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- HAMCALC software
- Carolina Windom antenna

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Geoff Brown, GJ4ICD, reports on superb 50MHz propagation - and a new VHF beacon band

grp corner
Take a look at the Colpitts oscillator with Dick Pascoe, G0BPS

satellite rendezvous
The latest on Phase-3D and the rest of the AMSAT-UK news from Richard Limebear, G3RWL

data connection
If you've had a problem using a BayCom modem with your Pentium, Chris Lorek, G4HCL, has some helpful hints

net communication
This month Jeremy Boot, G4NJJ, looks at how the Internet can help those wishing to carry out modifications to their Amateur Radio equipment

the help files
A new regular feature to help explain Amateur Radio jargon to beginners

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Don Beattie, G3OZF, with the UK's first review of this new 'Rolls-Royce' of HF and 50MHz amps

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Morse code: the Great Debate is turning out to be rather a damp squib.

When I wrote in the Ham Radio Today July Editorial that the RSGB change of policy on mandatory Morse testing was "a courageous move", I fully expected to receive a deluge of letters on the subject. Certainly I believed it to be a matter which polarised Radio Amateurs like no other. Yet I have been surprised at the low-key way in which UK Radio Amateurs have received the news.

For those who haven't been following the debate that closely, in the June issue of the RSGB's official magazine, RadCom, the RSGB's President, Ian Kyle, GIBAYZ / MIOAYZ, announced a change of policy on Morse testing. Until then, the RSGB had been in favour of mandatory Morse testing. Ian Kyle's leader article said that RSGB Council (the society's governing body) "would open discussions with the Radiocommunications Agency to begin a process of liberalising access to the HF amateur bands."

The long term aim would be that a Morse test would no longer be necessary for access to the HF bands. Such a change could only be made at an ITU policy-making conference, now unlikely to take place before the year 2002. In the shorter term, the RSGB proposed a 5WPM Morse test for access to the HF bands, but has since suggested that this may come with some restrictions, such as a lower power limitation or access to only some of the HF bands.

Traditionally at Ham Radio Today over the years, the one subject which could be guaranteed to keep cropping up in the postbag was whether the Morse test was necessary or not. Everyone seemed to have an opinion on this. Some felt it should be abolished immediately, others thought that any change whatsoever would spell disaster for the Amateur Radio service, whilst yet others felt that the Morse test should be replaced with some other 'barrier'. And yet now - when for the first time in the 100-year history of Amateur Radio there is sign of change taking place - what happens? The vast majority of Radio Amateurs and listeners ignores the news. Sure, a few members of the hard-line pro-Morse test camp (very few, I understand) have voted with their feet and resigned from the RSGB. Others have written indignant letters to the editor of RadCom. But the majority of Radio Amateurs and listeners seem not to care very much one way or the other.

What do you feel about this? Certainly there has been feedback, both to RSGB HQ, and during a series of 'Great Debate' meetings attended by RSGB Council Members and staff at radio clubs.

I believe that in a few years time, when there is only one class of Amateur Radio licence in the UK, we will look back on the 1990s and say, "what was all the fuss about?"
It is hoped to form a new radio club in the Eastbourne area of East Sussex. The club will meet on the second Monday of each month at 8.00pm in the Red Lion Public House, Wish Street, Willingdon, Eastbourne, commencing 10 August. Further details from Stuart Constable, M1BWU, tel: 01435 863020.

The AMSAT Phase 3D satellite will not be launched this year. AMSAT-NA say that the satellite will not be on board the Ariane 503 launch vehicle which goes into space in October. Instead, the European Space Agency (ESA) will launch a dummy Eutelsat payload. Keith Baker, KB1SF, the AMSAT-NA Executive Vice President, said: "Essentially we were bought out by strategic and commercial interests", whilst AMSAT-NA President Bill Tyan, W3XO, was quoted as saying: "This is obviously very disappointing news. We must, however, persevere and continue our present course to get the satellite tested and ready for a launch. And we pledge to do so." Keith Baker said AMSAT is continuing to look for a suitable launch opportunity and now is looking at other agencies, instead of limiting itself to the ESA Ariane programme. He said it was too soon to tell how this latest turn of events will affect fund-raising for Phase 3D. (The ARRL Letter Online).

For more on this story, see Satellite Rendezvous on pages 42 - 43.

The five lucky winners of the Ham Radio Today Royal International Air Tattoo competition are: H S Whitten of Nottingham; John Walmsley of Preston, Lancs; Martin Andrews of Dudley, West Midlands; R Collins of Salisbury, Wilts; and P O'Connor, G4SFG, of Halesowen, West Midlands. All five win a pair of tickets (worth £39 / pair) to the Royal International Air Tattoo, which takes place at RAF Fairford in Gloucestershire on 25 / 26 July.

