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All reasonable care is taken in the preparation of the magazine contents, but the publishers, nor the Editor, cannot be held legally responsible for errors in the contents of this magazine, or for any loss arising from such errors, including loss resulting from negligence of our staff. Reliance is placed upon the contents of this magazine at readers' own risk.
WINDMILLS AND WATERMILLS, 11TH MAY

Following the success of last year's event, Denby Dale ARS (West Yorkshire) are again organising the above event to be held on the 11th May 1997 on behalf of the Society for the Protection of Ancient Buildings (SPAB).

Last year, 32 Windmills and Watermills were activated, and the society hope that this year many more can be added to the list. The Denby Dale ARS say it gives them the opportunity to promote the SPAB, and the opportunity to visit, via the airwaves, the diverse range of Watermills and Windmills besides bringing amateur radio to the general public who will be visiting the individual mills.

Last year, individual QSLs were designed with a line drawing of the mill on one side and a potted history of the mill and the relevant contact information on the other - making a superb collection. A certificate was also given to those who contacted ten or more mills.

Contacts were made as far afield as America and Russia, which resulted in a query from a South African windmill who will hopefully join in the event this year. As the group expect even more mills on the air this year, they'd like to hear from anyone who feel they could put on or assist with setting up a station at one of the mills.

For more information, or if you feel you can help, contact Jasmine Marshall G4KFP, Hedgeways B&B, 63 Highmoor Lane, Hartshead Moor, Cleckheaton BD19 6LV, Tel. 01274 869849

RAYNET ACTIVE DURING N.YORKS EMERGENCY

RAYNET was called out on 28th December when part of the market town of Bedale, in North Yorkshire, had to be evacuated because of a severe fire which threatened to spread to two 30,000 gallon propane tanks. The incident was widely reported on national television and in the national press.

Members of the Richmond RAYNET Group were asked to provide radio links from two emergency rest centres to the Emergency Planning Department's Communications Centre at County Hall in Northallerton.

Fire fighters from North Yorkshire and Durham were called to deal with flames more than 30m high, after an accident in the former railway goods yard where bottled gas containers were filled from the bulk supply.

The depot stands in the centre of Bedale and 300 people had to be evacuated as the fire fighters played water onto the two tanks to prevent them exploding. Below the fire was brought under control, exploding gas cylinders were being thrown some 24m into the air. The incident, which left four families temporarily homeless, was one of the largest fires in North Yorkshire for many years. RAYNET was involved for eight hours until the rest centres could close down.

1996 was another busy year for RAYNET members, 444 events and operations were logged in the national RAYNET diary during the year, and it is estimated that RAYNET covered at least 650 events, exercises etc. in the calendar year. You can get further details on the RAYNET organisation from their Director of Publicity, David Hicks G6IFA, 12 Toll bar Rood, Christleton, Chester CH3 5QX, Email; 1 06473 100@compuserve.com

AMATEUR PROSECUTED

The Radiocommunications Agency have informed us that they recently carried out successful prosecution action in respect of the misuse of amateur radio in the Midlands area.

At Worcester Crown Court on 12th February 1997, an individual who was a licensed radio amateur at the time of the offence, pleaded guilty to the charge that on 22nd December 1994 he used apparatus for wireless telegraphy except under and in accordance with a licence issued on that behalf by the Secretary of State. He was sentenced on 21st February to 70 hours community service and ordered to pay £1,000 costs. A transmitter, an aerial and tapes were ordered to be forfeit.

SOLENT ATV REPEATER ON AIR

The Solent Club for Amateur Radio Television (SCART) tell us that, after three years of fighting bureaucracy and red tape, they have finally received their repeater licence and switched GB3AT (Amateur Television) on. The repeater is located at Pork Gate just outside Southampton, at locator SUQ96. It transmits on 1316MHz, running 4W into an 8dBd horizontally polarized omnidirectional aerial array with the receiver input at 1249MHz, with 6MHz sound. Further details from Jon Bennett, G6HNJ, Ravenswood, The Shires, Hedge End, Horr, SO30 4BA, Email; solenttv@compuserve.com
COACH TRIP TO DUNKIRK RALLY

We've held there is a coach trip to Dunkirk Airwaves Radio Rally in France on Sunday the 13th April. The coach plans to leave in Bude at 9.00am and return around 9.00pm. For further details contact Brian Elliott, G4MEO, tel: 01208 863199 during evenings or weekends.

NEW REPEATER WEB SITE

Dave Remnant of the South-west Here UHF Groups tells us that GB3BH the London area 23cm FM voice repeater (on 1297 000MHz) has a Web site on the Internet. The site is at http://remnant.demon.co.uk/bbands.htm

BEACON NEWS

The German propagation beacon, DX7V, has changed frequency to 3.5790MHz. The Sri Lanka beacon G45B has now joined the worldwide International Beacon Project. It transmits for 10 seconds in turn on 14100, 18110, 21110, 24520 and 28230kHz on a three minutes cycle. DX2NB operated using a 40W input to a 15m long loop aerial at his home station, whilst DF1BQ input to a 91m long loop aerial at his home station, whilst KB6KZ using a 20W input to a 91m long loop aerial at his home station, whilst KB6KZ using a 20W input to a 91m long loop aerial at his home station, whilst KB6KZ using a 20W input to a 91m long loop aerial at his home station, whilst KB6KZ using a 20W input to a 91m long loop aerial at his home station, whilst KB6KZ using a 20W input to a 91m long loop aerial at his home station, whilst KB6KZ using a 20W input to a 91m long loop aerial at his home station, whilst

ULSTER TITANIC SOCIETY EVENT

The Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by the Ulster Titanic Society's commemorates the 85th anniversary of the Titanic's completion in Belfast in 1912, with a special event station manned by
TRADE TOPICS

The following information is based upon submissions by suppliers, and is not necessarily endorsed by Ham Radio Today. We cannot be responsible for false or misleading claims by suppliers. Where indicated however, full and unbiased reviews of products are planned for a forthcoming issue of Ham Radio Today. Please kindly mention Ham Radio Today when replying to any items featured - thanks.

PMR CONVERSION HANDBOOK

The long-awaited follow-up to the 'Surplus 2-Way Radio Conversion Handbook' by Chris Lorek G4HCL has arrived!

Chris's second book entitled 'PMR Conversion Handbook' is now available from the Radio Society of Great Britain as well as from radio outlets and bookshops. This book is completely different to his first one, and features conversion details for radios covering the 50, 70, 144, 430 and 1296MHz amateur bands.

Chapter 1 outlines the different PMR systems and some of the legal and technical arrangements you will come across. Chapter 2 describes many of the possible pitfalls and gives sound guidance on buying PMR sets. Chapter 3 focuses on alignment using the minimum of test gear and tools - a SWR bridge and oscilloscope. The remaining three chapters describe the most common mobile, base station and handheld radios available, and how to convert them for amateur use, including aerial and antenna arrangements. Chapter 4 describes many of the possible pitfalls and gives sound guidance on buying PMR sets. Chapter 5 focuses on alignment using the minimum of test gear and tools - a SWR bridge and oscilloscope. The remaining three chapters describe the most common mobile, base station and handheld radios available, and how to convert them for amateur use, including aerial and antenna arrangements. Chapter 6 describes many of the possible pitfalls and gives sound guidance on buying PMR sets. Chapter 7 focuses on alignment using the minimum of test gear and tools - a SWR bridge and oscilloscope. The remaining three chapters describe the most common mobile, base station and handheld radios available, and how to convert them for amateur use, including aerial and antenna arrangements.

The 'PMR Conversion Handbook', ISBN: 1-872309-40-2, is priced at £12.99 for RSGB Members, £15.28 for non-members, plus £1.25 UK postage and packing (£2.00 overseas surface mail). Available from the RSGB, Lambda House, Cranborne Road, Thatcham, Berks RG19 3JE, Tel. 01635 281444. You'll also find it available at specialist radio dealers and bookshops.

WAB SOFTWARE

GW3ROT has produced a program for use with the Worked All Britain Award Group. The program called 'WAB4WIN' is in a Windows environment and we're told it has all the facilities that the keen WAB enthusiasts require. The program costs £15.00 of which £5.00 is given to WAB. Further details of this program can be obtained from Alan Carpenter, GW3ROT, 1312, 13 Dewing Ave, Manoir, Tenby, Pembrokeshire, SA70 7TS Tel. 01834 871604. Please mention Ham Radio Today magazine when enquiring.

KANGA CELEBRATE 10 YEARS

Kanga Products say "Doesn't Time Fly", as much to their surprise 1997 sees them celebrating their 10th year in business. They started supplying kits to the QRP enthusiast in Feb 1987, just one year after the firm's owner Dick GOBPS (our very own 'QRP Corner' columnist) retired from the Kent Fire Brigade. Their latest catalogue details a number of their new kits, including the 'termination wattmeter', an active aerial that fits within a film canister, and a medium wave radio, together with plenty more of the well-known Kanga kits. You can get a copy of their Spring 1997 anniversary catalogue from Dick GOBPS at Kanga Products, Seeview House, Crewe Road east, Folkestone CT18 7EG. Please mention Ham Radio Today magazine when enquiring, or see them on the Web at http://www.kanga.demon.co.uk

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POWERLINE BATTERY ISOLATORS

If you run a mobile rig drawing a high current, and you don’t want to end up with a flat main vehicle battery, the new range of Powerline battery isolators from Merlin equipment may very well be of interest. These allow simple yet effective charging of multiple battery banks from a single alternator or DC power source. As such, they’re very handy for use on vehicles or charging systems which require separate batteries for engine starting and ancillary equipment use.

The battery isolators automatically split the available charge between the multiple battery banks according to their individual requirements. The unit simply mounts on the bulkhead, with cables run to the respective battery posts. In most instances the installations take just 20-30 minutes. The range is available for all electrical installations, with single or twin alternators up to 100A, prices start at £30.00 ex VAT and carriage. For further information, contact Merlin Equipment, Unit 1, Hithercroft Court, Lupton Rd, Wallingford, Oxfordshire, OX10 981, Tel. 01491 824333, Please quote Ham Radio Today magazine when enquiring.

NEW FROM ALINCO

Alinco announce the arrival of their new miniature 2m handheld, the DJ-511. The set measures 55 x 100 x 28mm and is due to sell for around £99.00. Features include 340mW RF output, repeater operation, adjustable retractable aerial, CTCSS tone encoder, two types of scan function and 20 memories. A review is planned for a forthcoming issue (see also the June 96 issue Ham Radio Today for a review of the DJ-S41, which is the 70cm version of this handheld).

Also from Alinco is the new DX-701 SSB transceiver. It is an AM/SSB 100W all band radio with general coverage receive, suitable for both home and mobile use. Priced at around £599.00, features include 100 memories, a microphone speech compressor, RX pre-amp and attenuator, detachable front panel, noise blanker and squelch. GW is an optional extra.

For further details please contact Nevada Communications, 189 London Road, North End, Portsmouth, Hants PO2 9AE, Tel. 01270 663454, please mention Ham Radio Today magazine when enquiring.

SGC HF/VHF ATU

SGC Inc. have just announced the release of their new SG-231, automatic antenna tuner. The SG-231 joins SGC’s series of ‘Smartuners’ which use microprocessor control of PI and L networks to match virtually any loaded antenna transceiver.

The SG-231 features an expanded frequency coverage of 1.600MHz continuously, and complete frequency agility, with no operator intervention. Tuning solutions are stored in a non-volatile memory for fast (10ms) automatic recall. The SG-231 operates with any HF or VHF transceiver having 3-1000W output, requiring only 12V DC and RF connections.

The unit measures 43mm x 264mm x 89mm and weighs 6.6kg. It’s waterproof and is designed to be mounted at the aerial footpoint for maximum efficiency. Common applications include verticals, wire elements, dipole arrays, masts, mobile whips etc. The retail price is US$395 in the US, or contact your radio dealer for more information and local pricing.

MORSUM MAGNIFICAT

The English language edition of MM has just celebrated its 50th issue with a bumper 60-page issue. It was first published in the Dutch language by the late Rinus Hellemons PA0BFN in 1983, and in 1985 a ‘oneoff’ English language issue was produced. Over the last ten years, although only available by postal subscription, MM has become increasingly well-known in Morse circles around the world. It is an acknowledged and respected source of information on all aspects of Morse telegraphy, past, present and future, and it generates a unique enthusiasm amongst its readers. The latest issue features news on the support to keep the amateur radio Morse test, the closure of EFL, no more French coast stations on 500kHz, UK distress watch to close on 31st Dec 1997, Norddeich Radio, the World High Speed Telegraphy Championships 1997, and plenty more including articles on Morse learning methods, the Museum of Submarine Telegraphy, Canadian Railway Telegraph History, and ‘Reining in the Bug’. MM is published bi-monthly and is available by post from GC Arnold & Partners, 9 Wetherby Close, Broadstone, Dorset BH18 8JB, Tel/fax 01202 658474, sample copies cost £2.20 (overseas surface £2.25 or US$5.00), and full subscription rates are £12.00 UK, £12.75 EU, £15.50 rest of world airmail, please mention Ham Radio Today magazine when enquiring.
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CQ FROM G8IYA
EDITORIAL

Do we bury our heads in the sand, or do we take the bull by the horns?

On the front cover of this issue you'll see a handy 2m channel card, which I hope you'll find useful in helping to sort out all the new 2m channel designations which have been decided at the recent IARU conference, for immediate application.

At the very least, when you're having a QSO you'll know what "Please QSY to V44" or "See you on repeater channel RV62" means! On the back of the card there's also a list of the new CTCSS designator letters, as used for repeater access across Europe. Each repeater with CTCSS access facilities (in the UK at least) sends the letter ID of the CTCSS tone it uses along with its callsign ID, and again the card should come in very useful here.

Next month brings a similar card with the new 70cm and 6m simplex and repeater channels, with the forthcoming introduction of 6m repeaters you'll even know what channel F63 is!

NEW EPROMS
On a related note, I know many readers enjoyed seeing the MX295 PMR conversion article in issue 2 this year, and all the MX295 EPROMs supplied (Issue 2) from the Reader's Service following the publication of the article have the channels arranged in both the 'old' and the 'new' channel forms, including every 12.5kHz FM channel allocation. These are still available, as well as similar issue 2 EPROMs for the MX294 and MX296 from the date of this issue, the latter being suitable for use with all band versions of the MX296. Just contact Reader's Offers on 01442 665551 if you'd like to order your update.

ARE WE DYING?
Is ham radio going to die? "Of course not" you'll probably say.

Now, put yourself in the position of a lad or lass of around 14 or 15 years old. If you wanted to communicate around the world with others, would amateur radio have an immediate appeal? First of all, there's the mandatory course, or study period for the mandatory RAE, each taking a few months at least. Then it's a pile of money for a 'black box' transceiver (for VHF/UHF, remember that hardly any Novices go for the Class A1 plus the aerial system for home use, maybe also a pocket TNC or data interface to plug into the home PC with so they can play data communications and picture transmission. No, I'm not going 'over the top', as building a QRP CW transceiver and then trying to find QSOs with it isn't the thing most schoolchildren seem to be wildly excited about, no matter what some of us would like to believe. Just don't shoot the messenger, survey results clearly show that it's usually the experienced amateur who builds his own 'simple' projects. I'd like to think differently as well, because at 16 I built my own 30MHz frequency counter, with 26 integrated circuits, on the dining room table.

An alternative to getting on air on 2m or 70cm at low cost for the beginner is to use a converted PMR rig. But this still needs some degree of work, and some construction and modification experience certainly comes in useful.

If you've megamoney and can afford a legal-limit HF station complete with a mast and triband beam you're in luck. You will work around the world easily. There certainly is a 'magic' feeling in getting through with a simple aerial and 'low power', but these events are the exception rather than the norm; the typical teenager with many other interests to tempt them will usually find something else more interesting. Like plugging a microphone into the sound card on the family PC linked into the 'net, and chatting in full-duplex with other enthusiasts around the world. For a lot less money than a legal-limit HF station that'll even approach doing the same.

So what do we do? Some people say "This isn't amateur radio, I want nothing to do with it". Our potential amateurs of tomorrow then think that ham radio has even less to offer them, and carry on having interesting chats on the 'net with their friends around the world. What would you do if you were their age, in today's world?

TRADITIONAL STANDARDS
There are many arguments for and against keeping with the traditional standards of entry into amateur radio, rather than moving with the times. The question that I've seen asked by others, is "does today's entry route into HF amateur radio act as an incentive, or a disincentive, to the youth of today?". I have little doubt what the answer will be.

Maybe the youth of today want everything handed to them on a plate. OK, then ham radio will die. Unless we do something about it.

Like acknowledging the Internet and having promoted our hobby on it, sooner rather than later. Like showing, on the 'net, how you can get an ex-PMR rig going for next to nothing. Like promptly answering Emails, rather than ignoring the potential of Email. Like promoting the use of computers in the hobby by distributing radio PC software. Hang on, we at Ham Radio Today have been doing this for a while. So do someone else. If you know a budding young upstart, give them this copy of the magazine when you've finished it, or if you're reading this on the magazine bookshelf, go and buy it and do likewise. Or buy an extra copy and do likewise, keeping this one for yourself. Get your local newsagent to stock the magazine, so that youngsters can see it. Or at least the Internet Web site address which is on the front cover!
Chris Lorek G4HCL takes a look at Kenwood’s latest 'middle budget' HF transceiver with 'upper budget' facilities

Kenwood's latest 'middle-priced' HF transceiver, the TS-570D

The current 'buzz-word' amongst amateurs discussing HF rigs is clearly that of DSP - Digital Signal Processing. Connect an in-line DSP unit to the audio output of your receiver and suddenly interfering heterodynes disappear, the noise reduces, and readability can often be much clearer.

Kenwood's latest 'middle-priced' HF transceiver offering, the TS-570D, has just this built in, yet its price is lower than that of the earlier non-DSP transceiver it replaces, the TS-450SAT.

COVERAGE

The TS-570D covers all the amateur HF bands from 1.8MHz to 29.7MHz on transceive, together with a general coverage receiver covering 500kHz-30MHz. A further model, the TS-570S, adds transceive coverage of the 6m (50MHz) band and extends the receive coverage up to 60MHz. The set's transmit power can be varied between 100W and 5W in 5W increments, making it useful for QRP enthusiasts - the minimum power level on many HF transceivers being 10W and thus above the 'official QRP' power level of 5W. All modes of operation are fitted, CW, SSB, AM and FM, plus an FSK selection for frequency shift keying data modes (the maximum transmit power in AM mode is 25W).

For CW enthusiasts there's a built-in CW memory keyer with three 50-character memories. There's also a claimed 'first' with a 'CW auto-tuning' feature. This automatically changes the VFO frequency to exactly match the CW pitch, which you can vary between 400Hz to 1kHz, to the set's transmit sidetone frequency.

DSP

The DSP circuitry fitted is an audio-based system, not an 'IF-based' processor as used on transceivers such as the TS-870. Thus, the selectivity is determined by the IF filters fitted, these being supplied as standard for CW/SSB/FSK (2.2kHz), AM (4kHz) and FM (12kHz), with further optional narrow filters being available should you require. However, the DSP unit has variable audio 'slope tuning' with independently variable high and low cutoffs, and for CW the audio bandwidth can be preset to one of a number of narrow bandwidths for automatic selection.

Two noise reduction modes are provided, NR1 and NR2, one being most suitable for SSB with the other more suited for CW use. In addition, a 'beat cancel' facility can be selected which will automatically remove heterodyne tones from the received audio.

As well as receive audio filtering, the SSB transmit audio can be tailored to suit varying conditions, with upper and lower boost or a 'tailored filter' response for DX working. The set even has two 'personality' settings, A and B, in which you can store the settings you prefer for, say, two operators or for switching between ragchew and DX working.

AUTOMATIC ATU

The TS-570D usefully has an automatic aerial tuner built in as standard, such a unit is often an optional extra on such middle-priced sets. There are also two SO-239 aerial sockets fitted for use with two different aerials, with button selection of these from the front panel. A handy function is that the selection is memorized for you when switching bands, so the set remembers which band you use which aerial for.

An integral speaker is fitted to the top lid, and the transceiver comes supplied with a fist microphone fitted with a pair of up/down buttons. An optional microphone with four additional programmable 'function' buttons is also available. The transceiver needs a external 13.8V DC.
supply, the maximum current requirement being 20.5A. You can of course use your existing high-current shack supply for this, alternatively an optional matching supply, the PS-33, is available from Kenwood. This together with a matching SP-23 external speaker was supplied with the set I tested in this review.

**COMPUTER CONTROL**

As with virtually every HF transceiver nowadays, the TS-570D can also be remotely computer controlled from your PC by using a suitable RS-232 interface. For this, Kenwood can also usefully supply suitable custom-written software, in the form of the ‘RCP-2’ Radio Control Program. I freely downloaded my copy, which was just over 2Mb in compressed format, from the Kenwood Internet site: http://www.kenwood.net

The TS-570D measures 270mm x 96mm x 217mm and weighs 6.8kg. A carrying handle is fitted to the right-hand side of the case, with four small rubber feet on the other side, to help with carrying the set around.

**ON THE AIR**

The thing that struck me when I first switched the set on was the large, clear, orange-backlit LCD panel. The left-hand side section of this is also used to display a multipurpose meter, with an Smeter reading on receive and transmit power level, plus selectable SWR, AIC, or SSB speech processing level in transmit mode.

I found the set’s controls in general were intuitively very easy to use. For the less-used adjustments a ‘multi’ knob is used following a press of the appropriate button, i.e. ‘PWR’ to set the transmit power, ‘KEY’ to set the internal CW keyer speed (adjustable from zero to 100 WPM in 2 WPM steps), ‘MIC’ for microphone gain and so on. The LCD here gives a clear alphanumeric indication of the setting in each case.

