870

Kenwood TH-78E, excellent condition with accessories, £350 ono. Yaesu FT-790MkI, FM, SSB, CW transceiver, excellent condition, accessories, £250 ono. Icom IC-255A (American) 2m transceiver, needs attention, £175. Daiwa PS-140IIA PSU, £45. 8-ele 70cm beam, £20. G7UGX (W. Mids), Tel. 0121 333 3628

Sony Air-7, airband, FM/AM PLL, PSB Air, FM/AM PLL receiver with instruction manual, GWO, £175 ono. Yaesu VHF converter FRV-7700, 140-170MHz, with manual, GWO, £35 ono. F. Nash (Norfolk), Tel. 01553 770693

Two ex-army 88 AFV sets, plus one LF amplifier suitable for restoration, £25 ono, buyer collects. L. Atkinson (S. E. London), Tel. 0181 300 1894 evenings and weekends.

WANTED

Clandestine sets, WW2 and postwar, WS 18 parts set, German WW2 military radios. For trade; Red Army sets and receivers. R. Otterstad OZ8RO, Hosterkobvej 10, DK-3460 Birkerod, Tel. +45 4281 5205, Fax. +45 4468 1514

Navico AMR1000S 2m mobile, in good condition with no mods preferable. Will pay good price and collect within 60 miles of Reading. Alan G8LTN (Berks), Tel. 01635 869845

Racal TA944 100W linear, auto-tune with manual. John G0WEU (Barnet), Tel. 0181 449 6124

Eddystone 960, EB35, EC10, EC10 MkII, EA12, 888A, etc. Also 870A and any diecast speakers, panadaptor, edometer, etc., for cash, collection possible. Peter Lepino (Surrey), Tel. 01374 128170, or Fax. 01372 454381 anytime.

ATU, meter and SWR to fit amateur radio for housebound disabled student, cheap as possible. Mrs. Morris (W. Mids), Tel. 01902 492443

Datong Morse tutor in working order. E. Hotchkiss (S. Glam), Tel. 01222 707257

12 edition only 'ARRL Hints and Kinks Handbook'. A. Taylor

G3JMO (Redcar), Tel. 01642 486155

High gain ferrite rod aerials, must be half inch in diameter, no more or less, must be six inches long or more. Peter Tankard (Sheffield), Tel. 0114 2343030 anytime.

Surplus 2-Way Radio Conversion Handbook, or similar handbook, costs refunded. Robert Williams E17AF, San Martinus, Mountain Rd, Clonmel, Co. Tipp, Ireland

Any transceiver from the KW2000 series. Pat Dalley (Birmingham), Tel. 0121 373 2985

Alpha top band transceiver featured in HRT in 1984, kits supplied by G3WPO, working, non-working or part constructed.

A. Leigh G4DEN (Staffs), Tel. 01782 722574, or via packet G4DEN @ GB7PMB

Trio 9R.59D short wave receiver. Roy Coleman (Isle of Wight), Tel. 01983 865113

EXCHANGE

386 PC, 4MB RAM, 42MB HD, EGA monitor, keyboard, dotmatrix printer, 3.5in and 5.25in D/drives, upgradable. For Yaesu FT-201 and KW2000A, or Heathkit 100 and FT-102, or Eddystone 770U and other 770 series, or sell £300. EC10, £60. David Haigh (Halifax), Tel. 01422 244581

BT CF100 Fax/telephone, VGC. Exchange for 6 metre module to suit Yaesu FT-726R transceiver. P. Lawrence (Bradford), Tel. 01274 619333

Dewsbury Electronics Supa Tuta Plus (Morse tutor), used once, boxed. Exchange for packet radio TNC (Tiny 2 or similar). Stephen G17SIX (Bangor, N.Ireland), Tel. 01247 457679 after 6pm.

Swap American Megatrends computer, for good comms receiver. DX40, 4Meg RAM, 420Meg H/disk, Pace 14,400 Fax modem, CD, twin speakers, sound card, new CTX colour monitor, DOS 6.2, Win 3.1, 300Megs good software installed, sale considered. T. Foster (Northants), Tel. 01536 522007

Complete colour darkroom worth over £5,500, Durst M70 electronic enlarger, Durst four bath printo with dryer. Exchange for Icom IC-R9000, FT-1000, or Kenwood TS-850SAT. Brian Moran (Kent), Tel. 01634 671301

HRT DEC '95

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Address.....