Dr Dick Altrock of the US Air Force released a statement in conjunction with the National Solar Observatory about the peak of this solar cycle. He is looking at long-term variation of solar emission features that move toward the solar poles prior to solar cycle maximum. Since this emission feature appeared over a year ago at 55 degrees north latitude and is continuing to move toward the poles, Dr Altrock believes that the solar maximum earlier thought to be expected in the year 2000 may now occur next year instead.

City & Guilds say that analysis showed this exam to have been more difficult than normal, but that the performance of candidates was slightly better than average. This was taken into account during moderation of the paper and is reflected in the percentage of candidates who were successful in the exam. Of the 872 candidates who took the exam, 589 (67.5%) were successful, whilst 88.1% were successful in the first part, Licensing Conditions and Operating Procedures.

Radio amateurs in Slovenia, S5, were granted access to four new frequency bands on 13 June: 136kHz, 70MHz, 3.4GHz, and a new 40MHz "beacon band". More on this in VHF / UHF Message on pages 38 - 39.

Malta has now signed CEPT Recommendation T/R 61-01. UK Class A and B amateurs can now operate from Malta using the prefix 9H followed by an oblique stroke (%) before their own callsign, without the necessity of obtaining a Maltese reciprocal licence. For more details on operating abroad under the CEPT licence, see our exclusive "how to" guide in the May issue of Ham Radio Today.

New bands - in Slovenia

City & Guilds

New CEPT country

New-style exam report

A report on the May 1998 Radio Amateur Examination, the first of the new style in which candidates are required to be successful in the first part of the exam in order to be successful in the paper as a whole, has been received from City & Guilds.

City & Guilds say that analysis showed this exam to have been more difficult than normal, but that the performance of candidates was slightly better than average. This was taken into account during moderation of the paper and is reflected in the percentage of candidates who were successful in the exam. Of the 872 candidates who took the exam, 589 (67.5%) were successful, whilst 88.1% were successful in the first part, Licensing Conditions and Operating Procedures.

new bands - in slovenia
ra prosecutions

In a letter to Ham Radio Today, Mr C H Richards, of the RA stated that, "we have hitherto only been able to provide you with the most basic information when we have successfully prosecuted an amateur or CB user. We hope that these occasions are few and far between, as we normally hope to stop problems through giving advice and warnings rather than taking people before the courts. However, sometimes warnings do not have the required effect or we may feel that the public interest is best served by taking prosecution action directly..."

"I am pleased to tell you that henceforth the Agency will be publicising details of all its prosecutions by means of Press Notices...based on information provided by our own staff from information given in open court..."

"I hope that this will enable you to give a better picture of the misdemeanours of those we do prosecute and the facts surrounding the case."

stolen kit

An Alinco DR-130E 2m mobile transceiver, serial number T002601, was stolen from a car on the night of 19 June, in Newton Abbot, Devon. Any information to the Devon & Cornwall Police at Newton Abbot or your local station.

rae courses

An RAE course commences at Newstead Woods School, Avebury Road, Oprington, Kent on Monday 14 September. For further details contact the course tutor, Alan Betts, G0H/J, tel: 01689 831123.

The Glenrothes and District ARC is offering an RAE course on Monday evenings and a Morse code class on Tuesday evenings at Balweir High School, Kirkcaldy. Both courses begin in late September. Further details from Ken Horne, GM3YBQ, tel: 01592 265789 (evenings).

Herefordshire College of Technology, Folly Lane, Hereford, starts an RAE course in early September. Call the college on tel: 01432 352235 for further details.

An RAE course leading up to the May 1999 examination starts at South Notts College, Greenthorn Drive, West Bridgford, Nottingham on 16 September. The course tutor is Alan Lake, G4DVW, and further details can be obtained by phoning him on 0115 938 2509.

An RAE course at Newbury Technical College commences on Thursday 10 September, and at Swindon Technical College on 21 September. The tutor for both courses is Ray Oliver, G3NDS, tel / fax: 01672 870892.

An RAE course at Sawston Village College, Cambridge, in September. For more information tel: 01223 834492.

The 6m beacon GB3NHQ will not be returning to the air from RSGB HQ in Potter's Bar. The beacon was forced to close down because of a burnt out PA. Although the damage was extensive, that is only one of the reasons that it has not come back on the air. GB3NHQ was put on the air in 1984 to mark the opening of the new RSGB HQ building, and to provide a 6m signal from the south of England. Over the years the beacon has caused some difficulties when operating on other bands from the headquarters club station, GB3RS, due to the sheer signal strength and proximity of the antennas. The site is not ideal for VHF anyway, and for these reasons it has been decided not to put it back on the air from the HQ building.