Tuning around the bands with the TS-570D brought signals in quite well on both LF and HF bands, although I tended to find I needed the preamplifier switched on on the higher bands - this in any case being the ‘default’ setting of the receiver. Even on 7MHz at night, with my IF band trap dipole connected, I never needed to use the receiver attenuator to overcome intermodulation problems, as I didn’t find any. Users of tower-mounted full-sized three element 40m beams might find I occasionally found a degree of ‘splitting’ on SSB from adjacent stations, and on the narrow-band modes I wished several times for a narrower IF filter. The variable audio filtering fitted in the TS-570D did of course help, but a 500Hz IF filter would have been a lot better!

The ‘beat cancel’ automatic audio notch filter worked very effectively, certainly as well as the W9GR MkIII DSP filter which I usually use in my shack. I found the noise reduction facility useful for this system I can hopefully replicate several different ‘typical’ uses by readers by switching between aerials. On rather ‘busy’ bands using my dipoles, I occasionally found a degree of ‘splitting’ on SSB from adjacent stations, and on the narrow-band modes I wished several times for a narrower IF filter. The variable audio filtering fitted in the TS-570D did of course help, but a 500Hz IF filter would have been a lot better!

The TS-570D can be remotely computer controlled from your PC by using an RS-232 interface. For this, Kenwood can also usefully supply suitable custom-written software.
on very weak 'in the noise' signals as long as there wasn’t too much co-channel QRM.

However, in common with other audio DSP filters I’ve used this did impart a varying amount of hollow-sounding ‘bubbly’ type echo to the resultant signal. For normal SSB and CW listening I tended to use just the variable upper/lower slope filter, where it really did improve readability somewhat in noisy band conditions. On weak signals on the higher bands, and when I quickly tested the TS-570D with my VHF/UHF transverter system on receive, the noise reduction facility did sometimes just make the difference between a very weak ‘tropa’ signal being almost unreadable, and being G4 copy.

TRANSMIT

Reports on my transmitted SSB audio were repeatedly very complimentary. Also, switching in the speech processor didn’t bring any reports whatsoever of ‘switch it off, it sounds horrible’, even in ragchews with strong local stations. Further tests over a number of days running just SW with the processor in resulted in several good reports, even occasionally ‘across the pond’ on 80m and 40m with greyline propagation. I naturally had fewer QSOs on the higher bands due to the present sunspot cycle, and that’s where I did need the full 100W to get through.

The automatic aerial tuning unit operated very quickly, and a short period of mobile operation on 80m with my Gwhip proved the ATU to be most useful for ‘fine-tuning’ the whip, without me needing to repeatedly stop the car to readjust the whip length. It must be remembered that the ATU is only that, a ‘fine-tuner’, and plenty of other nice accessories built in. The internal audio DSP filter is one of these of course, saving you the cost of buying an upmarket accessory DSP filter to otherwise fit in the speaker line to achieve the same performance.

My thanks go to Kenwood Electronics UK (Tel. 01923 816869) for the loan of the review equipment. The TS-570D is available from all Kenwood dealers in the UK, please mention Ham Radio Today magazine when enquiring.

LAB TESTS

The measured SSB transmit intermodulation performance, i.e. the amount of ‘spreading’ of the transmitted signal, was very good - even with 10dB of speech processing switched in it didn’t noticeably degrade, echoing the very good audio reports I received on air. On receive, the blocking performance was quite good, likewise the intermodulation, in the latter case switching the preamplifier out gave an overall performance improvement of a couple of dB or so. The IF selectivity tended to ‘brooden out’ at the -60dB level, this being particularly noticeable with the SSB/CW filter position, hence not really placing the transceiver into the ‘contest grade’. You’ll probably need better filters and/or a better synthesizer for this, but for the transceiver’s price it certainly does offer quite acceptable performance...

LABORATORY RESULTS:

All measurements carried out in SSB mode, with attenuator and preamp off, unless stated.

RECEIVER:

S-METER S9 LEVEL;

<table>
<thead>
<tr>
<th>Freq. MHz</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>61.9µV pd</td>
</tr>
<tr>
<td>3.5</td>
<td>46.4µV pd</td>
</tr>
<tr>
<td>7.0</td>
<td>50.4µV pd</td>
</tr>
<tr>
<td>10.1</td>
<td>51.9µV pd</td>
</tr>
<tr>
<td>14.0</td>
<td>70.1µV pd</td>
</tr>
<tr>
<td>18.1</td>
<td>69.7µV pd</td>
</tr>
<tr>
<td>21.0</td>
<td>58.0µV pd</td>
</tr>
<tr>
<td>24.9</td>
<td>45.3µV pd</td>
</tr>
<tr>
<td>28.5</td>
<td>47.4µV pd</td>
</tr>
<tr>
<td>29.5</td>
<td>47.9µV pd</td>
</tr>
</tbody>
</table>

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;

<table>
<thead>
<tr>
<th>Preamp On</th>
<th>Preamp Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/20kHz spacing</td>
<td>76.0dB</td>
</tr>
<tr>
<td>20/40kHz spacing</td>
<td>93.4dB</td>
</tr>
<tr>
<td>50/100kHz spacing</td>
<td>89.4dB</td>
</tr>
<tr>
<td>100/200kHz spacing</td>
<td>88.5dB</td>
</tr>
</tbody>
</table>

SELECTIVITY:

<table>
<thead>
<tr>
<th></th>
<th>CW/SSB</th>
<th>AM</th>
<th>FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3dB</td>
<td>2.4kHz</td>
<td>5.1kHz</td>
<td>12.4kHz</td>
</tr>
<tr>
<td>-6dB</td>
<td>4.3kHz</td>
<td>6.6kHz</td>
<td>13.9kHz</td>
</tr>
<tr>
<td>-10dB</td>
<td>8.4kHz</td>
<td>9.3kHz</td>
<td>15.2kHz</td>
</tr>
<tr>
<td>-40dB</td>
<td>10.2kHz</td>
<td>10.2kHz</td>
<td>16.0kHz</td>
</tr>
<tr>
<td>-60dB</td>
<td>16.3kHz</td>
<td>16.3kHz</td>
<td>18.1kHz</td>
</tr>
</tbody>
</table>

BLOCKING:

Measured on 21.4MHz as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 0dB degradation in 12dB SINAD on-channel signal;

<table>
<thead>
<tr>
<th>Preamp On</th>
<th>Preamp Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>+/-50kHz</td>
<td>96.0dB</td>
</tr>
<tr>
<td>+/-100kHz</td>
<td>101.3dB</td>
</tr>
<tr>
<td>+/-200kHz</td>
<td>104.9dB</td>
</tr>
</tbody>
</table>
### Sensitivity:

Input level in µV pd required to give 12dB SINAD:

<table>
<thead>
<tr>
<th>Freq. MHz</th>
<th>Preamp On CW/SSB</th>
<th>Preamp Off CW/SSB</th>
<th>Preamp On AM</th>
<th>Preamp Off AM</th>
<th>Preamp On FM</th>
<th>Preamp Off FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>0.17</td>
<td>0.45</td>
<td>0.47</td>
<td>0.30</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>0.10</td>
<td>0.35</td>
<td>0.43</td>
<td>0.23</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td>0.14</td>
<td>0.38</td>
<td>0.38</td>
<td>0.26</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>10.1</td>
<td>0.16</td>
<td>0.37</td>
<td>0.39</td>
<td>0.26</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>14.0</td>
<td>0.20</td>
<td>0.52</td>
<td>0.51</td>
<td>0.35</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>18.1</td>
<td>0.18</td>
<td>0.52</td>
<td>0.46</td>
<td>0.30</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>21.0</td>
<td>0.15</td>
<td>0.47</td>
<td>0.41</td>
<td>0.27</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>24.9</td>
<td>0.08</td>
<td>0.35</td>
<td>0.22</td>
<td>0.14</td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td>28.5</td>
<td>0.10</td>
<td>0.38</td>
<td>0.24</td>
<td>0.16</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>29.5</td>
<td>0.09</td>
<td>0.36</td>
<td>0.25</td>
<td>0.16</td>
<td>0.61</td>
<td></td>
</tr>
</tbody>
</table>

### Image Rejection:

Increase in level of signal at the 1st and 2nd IF image frequencies, and the 1st and 2nd IFs (73.05MHz and 8.83MHz respectively), over level of on-channel signal, giving identical 12dB SINAD signal:

<table>
<thead>
<tr>
<th>Freq. MHz</th>
<th>Image Rej. 1st IF</th>
<th>Image Rej. 2nd IF</th>
<th>Image Rej. 1st IF</th>
<th>Image Rej. 2nd IF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>108.9dB</td>
<td>&gt;120dB</td>
<td>93.1dB</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>10.1</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>14.0</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>18.1</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>21.0</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>24.9</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>28.5</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
<tr>
<td>29.5</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td>&gt;120dB</td>
<td></td>
</tr>
</tbody>
</table>

### Harmonics:

<table>
<thead>
<tr>
<th>Freq. MHz</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>-72dB</td>
<td>-78dB</td>
<td>-78dB</td>
<td>-71dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>3.5</td>
<td>&lt;80dB</td>
<td>-79dB</td>
<td>&lt;80dB</td>
<td>&lt;74dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>7.0</td>
<td>-76dB</td>
<td>-63dB</td>
<td>-80dB</td>
<td>-72dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>10.1</td>
<td>&lt;80dB</td>
<td>-60dB</td>
<td>&lt;80dB</td>
<td>-70dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>14.0</td>
<td>&lt;80dB</td>
<td>&lt;60dB</td>
<td>&lt;80dB</td>
<td>-73dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>18.1</td>
<td>&lt;80dB</td>
<td>&lt;60dB</td>
<td>&lt;80dB</td>
<td>&lt;72dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>21.0</td>
<td>&lt;80dB</td>
<td>&lt;60dB</td>
<td>&lt;80dB</td>
<td>&lt;72dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>24.9</td>
<td>&lt;80dB</td>
<td>&lt;60dB</td>
<td>&lt;80dB</td>
<td>&lt;72dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>28.5</td>
<td>&lt;80dB</td>
<td>&lt;60dB</td>
<td>&lt;80dB</td>
<td>&lt;72dB</td>
<td>&lt;80dB</td>
</tr>
<tr>
<td>29.5</td>
<td>&lt;80dB</td>
<td>&lt;60dB</td>
<td>&lt;80dB</td>
<td>&lt;72dB</td>
<td>&lt;80dB</td>
</tr>
</tbody>
</table>

### SSB IMD Performance:

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

<table>
<thead>
<tr>
<th>ALC Onset</th>
<th>3rd Order</th>
<th>5th Order</th>
<th>7th Order</th>
<th>9th Order</th>
<th>11th Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>28dB/31dB</td>
<td>-43dB/-41dB</td>
<td>-52dB/-54dB</td>
<td>-54dB/-60dB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### S-Meter Linearity:

Measured at 14.25MHz:

<table>
<thead>
<tr>
<th>Indication</th>
<th>Sig. Level</th>
<th>Rel. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>3.70µV pd</td>
<td>-26.1dB</td>
</tr>
<tr>
<td>S3</td>
<td>5.44µV pd</td>
<td>-22.8dB</td>
</tr>
<tr>
<td>S5</td>
<td>9.40µV pd</td>
<td>-18.1dB</td>
</tr>
<tr>
<td>S7</td>
<td>25.7µV pd</td>
<td>-19.3dB</td>
</tr>
<tr>
<td>S9+20dB</td>
<td>842µV pd</td>
<td>+21.0dB</td>
</tr>
<tr>
<td>S9+40dB</td>
<td>8.19mA pd</td>
<td>+40.7dB</td>
</tr>
<tr>
<td>S9+60dB</td>
<td>67.6mA pd</td>
<td>+59.1dB</td>
</tr>
</tbody>
</table>

### Transmitter:

<table>
<thead>
<tr>
<th>Freq. MHz</th>
<th>Min. Power</th>
<th>Max. Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>6.2W/5.0A</td>
<td>118W/16.0A</td>
</tr>
<tr>
<td>3.5</td>
<td>6.1W/5.1A</td>
<td>115W/16.7A</td>
</tr>
<tr>
<td>7.0</td>
<td>6.0W/4.9A</td>
<td>113W/15.4A</td>
</tr>
<tr>
<td>10.1</td>
<td>5.8W/5.2A</td>
<td>111W/16.8A</td>
</tr>
<tr>
<td>14.0</td>
<td>5.9W/5.2A</td>
<td>112W/16.6A</td>
</tr>
<tr>
<td>18.1</td>
<td>5.7W/5.0A</td>
<td>108W/15.5A</td>
</tr>
<tr>
<td>21.0</td>
<td>5.5W/4.7A</td>
<td>110W/15.9A</td>
</tr>
<tr>
<td>24.9</td>
<td>5.6W/4.9A</td>
<td>108W/16.0A</td>
</tr>
<tr>
<td>28.5</td>
<td>5.5W/5.0A</td>
<td>108W/16.2A</td>
</tr>
<tr>
<td>29.5</td>
<td>5.6W/5.0A</td>
<td>108W/15.8A</td>
</tr>
</tbody>
</table>

### TX Power and Current Consumption:

Connected to stabilised 13.2V DC using supplied DC lead

<table>
<thead>
<tr>
<th>Freq. MHz</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>6.2W/5.0A</td>
<td>118W/16.0A</td>
</tr>
<tr>
<td>3.5</td>
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<td>115W/16.7A</td>
</tr>
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<td>7.0</td>
<td>6.0W/4.9A</td>
<td>113W/15.4A</td>
</tr>
<tr>
<td>10.1</td>
<td>5.8W/5.2A</td>
<td>111W/16.8A</td>
</tr>
<tr>
<td>14.0</td>
<td>5.9W/5.2A</td>
<td>112W/16.6A</td>
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<tr>
<td>18.1</td>
<td>5.7W/5.0A</td>
<td>108W/15.5A</td>
</tr>
<tr>
<td>21.0</td>
<td>5.5W/4.7A</td>
<td>110W/15.9A</td>
</tr>
<tr>
<td>24.9</td>
<td>5.6W/4.9A</td>
<td>108W/16.0A</td>
</tr>
<tr>
<td>28.5</td>
<td>5.5W/5.0A</td>
<td>108W/16.2A</td>
</tr>
<tr>
<td>29.5</td>
<td>5.6W/5.0A</td>
<td>108W/15.8A</td>
</tr>
</tbody>
</table>
The Radio Receiver Trainer contains nine receiver building blocks and a comprehensive training manual.

Simply connect the building blocks to build AM, SW, Superhet and Direct Conversion receivers. Decode SSB, CW and FM! Use proven building blocks to develop and test your own designs.

Full technical support and advice given

Pricing:
- Complete: £129.00
- Kit: £89.00
  (Kit excludes case & headphones)

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Building Blocks:
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- RF Oscillator
- Mixer
- IF Filter
- IF Amplifier
- AM Detector
- Beat Frequency Oscillator
- Audio Filter
- Audio Amplifier

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Cheilmsford Road Ind Est
Great Dunmow Essex CM6 1XG
E-mail cms@dial.pipex.com
Phone 01 371 875 644

World Radio History
ON TEST: RADIO SHACK PRO-2045

The Consultant Technical Editor finds plenty of active frequencies using this set's 'auto-store' mode.

I believe Radio Shack must have been listening carefully to the needs of scanners users. Why? Their latest production of the PRO-2045 is one answer to this. It has plenty of useful up-market features for base station operation, which combined with its wide VHF/UHF frequency coverage could make it a rather tempting proposition to have at your listening post. It was only after having a read of the manual, and using the set for even just a few minutes, that I realised this wasn't 'just another low-cost plastic scanner'. Instead, it was a rather powerful monitoring tool.

COVERAGE

The PRO-2045 covers 68-88MHz, 108-174MHz, 216-512MHz and 806-1000MHz. It can receive both narrowband FM and AM modes on any frequency, although it usefully automatically 'defaults' to AM on the VHF and UHF airband ranges (108-137MHz and 225-400MHz respectively). Fixed tuning steps of 12.5kHz are used for these airband ranges and on the UHF ranges, however fixed 5kHz tuning steps are used otherwise. 200 memory channels are available, arranged in 10 banks of 20 channels each, plus 10 'monitor' memories. A large rotary knob with soft click-steps can be used as a 'VFO' tuning knob as well as for switching between memory channels.

AERIAL

A telescopic whip terminated in an angled BNC connector to mate with the rear panel aerial socket is provided with the scanner for temporary use, although most hobbyists will probably connect a better-sited external aerial to the set. For this, Radio Shack have usefully incorporated a switchable internal attenuator, to help reduce any problems due to strong signal overload.

SEARCHING

The 'normal' search speed of the PRO-2045 is specified as being up to 100 steps per second. However, a fast 'Hypersearch' mode, which you can switch in when you're using 5kHz steps on FM, claims a staggering search rate of up to 300 steps per second! Even the normal 'memory scan' mode is capable of up to 50 steps per second. This thing's no slowcoach. To speed up the scan rate, the set can, if you wish, automatically scan your stored channels in a given memory bank in frequency order rather than in memory channel order, thus saving the set's internal synthesizer 'hunting' up and down between channels and thereby giving a faster overall scan rate.

AUTO STORE

To find new active channels, an 'auto store' mode lets the scanner search away between any two frequencies you've entered. It then automatically stores the active channels it finds into any number of memory banks you specify - it also 'remembers' what's already been stored and doesn't duplicate the frequencies.

SKIPPING CHANNELS

A 'search skip' facility also lets A rotary 'tuning' knob can be used for channel selection. A 3.5mm jack socket is provided on the front panel for headphone use, this can also be used for plugging in an amplified extension speaker.

The PRO-2045 has a wide range of useful facilities accessible from the front panel.

The PRO-2045 measures 57mm x 235mm x 205mm and weighs 960g. A pair of hinged plastic feet at the front of the case lets you tilt up the front of the set for table-top use.
A telescopic whip is supplied for local use, this plugs into the rear panel BNC connector.

The PRO-2045 measures 57mm x 23.5mm x 20.5mm and weighs 960g.

IN USE

My first operation when using the receiver, just like a 'child with a new toy', was to use the automatic search feature to initially fill some of the scanner's channels with active frequencies. After programming in the lower and upper frequencies for a 1MHz subband on VHF, within a few minutes it had found, and automatically stored for me, quite a number of active channels - very useful! A few extra bands followed, auto-stored in different channel banks, and it was well on its way to scanning many strong signals in my area. I also found the set would unfortunately sometimes pick up the lower, and upper, 12.5kHz increments as well, with these unwanted 'offset' frequencies being quite distorted. Thankfully the 'attenuator' facility helped here, although it shouldn't really have been necessary.

TECHNICALITIES

A triple conversion heterodyne circuit is used to give good image rejection in the set. Here, the first IF is 380.7MHz (254.4MHz at UHF), the 2nd IF being 10.85MHz with a 3rd IF of 450kHz. I measured the image rejection as being reasonable but not exceptional - I'd have expected a somewhat better 2nd image at VHF, although as you'll have read I didn't find any problems on air. The intermodulation and far-off blocking rejection performance was quite good, likewise the 25kHz adjacent channel rejection. However the 12.5kHz rejection was rather poor, explaining the effects found when I used the scanner on air.

CONCLUSIONS

The PRO-2045 provides a number of very useful operating features when compared with other scanners from the same 'stable'. I found the scanner most enjoyable, easy-to-use and having excellent performance in terms of strong signal rejection was particularly good. Switchable AN/FM across the frequency range however is a big 'plus'. The fixed 5kHz steps on VHF were rather a nuisance, in my mind this is the main operational limitation of the set although it still gave good reception with the unwanted 'offset'.

Our thanks go to Link Electronics in Peterborough (Tel. 01733 345731) for the loan of the receiver - please mention Ham Radio Today magazine when enquiring.
LABORATORY RESULTS:
All measurements taken at 145MHz, NFM, unless stated.

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**SENSITIVITY:**
Input signal level in µV pd required to give 12dB SINAD.

**SQUELCH SENSITIVITY:**
Level of signal required to raise receiver squelch
Threshold: 0.29µV pd (9dB SINAD)
Maximum: 0.59µV pd (16dB SINAD)

**ADJACENT CHANNEL SELECTIVITY:**
Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal:
- +12.5kHz: 7.7dB
- -12.5kHz: 9.9dB
- +25kHz: 51.2dB
- -25kHz: 51.0dB

**INTERMODULATION REJECTION:**
Measured as increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product:
- 25/50kHz spacing: 61.5dB
- 50/100kHz spacing: 62.3dB

**IMAGE/IF REJECTION:**
Difference in level between unwanted and wanted signal levels, each giving 12dB SINAD on-channel 145MHz FM signals:

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<tr>
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<th>70MHz</th>
<th>145MHz</th>
<th>435MHz</th>
<th>900MHz</th>
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<tr>
<td>1st Image</td>
<td>31.4dB</td>
<td>57.0dB</td>
<td>50.6dB</td>
<td>&gt;100dB</td>
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<tr>
<td>2nd Image</td>
<td>27.7dB</td>
<td>57.9dB</td>
<td>43.0dB</td>
<td>32.0dB</td>
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<tr>
<td>3rd Image</td>
<td>73.3dB</td>
<td>79.6dB</td>
<td>98.6dB</td>
<td>97.2dB</td>
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</table>

**MAXIMUM AUDIO OUTPUT:**
Measured at headphone socket, 1kHz audio at the onset of clipping (10% distortion), 8 ohm resistive load: 11.7mW RMS

**BLOCKING:**
Measured as increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal:
- +100kHz: 51.9dB
- +1MHz: 82.6dB
- +10MHz: 96.6dB
Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

**£49.95**
+ £3.00 p&p

**New DX-394**

**MAJOR FEATURES**

- Frequency Coverage
  - LW 150 - 509.9kHz
  - MW 510 - 1729.9kHz
  - SW 1.73 - 29.9999MHz

- Fine Tune
  - Fine tunes the reception signal, especially when you tune to SSB and CW

- **Step ▲, Step ▼**
  - Selects the 0.1, 1, 5, or 10 (9) kHz tuning frequency step sequentially

- **Band**
  - Selects LW (150-509.9kHz), MW (510-1729.9kHz), or SW (1.73-29.9999MHz) sequentially

- **LCD**
  - Large LCD display with LCD signal strength meter

**SALE PRICE ONLY £249.99**
+ £10 p&p

**ROBERTS R861 Short Wave Receiver**

**FM-STereo/MW/LW/SW DIGITAL PLL RDS WORLD RADIO**

- AM coverage 153kHz-29,999MHz continuous
- RDS-Auto clock set
- SSB (LSB/USB) 40Hz tuning steps
- Dual conversion if on SW
- FM stereo via earphone socket
- Direct frequency input
- Rotary tuning
- Auto scan
- Memory recall
- 307 memory presets
- 29 page SW station name memory
- Home/world time display
- Adjustable sleep timer
- AM RF gain control
- Soft carrying pouch
- AC adaptor
- Shortwave aerial
- Earphones
  - SIZE: 210 x 127 x 38mm (8.25 x 5.0 x 1.5in)
  - WEIGHT: 850g (30oz) without batteries.