Date.....*Send this coupon to: Free Readers Ads, Ham Radio Today, Nexus Special Interests Ltd., Nexus House, Boundary Way, Hemel Hempstead, Herts, HP2 7ST.*

The above details will **not** be published, enter **all** that is to be published, including contact information, in the boxes below (*Amateur Radio Equipment Only Please*).

***Delete as appropriate**

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2. These advertisements are offered as a free service to readers for the sale, exchange, wants, or help with, **amateur radio equipment only**. Ads from traders, or apparent traders, will be rejected. Readers should use our Classified Ads section (rear pages of this magazine) for ads not fulfilling these conditions, our Advertising Department (Tel. 01442 66551) will be pleased to accept prepaid ads.
3. All that is to be reproduced in the advertisement should be entered on the form printed periodically in the magazine, please use block capitals. Free ads must be no longer than 40 words, including contact information. One free advert per reader, per issue, maximum. A photocopy of the free ad coupon, accompanied by the original corner flash from the current issue, is acceptable. We cannot accept old or faxed coupons and requests.
4. All submitted free ads **must** include a name or callsign and either a contact telephone number (with STD code) and location (e.g. town or county) or a full address, or both, for readers to reply, these details must be included **within** your advertisement. The term QTHR will not be accepted. Each advertiser must also fill in their name and address in the space provided (these details will **not** be published), and must sign the form to indicate acceptance of these conditions.
5. Advertisements which are suspected of including illegal equipment and/or any equipment which transmits only outside of amateur bands will not be published.
6. We cannot be held responsible for printers' errors, however we will attempt to ensure that legible submissions are reproduced correctly. In the event of a gross error, at the request of the advertiser and at the Editor's discretion, a corrected version of the advertisement will be printed in the earliest issue in which space is available.
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9. As this is a free service, postal or telephone communication regarding publication of ads cannot be accepted unless an error is involved. Please remember, **all** ads received fulfilling these conditions will be published as space permits.
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TH 79E
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TM 741E

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FT 690R mk2
FT 530 2/70
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FT 23R 2M
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DJ 180 2M
DJ 580 2/70
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DJ F1E
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HF

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TS 50S
FT 890
FT 840
FT 757 GX1
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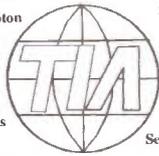
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Subscription/Back Issues Enquiries Hotline; 01858 435322.
Orders Hotline; 01858 435344

24hr HRT Editorial Voicebank and automatic fax-back information line;

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Member of the
Audit Bureau
of Circulation
ISSN No.
0269-8269



Subscription rates; UK £21.60, Europe and Eire £28.40, Sterling Overseas £29.60 US Dollars Overseas \$53, Airmail rates available on request. Cheques payable to Nexus

Subscriptions and Back Issues; Nexus Subscription Services, Ham Radio Today, Tower House, Sovereign Park, Lathkill Street, Market Harborough, Leicestershire LE16 9EF. Subscription Hotline; 01858 435344, Enquiries Hotline; 01858 435322 (Back issues are normally available for the last twelve months).

USA Subscription Agent; Wise Owl Worldwide Services, 4314 West 238th Street, Torrance CA90505-4509 USA.

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HRT Distribution; HRT is published by Nexus Special Interests Ltd., Hemel Hempstead. UK newstrade distribution by SM Distribution Ltd., 6 Leigham Court Road, London SW16 2PG. Tel. 0181 677 8111. Overseas and non-newstrade sales by Magazine Sales Dept. Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, Tel. 01442 66551. Typesetting by Ebony, Liskeard, Cornwall. Printed in Great Britain by Wiltshire Ltd., Bristol.

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"Yaesu did it again!"

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2 1/4" W x 4 3/4" H x 1 1/8" D
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 - UHF RX: 420-470 MHz
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706

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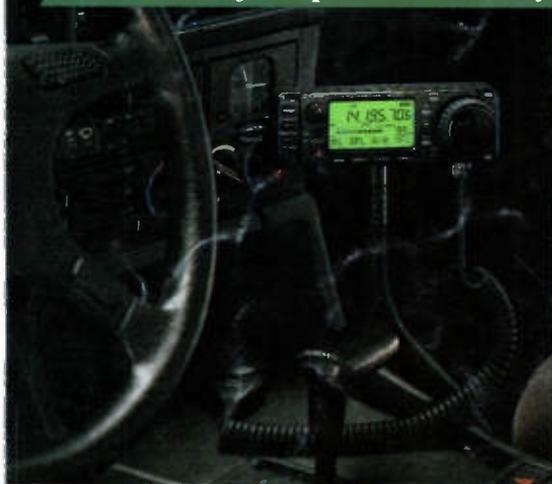
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