The RSGB VHF Committee is looking for a suitable site for the 4m beacon GB3REB, and it is now felt that there could be much gained by co-siting the 4m and 6m beacons.

There have been frequent enquiries as to whether equipment capable of transmitting outside the amateur bands is legal in the UK. Similarly, class B amateurs have asked if they are allowed to own transceivers which may transmit on the HF bands.

The RA has now clarified the situation. Doug Raynes of the RA Enforcement Policy Unit says, "Mast amateur equipment is, of course, capable of being used outside the amateur bands. The amateur bands are not fully harmonised [in all countries of the world]. Ed so manufacturers produce equipment capable of tuning over a wide range in order to achieve world-wide sales."

"It is legitimate for this extended range equipment to be sold and installed. Use of the equipment is controlled by the licence terms and limitations. Action is only taken by the Radiocommunications Agency for use outside amateur bands or outside the terms of the licence. There is no restriction, for example, on a class B amateur licensee installing equipment which contains frequency bands which can only be used by a class A licensee as long as he does not transmit on those bands which he is not licensed to use."

"So there you have it, straight from the horse's mouth. This very helpful clarification should put to rest any questions of class B amateurs not being allowed to purchase transceivers such as the Yaesu FT-847 or Icom IC-706."

car licence number plates

Auctions for the 'G' series of car number plates took place in mid July - so look out for lots of 'car callsigns' driving around now. Rumour has it that G3BSN, G3KMA, G3NOH and G3TUX are amongst those amateurs who can now be identified from their car registration plates.
**lottery cash for amateur radio**

The Mid Glamorgan Amateur Radio Group has received a grant of £5000 from the National Lottery. The money is to be used to purchase books, test equipment, demonstration equipment and radio sets in order to teach people about Amateur Radio and electronics.

Since its inception three years ago, around 40 people have passed the Novice RAE through the group, with many going on to receive their full Amateur Radio licences. In the past, the group has struggled through lack of funds, but the grant should certainly help to ease the strain on its budget. Another free RAE course commences in September. Anyone interested in joining should contact Roger Luke, GW3XJC, tel: 01656 733729.

**disaster relief made easier**

Thirty-three countries signed an ITU convention on 18 June to facilitate the use of telecommunications equipment in disaster relief and humanitarian aid operations. The Tampere Convention on the Provision of Telecommunication Resources for Disaster Relief and Mitigation (named after the town in Finland where the convention was signed) empowers countries requesting external assistance following a natural or man-made disaster to waive normal licensing and importation provisions covering communications equipment such as mobile phones or radios.

**new cdxc committee**

CDXC (Chiltern DX Club) - the UK DX Foundation now has over 400 members. Its AGM was held on 4 July, when the club’s new committee for 1998 - 99 was sworn in. The Chairman is Neville Cheadle, G3NUG; President, Don Beattie, G3OZF; Vice-Chairman, Steve Telenius-Lowe, G4JVG; Secretary, Barry Cooper, G4RKO; Treasurer Bob Whelan, G3PJT; Newsletter Editor, Don Field, G3XJT; and Ordinary Committee member, Mike Devereux, G3SED.

Membership of this national club is open to all who have an interest in HF DX and / or contesting and who have worked (SWLs heard) at least 100 DXCC ‘entities’. For further details and a prospectus send a large SASE to the Secretary, Barry Cooper, G4RKO, 1 Strouds Meadow, Cold Ash, Newbury RG16 9PQ, e-mail: cooperb@g4rko.demon.co.uk

**happy winner**

Tom Bates, G4MZS, of Wallasey, Merseyside, the winner of the joint Ham Radio Today / Lowe Electronics JRC NRD-545 DSP receiver competition of a few month’s ago, is shown in the photo with his new acquisition. Mr Bates, who is a member of the Royal Naval Amateur Radio Society and the G-QRP Club, said “this superb set will help me to read those weak QRP signals. I sometimes still think it's a dream that I've won.”

Look for another exciting Amateur Radio prize competition in Ham Radio Today soon.

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**Members of the Mid Glamorgan Amateur Radio Group, young and old, seem happy with their lottery cash grant.**

The CDXC AGM took place under canvas at treasurer G3PJT’s QTH.