**£199.00 + £5 P&P**

**FREE SW ANTENNA FREE PSU FREE SW FREQUENCY GUIDE**
**PRO 2042 BASE SCANNER**

(1000 CHANNEL WITH HYPERSCAN) JUST £359.99 WITH ANTENNA AND GUIDE OR £299.99 ALONE INC P&P*

- 1000 memory channels (100 channels x 10 banks)
- 10 limit search banks
- 50 channels/sec & 50 steps/sec scanning speeds
- Large orange backlit LCD display
- Rotary or keypad frequency control.

**Size:** 232mm W x 210mm D x 90mm H.

**Modes:** AM, FM and WFM.

**Step sizes:** 5kHz, 12.5kHz and 50kHz (WFM).

**COMES WITH TELESCOPIC ANTENNA AND OWNERS MANUAL.**

We are offering with each purchase of the PRO 2042 at a cost of £359.99 inc P&P*, both a copy of the 5th Edition UK Scanning Directory (RRP £18.50) and a choice of either our Skyscan DX V1300 discone antenna (RRP £49.95) or our Skyscan Desk 1300 discone antenna (RRP £49.00).

To take advantage of this special offer or for more information, call either Rod, Richard or Mary on:

**0121-460 1581 or 0121-457 7788**

Demand is likely to be high, and orders will be fulfilled strictly on a first come first served basis (subject to stock availability).

**Frequency Coverage**

<table>
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<th>Step</th>
<th>Mode</th>
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<td>5kHz</td>
<td>AM</td>
<td>137.00-224.995</td>
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<td>30.000-87.495</td>
<td>5kHz</td>
<td>FM</td>
<td>225.000-400.000</td>
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<td>87.500-107.995</td>
<td>50kHz</td>
<td>WFM</td>
<td>400.005-520.000</td>
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<td>108.00-136.995</td>
<td>12.5kHz</td>
<td>AM</td>
<td>760.000-1300.000</td>
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**QUANTEK FC2000 FREQUENCY COUNTER**

**SPECIFICATIONS**

| Frequency range: | 1MHz to 2.4GHz |
| Sensitivity (Typical): | 800μV @ 10MHz, 50μV @ 30MHz, 22μV @ 150MHz, 6μV @ 450MHz, 1μV @ 850MHz |
| Maximum Input Power: | +15dB (50mW), 1.26V RMS |
| Input impedance: | 50Ohm |
| Timebase stability: | +/-1ppm 25-35°C |
| Timebase ageing: | 1ppm per year typical |

| Timebase accuracy: | +/- 1 count in LSD |
| Gate time: | Fast 0.25 seconds for 1kHz resolution, Slow 2.5 seconds for 100Hz resolution |
| Power: | Internal nicad batteries 4 x AA, 700mAhr or mains adaptor/charger, 240VAC input, 12VDC output, centre positive |
| Size: | 100 x 87 x 28mm |

Specifications subject to change without notice

**RRP £135.95**

**PRICE £79.95**

**£5 P&P**

*Free P&P applies to mainland UK deliveries only.

This sensitive “nearfield” counter is ideal for on-air frequency checking. Simply hold the counter near to the transmitter to get an accurate frequency reading. Comes complete with nicads, AC charger and aerial. An ideal frequency counter for service engineers or surveillance personnel who need an accurate handheld counter.

**The UK Scanning Directory**

5th Edition

**SRP Radio Centre**

1686 Bristol Road South, Rednal, Birmingham B45 9TZ

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Fax: 0121-457 9009
Are you in the market for an easy-to-use handheld scanner but don't want to pay the Earth? If so, you're in the company of a lot of others!

The PRO-70 is aimed at the 'beginner' or 'second scanner' buyer, and its wide availability will naturally make it a tempting choice. Let's see what it's capable of...

SEARCHING

The scanner offers a frequency coverage of 68-88MHz, 137-174MHz and 380-512MHz, with a reception mode of FM. As such it covers the popular amateur VHF/UHF bands of 4m, 2m and 70cm, the VHF marine band, and virtually every PMR (Private Mobile Radio) band used in the UK. If you’re an aircraft enthusiast however you'll need to pay a bit more for a different Realistic model, from Realistic, as the PRO-70 doesn't cover the VHF or UHF airband ranges.

The set has ten pre-stored 'search' ranges available, making it easy to find new active frequencies without a lot of button pushing or needing reference to a frequency directory. The search bands are:

0; 68-75MHz
1; 75-82MHz
2; 82-88MHz
3; 137-144MHz
4; 144-148MHz
5; 148-174MHz
6; 380-420MHz
7; 420-450MHz
8; 450-470MHz
9; 470-512MHz

Once the set has found an active channel you're interested in, you can store this easily into one of the 50 available memory channels in the set for subsequent scanning, or into the quick-access 'monitor' memory channel provided while you're deciding one way or the other.

FREQUENCY STEPS

The frequency increments the scanner uses are 5kHz steps on VHF and 12.5kHz steps on UHF. You can also directly enter any frequency manually within these ranges for monitoring, or to commence a search up or down from that frequency with a further press of the 'up' or 'down' arrow buttons on the keypad. The PRO-70 can search at up to 50 steps per second, and at up to 25 channels a second in memory mode.

MEMORIES

Once you've searched around for a while, you'll no doubt have a number of memory channels programmed in, and you can subsequently scan through any selection of these as you wish with a quick press of the 'scan' button on the set's keypad. Any number of the channels can be locked out of the scan, the set will then automatically skip these in scan mode. Also, a two-second "delay" can be programmed on a channel-by-channel basis. Here, the receiver pauses for a couple of seconds after the squelch closes to listen for a reply on that frequency, before it starts scanning through the channels again.

POWER

The PRO-70 comes supplied with a battery case holding 6 AA s and cells, and you can use either dry cells or nicads here, an optional nicad pack.
also being available. The set’s liquid crystal display, besides indicating the frequency, memory channel etc., also has a small 'Batt’ icon which lets you know when your batteries are getting low. As an alternative, you can plug in an external 9V DC supply via an optional lead, this uses a coaxial connector with the outer connection as positive, automatically cutting out the internal battery pack when plugged in.

The PRO-70 measures 171 x 62 x 40mm and weighs 229g. It comes supplied with a plastic belt clip, a set-top helical aerial and a user instruction book.

ON THE AIR

It took me no longer than a few seconds to be receiving my first signals with the scanner, I found it really was easy very to use!

I found the pre-programmed 'search’ ranges especially easy to use. However, after some time I did find the use of these to be a bit limited if, for example, I just wanted to scan through a small frequency segment, like the FM sections of the 2m or 70cm amateur bands. But then, if there was a facility for setting lower and upper scan limits this would easily detract from the 'simple to use' nature of the set. However, scanning upwards from a programmed channel to search for activity was extremely easy. Programming the memory channels, either from the keypad or in ‘search’ mode, was also very easy. I found a useful facility of the set here was that it would automatically tell me on the LCD if I tried to program a duplicate frequency into a further memory channel, thus saving ‘duplicate scanning’.

When using the scanner out and about portable with the set-top aerial, I found the receiver was a little less sensitive than a typical amateur handheld or that of some other higher-priced scanners. But then it didn’t have the problems of overload I’ve found on these either. This was very clearly demonstrated when I used the set at home, connected to my rooftop-mounted VHF/UHF vertical aerial. Now why, whilst listening to my local 2m channels, wasn’t I getting the VHF paging breakthrough I usually expect on handheld receivers? For a quick test I substituted the PRO-70 with a ‘big-name’ handheld scanner, costing several hundreds of pounds, tuned to the same 2m channel - the latter just ‘fell over’ from the unwanted signals in my area. Reconnect the PRO-70 and I could hear the signals I wanted, with no interference whatsoever!

On the 'downside', I found the rejection of strong adjacent channel signals, i.e., 12.5kHz away, not too good. Also, the 5kHz channel steps on VHF were rather a 'pain' in use, in the UK we use 12.5kHz minimum steps on the frequency ranges covered by the PRO-70. The effective search rate here is rather slower than if 12.5kHz or 25kHz steps could be used, and I also sometimes found the set would halt in 'search' mode 5kHz lower than the actual signal. However its intended primary market of North America coupled with the economic price is probably the reason for these fixed steps.

LABORATORY TESTS

My measured lab results show that the strong signal handling, especially the intermodulation (one of the main causes of unwanted breakthrough problems in busy RF areas) was very good for such a scanner. A quick glance inside the set shows that it doesn’t use sophisticated or extensively screened circuitry, it must just be down to good circuit design. The blocking was also quite good at separations of 1MHz or greater, although as I found on-air the close-in selectivity was a little on the 'wide' side, i.e. +/- 12.5kHz signals weren’t rejected too well although the 25kHz rejection was quite adequate.

CONCLUSIONS

The PRO-70 is economically priced, it offers quite good on-air performance in terms of strong signal rejection for its cost, and it’s very easy to use. It doesn’t of course offer the flexibility or sophistication of higher-priced sets, but it covers the most-often used two-way VHF/UHF radio bands on narrowband FM and should offer plenty of enjoyable listening. It’s wide availability will I’m sure make it a very popular ‘first handheld’ scanner for many readers.

My thanks go to Link Electronics in Peterborough [Tel. 01733 345731] for the loan of the review scanner - please mention Ham Radio Today magazine when enquiring.
LABORATORY RESULTS:

All measurements taken at 145MHz, NFM, unless stated, with set powered from a set of fully charged AA nicads.

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<tr>
<td>512MHz</td>
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SENSITIVITY;

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

SQUELCH SENSITIVITY;

Level of signal required to raise receiver squelch

Threshold: 0.30µV pd (10dB SINAD)
Maximum: 0.50µV pd (21dB SINAD)

ADJACENT CHANNEL SELECTIVITY;

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

+12.5kHz: 8.7dB
-12.5kHz: 10.2dB
+25kHz: 56.8dB
-25kHz: 57.5dB

INTERMODULATION REJECTION;

Measured as increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product;

25/50kHz spacing: 62.7dB
50/100kHz spacing: 63.4dB

IMAGE/IF REJECTION

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

<table>
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MAXIMUM AUDIO OUTPUT

Measured at speaker/earphone socket, 1kHz audio at the onset of clipping (10% distortion), 8 ohm resistive load;

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Bill Robertson explains how mobile radio users get wide coverage on a single VHF/UHF channel, and offers a list of frequency updates.

To achieve wide-area two-way radio coverage, trunked radio systems are one answer, and these have been detailed in these pages in the past. However, prior to the advent of the latest microprocessor controlled digital signalling radios, an alternative system was used, and this is still extensively used throughout the UK by county-wide agencies and national motoring organisations. It’s called quasi-synchronous operation, sometimes called “simulcast” for short.

The idea is that, throughout the two-way radio coverage area, a single two-frequency radio channel is used, with the PMR base stations usually operating in duplex mode on the two-frequency channel and the mobile/portable users operating simplex. To obtain the required coverage area, multiple base station transmitter and receiver sites are used, all operating on the same channel. But for this, a few extra control features are needed.

Take a look at the accompanying diagram, and you’ll see that each base station site has a well-defined coverage area, some of which naturally overlap. In these ‘overlap’ areas, if the mobile or portable radio users hears the signal from two transmitters, there will be a beat note, dependent upon the usually slight frequency difference between the two transmitters. In an uncontrolled situation, if they are 500Hz apart, a beat note of 500Hz will be heard, if they’re 250Hz apart, a beat note of 250Hz will result. None of which helps towards good communications!

So, the precise frequency of each transmitter is carefully controlled, to be a small but accurately defined ‘offset’ from it neighbour. This offset is typically 5-6Hz in a VHF system, and 3Hz on UHF systems. If a mobile station is located in the ‘overlap’ coverage area of two of the transmitters, the user would experience a beat ‘note’ at this frequency, which in practice would be a slow ‘flutter’ in the received signal strength, i.e. 3 fades per second on a typical UHF system, due to the slowly changing phase difference at the received signals. This would be the effect if the mobile station was perfectly stationary (or for example if a receiver or scanner connected to a fixed external aerial was used). If the receiver was moving about, the phase effects would typically be far less noticeable. This will hopefully explain the wide-area coverage that’s reported on some systems, and the resultant ‘signal flutter’ on the signals from these systems to a fixed receiving site.

“But what of the multiple receiver sites?”, the technically-adept reader might ask. This is where the clever bit comes in, as usually the receiver audio from all the sites is fed to a signal ‘voting’ unit. Here, the relative signal strength from each receiver site is electronically assessed, and only the audio path from the site having the best received signal is passed onto the central control system, which may then (if wished by the system operator) be relayed to all transmitter sites. To retain accurate audio from each of the transmitter sites, individual ‘phase delays’ are incorporated in the central distribution system to ensure the same audio phase from each transmitter site, irrespective of the individual link characteristics.

Richard Davis says that on UHF frequencies around 433MHz, he hears a rhythmic ‘drumming’ noise, although it doesn’t sound like typical packet radio. He asks is it a data mode, and if so who uses it and can it be decoded?

This signal is likely to be the commercial data-over-radio service run by RAM in the UK. This sounds just like a ‘crunch, crunch’ noise, and the system is used by companies for transmission of all kinds of data over the national network. The actual data ranges from automatic despatch reporting, remote bar-code reading and stock control, spare parts ordering, even share prices and customer orders. In view of the type of data being transmitted, you’ll undoubtedly find a relatively secure algorithm is used by the service providers, so casual reception would be a rather difficult affair. If you’d like more information on the capabilities of the system, RAM have a home page on the web at http://www.ram.co.uk/

A query from James asks if it’s possible to decode POCSAG data from pagers and if any PC software is available for this. The answer here is “yes”, there’s already been the ‘PD’ software for DOS, and the ‘Semasoft’ program for Windows to my knowledge. Both of these have been featured in the magazine’s regular software offers over the last few months.

A message from Brian says that he’s seen an advertisement for an active aerial, available in kit form or ready-built from Maplin Electronics, which covers the very wide range of 1MHz to 2GHz. Brian asks about the performance, thinking that overload and
intermodulation may be a problem, and also wonders what it would be like at HF.

Any aerial, if used with a wide-band amplifier, will of course amplify the signal received at the aerial before passing it to the scanner. If the amplifier is at the aerial location itself, rather than down next to your receiver, it can help in overcoming feeder loss at the upper frequency end and thus improve the overall receive sensitivity. However if the overall gain of the system is too high, then you will certainly increase the risk of having strong signal overload problems with your receiver. On the HF bands, as the aerial is usually physically much smaller than a 'full size' wire dipole, you'll often find the performance quite reasonable for the size when used with a wide-coverage scanner, although you'll need to be careful on the HF broadcast bands where high-powered signals are the 'norm'.

LATEST SCANNER FREQUENCY UPDATES

I'm frequently asked for new VHF/UHF frequency lists and updates for various areas, and I'd be very pleased to publish these here if the space allowed. However this could easily fill several pages each month, and a shorter listing could possibly only be of interest to a small number of readers. In the past there used to be printed lists 'doing the rounds', to supplement published frequency directories. Now we have electronic means, with computer files commonly swapping between hands (and modems). I've managed to collect a large number of such frequency update lists in file form complete with schedules. As well as this, 13,800 utility stations from around the world are also detailed together with introduction sections on broadcast and utility listening, equipment, and modulation types. An excellent 'call round' HF reference guide for the serious listener.

Also from the same publishers comes the '1997 Super Frequency List on CDROM', which this year also includes 11,500 broadcast entries together with 13,800 special frequencies from the Utility Radio guide, together with 14,100 formerly active frequencies. It's in Windows format, with search routines to help you instantly find the information you're looking for. Superb if you use your PC in your listening post.

SHORT WAVE FREQUENCY GUIDES

A collection of the latest frequency guides from Klingenfuss publications have recently become available.

The '1997 Guide to Utility Radio Stations' has gained a solid reputation over the years as being the definitive information source on frequencies used by these HF services, including aeronautical, diplomatic, maritime, meteorological, military, police, press, and the like. The latest issue includes no less than 13,800 frequencies with 10,600 new updates, including those used in recent overseas conflicts. A comprehensive reference section also lists call signs, abbreviations, modulation types, codes, and plenty more. In my opinion, an indispensable book if HF utility listening is your interest.

The '1997 Shortwave Frequency Guide' will be of interest to those who are also interested in HF broadcasters, including clandestine stations, with 11,500 entries arranged in an easy-to-use form complete with schedules. As well as this, 13,800 utility stations from around the world are also detailed together with introduction sections on broadcast and utility listening, equipment, and modulation types. An excellent 'call round' HF reference guide for the serious listener.

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The Shortwave Frequency guide has 484 pages, ISBN 3-924509-57-3 and sells at £23, the Utility Stations Guide having 588 pages, ISBN 3-924509-97-2 and selling at £36, with the CDROM at £27. You'll find them available or to order at your specialist radio dealer or bookshop, or you can contact the publishers direct, Klingenfuss in Germany, Tel. +49 7071 62830, Fax +49 7071 606849, Email 101550.514@compuserve.com. Please mention Ham Radio Today magazine when enquiring. My thanks go to Klingenfuss for the provision of the review copies.

MPT1327 TRUNKING DECODER

I recently came across what's described as the "World's First low cost MPT1327 trunking decoder aimed at the hobbyist". Although the decoder is being produced in Australia (where one state's Emergency services use an MPT1327 trunking network) it could also be used in the UK where MPT1327 trunking is used by the Band 3 trunked systems, plus many Gas, Electricity, Water and Rail companies as well as a number of other companies. Better still, I've now just received a prototype sample of the very decoder, and I've arranged for a review of this to be featured in next month's column when I've had a chance to give it a test.

Bill Robertson is always pleased to hear from readers, and will answer queries through this column. You can write to him c/o the Ham Radio Today Editor, either by post, fax, or Email.

Readers should note that, depending upon your country's regulations, reception of some services may not be allowed unless you have appropriate permission. The RA's "Receive-Only, Scanners" Information Sheet provides more information for UK listeners, you can obtain this free of charge from the Radiocommunications Agency.
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Part 4 of Experimenting with Video - a PIC-controlled video line trigger by Robin Abbott to use with an oscilloscope in isolating individual lines of video to test and debug video circuits.

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An inexpensive add-on from Raymond Haigh that stretches your meter to higher accuracy on high impedance and signal measurements.

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Brian Kendal G3GDU shows how you can build a handy piece of test equipment for your station.

Often surprises me to see how little test equipment the average ham radio operator possesses. A multimeter - yes, a VSWR bridge - certainly, component bridges, output meters, oscilloscopes etc. Well - umm - err! Many hams build equipment but rely on nothing more elaborate than their ears to determine whether their new product performs better or worse than its predecessor.

In contrast, in professional workshops, the shelves are loaded with every type of test equipment that can be imagined and the engineer would not even consider releasing his work to the outside world without a complete specification which could prove beyond any reasonable doubt that the new equipment was a substantial improvement on what had been produced before.

It may be argued that good test equipment is expensive, which is true, but many pieces can be constructed at home which, using the station multimeter as a standard, are of more than adequate accuracy for the home constructor. Typical of this is an audio output meter.

**BASIC PRINCIPLES**

The basic principle of operation of an audio output meter is that a resistor is substituted for the loudspeaker. The voltage developed by the audio signal is then rectified and measured from which the audio power can be calculated. The first essential is therefore to select a load resistor of suitable value and rating. Most communications equipment uses 3 ohm loudspeakers, whilst with the addition of 8 ohms, most other domestic equipment can be covered. The power rating should be adequate for the equipment to which it may be attached.

There remains the task of measuring the voltage generated. This can be simply achieved by use of a diode feeding a meter through a dropping resistor. The diode can be of almost any small-signal type, but it may be found advantageous to use a germanium diode if it is wished to measure very low power levels.

The meter should preferably be of a reasonable sensitivity, say 200 µA FSD or better, and have the largest scale possible if only for ease of reading. A less sensitive movement may be used, but this may well have penalties when working at low audio levels. Most good commercial audio output meters use a 100mm scale and this is probably a fair trade-off between cost and accuracy, although smaller meters can still prove extremely useful.

To increase the versatility of the meter, several switched ranges should be available, which can be provided with the help of a rotary switch. This meter provides 50mW, 500mW and 5W ranges at 3 ohms, together with 500mW...
and 5W at 8 ohms. The number of ranges available in this meter is only limited by the types of switches used.

Initially the dropper resistors for the meter are not wired in as these will be selected at a later stage.

Fig.3. Switching arrangements to permit both 3 and 8 ohm operation

CONSTRUCTION

The circuit was constructed in an Eddystone diecast aluminium box, this being selected as it is robust and it was intended that the meter would be in use for a very long time. The meter movement was mounted in the lid of the box with the range switch by its side. This was chosen as a good quality meter movement was available, but this was of such a size that it could only be mounted in this orientation. The input connector is a standard 6.3mm jack socket.

The wiring is very simple with the only unusual feature being the use of the two load resistors, only one of which is used for 3 ohm measurements whilst both are in series on the 8 ohm ranges.

CALIBRATION

The basic technique for calibration is that an appropriate voltage is applied to the load resistor and then the dropper resistor for each range is selected to give full scale deflection. There are two ways in which this can be done. The first is to apply power from an audio oscillator, measure the output on an oscilloscope and then adjust to the appropriate level. The second is to apply the voltage from a single cell battery in series with a 25 ohm potentiometer and again adjust for the required level. At various times during the construction of the meter, I used both methods and the results agreed within the limits of experimental error.

During calibration, a 10k ohm linear potentiometer was substituted for the meter dropper resistor. The first range calibrated was 50mW. A quick calculation revealed that at the 50mW power level, 0.39V would be generated across the load resistor. Using the DC calibration technique, the 25 ohm potentiometer was adjusted until 0.39V was indicated on the multimeter. The 10k potentiometer was then adjusted until the meter read full-scale deflection. The input voltage was then disconnected and the value of the used part of the 10k potentiometer measured. Your 'stock' of available resistors, if available, can then

---

<table>
<thead>
<tr>
<th>Power Level</th>
<th>% age of F.S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mW, 500 mW, 5W</td>
<td>100</td>
</tr>
<tr>
<td>40 mW, 400 mW, 4W</td>
<td>91</td>
</tr>
<tr>
<td>30 mW, 300 mW, 3W</td>
<td>75</td>
</tr>
<tr>
<td>20 mW, 200 mW, 2W</td>
<td>60</td>
</tr>
<tr>
<td>10 mW, 100 mW, 1W</td>
<td>41</td>
</tr>
<tr>
<td>5 mW, 50 mW, 0.5W</td>
<td>23</td>
</tr>
<tr>
<td>1 mW, 10 mW, 0.1W</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 1. Comparing power level with percentage of full scale deflection of meter reading
be searched until one of a similar value was found. If none is available, one or more resistors can probably be paralleled until the correct value is obtained.

The calibration of the second, 500mV range, is similar, except that the required voltage across the load resistor was now 1.2V. On the 5W range however, I found a problem arose. The voltage required across the load resistor was 3.9V, which meant that a current of over 1A would be flowing. This is more than a dry cell can supply, and it will also possibly be too much for the 25 ohm potentiometer. The answer is simply to keep the voltage across the resistor at 1.2V and adjust the 10k potentiometer such that the meter indicates 23% of full scale deflection.

For calibrating the 8 ohm ranges, exactly the same technique is used except that for the 50mV range, 0.63V is required and 2.0V for 500mV. A two cell battery must obviously be used for this range.

With all the dropper resistor values selected, the resistors can be soldered to a piece of Veroboard, fixed into the case and wired into circuit. The only remaining task is to calibrate the scale for lower power levels. This can easily be done by comparing with the table shown in this article. Whether it is decided to redraw the meter scale, or attach a calibration chart, is a matter of personal choice. The table is valid no matter what sensitivity of meter movement is used.

**ACCURACY**

If constructed and calibrated as described here, the overall accuracy should be between 10 and 20%. This may seem poor, but in practice it will be found adequate for all normal purposes. It is also highly unlikely that the equipment which you are testing will have an output impedance of precisely 3.0 ohms, so there will inevitably be a small mismatch.

The absolute accuracy of the equipment is not particularly important. What is necessary, however, is consistency of measurements. The output meter as described here will meet this requirement admirably.

Since completion, tests which I’ve conducted indicate that the meter is not frequency conscious within the audio range and that the accuracy is well within the figures which I’ve quoted.

**FINALLY**

The construction of this audio power meter is not an arduous task. The whole construction including metalwork, design and calculation, I completed in two afternoons in my workshop a couple of years ago. Since then it has more than proved its worth to me during the construction and testing of many other projects.

Few projects which I have tackled over the years have been completed so quickly, yet have proved so useful over the succeeding years. I can only recommend that other constructors try it and see for themselves.

Any reported updates to this project following publication will be available on the Ham Radio Today Voicebank information line, Tel. 01703 263429 (use with a DTMF phone) for up to 12 months following publication.

Any other queries regarding this project should be addressed to the author, Brian Kendal, G3GDU, c/o the HRT Editor (ensure you write the author’s name followed by the HRT address so that your letter can be forwarded), enclosing an SAE if a reply is required.

Here’s one book I always make a point of looking out for each year, and I’ve also been known to regularly ‘dig into my pocket’ for it (rather than getting the Editor to buy it for me!). It’s the annual edition of the ARRL Handbook of course. This year’s volume has a massive 1190 pages, and a grid locator utility.

There’s also a simple CVV program and bookshops, our 1997 copy priced at US$38. It’s available in the UK from specialist radio dealers and bookshops, our 1997 copy came (as it also did in over many past years) from Poole Logic in Dorset, Tel. 01202 683093, who also offer a mail order service (please remember to mention Ham Radio Today magazine.

Our Technical Editor gets even more technical with the ARRL’s latest ‘encyclopedia of amateur radio’
Jeremy Boot G4NJH continues his series on Ham Radio and the Internet

Yesterday I received an email from a correspondent in Canada. He told me that 1,500 employees were being laid off by CBC in accordance with some rationalisation programme in their shortwave transmissions at Sackville, one of their principle relay sites.

If you were a broadcaster, how best these days would you wish to get your message to listeners abroad? In the advanced countries, you might use local radio stations to carry your broadcasts (as the BBC do in the Far East and in the US); you might use local cable services, and in Europe you would certainly use satellite channels. One has only to tune around the channels on the Astra satellites to see how full they are of the VOA, Deutche Welle, RSI, BBC etc.

But would you bother with short wave as a medium at the end of the 20th century, unless you had to? Well, for remote areas with limited technology, the outback of Australia where it is alive and well, yes, for much of Africa and South America, yes; and for other places not yet served by domestic satellites, probably yes again. But for the US, much of Europe? I suspect the answer would be “no” or “not for much longer”. Short Wave is unreliable. It depends heavily on the sunspot cycle, and a host of other, not always very predictable, conditions.

Short Wave was the miracle of its age; it went worldwide: it needed little to receive it: most radio sets, however primitive, included the little to receive it: most radio sets, however primitive, included the value of different bands and thinking of new uses for the free up space.

But what of us amateurs? Have we really made such progress apart from better receivers and transmitters? Or are we fundamentally doing what our founding fathers of the 20’s did? Has moonbounce, UHF, Packet, Packet radio and SSTV made us rethink our position, or fundamentally stay in one place? We still have fewer newcomers to the hobby than is healthy. Why? Could it be because we lack vision or the will to innovate? Could we be too compliant? Might we - heaven forbid - risk becoming more and more a rump of eccentrics in a fastmoving world of technology, left over from a glorious, but bygone age?

Herein lies a paradox for radio amateurs. We are happy as we are. We don’t see the need for change, yet change we must. At this point, let me say the magic word “internet” again and let those - most of whom know nothing about it - say, “I told you so!” and stop reading any more of this. Well, you’ve paid for the copy so you may as well read on anyway…. Last time I wrote in HRT, it was about the relationship between Internet and Radio as I see it. In short, Internet can’t be uninvented: it gives us an insight into what might be in a myriad of communicationrelated ways and it won’t go away. Nor must we fear if we are not eventually to become that rump of unsuccessful hasbeens. It is not that we have to surrender what is dear to us, but someone, somewhere, Radio Society leading the way or inventing genius (and I am not one) needs to add to that catalogue of intriguing new things we have already seen. In part. Packet, SSTV, satellites, meteor showers, whatever. It was - it is - good, but it isn’t enough.

With fairly simple equipment, an Internet connection and the right software (I am thinking of ‘phone) you can have the equivalent of an HF-type “GSO” with another fellow amateur, but with video, a whiteboard, the ability to transfer files whilst all this is going on, and privacy to bootstrap.

“So what?”, you gasp. “This isn’t Radio! This isn’t what I sweated for, did the Morse for, studied for, climbed on the roof in a howling gale for to get that aerial up!” No it isn’t. I quite agree. But we belong to that group of people who all but perfected radio transmissions in the earliest days, before the broadcasters took it over, who were the boffins behind Radar in wartime, who led the way in all sorts of other areas too. Is it so much to ask that amongst us there isn’t yet more out there? I’m not sure what, I admit it: I haven’t the prescription or a crystal ball. Computers and computers are not a substitute for Radio. Internet is not a substitute for all the knowledge and selftraining in a hundred ways that we acquire in our amateur radio careers. Neither, indeed, substitutes the camaraderie, help, friendship that each one of us experiences as amateurs. But these other things must teach us not to tread water but to look forward, actively if we are able, or by encouragement if we have not the expertise ourselves. A start would be a substantial rewrite of the VWT Act and its antique and outdated provisions (3rd party traffic and the like). But one often feels that controlling authorities are bogged down in their own survival rather than real, practical, farreaching action. This is the nature of the beast: I understand this. Perhaps it is inevitable.

But I do not write all this in a pessimistic vein. I am cheerfully confident that the future is bright, innovative and that what we presently enjoy will be in the end enhanced, not lost. But only if we wake up to reality now, not later. Men (and women) of Action and Vision, stand up!

I am sorry Sackville is on its way out and that shortwave broadcasting is slowly but surely going the same way. It closes the door on a marvellous and historic époque in radio. But it isn’t the end of the road for broadcasting, no more than it necessarily spells the end of the road for us in the amateur radio world either.

Jeremy Boot G4NJH
Email: asperges@innotts.co.uk
Web: http://www.innotts.co.uk/~asperges/

Addendum: Since the above appeared, word has come that Sackville IS to be spared after all. It seems a Minister had made a promise that it would not close “in her lifetime”. Good to see that - Ed.
Welcome to the 1997 Sandown Model Show, a must for ALL modelling enthusiasts. Sandown '97 offers an unmissable combination of superb outdoor flying demonstrations and displays, a stunning model boat pool, spectacular outdoor model car racing together with a vast number of clubs and societies. Of course, this show would not be complete without a vast range of top quality trade stands - and we offer these in abundance! All the UK's leading manufacturers, suppliers, distributors and retailers are there - we guarantee you will be able to see and buy all the latest products.

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- **Children £4.00 (£3.00 Advance)**
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**Advance Ticket Hotline 01442 244321**

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EXPLORING BROADCAST BAND FILTERS

Ben Nock G4BXD offers a filter solution to the problem of breakthrough onto the lower short wave bands of strong MW signals on some receivers.

Anyone who has an early Trio/Kenwood general coverage receiver such as the R600, or a collection of ex-military equipment and an urge to get it fired up and see how it performs today, is usually confronted with broadcast breakthrough on the lower shortwave spectrum, i.e., around the 160 and 80m bands. Unfortunately, on a couple of the sets in my modest collection that cover this band, the front end of the receiver was such as to let through the very strong broadcast signals from the medium wave, thus making reception on 160 and 80m quite impossible. The option offered here is fit a filter, either in the set or as an 'add-on' in a small screened box.

This breakthrough was particularly bad on my old 22 and 62 sets. These ex-military sets have a 'Roller Coaster' in the front end, which is a large coil wound on a former that can be rotated whilst a sliding contact moves up and down the coil turns. This acts along with a variable capacitor as both the transmitter output L/C and the first tuned circuit on the receive side. The plague of medium wave stations across the 2 to 4MHz range was strange, more so as the oscillator is on the high side of the aerial frequency. So, tuning to 1.9 MHz the oscillator is on around 2.4 MHz, so one could expect to hear a signal on around 2.8 MHz. But as to where the broadcasters come from, it must be pure signal strength alone overloading and modulating the front end.

Disconnecting the aerial feed from the roller coaster tuned circuit to the grid of the RF Amp in the receiver removed the broadcast stations completely, showing that the interference was coming in via the RF feed to the first RF Amp and not by any other route.

Some form of filter was needed to remove the broadcast stations whilst allowing the required signals through. A high pass filter, with a cut-off just below the lowest frequency on the set, was thought desirable and a suitable circuit sought.

The ARRL 1986 handbook details a 10 pole broadcast filter. The response of this filter as it stands is shown in Fig. 1. This is a computer simulation of the filter based on 50 ohm input and output feeds, using 'SPICEAGE' circuit simulation software.

The three series tuned circuits, L1/C5, L2/C6 and L3/C7 are tuned to spots in the MW band. The frequency...
of each circuit can be found from the formula:

\[ F = \frac{1}{2 \pi \sqrt{LC}} \text{ MHz} \]

Where \( L \) is in \( \mu H \) and \( C \) in \( \mu F \)

Adjusting the values of the various capacitances deepened the trough in the middle of MW, especially helpful if you 'suffer' from a strong Radio 1 signal! The three tuned filters could be adjusted to reject some particular strong station, the dip at around 1.4 MHz being suited to a local radio station, the centre dip to Radio 1 and the lowest dip to Radio 3 say.

As the input impedance of the valve stages were going to be much higher than 50 ohm, I undertook some experimentation of the filter. Using a load of 100k and with slight alteration of component values I obtained the result in Fig. 2, see component chart for details.

As can be seen the main body of the MW band has been reduced to below -60dB. The attenuation though does not start to fall until around 1.75MHz. As there are cordless phones in that area I thought that it might be nice if the attenuation could be moved closer to 2MHz and thus I started to work on the phone area as well.

To this end I produced a 13 pole version, with the result shown in Fig. 3. This used a 2mH choke as the load, representing the grid circuit of the 22 set RX. The attenuation in the 1.6-1.75MHz area is now starting to reach -10dB, but there is a slight reduction of the 160m band, in the order of 3 to 4dB. Of course, compared to the fact that this band was unusable before, the slight loss is better than nothing. This filter would of course be ideally suited to sets that do not quite, or fully, cover the 160m band, varied slightly by opening or squeezing the turns around the ring.

Construction of the filter is on an original double sided PCB. If double sided is used then the upper surface can be the ground plane and one end of L1/13, and C2 can be soldered directly to it. Small pads of copper underneath are used to connect the other components. If single sided board is used then an earth track, running from one end of the board to the other, is needed, with separate pads for the tap ends of C1/C3 and L2 along with the interconnecting capacitors.

As well as use in the sets already mentioned, the filter would be suitable for any receiver requiring the reduction of MW interference. It's also suitable for placing after a QRP transmitter (50 ohm version) to get rid of any signals in the MW range reaching either an amplifier or the aerial being used.

Should interference from only one station, say Radio 1, be experienced then a simple parallel tuned circuit, in series with the aerial lead, could be used. Assuming that it will need fine-tuning onto the exact frequency, the capacitor could be a variable or the coil adjustable. Assuming a capacitor of 300pF, an inductor of 81µH would be needed for a frequency of around 1052kHz.

Once completed, the filter can either be installed inside the set if it only covers 160m upwards, or in the case of a general coverage set with MW and LW coverage, the filter can be housed in a small case and plugged in and out as required.

If the filter is housed externally to the set, then the connections to the box should be screened, with a good quality plug and socket used. I would suggest either SO-293 sockets and PL-259 plugs or better still, use BNC connectors. You could switch the filter in and out, but you will have to ensure

CONSTRUCTION

The coils are wound on 0.7 OD / 0.35 ID powdered iron rings, 26 turns 22 SWG for L1, 30 turns 24 SWG for L2, 29 turns 24 SWG for L3. The actual notch frequency of each tuned circuit can be

Broadcast band filter circuit, high pass above 2MHz
the use of a quality switch with high isolation. Otherwise all the good work is wasted due to leakage and capacity coupling.

Filtering out the unwonted signals should enable you to try a bit of 160m DXing. New Zealand and Australia are very active these days on that band. I hope it helps your broadcast interference problems. Happy hunting!

Component layout. One end L1/L3/C2 goes to ground, small pads of copper underneath connect other caps/L.

**COMPONENT CHART**

<table>
<thead>
<tr>
<th>L1</th>
<th>C1</th>
<th>L2</th>
<th>C2</th>
<th>L3</th>
<th>C3</th>
<th>L4</th>
<th>C4</th>
<th>LOAD</th>
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<tr>
<td>3.6</td>
<td>15</td>
<td>4.9</td>
<td>3</td>
<td>4.8</td>
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<td>4.8</td>
<td>3</td>
<td>50R</td>
</tr>
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<td>3.6</td>
<td>10</td>
<td>4.9</td>
<td>2.6</td>
<td>4.8</td>
<td>4.3</td>
<td>10k</td>
<td>2 mH</td>
<td></td>
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<td>4.8</td>
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<td>2 mH</td>
<td></td>
<td></td>
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<tr>
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<td>4.9</td>
<td>2.2</td>
<td>4.8</td>
<td>4.0</td>
<td>2 mH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

L in µH, C in nF

**BOOK REVIEW - WORLD RADIO TV HANDBOOK**

Reviewed by the Editorial Staff

For many years, the World Radio TV Handbook has been giving up-to-date information on broadcasters worldwide. The broadcast scene is certainly changing, especially on HF in the current sunspot minimum. Broadcasters are also very active on satellite, with both Radio and TV, and increasingly you'll find audio 'clips' from programs on the Internet.

The Handbook has kept up with this admirably, and in this year's edition a new graphical format has been included to show the time and frequency information, making it easier to find the details needed. It also provides Internet addresses for the stations included, along with other contact information including phone and fax numbers, senior personnel etc.

Of course, the handbook contains a very comprehensive collection of up-to-date broadcast schedules, arranged by country, area, plus an hour-by-hour section on international broadcasts in English on a country-by-country basis. There are reviews of broadcast receivers, together with a number of technical articles on subjects such as the solar cycle, what to expect in 1997, radio on the Internet, and a very useful receiver 'price table' where sets are compared with star ratings given for selectivity and dynamic range, plus prices in six different geographic areas including Europe. Also detailed are lists of clubs around the world for DXers, plus times of DX and media, and arts and culture programmes from a wide number of stations.

Once again, the 1997 handbook has shown itself to be a very authoritative publication, one that certainly finds a home each year in the HRT Technical Editor's shack!

143mm x 230mm with 560 pages, ISBN 0 8230 7797 7, it's priced at £19.95. You'll find it available or on order from your local specialist radio store or bookshop. It's distributed in the UK by Windsor Books International, The Boundary, Wheatley Road, Garsington, Oxford OX44 9JE, please mention Ham Radio Today magazine when enquiring. Our thanks go to Windsor Books International for the provision of the review copy.
SOFTWARE OFFER

Another superb collection, exclusively for Ham Radio Today readers

This month we've another bumper selection of the very latest Ham Radio PC software for you. Each selection is exclusive to Ham Radio Today readers, and is offered on a cost-only basis as a 'thank you' for buying the magazine.

UK VHF/UHF Frequency Updates and Listings is a huge collection of text-based files containing frequency listings and updates for users throughout the UK (see this month's 'Scanners' column). As well as regional listings, i.e., London, Sheffield, Leicester etc., there are frequency compilation listings for many events such as several UK air shows, carnivals, rallies etc. In all, over 20 files packed with frequency listings together with their users including many airband listings. Note that all the information here is publicly available, but you'd probably need to spend a considerable amount of time in collating it!

WISP is a complete Windows package for amateur satellite communication. Using the Low-Earth-Orbiting satellites you don't need large aerials, even a small 2m/70cm collinear is often enough, and with Phase 3D coming along soon this program is going to be very popular! There are full mail facilities including automated upload/download, taking the 'mystery' out of exchanging messages and files, including image files to and from the satellites. If you've never tried amateur satellites before, now's the time! Included on the disk are full help and information files, including details of the AMSAT organisation. The program is fully functional, however you're encouraged to register it with AMSAT-UK or if overseas your local AMSAT organisation, if you find you like the program and regularly use it on the satellites, full information is in the extensive on-line 'help' files.

RF Propagation Calculator is a freeware Windows utility for calculating VHF/UHF line-of-sight and diffraction propagation distances, it even takes into account buildings and obstructions, good if you're in a 'less than ideal' VHF or UHF location. An excellent graphical format is used making the program easy to use with clear results.

Finally there's a large collection of the very latest Ham Radio Information Files covering all sorts of topics ranging from buying a new rig, to curing telephone interference, to packet radio, to tips on increasing your CW proficiency, and much more. Plenty to keep you busy!

All the above are contained on a single disk, as this month's collection. They are all fully functional freeware or shareware programs for amateur radio use, and are not 'demo' programs. Each program comes with full on-disk documentation, and each month's collection is provided with easy on-disk installation routines and an information sheet.

FROM THIS MONTH'S COLUMNS

Winpack V6.2 update plus over 40 'plug-in' files. Since Winpack V6.1 was released it's been incredibly popular, and an update has subsequently been released to upgrade it to version 6.2. Note that this is not a complete program, it's an update, which will unfortunately not fit onto the same disk as all the Winpack
as a 'carbon' server, BBS
a full UK English dictionary file,
message and file utilities such
don't normally come with the
additional programs written by
include an outgoing message
transfer/extract them to your
on the disk with an easy on- disk
extraction routine to
independent authors, and
self- extracting compressed form
opportunity to also collate over
separate disk is needed.
2Mb worth, which are stored in

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Important notes: Please do not make your cheque or Postal Order payable to any other individual or any company (note that 'Mr. S. Lorek' is not acceptable), if you do, your order cannot be processed and will be held awaiting an SAE from you. Other payment methods, such as foreign currency, unfortunately can’t be accepted. Orders for this month’s offer will be accepted up to 30th June 1997. Disks are sent by standard post at readers own risk. Queries regarding supply of disks should be sent to the above address regarding supply of disks should be sent to the above address with an SAE for reply. Faulty disks will be freely replaced if returned with an SAE within 28 days of receipt. Please do not contact Nexus or the
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disks, they cannot help
you. Disks are usually placed in the post within 48 hours of the receipt of your order, but please allow up to 28 days for delivery.

The Winpack upgrade now also handles image and HTML files

Vol. 1 installation files, hence a separate disk is needed. However we’ve taken the
opportunity to also collate over 40 ‘plug-in’ file collections (over 2Mb worth, which are stored in
self-extracting compressed form on the disk with an easy on-disk extraction routine to transfer/extract them to your
hard disk). The plug-ins are additional programs written by independent authors, and
don’t normally come with the WinPack program. They include an outgoing message
spelling checker complete with a full UK English dictionary file, message and file utilities such
as a ‘carbon’ server, BBS

information finder, chat server, callbook utility, and plenty more to keep you busy!