**There will be a ‘black tie’ Amateur Radio dinner, to celebrate the 100th anniversary of Amateur Radio itself, at the Donington Thistle Hotel, Castle Donington, on 25 September (note that this is the Friday of the Leicester Amateur Radio Show at nearby Donington Park). After dinner speakers include Pat Hawker, G3VA, who has been writing the Technical Topics column in RadCom magazine for over 40 years, and Ian Poole, G3YWX. Tickets cost £30 and are available from Marcia Bromson, 2E1DAY, at RSGB HO, tel: 01707 659015 as soon as possible to reserve a space.**

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**Founding members of the Mid Glamorgan Amateur Radio Group, young and old, seem happy with their lottery cash grant.**

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The CDXC AGM took place under canvas at treasurer G3PJT’s QTH.
The Yaesu FT-100, which we previewed first in the July issue of Ham Radio Today, is expected to make its first appearance in the UK, as we predicted, at the Leicester Amateur Radio Show on 25/26 September. However, this will be a pre-release demonstration model only; production samples are not expected much before the end of the year.

Four new versions of the 'E-type' G2DYM 'anti-interference, anti-TVI' trap dipole antennas are now available. Ideal for restricted space QTHs, they can be put in in many different configurations, depending on the space available. The four versions vary from 54ft to 108ft long, and from £99.75 to £179.90 in price. Send an SASE to R Benham-Holman, Cobhamden, Beerdown, Uplowman, Tiverton, Devon EX16 7PH; tel 01398 361215 for an information sheet.

The Lake Electronics NRF2 is a passive audio noise reduction filter. Designed to fit into the headphone or external loudspeaker line of any receiver, it is a true six-pole Chebyshev filter with a very steep roll-off at around 300Hz and 2.6kHz, thus removing LF hum as well as high-pitched 'splatter' and whistles. Connections in and out are by 3.5mm jacks, suitable for many modern receivers, but two plug-in adaptors are included in the price to allow for input and/or output connections to standard 0.25in jacks. Being a passive device, no battery is necessary.

The NRF2 comes ready built (not a kit) at £16.50 plus £1 P&P from Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX.

Harry Leeming, G3LLL, who writes the popular All in a Day's Work column for Ham Radio Today, is retiring and closing down his business, Holdings Amateur Electronics, in Blackburn, Lancs. The shop will close its shutters for the last time on Saturday 22 August. Until then, there is a big sale of test equipment and spares at the shop at 45 Johnston Street, Blackburn BB2 1EF. The shop is open on Thursdays, Fridays and Saturdays until 22 August, but phone Harry first to be sure, tel: 01254 59595.

The American Amateur Radio equipment manufacturer, Timewave Technology, has filed for Chapter 11 bankruptcy. Timewave President Randy Gawtry, KOCBH, says Timewave plans to continue normal operations while it prepares to file a reorganisation and debt payment plan with the federal bankruptcy court.

The move comes a little more than a year after Timewave acquired the rights to the AEA digital product line after AEA ran into financial trouble. Timewave is best known for its DSP filter accessories, such as the DSP-599zx. "We're still operating and we're still doing repairs and upgrades for our DSP products," Randy Gawtry said. "Nobody should panic." He said the company still expects to have its new DSP-2232zx multimode TNC on the market later this year, although he conceded that under Chapter 11 bankruptcy, any number of things could happen. (The ARRL Letter Online).
Hard on the heels of Yaesu's VL-1000 amplifier [reviewed on page 12 of this issue! - Ed] comes news of Icom's 160-6m solid state 1kW output linear amplifier, the IC-PW1. Icom's latest high-power HF / VHF amplifier has a detachable desktop control panel measuring just 205 x 82 x 75mm, allowing the operator to tuck the power supply and amplifier away under the bench. It is priced at £3695.

**Icom hf / vhf amp**

The World Radio TV Handbook (WRTH) has been acquired from BPI Communications Inc by WRTH Publications Ltd, a new company specifically established to publish this world famous reference book. The editorial offices in Amsterdam have closed down and moved to Milton Keynes, where David Bobbett, G4IRQ (a former editor of Ham Radio Today in the 1980s), will be the new editor. Former WRTH editor Andrew Sennitt has decided to pursue a career as a freelance telecommunications consultant. The current issue of the WRTH was reviewed in the July issue of Ham Radio Today.

**WRTH comes to UK**

The SGC SG-231 'Smartuner' is an automatic antenna tuner designed to be placed at the antenna feedpoint, thus eliminating losses caused by a high VSWR on the feedline. Covering 1-60MHz at power levels of up to 100W, it is the perfect match (no pun intended) for modern HF transceivers covering the HF bands and 6 metres. The SG-231 is weatherproof and requires no operator intervention. It will operate with any transceiver. It requires just 13.6V DC and is suitable for both home and mobile operation.

Thanks to a special bulk deal with SGC, UK importers Nevada are able to offer the SG-231 at £349, no less than £150 off the original price.

Nevada, 189 London Road, North End, Portsmouth, Hants PO2 9AE; tel: 01705 662145; fax: 01705 690626.

**Future scanning radiomax software**

Future Scanning Systems of Oklahoma, USA, has announced a recent upgrade to RadioMax, Windows based software allowing PCs to control receivers, scanners and audio tape recorders. RadioMax controls radios by AOR, Drake, Icom, Radio Shack / OptoElectronics, Lowe, Kenwood and Uniden.

Recent improvements to the program include support for the Uniden BC995XT TrunkTracking receiver, more extensive database file support for formats such as Betty Bearcat and Mr Scanner files (up to 5 million records per file), higher resolution and faster graphic zooming of spectrums, duplicate frequency detection-lockout, plus ten user programmable audio alarms.

Some standard features of RadioMax are user-scaleable high resolution graphics that constantly display in real time position, locked channels, hits, signal level and hit history. RadioMax supports full disk logging, tape recorder control, audio generation of hit frequency and times, built in 'one click' channel and global editors, real time spectrum analysis, 'slide' tuning etc. The program is available directly from Future Scanning for $45 (plus P&P).

For more information write to Future Scanning Systems, 6105 SE Nowata Road, Bartlesville, OK 74006, USA, or tel: +1 918 335 3318. More information and a functional evaluation version of the software is available for download on the Internet, at www.futurescanning.com

The Kenwood stand at the Kansai Ham Festival in Japan, which took place in June. *Ham Radio Today*’s Japanese reporter, Taizo Arakawa, JA3AER / GWORTA, reported that there were few new products around (most new Japanese products are launched at the giant Tokyo ham fair in August).
TCSS, short for 'Continuous Tone Controlled Squelch System', employs a low-frequency tone in the range of 67 - 250Hz, running continuously in the background of your FM speech transmission. UK and European repeaters on 2m, 70cm and 23cm can be accessed with a 1750Hz toneburst, but many are now also being fitted with CTSS access facilities and UK 6m repeaters rely solely on CTSS for access.

In the UK, CTSS tone access frequencies for repeaters are arranged by geographical area - see Fig 1. You can easily tell which repeater(s) you can hear do actually use CTSS, and if so which tone frequency, as these repeaters suffix the appropriate CTSS tone letter designation to the end of the repeater’s Morse or speech callsign identification. Note the tone letter designations have been proposed for pan-European repeater use. We just use the lower frequency set of CTSS tones here in the UK, those elsewhere using the fuller range of available CTSS tone frequencies.

Many modern 'black box' transceivers already have CTSS fitted, whilst in others it is available as a plug-in option, at an additional price. But what about other sets, such as earlier amateur transceivers as well as ex-PAR and homebrew rigs? The simple project described here can add CTSS encode to your transceiver for a component parts cost of less than £8.

The circuit is shown in Fig 2. It is identical to a purpose-made IC, the FX315, which has been used in professional circles for many years. I have built a number of these units for my own use. It draws only 1.5mA in use, so it’s eminently suitable for handhelds, as well as mobile and base station transceivers. There’s no tone alignment needed, so you can just fit and forget it for use in your geographical area. For multi-tone encode, a small DIP switch can be added to switch between any of the 40 standard CTSS tone frequencies provided.

circuitry

The FX315 is a monolithic CMOS integrated circuit tone generator, which has been designed especially for sub-audio tone squelch systems. It’s made by Consumer Microcircuits Ltd (CML) and, although it’s a ‘specialist’ IC, it is readily available throughout the world. I bought a couple direct from their office in the UK a few weeks ago for just under £4.00 each plus VAT. The address is Consumer Microcircuits Ltd, 1 Wheaton Road, Witham, Essex CM8 3TD; tel: 01376 513833.

An on-board oscillator circuit is contained within the IC, from which all the CTSS tone frequencies are generated. This oscillator requires an external 1MHz crystal, so if you have one of these in your junk box you can save yourself some money. Otherwise, I’d recommend using a low-cost 1MHz ceramic resonator which is available for less than £1.00 from component suppliers such as Maplin. I’ve used both crystals and ceramic resonators and either will work fine in the circuit described here.

Apart from setting the CTSS tone output level, there’s no alignment needed at all in this project. That’s because the IC uses digital division and filtering techniques to produce a ‘rock stable’ output tone frequency, derived from the 1MHz oscillator.

To select the required CTSS tone frequency you simply connect one or more of the IC programming input lines, D0 to D5, to ground, Table 1 gives the required program input links. The D0 to D5 input lines are internally pulled up to positive logic ‘1’ by the IC, thus if any pin is left unconnected it’ll be automatically linked to logic ‘1’. Shorting any pin to ground gives logic ‘0’. For example, for my location in Hampshire (area B on the map in Fig 1), repeaters use 71.9Hz, so all that’s needed is to short D5 to OV, or IC pin 6 to OV, to provide a 0 on D5 and 1 on all other lines.

construction

Because of the very simple circuit arrangement, making a ‘one-off’ PCB for the project could be regarded as rather overkill. The component layout isn’t at all critical, I used Veroboard for my units, although even this isn’t necessary as you could simply solder the components directly to the IC pins if you wish. This works well if you need to get the finished unit into
CTCSS Encoder Unit

a small area such as inside a handheld transceiver case. A hint here is that the IC pin legs are horizontally and then soldering the component leads, suitably trimmed short, to these pins aids construction and achieves a thinner 78s05 assembly, which would fit into spaces where otherwise wouldn't be enough depth.