ORDERING

Ham Radio Today Software Collections are supplied on
1.44Mb PC disk format. Each of this month’s disks, HRT
Vol. 15 No. 4, and the WinPack Version 6.2
disk, are priced at £2.00 per disk including UK p/p and VAT.

Readers outside the UK (including Eire) should instead
send a Sterling (not foreign currency) bank draft/demand
which can be drawn on an
English bank, or cash (i.e. a UK
£5.00 note for two disks), to
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please allow up to 28 days for delivery.

HAM RADIO TODAY SOFTWARE OFFER VOL 15 NO. 4

Please send me; Qty of this month’s disk (HRT Vol. 15 No.4), Qty of the latest WinPack V6.2 update plus ‘plug-in’ disk.

Cheques/POs payable to S. Lorek (please not ‘Mr.’, nor any other individual or company). Disks at £2.00 per disk inclusive of disk and UK p/p, outside UK at £2.50 per disk inclusive of disk and airmail p/p. This month’s offer is valid only until 30th June 1997. If you don’t wish to cut this coupon, just use a separate
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Letter of the Month

Dear HRT,

I’ve been thoroughly enjoying Vol.15 No.2 (why no date I wonder?) until I reached page 30 and then I found myself puzzled by member of the BAWMC’s British Warships and Winging Club. I’m not a member but I’m sure that my views are shared by many. What is it about a piddling little test that they could get themselves into such a stew about? It’s hard to imagine. It’s hard to believe that quite commercial British publishers would have taken them on. And the tests went on at a bit of a chillie so let’s be good to our readers. I’ve heard that radio amateurs are but a small slice of society and any test that asked them to write anything is not a reasonable one. I’ve heard that they really don’t nave either very which way the cat jumps. My father often told me that most of life’s fun comes from anticipation and not acquisition. I’ve included a copy to Mrs. Lee; try and put some thinking on board. I was able to quite easily studying for my PRC and subsequently passing the Morse test. I try to keep reading that it’s important, keep on going, and get on top of it. But it’s really very strange that when I switched on a general coverage receiver I seem able to hear it all over the place. While composing this Epistle I’m listening to a CW transmission from Bahrain on 8447kHz. Is it doing anything to you? I’d do it the right way round. Learn the Morse first. Then do the PRC and subsequently a Morse test. We mustn’t be too lenient. If I had my time over I’d do it right the first time. Then I’d do it the right way round. Learn the Morse first and then do the PRC. It’s been rattling away for ages. Because I had time to think through this Morse test, I don’t feel I need to read the replies. It’s a brilliant little book entitled ‘Morse Code: The Complete Language’ published by the ARRL.

Roger Lee, GCE, C&G, Member RSGB, Member Silent Majority, G4JTJ
DEAR HRT,

I have just received Vol. 15 Issue No. 2 in today's post and I was quite surprised to read the article on Novice Radio Licensee dropout. Though in a way I am not surprised, as the technical knowledge led to the "B" class licence holders is so narrow that it turns out operators that are too blinkered. So blinkered in fact, that the Novice has one thing over them, that is, "practical application". It is the practical knowledge that will leave many old "B" class holders floundering in the fog of "lack of Knowledge".

Whoever thought up the Novice exam must be commended, for in time these Novices will go forward and gain "B" and "A" class licenses, knowing full well that they have a very good electronic grounding.

To encourage the Novice licensee, and for others to seek out and work Novice stations, the Wincanton Amateur Radio Club has formulated the "Postcode Charity Challenge" (see Radio Today, HRT Vol. 15 No. 3 - Ed.). The Wincanton Club, though small, has done quite a lot to encourage the young and old Novice (for we have both), to take part in Club events and given every encouragement. It took us three years, through no fault of our own, but we do have a 70cm repeater coming on air this spring which will cover the area of South East Somerset, North Dorset and South West Wiltshire.

You might wonder why my original letter is written on "Ex Canadian Radio Amateur Network" headed paper? Well that's another hat that I wear. At the end of World War II there were some 9,000 Canadians who decided to marry and settle down in Britain. Of course this original number has now dwindled and not all are radio amateurs, but there are enough of us who get together on air to chew the fat on a Thursday afternoon. Most of those who join in are now in their late 80's and 90's and can usually operate with a degree of skill. One member though has to have a local friendly Ham come in and help as he has Parkinsons and Alzheimers, but Thursday afternoon is the highlight of the week for him.

Keep up the good work, Jim Hatch, G3OOL, ex VE2BEV and VE3CIII

DEAR HRT,

I have just read the letter of the month in Ham Radio Vol 15 No 2 by Mr. A L Dick, To me, was of thinking they say it for the G1's, GB's and G7's, who wish to progress further into radio and onto the HF bands, but are held back by the RSVG because they think if a person can't read or send Morse at 12 WPM, they are not capable of being able to operate on HF. If that is so, what is the RAE needed for? Don't the powers that be know for every 100 people who pass the Morse, only 15 to 20 stay with it and the other 80% are glad to be rid of it. The RSVG Baoy they work for all radio amateurs, so let's hear them doing something positively for the Class B's for a change, then maybe the Radio Amateur hobby will begin to grow again.

Will anyone tell me why I need to know Morse to operate on HF? A test on HF operating would be more appropriate.

Roy Moss, G7UVO

As well as our post and fax facilities for receiving letters, you can Email your 'Letter' direct to: hrt@netlink.co.uk

DEAR HRT,

As an SWL for some 35+ years and a 'B' Licence holder for 8 years, I would like to make the following comments.

I see from the Editorial of GB8YA (Vol.15 1st Issue) 1 that the old "Use it or lose it" tag is back again. Nothing is wrong with this statement, it is quite true, but as one who has spent many hours calling CQ on our supposedly busy NA crowded ham bands (with no takers), our numbers are spread far too thinly over the amateur spectrum for our own survival.

That the Novice 'B' licence holders outnumber Novice 'A's by about 10:1, must tell us something about the popularity of Morse as a whole. We have those who look down their noses at modern black box operators, but the ham gear of today is light years ahead of my first CR100.

Future commercial pressure for space on the radio spectrum, I have no doubt, will dictate the shape of amateur radio as a hobby in the future. The point I am trying to make is, if the powers that be in our hobby don't lighten up, soon it may be too late.

We have the old argument for and against the Morse test. Why do class B's have to pay the same licence fee as A's? Etc. It is time for amateur radio as a hobby to get it's act together before it's too late.

A. McColl, G7BZU

A DIFFERENT APPROACH?

Firstly the comment: Ever since before most of us were born, competence in Morse has been a requirement for transmission on the amateur bands below 30MHz. Everyone coming into the hobby has known about that, yet they still made the decision to spend their money and get involved. Of course, if they didn't know about the Morse requirement, that they've been poorly informed by those who taught them for the RAE, but it still isn't the fault of the RSVG, the RA, or anyone else in authority. How much sympathy would I receive if I complained that having spent a lot of money learning to drive, I still wasn't allowed to do 100 MPH on public roads? Now for the suggestion: Why not retain the current system, but add to it an option: For an A licence, pass at least one of the following in addition to the RAE: Morse test, or Advanced examination on data modes, or Advanced technical examination, or Test appropriate to voice modes - maybe a simple foreign language exam. This way, people would tend to gravitate toward the test that interested them most - Those who intended to work data would take the datamodes test, being examined on things they'd want to learn anyway. Morse fans, wanting to improve their Morse, would be happy to take the Morse test. I should add, for those who don't see the need for an advanced technical test - it was only when I studied for the American "extra" examination that I realised how much I didn't know!

Perhaps it's ironic that the eventual abolition of the Morse test worldwide, in bringing many new amateurs to the HF bands, would increase the need for power and bandwidth efficient modes, like Morse!

Paul Duell, G0TILG, AE4QC
QRP CORNER

Dick Pascoe G0BPS relates a sad story of a QRP Novice operator

The continuing explosion of the Internet has not yet apparently affected the QRP enthusiasts, in fact it appears to have increased their interest in the hobby. The group exchange information on a daily basis. This time last year we were struggling to get anyone on, but now we have several dozen from all over the world, checking in on a regular basis.

This type of group needs a mainstay. In the USA with their group it is the 'Rocket Scientist' Chuck Adams, over here we have Frank G3YCC. He keeps the group going with a regular input of news and views that he collects from many varied sources. (Try http://www.qrpclub.demon.co.uk and http://www.geocities.com/CoapeC anveral/5179 - note the lower and upper case).

Frank also runs a very well built set of world wide web pages (WWW). For the uninitiated, these are a set of pages that can be accessed by anyone with a web browser program. It reads much like a newspaper would, with links to many other WWW pages. Many items of interest are to be found on Frank's pages, including simple tips like "always cover the positive side of a sealed lead acid battery, this avoids problems if a metal object is dropped on it," he also has a very nice circuit for a simple HF MOSFET PA that should deliver up to five watts.

EARS

Here's news of a GRP beacon and an experimental group. The South African "Experimental Amateur Radio Society" (EARS), has sent an invitation to all Cavers and SVVLs to join the group. There are no membership fees, just postage costs to cover for their magazine (no details of this cost yet).

The purpose of EARS is to promote experimentation and analyses using reports from members worldwide. For further details contact EARS at PO Box 53090, Troyeville 2139, Johannesburg RSA. Email: roger@netco.za

The South African beacon is on 7.003MHz as ZS6FOR. This is apparently the only licensed beacon in that country on the band. The beacon will be giving out 25W increasing until it is reported. The transmitted signal will be VE VE DE ZS6FOR GRID, LOCATOR, QSL ADDRESS, (CODE WORD) BT (This code word will change on a weekly basis). Sent for about five minutes every 30 minutes each weekend between 1200 and 1600 UTC. Further information which arrived later, reports that the Tanzania People's Defence Force also uses this frequency as part of their digital network (another incursion into the amateur bands?).

QRP FESTIVAL

A message from Les Jackson G4HZI announces the "Red Rose QRP Festival", which will be held on Sunday 1st June 1997, at the Formby Halls, Alder Street (off the High Street), Atherton, Manchester. The festival will be open to the public from 1100 until 1600, and is organised by the West Manchester Radio Club to promote QRP and homebrew.

It is intended that this should be very much like the Rochdale event with few, if any, back boxes, computers etc., Tables are available for £5 each. There will be a 'Bring and Buy' of course with refreshments (meat pie and mushy peas perhaps?). A huge car park is available with easy access from the motorways. A talk-in station is also available. For more details contact Les on 01942 870634. I am not certain yet, but I hope to be there and report back on this event.

To reinforce my previous comments about QRP, not being solely limited to HF, I offer the following information about some 24GHz experiments. Petra and Charlie's being just 400mW and Ari's being 100mW. Thanks to Dave GODJA and Simon GM4PM for the information culled from the G-QRP Internet group.

SSB QRP

SWGOKE has been very active on QRP SSB, with a total of 257 countries, using just five watts of SSB from his old Ten Tec 509. He took part in the 'All Asian SSB DX Contest', enjoying good conditions from SM to the far east. He reports 50+ signals from Greece causing him problems on the QRP SSB frequencies (we don't own them either). He reports acquiring a Icom 706 and hopes to work many 'G' stations about 14,280 - 14,280MHz.

Chris, G4LDS also has an interest in QRP SSB from his FT707, with a switchable attenuator between the driver stage and the PA. Living in a small flat causes problems, but he still manages to get a G3FGZ aerial in the loft. Only 27 countries confirmed, but all from a flat with an indoor aerial. You see, it can be done. The sunspot count increasing in 1998/9 should enable us to work a lot more on the bands up to 10m.

TUNDRA TELEGRAPH

News of a new QRP club formed recently in Alaska, I sent for the information and was grateful for a reply by return by Email. I was also welcomed as member number 111 (that should be great own, better than my G3RQP club number 2559 where it is always taken as the signal report).

Their newsletter, the 'Tundra Telegraph', was sent in ASCII...
format so I was able to read it with the PC's Notebook program. Many of the early members were of course from the northern part of the US continent, but there were also a few from overseas. Their aim is to get more QRP activity from Alaska. Details of their 'round table' nets showed that they can be found on Wednesdays on 80m; 3.725MHz at 0615 UTC, or for listeners in the UK on 40m; 7.125MHz at 0630 UTC, On Sundays at the same time and frequencies.

If you would like more information on the Alaska QRP club then check out their www pages at http://www2.polarnet.com/oqqrp, or Email Bruce KL7JAF on: akcirp@polarnet.com. For those without Email facilities, I can send a request for you if you drop me a line.

**NOVICE GIVES UP**

One of my recent disappointments was when a Novice I knew decided to call it a day and sell all his equipment. He was elderly and although he had spent time doing the course and getting his Novice 'A' licence, he found that five to six words per minute were his maximum when sending, he could receive up to ten words per minute though. Many, many times he would go on the air, put out a call and get an answer back at fifteen or more words per minute. Very often the other operator wanted the contact, they wanted the UK call for their logs, but could not understand the need to slow down.

I am sure that, even now after several years of the Novice licence, many non-UK amateurs still think that we all have passed a twelve words per minute test. If only courtesy would prevail and all operators reply at the speed of the caller. Even with my modest 15VPM I still get answered by much higher speed stations. Remember 'ORS' means slow down please.

Another question, this time about power levels. I am sure that all readers are aware of the 5W output limit for QRP awards (5W carrier, 10W PEP) and often this is not obtainable with modern rigs. Yes, we could use the negative supply on the ALC via the accessories socket on many rigs, but this is not always an option. The easiest way to lower the transmitted signal is to attenuate it some way. Unfortunately, by fitting an attenuator in line after the rig, the receive signal will also be attenuated. One way to overcome this is to fit a switch, either a physical switch, or a relay controlled by a simple changeover circuit.

The circuit shown here is one way that this could be done. When the key is depressed, the relay is thrown over and the signal sent through the attenuator. When the key is released, the receive path is made bypassing the attenuator. Almost any transistors may be used providing they are a PNP transistor for TR1 and an NPN transistor for TR2. The switching time is controlled by VR1. It can be built 'ugly style' or on Veroboard. There should be no problems, except for checking the contacts on the relay to ensure you get them the right way round.

**TRIVIA**

Questions and ideas floating around recently included a question on what was a "hand key"? Answers included "something to wipe your nose on" and "an up/down switch".

Another idea which I had heard before but forgotten, was for those with speakers set into the top of their rigs or receivers. The use of a margarine or butter tub, with a side cut away fully and laid over the speaker, will reflect the audio to the front. The author insists that there is no difference between using margarine or butter for this. I beg to differ; surely butter is much better.

That's it for this month, news, views and comments to me via the Editor, via GB7RMS, Email: Dick@kanga.demon.co.uk, or snail mail to; Seaview House, Crete Road East Folkestone, CT18 7EG.

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De VHF/UHF MESSAGE

Geoff Brown GJ4ICD reports on superb conditions and suggests trying new propagation modes

EME news from Allen K2UYH

Here's a few interesting reports of what is happening on the EME scene.

EME operator Allen K2UYH

News from CT1DMK, Luis who writes on his 23cm activity: "I dedicated most of my free time to completing my 23cm PA. Actually completing one half of the PA, which in the near future will consist of two Gl7b coaxial cavities in parallel for a bit more power. In December I was active with 500W, with good results. I could hear my echoes peaking 12dB above noise. SSB echoes were good, but not all the time."

On 14th December, Luis worked ZS6AXT (O/O), ZS6AXT (559/529), N2IQU (559/529) and on SSB (559/529) - "my first QSO on SSB with a similar sized station". On 15th December, [559/559], W8SIUA (559/449), W2UHI (559/449), N2IQU (555/45) on SSB, K2UYH (54/44) on SSB, F1ANH (539/549), ZS6AXT (539/559), F1ANH (52/43) on SSB, W2UHI (539/539), L8FL (549/539) and VE3BGN (O/O).

On Christmas day at 0115 (also local time), he interrupted the traditional family festivities to show his father (CT1RO, an old timer) some EME echoes on 1296MHz, (an extremely high frequency in his opinion). We had the luck to find W2UHI for a QSO and we exchanged HO! HO! HO! for reports in CW and SSB.

Steve K1FO found 70cm conditions excellent throughout the month of December. Activity was OK but not great and he was disappointed not to work any initials. Stations worked in December were on 7th Dec WA8WZG, on 14th Dec W7QX (new call for W9QXP) and on 30th Dec W2UHI and WA4NJP, JA3IAF, JASOUY, JO3RNL and JS3SIM, and on 29th Dec K5JL, KORZ, W7QX and JA9BOH.

Steve has increased his 70cm initial count by one. He originally worked JH1EFA, several years ago, in grid PM95. Shigeru was worked again in the 1996 EME contest located now in PM96. 70cm EME totals for K1FO are 50 initials, 49 states and 75 DXCC.

144MHZ OPENING VIA ES

Another winter surprise here, when 2m opened from Connecticut to Florida on the 11th January. Ron WZ1V reports working the following; W4CHA (EL88), KD4ZAT (E1.99), WA4LOX (EL87), WB4JEM (E1.99), with most signals being 59. WB4JEM also contacted KB2PLL at around 2211z.

50MHZ RANDOM MS

There are still a few weeks to go before the main sporadic E season starts. Readers may be interested, that it is worth trying other modes for...
communications. Random meteor scatter is one such method used, whereby you can increase your country score, especially if the country in question is too near for ES, or too far for tropo.

One such station that has had success is Gavin GMOWDD in IO65. Gavin runs 50W to a three element beam, and was most surprised to find how easy and simple it really is.

Using standard IARU Region 1 techniques, Gavin completed an SSB sked with myself in just over 15 minutes. He was astonished at the 45 second burst in mid-January, peaking S9+. Gavin's words were "This method is certainly under-used". Many operators think that only major showers produce results, however on 50MHz things are much easier, and, if you

X-ray chart showing the data for Jan 20th and the ES opening the same day.

monitor the 48, 250MHz TV carriers you will soon learn that there's an awful lot of random activity. Have a go and let me know your results. Better still, Email me for a sked!

**JANUARY 20TH, A DAY TO REMEMBER!**

Well what a day to remember for propagation in the winter! Europe had been watching all the openings the USA had been having, and at last it was our turn. The X-ray flux showed high levels on the 19th and 20th, as mentioned before, this may be one of the causes of ES.

At 1800z the reported MUF in Germany was 88MHz, with 50MHz sounding like 20 metres! Most countries in Europe caught the openings with even H60LT getting in on the act. This is what was logged at my OTH, LA, SM, OH, SP, DI, OK, OE, H89, HB0, GM, EA, CT, I, and PA0. Some very short skip was noticed with stations in Germany being S9+. If you look at the X-ray chart for the 19th/20th, it is interesting to compare the opening and the large increases in activity.

**UK MICROWAVE RECORD**

I speak with Bob G3GNR quite often on the 80m microwave net (0800 to 0900z most days on 3.625MHz). Bob reports that on the 14th of January at 2330z, he contacted SM6ESG in JO67CC on 10.3681GHz. The distance worked was 1275km, which is believed to be a new UK distance record for 10GHz tropo. Congratulations Bob!

**G4CVI**

It is with sad news that I have to report the death of Richard Diamond G4CVI. Richard was an avid VHF/UHF operator. During past years he gave many a new country on 50MHz and 144MHz EME, whilst being part of the Camel Trophy Communications team in 8R1, 9M6, V31 and others. Richard also installed 50MHz beacons in V31 and 9M6. Our condolences go to all his family.

**BEACON AND GENERAL NEWS**

George JY9QJ is interested in coming on 50MHz. JY4MB has offered George a 50MHz beam (probably the one we left in 1994). George has also asked about the beacon, although it looks like JY4MB had forgotten about it, and May 97 has now been suggested as a date to get it on the air.

Eric F5JKK will go to TT8 in March, with his HF/50MHz radio and 5 element aerial. Eric is looking for more power.

The YBOZZ beacon which was prepared by Rex VK8RH, was installed on 50.042MHz at the Jakarta Repeater site in QL33, with a ground plane at 20m high last month according to YCOUVO.

The 5VV1AU beacon prepared by Richard K1KN is expected to be installed by Phil, 5V1AU, and operational on 50.050MHz in AH46, with 10Wand a 5 element aerial. Mick K1KN advises the following:

K1NKJ on 50.061MHz, 25W to a vertical.
GB3IQJ has been replaced with a new setup. It has better FSK and the frequency is spot on at 50.065MHz.
The beacon on 50.070MHz, formerly identified as W2CAP/B, is now identified as W1RA/B, which is Steve's new callsign.

News and views please, along with any photos you may like to send, to: Geoff Brown, TV Shop, Belmont Rd, St Helier, Jersey, Channel Islands or phone/fax 01534 877067. or Email to equinox@itl.net
DATA CONNECTION

The latest WinPack upgrade, some useful 'plug-ins', and BBS/node news are covered by our resident datacomms SysOp.

Just when you thought WinPack version 6.10 was the best ever, software author Roger G4IDE has done it again, with an update to provide even more facilities, including support for 'viewers' such as HTML as used for Internet web browsing. The possibilities are now even greater, with the optional addition of speech files, moving images, and so on in your packet messages. All we need are the required high-speed packet links!

Roger says it's an "experimental/development" update, and is designed to be used by people who have got WinPack V6.10 working totally successfully and who want to try something new. It's not for people who are having problems with V6.10! Some of the changes are new features not only to WinPack, but to AX25 packet in general, the major new features being:

1; Support for Viewers for messages and for 7-plus files.
2; An extra program, WinScape, which allows you to use Netscape interactively on AX25 packet.
3; Host mode support for TF2.7b and WA8DED.
4; Quick message reply with auto-quote.
5; Support added for using WinZip instead of PKZIP/PKUNZIP.
6; The "Mail only this session?" prompt can be disabled from the "Mail", "Mail Options" form.
7; A change made to SPEECH.EXE to try and stop it taking the focus from other applications.
8; MD2 Password support files included within the program directories.

There are many other improvements (Roger lists 32 in total), and no doubt if you've been active on packet you may already have seen others using this update. The update has been issued purely as an update file, and not as a new V6.20 program, so at the time of writing you'll need V6.10 installed to use it. If you'd like a copy of the update on disk (together with rather a lot more for WinPack - see below), I've arranged to have this made available as a service to readers from the Ham Radio Today software service - see the 'Software Offer' section elsewhere in this magazine for ordering information. As usual, if a later version becomes available by the time this appears in print, this will be included.

Incidentally, if you have problems in contacting Roger G4IDE via packet, his local BBS has recently closed, but you can instead send mail to his G8 callsign, G8MZX @ GB7SKG.

WINPACK 'PLUG-INS'

As well as the 'core' program, a large number of software writers, both amateur and professional, have produced 'programs that can be used as 'plug-ins' for WinPack. These include news and information servers, file utilities, and routines where you can instead send mail to his G8 callsign, G8MZX @ GB7SKG.

WinPack V6.2 now offers HTML facilities, here's a recent packet message received off-air using this format.
outgoing mail message replies! Besides these, I've also collated over 30 more 'plug-in' program collections for WinPack, if you'd like a copy of all these on disk together. The plan is to include the spell checker and dictionary, I've added all these to the WinPack V6.2 upgrade disk available this month from the Ham Radio Today software service.

**SUNPAC NEWS**

SUNPAC, the Southern Packet Radio Users Network group, tell me that following many problems with the computer at the GB7TW node system on Chillerton Down on the Isle of Wight, an upgraded PC was prepared and has now been installed. At the same time, the parameters were changed to bring it inline with SUNPAC and DCC recommendations by removing all node broadcasts and internode linking on user access channels. This may mean some users will experience the error message of 'a port number is required' when trying to utilise a connection sequence that worked previously, such as connecting to a DX packet cluster via the 2m part (e.g. you'll need to specify port 2 to connect to the local GB7SMC cluster). Also, to connect to the GB71OW BBS, until the restoration of the 4m link is completed you should use 'C 3 BBSIOW-1' to prevent a 'roundabout route'.

Recently 'on air' in the SUNPAC area is the GB7SUN BBS, located in Portsmouth. GB7SUN's user access ports are 144.550 and 432.675MHz, and there are 144.550 and 439.875 MHz; 1200 Baud mail-link GB7ZKX - GB7MSF (Newcastle Upon Tyne), 430.650 MHz; possible direct DX Cluster link GB7TXD - GB7ZKN 439.875 MHz; backup mail-link, and 1299.725 MHz; 2400 baud mail-link to RHB18 (Robin Hoods Bay). You can get further details direct from Ernie G3ZXN @ GB7ZKN. #18.GBR.EU

**DCC MEMBERSHIP VACANCY**

The RSGB's DCC Chairman, Paul G0MHD, says that it is with regret that he has accepted the resignation of Mike GOOPC as the Secretary of the DCC. Mike has worked very hard for the good of the network over the last few months, his work is valued by the DCC and they wish him all the best for the future. However, as a result of the resignation, there is now a vacancy on the DCC for a Secretary, with Ian GORDI having 'stepped in' to help out at the moment. If you are interested, are a full member of the RSGB, and have held a secretarial position in a local club or group in the past, the DCC say they would like to hear from you! You can contact Paul via packet with a message to G0MHD@GB7MH D.#38.GBR.EU or Email to paul@g0mhd.demon.co.uk.

**GB7TW NOW OPERATIONAL**

GB7TW in Newcastle upon Tyne is now operational, serving the Tyne and Wear area, the system being run by Ernie, G3ZXN. You'll find it on the following frequencies; 70.3125MHz; 1200 Baud mail-link GB7ZKX - GB7MSF (Newcastle Upon Tyne), 430.650 MHz; possible direct DX Cluster link GB7TXD - GB7ZKN 439.875 MHz; backup mail-link, and 1299.725 MHz; 2400 baud mail-link to RHB18 (Robin Hoods Bay). You can get further details direct from Ernie G3ZXN @ GB7ZKN. #18.GBR.EU

**EMAIL 'LOOKUP' AVAILABLE FOR FBB BBSS**

I'm informed by Deni WBOTA for a system that is currently running on an Email address 'lookup' service on FBB type packet bulletin board systems bulletin program is now available. The software allows entry and lookup of the Email addresses of ham radio operators around the world, and although the database is not large yet, it is growing very rapidly. If you're running an FBB system, you can download the files EMAIL1.ZIP (the program itself) and EMAILDB.ZIP (The Email database) from either http://www.dwatt.com/nk3t.html or by anonymous ftp from dwatt.com. For more information via packet you can contact Deni with a message to WBOTA @WBOA.T, SH6RVA, USA, N.

**CTRL-Z, END OF MESSAGE**

I'm very happy to cover topics of interest to readers in this column, so please do get in touch and let me know what your interests are. Also, if your local data group are 'showing the way' then don't be shy, let me know and I'll be pleased to publicise it - you might even get a few more people interested who aren't currently on data.

You can contact me via the Ham Radio Today editorial group, or via email, fax and voicebank systems, or by packet with a message to G4ACL @ GB7XZ. #48.GBR.EU

**G7JJF PACKET SOFTWARE REGISTRATIONS**

I've enthusiastically featured the packet radio software by Jon G7JJF in these pages before, and many copies have been distributed and in use in the UK, for standard TNCs, for BQG node systems, and for use with a BowCom modem. I even know about one commercial use of Jon's program for vital international aid and relief work on HF data systems.

News is that G7JJF software can now be registered with just a telephone call. Venus Electronics have been appointed as the agent for Jon's software, and registration access codes can be obtained by phone using your credit card, the registration costing just £10.00. Venus Electronics tell me they will also be including a registered copy of the G7JJF terminal program either DOS or Windows with their popular DigiPack Packet Modems. For registration or more details contact Roland Brade at Venus on Tel. 01252 837860, Fax. 01252 837860, or Email sales@venus.com. Please mention Ham Radio Today magazine when enquiring (no, we don't get a 'cut'!)

**SOFTWARE**

**G7JJF PACKET SOFTWARE REGISTRATIONS**

I've enthusiastically featured the packet radio software by Jon G7JJF in these pages before, and many copies have been distributed and in use in the UK, for standard TNCs, for BQG node systems, and for use with a BowCom modem. I even know about one commercial use of Jon's program for vital international aid and relief work on HF data systems.

News is that G7JJF software can now be registered with just a telephone call. Venus Electronics have been appointed as the agent for Jon's software, and registration access codes can be obtained by phone using your credit card, the registration costing just £10.00. Venus Electronics tell me they will also be including a registered copy of the G7JJF terminal program either DOS or Windows with their popular DigiPack Packet Modems. For registration or more details contact Roland Brade at Venus on Tel. 01252 837860, Fax. 01252 837860, or Email sales@venus.com. Please mention Ham Radio Today magazine when enquiring (no, we don't get a 'cut'!).
Don Field G3XTT shows how 160m can offer interesting possibilities, and discusses the relative costs of HF gear

The VKOIR operation is over, and it's time to take stock. This operation was unique in many ways, one of which was the Internet Reflector set up especially in connection with the operation, which quickly attracted over 1500 subscribers. Predictably some were complaining, within hours of the operation starting, that their favourite band(s) hadn't been activated, that the operators didn't know what they were doing, and so on. However, the general opinion seems to have been that this operation was a great success. Certainly, within the first 24 hours amateurs in the UK had been able to work them on 17, 20, 30, 40 and 160 metres, which can't be bad! And there were still another nine days to go, for those still straining at the leash.

In the end they broke a number of records, with over 80,000 contacts in all, a new DXpedition record. On 160 metres alone they made 1241 contacts, which is some going given that they were thousands of miles from even the nearest centres of population. UK stations were able to work them on all HF bands except 10 metres which, unfortunately, never opened to that part of the world.

By running up to six well-equipped stations simultaneously, the group were able to exploit all band openings and to work through the pileups right down to the weakest callers. I remember listening on one occasion when they had three stations simultaneously on 20 metres on CVV, RTTY and SSB! The daily bulletins included many messages from happy callers, with stories such as having worked VKOIR with an indoor dipole, with powers as low as 1W, and so on. The sense of elation at these achievements was tangible and must have given the VKOIR team a real sense that what they were doing was appreciated.

Of course, there were the usual problems of deliberate interference, bad operating, and so on. But there were plenty of good signs, such as the way European callers stood by when requested, during the brief daily openings to the East Coast of the US.

In due course there will be a book and a professionally produced video of the operation. They should be fascinating! The group were unable to operate from the French Antarctic Islands (Kerguelen and Amsterdam Islands) on this occasion, so maybe they will make these the target of a future operation, and we can enjoy a similar experience all over again.

Let's hope so. In the meantime, very many congratulations to all who worked to make VKOIR such a success.

160 METRE DX

As well as VKOIR, there was plenty of other rare DX on 160 metres during January and early February, so much so that at times the band sounded more like 20 metres! To give some idea, my own log includes VO9QM (Chagos Island), 9Y7SV (Vietnam), a couple of VK3 stations (Australia, zone 30), 9X4WW (Rwanda), 9J1T (Curacao), VP2EV (Anguilla),

<table>
<thead>
<tr>
<th>Numbers of contacts made by major expeditions in recent years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 VKOIR Heard Island Jan 1997 80673 QSOs</td>
</tr>
<tr>
<td>1 4J1FS MV Island May 1992 74495 QSOs</td>
</tr>
<tr>
<td>2 ZA1A Albania Oct 1991 69500 QSOs</td>
</tr>
<tr>
<td>3 3YCP Peter 1. Is Feb 1994 60000 QSOs</td>
</tr>
<tr>
<td>4 AH3C/KH5J Jarvis Apr 1990 55000 QSOs</td>
</tr>
<tr>
<td>5 AH1A Howland Jan 1994 52000 QSOs</td>
</tr>
<tr>
<td>6 TOOCl Clipperon May 1992 50100 QSOs</td>
</tr>
<tr>
<td>7 3V8R Near Burma Aug 1991 50000 QSOs</td>
</tr>
<tr>
<td>8 3VXV Bouvet Jan 1990 49000 QSOs</td>
</tr>
<tr>
<td>9 XF4L Revilla Gigedo Apr 1989 47943 QSOs</td>
</tr>
<tr>
<td>10 3D2AM Conway Reef May 1990 45000 QSOs</td>
</tr>
</tbody>
</table>

Two of the attractive QSL cards sent out by Tunisian club station 3V8BB

For more information on VKOIR, visit their website at www.vkoir.com
station design. In a year or two it systems which are once again the suppose it is the downturn in high and VK9IR operations, for example, promoted this focus on low bond and conditions which has into the demand. To a large extent I most. In practice, both operations those of us who have more modest developed Gladiator single-band commercial sale but for loan to Creek, Michigan, not for beneficial to all of us, but especially low band enthusiasts in Battle (a 17m high, very made of a special alloy so that it is light and can be erected easily in field conditions. That VK9R operation used a Battle Creek Special aerial (a 17m high, very substantial top-loaded vertical made by low band enthusiasts in Battle Creek, Michigan, not for commercial sale but for loan to bona fide expeditions), as well as a four-square array using the newly-developed Gladiator singleband vertical aerials from the US (the 160m version is only 7.6m high). These developments are beneficial to all of us, but especially those of us who have more modest stations, as they bring rare DX much more within our reach. If the XZ1N and VK9IR operations, for example, had put out a more typical signal on 160m they may have expected to make a couple of hundred contacts on the band at the most. In practice, both operations made well over 1000 contacts on 160m, digging much deeper into the demand. To a large extent I suppose it is the downturn in high band conditions which has promoted this focus on low band station design. In a year or two it will be 1.5 and 10 metre aerial systems which are once again the focus of our attention.

**OTHER DX**

On the higher bands there were some surprises. DJ5SI showed up as TN9X from the Congo, and PA3CC showed up /STO from Southern Sudan as just two examples. The Brazilian DXpedition to St Peter and Paul Rocks also came off OK. Mind you, we have some rare DX on our own doorstep, if you’re contemplating an expedition. Apparently, in a Japanese poll Jersey came out as the “Most Wanted European Country” on 80 metres, so pack your bags and on 80 metre dipole and become rare DX!

For the future, DX News Sheet reports that Peter PDK6K will be active from 9W9CC from 19th April until 6th June. He will operate on SSB, AMTOR and RTTY, 80 to 10 metres, especially at 1100 on 15m, 1200 on 20m, and 0000 on 80m looking for Europe. QSL to his home call.

**70 YEARS OF OUR HF BANDS**

Prior to 1927 the allocation of spectrum (which, in those days, meant what we would now regard as HF spectrum) was on a national basis, with no international co-ordination. For example, US amateurs had slots from 7000 to 8000kHz, and from 14000 to 16000kHz, while Australian amateurs had a slot around 9000kHz. This made intercontinental contacts something of a challenge! What is more, as it became obvious that, contrary to earlier expectations, the short waves were actually useful for long-distance communication, the professional users increasingly cast their eyes on amateur allocations.

An International Convention, the forerunner of subsequent World Administrative Radio Conferences, was convened in Washington in 1927 to sort out allocations on an international basis. As W5810 tells the story in CO Magazine (May 1994), the US representatives were strongly in support of amateur radio, while many other countries (including the UK) were suspicious of amateur radio and were determined to stamp it out. As in all these types of events, there were compromises, and lots of behind-the-scenes lobbying. But in the end, amateurs did well out of the Convention, with harmonically related allocations throughout the HF spectrum.

These allocations have, to a large extent, stood the test of time. There are regional variations, and some of the above allocations have since been trimmed slightly. But in return, the 15 metre band was allocated post-war, and the 30, 17 and 12 metre bands were allocated at the 1979 WARC. Many authorities who were sceptical about amateurs back in 1927 have, I’m delighted to say, come to recognise the important role that amateurs can play in providing a pool of trained communicators (invaluable during World War II), in providing emergency communications, in undertaking experimental work (amateurs, for example, pioneered a number of advances such as packet radio and low-earth-orbit satellites) and in providing a starting route into electronics as a career.

But 70 years on, the HF bands continue to have a significant role to play in both amateur and professional communications, largely due to technical advances. Just as our HF bands were beginning to be unusable due to heterodyne interference between adjacent carriers, for example, single-sideband suppressed carrier transmission came along and the problem was largely eradicated. Now DSP techniques are allowing error-free data transmission over marginally propagation paths with extremely modest power levels. Over the next few years we, as amateurs, can look forward once again to the delights of another superb peak, and worldwide communication on the higher HF bands.

On a related topic, G3RZP argues cogently in the latest Chiltern DX Club Newsletter that amateurs in the UK receive a great deal of support from the RA, much more so than, for example, US amateurs and the FCC. Peter believes this is, at least partly, because we continue to pay licence fees, which help to support RA resource for matters such as tracing intruders on the amateur bands and warning them off. US amateurs had a number of years ago that charging them for their licenses was unconstitutional, and the licence fee was dropped. One result, however, has been that the FCC is not inclined to spend money on matters related to amateur radio, which has a number of detrimental impacts on the amateur service.

**COST OF HF GEAR**

Finally, as a footnote to my remarks last month about equipment for split-frequency operation, I still see comments from time to time to the effect that HF amateur radio is becoming too expensive, and that this puts off newcomers. I was reflecting the other day that my first ‘modern’ transceiver, bought soon after I started paid employment, was an FT-101 Mk1, bought secondhand for £200 at a time when my salary as a fresh graduate was £2000 p.a. So a tenth of my salary for what, by current standards, would be regarded as very indifferent radio. The receiver was dreadful, with bipolar transistors in the front end that overloaded at the slightest provocation. To work ‘split’ I needed a separate receiver, as there was only one VFO. Of course, it only had six bands and certainly didn’t offer FT8 and RTTY.

Nowadays an equivalent salary would be £15,000 or so, and a tenth of that would buy you a very fine secondhand receiver, or even a pretty good brand new one, with far more facilities, a computer interface, and an excellent general coverage all-mode receiver. Older generations of us, still more than adequate, can be bought for a lot less. I have long considered that the real expense of a good HF station is the estate needed to give you enough space for some really effective aerials. Several acres on a cliff-top somewhere sounds ideal... Oh well, I can but dream...

Until next time, good DX and 73.

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**Original harmonically related HF band allocations:**

<table>
<thead>
<tr>
<th>Band</th>
<th>Allocated for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1715-2000kHz</td>
<td>amateur domestic</td>
</tr>
<tr>
<td>3500-4000kHz</td>
<td>amateur or local</td>
</tr>
<tr>
<td>7000-7300kHz</td>
<td>international or local</td>
</tr>
<tr>
<td>14000-14400kHz</td>
<td>international or local</td>
</tr>
<tr>
<td>28000-30000kHz</td>
<td>experimental (purposes)</td>
</tr>
<tr>
<td>50000-60000kHz</td>
<td>experimental (purposes)</td>
</tr>
</tbody>
</table>
SATELLITE RENDEZVOUS

Richard Limebear G3RWL with news on amateur satellite use by the Heard Island Dxpedition together with the latest on Mir operation

As the Heard Island Dxpedition, VKOR, has been using digital amateur satellites to transmit log data from one of the most remote locations on earth. Logs are uploaded from VKOR, downloaded by ON1A1G, and transmitted from Belgium via the Internet to waiting hams around the world. Anyone wanting to find out if they are in the log, may send an Email message, with their callsign in the body of the text, to heard-log@ve7tcp.ampr.org or check out the log data on the expedition’s Web site at http://www.ourumtel.com/heard-log.html These servers will check the latest available log data.

RUSSIAN SATELLITES

As of January 1st, the 2m voice and packet frequencies for Mir have reversed from 145.800MHz up and 145.200MHz downlink, to 145.800MHz downlink and 145.200MHz uplink for groundstations.

FM voice ops:
uplink 145.200MHz TX
downlink 145.800MHz RX

Packet ops:
uplink 145.200MHz TX
downlink 145.800MHz RX

Astronaut Jerry Linenger has replaced John Blaha aboard Mir and will return on STS-84 (scheduled for May). Jerry is the first of the long-term Mir astronauts who was licensed for a previous shuttle mission before his assignment to Mir. He earned the call sign KC5HBR while training for his only previous spaceflight, STS-64.

As far as third-party agreements go, the temporary third-party agreement which permits John Blaha to talk to unlicensed students expires when John leaves Mir. So it will be illegal to permit non-hams to talk to Jerry until the paperwork is approved for Jerry’s third-party agreement.

Also, unlike the previous Mir occupants, he’s got a family which is just starting. He has a one year old son and another child expected in June. Jerry is quite aware that he may be in space while his second child is born if there are any delays. Jerry is scheduled to spend 132 days aboard Mir, but of course that may change for other reasons. He will become the first US astronaut perform an EVA from Mir (wearing a Russian spacesuit).

In the past, astronaut’s activities have changed, especially after long periods in space. So while Jerry may not plan on using the radio much while he’s in space, that may change over time.

Table 1 shows preliminary, unofficial, data for the new Russian Satellite, RS-16. A speculation is that it might be interesting to listen between the two 70cm beacons to see if there’s a transponder downlink there, likewise with ROBOT’s. Places to try for a robot uplink might be: a) 40 kHz LF of uplink passband, or b) somewhere around 145.830/840MHz. Strange, though, about a year ago they released the information that the next RS would have a store-and-forward capability.

While we’re issuing rumours, here’s another one: There appears to be some possibility of a throwout spacecraft (or twos) to be ejected from Mir (remember the Ikarus series); orbital lifetime about 100 days. More information will be forthcoming once we get a decent translation of the text. Here’s what’s available:

"It is main positions on the small satellite with by radio amateur equipment of started with Russian orbital complex ‘Mir’. I ask to deliver to all active principals Atv1SAT. Oxtditions: Russian Space rocket corporation ‘ENERGY’ By name S.P.Kopolev we ore taken to install on the satellite radioamateur an equipment, to release the engineering specifications and to start, and AMSAT is taken to make radioamateur equipment according to our space requirements, to conduct her trials, to release the engineering specifications. The onboard equipment should be made for us in two full packages (Flight N1 and Flight N2) and to give For Russian Center of Flight Control in city Korolev

| Preliminary, unofficial, data for the new Russian satellite, RS-16: |
|------------------|------------------|
| **Period** | 95 min |
| **Inclination** | 97.2 deg. |
| **Uplink** | 145.915-145.948MHz |
| **Downlink** | 29.415-29.448MHz |
| **Beacons** | 435.50-435.548MHz |
| **PWR 29 MHz Down** | 1.2 W/4 W |
| **Beacon 1** | 435.504MHz |
| **Beacon 2** | 435.548MHz |
| **PWR 435 MHz Beacons** | 1.6 W |
early November. Internet web while they were in France back in
Mueller, DG7FDQ, accomplished carrying structure that he and Konrad
that Dick Jansson, WD4FAB, took of appeared back in mid-
wide Web site. Contained in this
PHASE 3D
is now off by a bit, especially at
orbit doesn't change very fast, things
orbital configuration. Although the
some problems observing the current
phases of flight.
-Orientation of the vehicle-constant rotation axis on the Sun with by
delay up to 10.-15 first 10 days of
flight and up to 30-35 in end to a
phase of flight;
-Two buffer storage batteries on the basis pressurized Ni-Cd of
accumulators, onboard ensuring power supply systems on a shadow
site. Total capacity of the battery no more tha."

KEPLERS

There is a problem getting updated Keplers, with 1996 day
299 still being the current set. Apparently NORAD are having some problems observing the current
orbital configuration. Although the
orbit doesn't change very fast, things are now off by a bit, especially at
perigee. Try adding about 1.5
minutes to any predictions.

PHASE 3D

KB5MU has uploaded eight new photographs of ongoing Phase 3D
work onto the AMSAT-NA World Wide Web site. Contained in this
release are photos of some of the support equipment and work
ongoing at the Orlando Lab, as it appeared back in mid-October,
1996. There are also two photos that Dick Jarson, WVD4FAB, took of
some of the initial dynamic testing of the P3-D spaceframe and SBS
housing structure that he and Konrad
Mueller, DG7FDQ, accomplished while they were in France back in
early November. Internet web browsers should be pointed to the
AMSAT-NA home Page at:
www.amsat.org and click on the
10GHz feed horns mounted on Phase 3D

-'New Phase 3D Photos' announcement just under the 'Feature
Article' banner. Doing so will link you directly to the area where these
new photos can be viewed.