The IC is a CMOS type, so take suitable static precautions when you're handling it, also make sure you observe the correct polarity of the electrolytic capacitors when soldering them in.

connections The FX315 requires a 5V supply. if you connect it to any voltage higher than 7V you risk destroying it. Many transceivers have a switched +5V line on transmit, which is ideal. If you need to use a higher voltage supply, eg the main 13.8V supply rail in your mobile transceiver or, say, the 7.2V or 9.6V nicad voltage in your handheld, you need to add a simple voltage regulator such as a small 7805 three-pin regulator. Remember to add suitable decoupling capacitors on the input and output of such an IC to prevent oscillation. A suitable circuit is shown in Fig 3, the capacitor values are not at all critical and you can use any suitable type from your junk box.

You'll need to feed the audio output from your transmitter's audio stages after the microphone audio shaping and amplification circuitry. You can not just connect it to your mic socket. If you do, you will almost certainly find it gets filtered by your rig, the result being no CTCSS tone transmitted at the output! If your set has an internal connector for an optional CTCSS unit, this is an ideal connection point. Simply connect the tone output line from the unit to the TX tone input line on the connector. Virtually every ex-PMR rig has facility for a CTCSS unit, and a quick check of the conversion details or a circuit diagram will show you the correct polarity at these pins aids construction and achieves a thinner 78s05 assembly, which would fit into spaces where otherwise wouldn't be enough depth.

For setting the level required, if you've test equipment then I'd suggest initially setting the output level to the lowest possible, gradually increasing it until you access the repeater satisfactorily on-air. After you've wired the unit into your transceiver, all that remains is to set the tone output level correctly. You'll need to achieve between 10% and 20% of your peak system deviation for the CTCSS tone, ie 250 - 500Hz deviation for 12.5kHz spacing, and 500Hz - 1kHz deviation for 25kHz spacing, 500Hz being a good 'in-behaviour' setting for both. The FX315 gives 0dBm output into a 600 ohm load (775mV), and depending upon your transmitter's circuitry this might already be a suitable level.

**Component List**

<table>
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<th>IC</th>
<th>Comment</th>
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<tbody>
<tr>
<td>IC1</td>
<td>FX315PJ</td>
</tr>
<tr>
<td>C1,RV1</td>
<td>1µF/16V electrolytic</td>
</tr>
<tr>
<td>C2</td>
<td>33p</td>
</tr>
<tr>
<td>C3</td>
<td>68p</td>
</tr>
<tr>
<td>C4</td>
<td>0.1µF/16V electrolytic</td>
</tr>
<tr>
<td>R1</td>
<td>1M</td>
</tr>
<tr>
<td>R2</td>
<td>74k</td>
</tr>
<tr>
<td>R3</td>
<td>56k</td>
</tr>
<tr>
<td>R4</td>
<td>4.7k</td>
</tr>
<tr>
<td>C5</td>
<td>1µF/16V electrolytic</td>
</tr>
<tr>
<td>C6</td>
<td>100n</td>
</tr>
<tr>
<td>C7</td>
<td>1nF/100n</td>
</tr>
<tr>
<td>R5</td>
<td>1M</td>
</tr>
</tbody>
</table>

**Software (not connected)**

Connecting a series resistor of a suitable value, ie the variable pre-set VR1 in the circuit diagram, will reduce this if needed, you should choose the value of this to suit your rig's circuitry. You might need to connect this instead as a potentiometer, ie with one leg grounded and the output taken from the wiper, in cases where the transmitter has a high input source impedance, although check here that your normal speech deviation isn't affected. Again depending upon your transmitter's circuitry, you may or may not need a series capacitor, ie C5 in the circuit diagram, to isolate any DC component on the output.

For setting the level required, if you have access to a deviation meter then all well and good. If you've no test equipment then I'd suggest initially setting the output level to the lowest possible. After you've wired the unit into your transceiver, all that remains is to set the tone output level correctly. You'll need to achieve between 10% and 20% of your peak system deviation for the CTCSS tone, ie 250 - 500Hz deviation for 12.5kHz spacing, and 500Hz - 1kHz deviation for 25kHz spacing, 500Hz being a good 'in-behaviour' setting for both. The FX315 gives 0dBm output into a 600 ohm load (775mV), and depending upon your transmitter's circuitry this might already be a suitable level.