OSCAR 13 CONTACT

W6BLO is compiling a list of stations who made QSOs during the
first and last few orbits of AO-13. Interest in the project has come from
a surprising number of sources.
Opening day was orbit No.80, on
22nd July 1988 and the final orbit
was on 22nd Nov 1996, No.6480. Those reporting are
cautioned not to use orbit numbers
that were logged, other than from the
satellite itself. Instead, use UTC
date for all reference, unless the orbit
number was obtained from AO-13's telemetry. NASA orbit numbers have
in error consistently, sometimes
by as much as two orbit numbers.
Judging by the activity levels
observed at W2RS (especially on
RS-10 and RS-12), OSCAR SKN
'97 was a great success, with lots of
fun for all who took part.

AMSAT IN QATAR

We have learnt of the establishment AMSAT-Qatar. Like all
other AMSATs around the world, AMSAT-Qatar say they will actively
work and donate on all AMSAT
projects. AMSAT-Qatar's president is
Mohamed Althani, A71EY, and the
board members will be announced
soon. For more information contact
AMSAT-Qatar at: AMSAT-Qatar
P.O. Box: 2260 Doha Qatar Tel: (974) 355553, Fax: (974)
427136.

TRAKBOX SOFTWARE

Trakbox users may be interested to hear that, in a recent internet
message, JA6FTL says that a new software version, TrakBox v3.40a,
will be released soon. This version
also includes compliance for dates
after year 2000.

OSCAR 10

It's still operational in ModeB and
currently available when in view, but
please do not attempt to use it if
you hear the beacon or the
transponder signals taking.
Generally, once AO-10 hits
height, it shuts down.

AMSAT-UK NEWS

If it's not already in your diary, the
12th AMSAT-UK Colloquium will be
held at Surrey University, Guildford,
Surrey, UK, from Friday 25th to
Sunday 27th July 1997. This year's
event will comprise three days of
technical matters only; there will be
no 'political' subjects.
Last month Ron G3A,N reported
that sales were down and I said:
"buy something from AMSAT-UK
please." AMSAT-UK mouse-mats are
now in stock at just under a fiver
should anyone be interested, but the
AMSAT-UK diaries are now out of
stock.
For further information about
AMSAT-UK contact: AMSAT-UK, c/o
Ron Broadbent MBE, G3AAJ, 94
Herongate Rd, London, E 1 2 5E0.
AMSAT-UK Keplers are put out
monthly and are now available
as a service to
readers by automatic fax retrieval
from the 24hr Ham Radio Today
faxback line, 01703 263429
(use with a personal DTMF, i.e.
touchtone', phone/fox keypad -
follow the voice menu, request fax
document 46 from the satellite
voice menu for this month's.

LATEST KEPLERS

AMSAT-UK Keplers are put out
on pocket weekly sent to KEPFER @
GBR. The latest satellite Keplers as
provided to us by AMSAT-UK are
also available as a service to
readers by automatic fax retrieval
from the 24hr Ham Radio Today
faxback line, 01703 263429
(use with a personal DTMF, i.e.
touchtone', phone/fox keypad -
follow the voice menu, request fax
document 46 from the satellite
voice menu for this month's.
Ready-programmed EPROMs are available for the MX290 series ex-PMR transceiver conversions featured in Ham Radio Today. These are available for the MX294 (2m or 4m, published Ham Radio Today Mar 94), MX295 (2m, published Ham Radio Today Vol.15 Issue No.2), and MX296 (70cm, published Ham Radio Today Dec 94).

Issue 2 EPROMs are now available, conforming to both ‘old’ and ‘new’ channel allocations on 2m and 70cm.

The 2m EPROMs are programmed for both the MX294 and the MX295 with all simplex, repeater, and reverse repeater channels, between 144.5000MHz and 145.8000MHz 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 70cm simplex, repeater, reverse repeater and packet channels used in the UK, and is suitable for both ‘low’ and ‘high’ band variants of the MX296.

Each EPROM comes supplied with connection information and a channel list. Photocopies of the conversion articles should you require them are available from our photocopy service, see the rear of this magazine for ordering information.

The price below includes UK p/p, outside UK (including Eire) at £10.99 per EPROM.

CREDIT CARD HOTLINE; 01442 66551 (24HR)

Send coupon to; Nexus Reader Offers, Nexus House, Boundary Way, Hemel Hempstead, Herts. HP2 7ST. Please allow up to 28 days for delivery. Price outside UK; £10.99 per EPROM.

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

To include your club, or rally, in this section, make sure you send us your events details in time. We only list active clubs, i.e. those who send us their民主生活ates and events to be included in the issue published on the 23rd May. Must reach us by the 11th April. Details of events/talks, etc., not included due to space restrictions. We can only include clubs that send us details of events and visits, not individuals. Some events may be missed out because their details arrive too late.

Appledore & District ARC meet on the third Monday of each month, 7.30pm, at Appledore Football Clubroom, Devon. Club CVI on 8000m - 8300m every Wednesday on 28 200kHz. 8.30pm - 9.00pm SSB. Morse speed adjusted to the slowest sender. 2m FM every Tuesday 145.475 at 8.00pm. Planned club events/talks.

Axminster Vale RS meet on Wednesday evenings in the Village Hall in Axminster, located on the A31 between Axminster and Honiton. Club diaries. For further details contact Dave Brierley G3YQG, Tel. 01373 476724.

Blackmore Vale ARC meet on the second and fourth Tuesday each month, 8.00pm, at Shottesbrook Upper House, Dorset. A club net is held every Sunday on 145.350kHz at 7.00pm local time. Newcomers and visitors always welcome. Planned club events/talks.

Apr 8th - AGM

Further information contact Stuart G7IJE, Tel. 01767 833554, or GB7FQS@GB7DI.

E-mail: Stuart.sutcliffe@gacom.com

Orestone Road, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or direct to the Editor's desk by fax on 01703 263729 or by Email to nh@netlink.co.uk

Bristol ARC meet every Thursday, at the Scout Hut, Fishponds, St. George, Bristol. Planned club events/talks.

Apr 3rd - Round table on fox hunting

Apr 10th - Air traffic control periods

Apr 17th - Thoughts on Longwave

For further details contact David G4ZBT, Tel. 0117 955 1226 or G3YQG. Tel. 01454 772002.

Orestone Road, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or direct to the Editor's desk by fax on 01703 263729 or by Email to nh@netlink.co.uk

Bristol (South) ARC meet every Wednesday at the Withciffe Hall, Association, Bridge Farm, Horspath, Oxford, Oxon. Road, Westcourt, Bristol. Club diary of events/talks. 

Apr 2nd - 10GHz activity evening

Apr 9th - Microwave radio demos. G3PS

Apr 16th - Quiz night

Apr 23rd - 3rd building to build a basic receiver, G0TDS

For more information and meeting times, Tel. 01275 834282 24th Answerphone.

RSGB Bristol Group meet on the last Tuesday in the month, 7.30pm, at New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. Club diary of events/talks.

Apr 22nd - Aerials, Ears, Eyes & the Radio Operator

May 19th - Microwave radio demos. G3PS

Further details can be obtained from Robin Thompson G0TMK, Tel. 01225 420442.

Bromley and District ARC meet on the third Tuesday of each month, 7.30pm for 8.00pm at the Victory Scout Hall, Kentish Gardens, Hayes, Kent. Club net Sundays 11.00pm on 145.500kHz FM. Planned events/talks.

Apr 15th: Propagation, Alan G0TGV

May 20th: Construction - Wavemeter

June 1st: Direction Finding hunt

For further details contact Alan Messenger G0TGV, Tel. 0181 777 0426.

Bromsgrove ARC meet on the second and fourth Tuesday of the month at Linsay End Working Men's Club, Alcester Road, Buracl, Bromsgrove. The club run regular Nights on the air/Construction evenings.

Planning diary of events/talks.

Apr 22nd - Loop aerials

May 17th - AGM

May 27th - DF hunt (on foot)

Further details from Barry Taylor G0TTP, Tel. 01527 247200.

Buxton ARC meet at the Lee Wood Hotel, Buxton, on 8000m on the second and fourth Thursdays each month. Club diary of events/talks.

Apr 8th - Home made box etc.

Apr 22nd - Data related talk by Bob G0GFB

May 13th - Quiz night

May 27th - Why don't you answer CO calls?

For further information contact Derek Carson G4HMO, Tel. 01298 253508 or G4HMO@GB7FAD.

Cheltenham AR Association meet on the first Monday of the month at the Prestbury Library, The Prestbury, Prestbury, Cheltenham, on 7.30 for 8.00pm. Visitors and prospective members welcome. Club nets Wed 9.00pm, Thurs 9.00pm & Fri 9.00pm, at Anns Ruis & Anns KUS at 9.00pm. 2m SSB at 144.650MHz. 2m FM on 145.365MHz.

Mid Cheshire ARS meet every Wednesday, 7.30pm, at Grange Hall, Town Hall, Chester. The club holds regular on-air contacts. Morse and CB courses available. Visitors and new members welcome.

For further details contact the Club Secretary, Mrs P. Thame G4NKS, Southern House, 9 Southern Rd., Cheltenham, Gloucestershire, GL53 9AW. Tel. 01242 241099

For further details contact Dave Brierley G3YQG, Tel. 01275 834282, or GB7FQS@GB7DI.

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Further details can be obtained from Robin Thompson G0TMK, Tel. 01225 420442.

Cornish RAC meet on the first and third Thursday each month, 7.30pm, at Penmonoller Village Hall, near Torpoint, Cornwall. The club holds regular on-air contacts. Morse and CW courses available. Visitors and new members welcome. Planned club events/talks.

May 17th - Morse tuition

Mid Cheshire ARS meet every Wednesday, 7.30pm, at Grange Hall, Town Hall, Chester. The club holds regular on-air contacts. Morse and CB courses available. Visitors and new members welcome. Planned club events/talks.

May 17th - Morse tuition

Further details can be obtained from Robin Thompson G0TMK, Tel. 01225 420442.

Craven RAC meet on the first and third Thursday each month, 7.30pm, at New Inn, Vickers, Vale, Harrogate.

For further details contact Robin G0VWW, Tel. 01067 209424.

Croy Valley RS meet on the first and third Thursday of each month, 8.00pm, at the Progress Hall, Admiral Seymour Road, Ilfracombe, Devon. Planned club events/talks.

May 17th - AGM

May 24th - Open forum

May 31st - Satellite tuition

Further details can be obtained from Stuart G7IJE, Tel. 01767 833554, or GB7FQS@GB7DI.

Elland Radio Club meet every Wednesday evening, 7.30pm, at the Village Hail, Harlow, Herts. The club is a registered club for QSL activity and emergencies, and also runs Morse and Novice courses. Planned club events/talks.

For further details contact Don G3JNJ, Tel. 0181 8323545.

Hoddesdon Radio Club meet alternate Thursdays at the Conservative Club, Ivey Road, Hoddesdon from 8.30pm onwards. SSWG and visitors very welcome.

For further information contact Don G3JNJ, Tel. 0181 292 3679. Email: g3jnhod@compuserve.com

Iowa Radio Club meet on the first and fourth Tuesday of each month, 7.30pm, at Loveland Village Hall, Loveland Town, Loveland, Herts. The first Tuesday of the month is usually a Natter Night. Visitors and new members always welcome.

For further details contact John G3NLI, Tel. 01707 479264.

Hampshire and District ARC meet on the first and fourth Tuesday of each month, 7.30pm, at Loveshaw Village Hall, Laverne Town, Faversham, Kent. The first Tuesday of the month is usually a Natter Night. Visitors and new members are welcome.

For further details contact John G3NLI, Tel. 01707 479264.

Isle of Man ARC meet on Mondays, 8.30pm, at The Royal Navy Association Club, Victoria Quay, Douglas. The club is a social club and provides Morse tuition. Further details can be obtained from Stuart S. Swain, Tel. 01730 472864.

To add your club, rally, etc., to this section, please send us your event details. We only list active clubs, i.e. those who send us their民主生活ates and events to be included in the issue published on the 23rd May. Must reach us by the 11th April. Details of events/talks, etc., not included due to space restrictions. We can only include clubs that send us details of events and visits, not individuals. Some events may be missed out because their details arrive too late.
Itchen Valley ARC meet on the second and fourth
Fridays each month, at the Scout Hut, Brookfield Lane, Chantry, Nursling, Hants just up Pit Road from B24, 7.30 pm for 8.00 pm. Planned club events/talks;
Apr 15th - Talk by G4RNC
Apr 25th - Development of amateur radio, G7SAW
Further details from Sheila G0VIN, tel. 01703 813827

Keighley ARC meet at the Cream Club, Inglewood, every Thursday at 7.30pm. Club meetings are 'natter nights' and include talks on the air, visits, future events/talks include;
Apr 16th - Talk by G2GOF
Apr 24th - Talk by G2AEF
May 15th - Computer/simulations
May 22nd - Cable TV, by G4DCF
Further details from Jack Birse, G4ZVD, 178 long lane, Keighley, W. Yorks BD21 4TT, Tel. 01535 219858

Leicester RS meet every Monday, 7.30pm, at the Chantry, Gilmore Cartage, Grange Road, Leicester. The HF and VHF stacks are available at each meeting, and have regular HF/VHF nights on the air combined with a general matter evenings. The club also run RAE, Novice and Morse courses. Planned club events/talks;
Apr 7th - Morse test
Apr 21st - Weather shower & thunder clouds, D2RSL
Apr 28th - RS 'junk sale': donated items, proceeds to RS.
May 19th - Under a tenner & constructors competition
For further details contact Stan H, G3HYH, Tel. 0116 239 4367

Loughborough and District ARC meet every Tuesday evening, at Hinckley Community College, Shepshed, Leicestershire. The club have on 'the air' evening on the first Tuesday each month;
Planned club events/talks;
Apr 8th - Fun 2m DF with clues
Apr 15th - Forum 'Computer night'
Apr 22nd - Visit to Rugby Radio Station
Apr 29th - Junk Sale
May 13th - Basic faults - video recorders
For further details contact Ian GB8SNF, Tel: 01509 218259

Maidstone YMCA ARC meet at the YMCA Sports Centre, High Street, Maidstone. They run RAE and Morse courses. GB2GWM is on Sundays, 8.00pm. 144.250MHz USB/CW, club net on 9.00pm. Planned club events/talks;
Apr 4th - Junk sale (visitors £1)
Apr 11th - Talk by G5PMB
May 3rd - GB2GWM Morse tests
May 25th - Club mobile rally
For further details contact Mike Glaister, Tel. 01634 857675

Malvern Hills ARC meet on the second Tuesday each month, at the Red Lion, Malvern, Worcestershire. Planned club events/talks;
Apr 8th - Construction evening, by Mike Glaister
Apr 15th - Amateur Television
Apr 21st - Fox hunt
May 1st - Talk by G4UMQ
Further details from John Jones, G4ZXS, Tel. 01902 741877

Midlands AX2S Packet Radio Users Group (MAPX2), meet on the first Monday each month (when this is a Bank Holiday, the meetings are on the second Monday), 8.00pm, at the Perrott Community Centre, Perrott, near Wolverhampton. Non-members and visitors welcome (members 30p per evening to help cover costs)
Apr 7th - AGM/packet software discussion
May 5th - A practical comparison of the Tiny2 and the PK232 TNCs
For further information contact Secretary Ed lovecho G4X2K, Tel. 01902 741877 (evening)
Further details can be obtained from Mike G4E01., Tel. 01603 789792. A programme of future club events/talks is available on packet by typing 'NARC

Newbury and District ARC meet on the fourth Wednesday each month at the Bucklebury Memorial Hall, Bucklebury near Thatcham, at 7.15pm. Planned club events/talks;
Apr 23rd - AGM
For further details contact the club secretary, Tel. 01635 863310

Norfolk ARC meet every Wednesday at The Norman Centre, Bignold Road, off Drayton Road, Norwich, 7.30pm for 8.00pm start. Informal meetings are usually held on alternate Wednesdays when it is a night on the air, construction QRP and Morse practice evening. Club events/talks;
Apr 2nd - AGM
Apr 2nd - "On air and natter night'. Visitors always welcome.
Further details can be obtained from Mike G4E01., Tel. 01603 789792. A programme of future club events/talks is available on packet by typing NARC

Salop Amateur Radio Society meet at The Telescopes, Abbey Foregate, Shrewsbury, every Thursday. They presently run a Novice course on Tuesday evenings (details from Tony MOAMP @ GBP7SK) and regular 'on air/natter nights. Planned club diary of events/talks;
Apr 10th - Construction evening
Apr 17th - Telford Rally discussions
Apr 24th - SSB, by Simon GOEIY
May 8th - Junk sale
For further details contact lan G7SB0, 56 Rosselyn, Harlescott, Shrewsbury SY1 4LA, or @ GB7PMB
Internet: http://www.clemolv.demon.co.uk

Sheffield ARC meet every Monday (except bank holidays), 7.30pm, at the 197 Club, Brook Hill. Sheffield (this is the lecturer's social club opposite the main building of Sheffield University.) The club also run on-air and Novice courses. Planned club diary, Apr 14th - 'bargage received', by Ron G4U4MQ
Apr 21st - Fox hunt/primer night
Apr 28th - Talk by Rev. George Dobbs, G3IVY
May 15th - Fox hunt
For further details contact Brian GB7W, c/o 158 Skirmerthorpe Rd, Sheffield S4 6BO, or packet G76PBW or email: Brian.G76PBW@virgin.net

Silverthorn RC meet every Friday, 7.30pm at the Adult Education and Community Centre, Friargate, Hill House, Simonstone, near Harrogate, DOR 4GE. A warm welcome is given to everyone. They offer Morse tuition and tests, and have a fully equipped shack with packet radio facilities for members to use, plus regular 'on air' and social evenings. Planned club diary of events/talks;
Apr 11th - Junk sale
For further details contact Andrew worby, G0LWS/G1NP, at above address, or from Dave G0KHC, Tel. 0181 505 1871, or packet G1NPT @ GB7TUT. A programme of club events can be obtained by using REGFIL on line C: \CLUBS\SILVERTH\CLUBINFO.TXT from GB7TUT

West Somerset District ARC meet on the first Tuesday each month, 7.30pm, in Room GB7, Gibbs Block, West Somerset Community College, Minehead. Somerset. RAE and Morse instruction available. All visitors are welcome. Planned club events/talks;
Apr 1st - Construction contest
May 6th - Radar, invited speaker
Jun 3rd - Fox hunt, all invited
Further details contact Alan C. Elliott, MOADJ, Tel. 01643 707207

Stourbridge and District ARC meet on the first and third Mondays each month (except bank holidays), at the Robin Woods Centre, Scott's Road. Stourbridge. The first Monday is usually on 'an air and natter night'. Visitors always welcome. Planned club events/talks;
Apr 7th - On air and natter night
May 12th - On air and natter night
Further details from Gordon Bryant G0TVZ, Tel. 01384 305206

'Starlite' monthly newsletter of the Stourbridge ARC

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;
Apr 8th - AGM
Apr 28th - Top Band direction finding competition
May 12th - Visit to the Technical Operations Centre, BBC Transmissions, Warwick (numbers limited)
Further details from Club Secretary Jeff Porter G4OCHL, Tel. 01789 773280

Newsletter of the Sutton & Cheam ARC

Sutton and Cheam RS meet on the first Thursday (natter night) and third Thursday (normal meeting) each month, 7.30pm, at Sutton United Football Club, The Borough Sports Ground, Gander Green, Sutton, Surrey. Club 'natter freq' 70.3875MHz, Club nets: 20.30 Man starting on 145.300MHz then GB7Y, Tue at 10.30 on
Swindon and District ARC meet every Thursday evening, 7:00pm, at the Eastern Community Centre, Savernake Street, Old Town, Swindon. The club hold regular net and operating evenings, and 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:
- Apr 20th – Contest logging – practical session

Swindon end District ARC meet every Friday each month, at St Andrews Church Hall, Herben Road, Swindon. They have regular get-togethers at their rally night, see above. Contact details; The Radio Society, 29 Trevorton, Pinewood Road, High Wycombe, Bucks HP12 4DD. Internet: http://www.3renehurst.co.uk

Swindon Amateur Television Club (RARE) run regular meetings for Amateur Television (ATV) enthusiasts. Information from Vice Chairman Margery Hey, Tel. 01743 873815. Fax, 01743 874729 Packet: G6FHMOGB7PMB. The RARE Training Team can be contacted at Service House, 22 Upper Ground, London SE1 9SA. They operate a 24hr national emergency contact line, 0171 211 0211, for home study, for blind, deaf and disabled amateurs. Information for their AGM is available from Membership Secretary Bill McCall, GB7VVRG, 39 Sadler Street, Northwich, Cheshire, CW8 1FA. Tel. 01606 783270, or 0115 925 6597. VHF Packet: G6FHMOGB7PMB.