**Software (not connected)**

Connecting a series resistor of a suitable value, ie the variable pre-set VR1 in the circuit diagram, will reduce this if needed, you should choose the value of this to suit your rig's circuitry. You might need to connect this instead as a potentiometer, ie with one leg grounded and the output taken from the wiper, in cases where the transmitter has a high input source impedance, although check here that your normal speech deviation isn't affected. Again depending upon your transmitter's circuitry, you may or may not need a series capacitor, ie C5 in the circuit diagram, to isolate any DC component on the output.

For setting the level required, if you have access to a deviation meter then all well and good. If you've no test equipment then I'd suggest initially setting the output level to the lowest possible, gradually increasing it until you access the repeater satisfactorily on-air. Then note the trimmer position and increase it somewhat further, say to double the amount from this 'minimum access' point, for reliable operation.

**kit available**

Not so much a kit, as a bagful of components. As a special offer to Ham Radio Today readers, JAB Electronic Components is making all the required parts available for £7.80. Parts for the optional regulator are just 95p extra. Add £1 for P&P. The parts will be available from mid-August. Please order direct from JAB Electronic Components, PO Box 5774, Great Barr, Birmingham B44 8PJ, tel: 0121 882 7045, fax: 0121 881 1329.
This review is written to give some user impressions of the 'Quadra System' VL-1000 amplifier, recently released by Yaesu Musen. The amplifier was used very effectively during the February 1998 Spratly Island (9M0C) DXpedition [see Ham Radio Today April 1998 - Ed], where four of these units operated round the clock for 12 days without any problems. This review is not written with the help of any sophisticated test equipment, but is simply one operator's view of the performance and functionality of the equipment.

**overview**

The amplifier is designed to provide a full 1kW PEP SSB output on all HF bands, with 500 watts PEP on 50MHz. The Quadra comes in two cases, the amplifier itself, the VL-1000, and a separate power supply unit, the VP-1000. The amplifier and power supply weigh together some 21kg with, surprisingly, the power supply being the lighter unit. This is explained by it being a switched mode design, with no adjustments being needed for mains voltages from 117 to 240 volts. However, when the amplifier is run from 117 volts, the amplifier power output is limited to some 500 watts PEP. The final stage of the amplifier uses eight rugged MRF-150 MOSFETs with a 48 volt DC power rail. An automatic ATU is built in with 250 memories to memorise settings for each band and frequency, to-
level. This is simply done by feeding RF to the amplifier whilst it is running into a dummy load, and holding two of the push buttons until the desired level of RF output is obtained. This pre-sets the ALC for the future and is a useful feature when the amplifier is capable of significantly more output power than licence regulations permit.

Then, band by band, the antenna tuning unit in the amplifier is engaged, and allowed to match the antennas, and the appropriate antenna output notified to the amplifier. With the FT-1000MP as an exciter, the procedure is particularly simple, and just pressing the ‘tune’ button on the linear causes the FT-1000MP to switch to a continuous carrier mode, providing the tune-up power for the linear. As soon as tune up is complete, the amplifier immediately shuts the RF power down, and the antenna is fed through to the transceiver. As one often does not have yet to find a way to cause the amplifier to heat up!

Specifications of the VL-1000 / VP-1000 (adapted from Yaesu specifications)

<table>
<thead>
<tr>
<th>Function</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF drive power</td>
<td>80 watts (max) for full output</td>
</tr>
<tr>
<td>Spurious emissions</td>
<td>Better than -50dB</td>
</tr>
<tr>
<td>3rd-order intermodulation products</td>
<td>At least -30dB</td>
</tr>
<tr>
<td>Input SWR</td>
<td>50Ω unbalanced</td>
</tr>
<tr>
<td>Output impedance</td>
<td>50Ω unbalanced</td>
</tr>
<tr>
<td>Automatic Antenna Tuner</td>
<td></td>
</tr>
<tr>
<td>Matching range</td>
<td>16.7 - 1500Ω (1.8kHz band)</td>
</tr>
<tr>
<td>Maximum power</td>
<td>1200 watts</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>1.5dB</td>
</tr>
<tr>
<td>Matched SWR</td>
<td>Less than 1:5:1</td>
</tr>
<tr>
<td>VP-1000 Power Supply</td>
<td></td>
</tr>
<tr>
<td>Input voltage</td>
<td>AC 100 - 234V (automatic switching)</td>
</tr>
<tr>
<td>AC current drain</td>
<td>1.4A (AC 220V @ 1kW output)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>413W x 151H x 381Dmm (inc feet, switches)</td>
</tr>
<tr>
<td>Weight</td>
<td>14.6kg (32.2lb)</td>
</tr>
</tbody>
</table>