Trowbridge and District ARC meet at Southwick Village Hall, Southwick, Trowbridge, Wilts for a main meeting every first Monday of the month, and a net every third Monday evening (except October). The club also run an RAE course (for details contact Chris GOFHPX Tel. 01225 764874 evenings). Visitors welcome, fee 50p. Planned club events/talks:
- Apr 18th – G9TJ and JA0FMA (from Japan)
- May 9th – Switch Mode PSUs, by G8PYE
- May 16th – Using the GDO, by G3YOL
- May 23rd – Desert Island Radio, by G4ZXO
- May 30th – Video editing, by G3RXG

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. Further details from Peter G4VTO, Tel. 01803 864528 (day/weekend). Further details to Tarrant ARS are available from G3TSK, 17 Manor Way, Tarrington, North Cornwall. Internet: http://www.3renehurst.co.uk

Wimborne and District ARS meet on the second and last Friday each month, at St Andrew’s Church Hall, Herben Road, Wimborne. They have regular get-togethers at their rally night, see above. Contact details; The Radio Society, 29 Trevorton, Pinewood Road, High Wycombe, Bucks HP12 4DD. Internet: http://www.3renehurst.co.uk

Wirral and District ARC meet at 8:00pm, at the Lord Crichton Club, Mill Hill Road, Ibby, Wirral. The club hold regular get-togethers at their rally night, see above. Contact details; The Radio Society, 29 Trevorton, Pinewood Road, High Wycombe, Bucks HP12 4DD. Internet: http://www.3renehurst.co.uk

Yeovil ARC meet every Thursday at 7.30pm, at the Red Cross Centre, 72 Grove Avenue, Yeovil, Somerset. The club run Novice and RAE courses, plus Morse tuition if required, by arrangement with G3GC. All are welcome. Club nets, Sundays, 10.30 on 3.655 MHz (80m SSB), Tuesdays 20.30 on 1.755 MHz (2m FM) and Fridays 20.00 on 3.550 MHz (144MHz). The club also run on Saturday and Sunday afternoons. For further details contact Phil GOJS, Tel. 0151 677 1497, or SF GOJSB @ GB7GAR

Yeovil Amateur Radio User Group (YARUG) meet every Thursday at 7.30pm, at the Red Cross Centre, 72 Grove Avenue, Yeovil, Somerset. The club run Novice and RAE courses, plus Morse tuition if required, by arrangement with G3GC. All are welcome. Club nets, Sundays, 10.30 on 3.655 MHz (80m SSB), Tuesdays 20.30 on 1.755 MHz (2m FM) and Fridays 20.00 on 3.550 MHz (144MHz). The club also run on Saturday and Sunday afternoons. For further details contact Phil GOJS, Tel. 0151 677 1497, or SF GOJSB @ GB7GAR

NATIONAL AND INTERNATIONAL

British Amateur Radio Teledata Group (BARTG) have a quarterly magazine, "Cloudburst", and hold a rally and HF RTTY contest each year. For more details about their monthly meeting, Members Secretary Bill Mccall, CD5BD, 14 Pinfold Street, Malby, Rotherham, South Yorkshire, S63 3GD, Tel. 0114 2141010 Ext. 722. From 8.30pm to 9.30pm, Sat and Sun before 9am, or via GB7WJR. Internet: http://www.bartg.deamon.co.uk

British Amateur Television Club are particularly active with Amateur Television (ATV) transmissions and reception of visual signals. They produce a monthly newsletter, called CQT and have regular get-togethers at their rally nights, and hold their own rally each year. Details from Club Secretary Bob Mitchell, GB7KAS, 69 Woodlawn, Greenhills, Pinewood Road, High Wycombe, Bucks HP12 6DD.

G-GRP Club publish a quarterly newsletter, "News of the World" and regular get-togethers of their rally stands across the country. For membership details, contact GB7YC, 69 Woodlawn, High Wycombe, Bucks HP12 6DD. Membership fee £10.

International Short Wave League who also run an International QSL bureau for amateurs and SWLs have a monthly magazine and regular get-togethers of their rally stands plus several aerial nets on HF and VHF. For more details send an A4 sized SAE to: ISVLHC, 3 Bromyard Drive, Cheltenham, Glos. GL50 4JF. Internet: http://www.g-grp.com

The Irish Radio Transmitters Society publish regular newsletters giving details of local activities, and have an annual AGM. They also have a video library. Their AGM this year will be held on the 26/27th April at Ballinalee, Longford. For further details contact Dave Morris, G3GC. All are welcome. Club nets, Sundays, 10.30 on 3.655 MHz (80m SSB), Tuesdays 20.30 on 1.755 MHz (2m FM) and Fridays 20.00 on 3.550 MHz (144MHz). The club also run on Saturday and Sunday afternoons. For further details contact Phil GOJS, Tel. 0151 677 1497, or SF GOJSB @ GB7GAR

Radio Amateur’s Emergency Network (RAYNET) can be contacted at Hunsdon, Newton-le-Willows, Bedale, N. Yorks. Tel. 01743 874245. They have a quarterly newsletter for people interested in the National Training Scheme, and can be contacted on P.O. Box 2, Chinnor, Oxon OX9 4JH.

The Radio Amateur Invalid and Blind Club of Great Britain (RAIBC) are a registered charity, dealing with radio/computer equipment, and organise courses for home study, for blind, deaf and disabled amateurs. Information from Secretary, RAVE, 1 Allfield Cottages, Condover, Shrewsbury, SY5 7AP. Tel: 01743 872315. Fax, 01743 872429 Packet: GB7VVRG. Email: info@raic.org.uk

Radio communications are the licensing authority for all UK radio amateurs. They have a large number of free publications, including the booklet "How to Become a Radio Ama", and their "Radio Licence Information Service" can also offer advice on many aspects of licensing. They are currently in alternative temporary office at the Kings Beam House, 22 Upper Ground, London SE1 9SA. Direct Amateur Radio line: Tel. 0171 211 0180. General enquiries: Tel. 0171 211 0591. Answersphone service: Tel. 0171 211 0591.

Radio Society of Great Britain (RSGB) are the National Society who have been representing UK radio amateurs and short wave listeners for many years. They are based at Lambeth House, Commercial Road, Poole BA2 3JE. Tel. 01202 565015. Internet: http://www.rsgb.org

The United Kingdom Radio Society (UKRS) are a newly-formed National Society (see "Radio Today" Sept/Oct). They can be contacted at Box 100, Meadow House, Snowhill, Chester, CW1 6AF Tel. 0151 783270, or 0115 925 6597. VHF Packet: GO7SEXGMB7PMB. Email: info@ukrs.org.uk Internet: http://www.4kgs.org

Subscription Services Ltd. handle the issuing of amateur and SWL licenses in the UK and on behalf of the Radio Communications Agency. They can help regarding enquiries concerning individual licenses rather than general licensing matters which the RA handle, see above. Contact details; The Radio Licensing Service, 24hr national emergency contact line, 01743872315. Fax, 01743 872429 Packet: GB7VVRG. Internet: http://www.rsls.org

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 of their rally stands plus several aerial nets on HF and VHF. For more details send an A4 sized SAE to: ISVLHC, 3 Bromyard Drive, Cheltenham, Glos. GL50 4JF. Internet: http://www.g-grp.com
RALLIES

If you're travelling a long distance to attend an event, we recommend you contact the organisers or check the latest information on their website.

APRIL 6TH
Launceston ARC Rally. Launceston College. Featuring trade stands, Bring & Buy and demonstrations. Refreshments and hot snacks available from 10am. Doors open at 10am. For further details contact Gary Sait. Tel. 01473 345 604.

APRIL 9TH
SAMS' 97 Computer & Electronics Show. Bingley HI Club, Bradford. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01788 265 602.

MAY 5TH
Darlington Radio Rally. Weetwood, Harrogate, Yorkshire. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

MAY 11TH
Droitwich Manor Radio Rally. Droitwich Manor House. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Dave G6VX. Tel. 01684 777 787.

MAY 18TH
Durable Downs Radio Club - 14th National Motor Car Boot Sale. South Coast, Ringway, Park. Last 10 years. 10am to 4pm. No stalls. For further details contact John, G0JAP. Tel. 01622 735 690.

JUNE 22ND
Borough & District ARC Rally. Borough. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

BRITISH AMATEUR TELEVISION CLUB ANNUAL RALLY, Spalding. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

BROADSTAIRS RALLY 1997
SAMS '97 Computer & Electronics Show. Broadstairs, Kent. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

BRIDGEND & DISTRICT ARS RALLY
MAY 4TH
Bridgend & District ARC Mid-Summer Radio & Computer Rally. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

BARTG ANNUAL RALLY 1997
SEPTEMBER 13TH
Newcastle upon Tyne. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

BROCKHAMPTON RALLY 1997
SEPTEMBER 14TH
Brockhampton, Worcestershire. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.

BROADSTAIRS RALLY 1997
BRIDGEND & DISTRICT ARC MID-SUMMER RADIO & COMPUTER RALLY
MAY 4TH
Bridgend & District ARC Mid-Summer Radio & Computer Rally. Featuring trade stands, Bring & Buy, trade stalls, demonstrations, competitions and a selection of electronics for the home. Doors open at 10am. For further details contact Mike Wooding, G6IOM. Tel. 01473 741 531.
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Eddystone Receivers: EC10, 358X, 830/7, mounting blocks 774, 870, 870A. Wartime civilan, Clarke & Smith, plus lots of Eddystone spare parts, ring for lists, including brochures etc. Peter Legino (Surrey), Tel. 01372 454381, or 0374 128170 anytime.

Yaesu FT-747GX, all mode, general coverage transceiver, with hard and mic and operating manual, £425 ono. Cash only. Wanted: HF crystals, send your list, or fax 0181 505 6303. M. Evans, 120 Loughton Way, Budhurst Hill, Essex IG9 6AR

Yaesu FT-790R Mk II, mint condition, with box, manual and case, £240. Also 70MHz FM radio, £10 each. Buyer to collect. For more info contact Ian Hughes (Walsall). Tel. 01922 30668 after 5.30pm.

Yaesu FT-8500 FS10, brand new, in box. Watson W-30 and Watson W-770HB aerials, £550 the lot. C. Boydell (Bolton), Tel. 01204 840035

Icom T42E 70cm handheld transceiver, as new, CTSS fitted, mic, speaker mic, charger, case and manual, £150. Vic 20 plus 10k RAM pack & tape player, boxed, £20 plus postage. Terry G40XD (Herts), Tel. 01462 435248 after 6pm.

Notebook computer, ideal for use with 4023, TFT screen, Windows 95, 586B, 686B, complete with software, lowerArmaster ACARS decoder, AEACa7734 super for on-screen picture of Fox, RTTY, Navtex, package only few months old, boxed, £700. M. Wynn (Oxford), Tel. 01865 749374

PRO-34 hand held scanner, 200 memories, freq range 68-88, 108-136, 136-174, 380-512, 800-960MHz, AM, FM, S&G, A. Camp (Shrops), Tel. 01584 872618

Vectronics VC-300D aerial tuner, 1-830MHz, 300W continuous. Cross needle forward reflected SWR meter plus 21 segment bargraph. Built in dummy load. Manual, unmarked, excellent condition, £50. A. Brooks (Basingstoke), Tel. 01256 473715

AR3000A, £650. PRO-2006, £200 both mint condition, hardly used. PRO-2006 boxed. Manuals and aerial included. Grant (Barnsley). Tel. 041 1116544

AEA PK-232MBX data controller, Icom and Yaesu connectors, boxed, excellent condition, £200 no offers. P. Noone (St. Helens), Tel. 01942 273143

HRO(MX) UX valves, original PSU, 9 general coverage coils and 5 bandspread coils, £90. Approx 75 1960/84 American magazines, "Ham Radio", "QST", "CQ", 20p per copy. Collect or carriage extra. R. Grant (Hants), Tel. 01329 843219 MW295 SKI, as described in Feb 97 HRT, in very good condition, £12 plus postage. Jim (Grimsby), Tel. 01472 310609

FT-1 general all mode transceiver, £350 ono. FC-107 ATU, £150, includes YM47 scanner mic, G54V plus 103 coax, case or carriage. Collect. Steve G0HIN (Hull), Tel. 01482 797646

AKD 6m radio model 6001, only few months old, used only four times, £180. 6m half way folded aerial, 10k high. £48. William Thomas (Kent), Tel. 01634 712270

Packet TNC kit, case, PCB, no firmware, needs completing. 9600 PCB, case, populated, needs completing, £45 each. Various other items. Wanted: Eddystone EC10 receiver, mains power unit, good working order, good condition and appearance. GBSU (Devon), Tel. 01395 265059


Pakratt PK322, manual, box, leads, £120. Also Datong FL3, boxed, £70. Both good condition. Brian (Cornwall), Tel. 01579 363192

Icom R-7000 professional scanner, 25-2GHz. Perfect order throughout, includes remote control and voice options, mains or 12V operation, £595. David G1XXR (Bournemouth), Tel. 01202 433199

Cushcraft A45, brand new, boxed, £325. F. Godfrey (Notts), Tel. 01909 530204

Yaesu FT-101ZD, WARC, excellent condition, original box and manuals, full HF transceiver, £300 ono. A. Grannan (Hull), Tel. 01482 814912

W5 No.52 receiver with PSU, £60. No. 19 Set, AC PSU fitted, no TX, RX works great, £80. GRC-9 Hf transceiver with PSU etc., £180. BE201 VHIF, £80. Miniature Morse key, £20. Wanted: military radios, W/H? Ben (Wids), Tel. 01562 743253

IC-3200H dual band 2m/70cm transceiver, £185. FT-747GX, £200. FP-757GX power supply, £50. KPC2 Pocket com II, £45. ACU FC-700, £30. Assorted aerials, £40. Tony (Fareham, Hants), Tel. 01329 312576 evenings.

Quantity Stormo 600 modules, CQG, CQG, CQI tone boards, osc mods, control panels, LUTs, some H/B, U/B CQM CQIs, other spares, lamps, PAs, transistors, Tcoan coils, Pye repeater T401, T402, L. U. offers. Will James (Perth), Tel. 01738 812611

2m handhelds: Delcom U2, fully programmable 4.5W rig with two battery packs, simple/duplex/scan modes, helical aerial, handbook, charger. Has LCD display, external mic/LS/12V jacks, lopower (1W) switch etc., in original packing, £75. GBAKA (Reading), Tel. 01189 701163

Maxon CGX4020 PMR transceiver, 2SW, 4 channels converted to 70cm, one channel.
boxed as new, instructions, £350 inc. carriage. Yaesu FT-7700 ATU, boxed, instructions, excellent condition, £45 inc. carriage. S. Clifton (N. Wales), Tel. 01492 878107

Yaesu FT-2900MK2 2m all mode transceiver with FL2025 25W matching linear, both boxed, VGC, £350. Tel. 01474 823797

Kenwood TS-690S HF + 6m, 1.8kHz filter fitted, boxed as new, £875. MEJ 784B DSP filter, as new, £175. Alan (Penrith), Tel. 01736 62809, or 362809 after 11th March

Winch for tower, Pfaff auto brake, as supplied by Strumech for P40, in box, never been used, £60. G. Perry (Manchester), Tel. 0161 723 4306

WANTED
For reception set R216, the front panel metal cover contains two elevating screws. Also metal panel cover for supply unit containing a spares case and fashion lamps. Any help please. Andrew Humphris (Warwick), Tel. 01926 400876

Heathkit SB101 transmitter and SB200 amplifier. Also Tokyo HT120 20W CW/SSB mobile transceiver, GM4PPT (Ayrshire), Tel. 01292 570517

Yaesu NC-8 / FT-708R battery charger and FNB-2 battery. Alan (Cleveland), Tel. 01642 478020

455 IF SSB filter, e.g. Kokusai MT455 10CK or similar. Also receivers G20AF MkII, G3PDM, G4DTC ‘Ultimate’, working or not, £875. MFJ 784B DSP filter, as new, £250. E. Archibald, 32 Dunedin Rd, Austin, Cleveland, M6 8L8

realistic scanner, portable handheld, 200 channels, programmable, with extra telescopic aerial and book, mint condition, still in box, £200. Nick (Chorley, lancs), Tel. 01257 263603

Kenwood TS-830S HF transceiver, very good condition, only used QRP, £300. Standard CB900 2m FM mobile transceiver in good condition, £50. Geoff G4OVW (Bath), Tel. 0973 857595

Yaesu FRG-100 comms. receiver, keypad for direct frequency access, Tel. 01257 263603

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).

Free Readers Ads will be inserted as and when space permits. These advertisements are offered as a free service to readers for the sole purpose of exchange and at the Editor’s discretion, or corrected version of the advertisement and/or any equipment which transmits only outside of the above conditions will be published in the earliest issue in which space is available.

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Heathkit SB101 transmitter and SB200 amplifier. Also Tokyo HT120 20W CW/SSB mobile transceiver, GM4PPT (Ayrshire), Tel. 01292 570517.

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MFJ 784B DSP filter, as new, £250.

E. Archibald, 32 Dunedin Rd, Austin, Cleveland, M6 8L8.

As this is a free service, postal or telephone communication of this magazine for ads not fulfilling these conditions, our Advertising Department (Tel 01442 66551) will be pleased to accept prepaid ads.

These advertisements are offered as a free service to readers for the sole purpose of exchange and at the Editor’s discretion, or corrected version of the advertisement, and/or any equipment which transmits only outside of amateur bands will not be published.

1. If you require a guaranteed immediate insertion of your ad, please use the prepaid classified ads section at the rear of the magazine. Free Readers Ads will be inserted as and when space becomes available, on a free transcribed basis, subject to these conditions.

2. These advertisements are offered as a free service to readers for the sole purpose of exchange and at the Editor’s discretion, or corrected version of the advertisement, and/or any equipment which transmits only outside of amateur bands will not be published.

3. All that is to be reproduced in the advertisement should be entered in the form printed in the current issue. 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 coupon from the current issue, is acceptable. We cannot accept old or torned coupons and replies.

4. All submitted free ads must include a name or call sign and either a correct 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 or any equipment which transmits only outside of amateur bands will not be published.

6. We cannot be held responsible for parties’ 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.

7. Neither the magazine nor its publishers will accept any responsibility for the contents of the advertisements, and by acceptance of these conditions the advertiser understands that the above conditions apply.

8. Advertisements are accepted in good faith, however the publisher cannot be held responsible for any losses or misrepresentations in the advertisement, nor for the activities of advertisers or respondents.

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.

10. The magazine reserves the right to refuse to accept an entry, or to delete any sections, or the entire text, of any advertisements not fulfilling the above conditions.
Ham Radio Today is available on audio tape for those unable to read normal print.

For details write to:
Talking Newspaper Association, National Recording Centre, Heathfield, TN21 8DB
Tel: 01435 866102
For the foremost in top-performing, durable, dual band handhelds there is one choice. The FT-50R. Manufactured to rigid commercial grade standards, the FT-50R is the only amateur dual band HT to achieve a MIL-STD 810 rating. Water-resistant construction uses weather-proof gaskets to seal major internal components against the corrosive action of dust and moisture. And, the rugged FT-50R withstands shock and vibration, so throw it in with your gear!

Dynamic and exclusive features set the FT-50R apart, too. Wide Band Receive includes 76-200 MHz (VHF), 300-540 MHz, and 590-999 MHz*. Dual Watch checks sub-band activity while receiving on another frequency, then when a signal is detected, shifts operation to that frequency. Digital Coded Squelch (DCS) silently monitors busy channels. Auto Range Transpond System™ (ARTS™) uses DCS to allow two radios to track one another. And, the FT-50R is ADMS-1C Windows™ PC programming compatible, too. To round out the FT-50R, it has four battery savers, and super loud audio—remarkable in an HT this size.

Battery Voltage displays current operating battery voltage. Digital Coded Squelch (DCS) silently monitors busy channels. Auto Range Transpond System™ (ARTS™) uses DCS to allow two radios to track one another. And, the FT-50R is ADMS-1C Windows™ PC programming compatible, too. To round out the FT-50R, it has four battery savers, and super loud audio—remarkable in an HT this size.

A reliable companion where ever you go, the FT-50R is one tough little dual bander with all the features you want!
<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS-300</td>
<td>Base Stand: A full adjustable desk top stand for use with all handhelds.</td>
<td>£19.95</td>
</tr>
<tr>
<td>QS-200</td>
<td>Mobile Mount: Mounts on the air vent grills on a car dashboard.</td>
<td>£9.99</td>
</tr>
<tr>
<td>TELESCOPIC SCANNER ANTENNA</td>
<td>Extends portable scanner range. Nine sections, centre loaded. For 1-1300MHz, BNC connector.</td>
<td>£9.99</td>
</tr>
<tr>
<td>REALISTIC PRO-44</td>
<td>50 channels continuous coverage</td>
<td>£99.99</td>
</tr>
<tr>
<td>REALISTIC PRO-26</td>
<td>200 channels continuous coverage</td>
<td>£219.99</td>
</tr>
<tr>
<td>AER-1</td>
<td>Portable short wave aerial: A retractable long wire aerial that can be used with all short wave receivers. The aerial is provided with a 3.5mm plug for receivers with a suitable socket and an adaptor to clip the aerial to the telescopic rod aerial of sets with no aerial socket.</td>
<td>£14.95</td>
</tr>
<tr>
<td>UNIDEN UBC-220XLT</td>
<td>200 channels</td>
<td>£169.95</td>
</tr>
<tr>
<td>UNIDEN UBC-3000XLT</td>
<td>400 channels</td>
<td>£249.95</td>
</tr>
<tr>
<td>YUPITERU MVT-7100</td>
<td>500 channels</td>
<td>£239.95</td>
</tr>
<tr>
<td>AOR AR-8000</td>
<td>Super Deal</td>
<td>£339.00</td>
</tr>
<tr>
<td>ICOM IC-R10</td>
<td>Super Deal</td>
<td>£339.00</td>
</tr>
<tr>
<td>YUPITERU MVT-9000</td>
<td>1000 channels</td>
<td>£299.95</td>
</tr>
<tr>
<td>UNIDEN UBC-9000XLT</td>
<td>500 channels</td>
<td>£299.95</td>
</tr>
<tr>
<td>REALISTIC PRO-2042</td>
<td>1000 channels</td>
<td>£299.95</td>
</tr>
<tr>
<td>QUANTEK FC-2000</td>
<td>&quot;Near Field&quot; Frequency Counter</td>
<td>£79.95</td>
</tr>
<tr>
<td>OPTO CUB</td>
<td>Nickel Metal Hydrode (NiMH) Batteries.</td>
<td>£139.00</td>
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<tr>
<td>QUANTEK SCOUT</td>
<td>Nickel Metal Hydrode cells, free of toxic or hazardous elements such as cadmium, lead, mercury or lithium, can be used repeatedly and disposed of safely when finally thrown away. A service life of 500 to 1000 charge/discharge cycles can be expected, and the capacity related performance is normally 30 to 50% better than that of the best equivalent NiCad cells.</td>
<td>£139.95</td>
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For your free CB Radio Catalogue Telephone 0121-457 7788