General

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>Power output (with 220V AC input)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF</td>
<td>1000 watts (SSB/CW)</td>
</tr>
<tr>
<td></td>
<td>500 watts (FSK-RTTY / FM)</td>
</tr>
<tr>
<td></td>
<td>250 watts (AM carrier)</td>
</tr>
<tr>
<td>50MHz</td>
<td>500 watts (SSB / CW / FSK-RTTY / FM)</td>
</tr>
<tr>
<td></td>
<td>125 watts (AM carrier)</td>
</tr>
<tr>
<td></td>
<td>500 watts (SSB / CW / FSK-RTTY / AM)</td>
</tr>
<tr>
<td></td>
<td>125 watts (AM carrier)</td>
</tr>
<tr>
<td>Input voltage</td>
<td>DC +48V, DC -12V, DC -12V</td>
</tr>
<tr>
<td>Current consumption</td>
<td>48A (DC +48V), 2.8A (DC +12V), 0.1A (DC -12V)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>413W x 151H x 451Dmm (inc feet, switches)</td>
</tr>
<tr>
<td>Weight</td>
<td>21kg (46.3lb)</td>
</tr>
</tbody>
</table>

Manual review

**VF-1000**

When used with the FT-1000MP transceiver, there is a facility to control the mains on / off power to the linear from the FT-1000MP power switch. This is very useful, but there is no way, when using this feature, to disable the VL-1000 power-up and still maintain the feed-through of the antenna to the transceiver. As one often does not want the linear to be running when monitoring the bands, this means disabling the automatic power-up linkage to the FT-1000MP and controlling the mains on / off manually. In this way the antenna is fed through to the transceiver as would normally be expected. Other than this one very minor point, the amplifier must be considered an outstanding piece of equipment, taking the concept of solid state linear HF / VHF power amplifiers to a new level of sophistication and integration.

However, nothing of this quality and technical prowess comes cheap. The recommended retail price for the Quadra in the UK is £4480, but it is available from stock from ML&S (tel: 0161 566 1120) and in the US (tel: 01705 662145) at £3995. There is an option, the MR-1000 19m mounting rack for the amplifier and power supply, which costs £229.
(COM213) 100 CHANNEL SCANNER
A high-specification scanner offering 100 channels in 10 banks, with 1 Priority Channel in each bank. For speed and ease of use it offers Jetscan, which can scan 100 channels per second, and also Jetsearch, which can search at up to 100 steps per second. It also features programmable band search, lock-out for up to 10 frequencies, channel look-out, 2 second scan delay, data noise/birdies skip, a key lock and a green back-lit display. 66-88, 108-174, 406-512, 806-956.
£119.99 + £5 P&P.

(COM102) 10 CHANNEL SCANNER
This state of the art 10 channel scanner is fully programmable and can receive a variety of PMR communications. It is robustly designed and offers a full frequency LCD display for ease of use. Also features an in-built circuit for recharging Nicad batteries. 66-88, 137-174, 380-512.
£49.99 + £5 P&P.

(COM205) 400 CHANNEL SCANNER
The B111 is the last word in programmable scanners. A free standing desk top unit covering nine radio bands in the 25-512MHz and 806-1300MHz ranges. Operates from AC mains or car cigar lighter via suitable adaptor. It incorporates a microprocessor avoiding the need to change crystals and gives special functions such as scan delay, memory back-up, priority channels and many more.
£249.99 + £5 P&P.

SANGEAN ATS 909 FM-Stereo/MW/LW/SW PLL Synthesized receiver
The ATS-909 is a continuously tunable receiver from 153kHz-29999kHz. This receiver is capable of receiving and tuning all the short wave bands and any stations in between
- 307 memories (281 in SW, 18 each in MW/FM, 9 in LW plus priority station)
- Five tuning methods – direct frequency tuning, auto scan, manual tuning, memory recall and rotary tuning
- ATS (auto tuning system) – auto scan and preset in priority of signal strength in FM/MW/LW bands
- EZ PROM for memories back-up
- FM stereo via earphones
- 29 pages SW stations name memory, 9 memories in every page
- Automatic search strongest signal station within SW station pages
- SSB (USB/LSB) 40Hz/step on fine tuning
- AM RF gain control
- Built-in 42 world cities time plus D.S.T. device
- 3 individual timers
- Adjustable sleep timer
- Alarmed by radio or HWS (Humane Wake System) buzzer
- Battery and signal strength indicator
- Direct key to recall favourite station in one button
- Dual conversion device
- REC out and standby control output
- Pre-programmed station name and frequency according to customer’s requirements before ex-factory
- AM wide/narrow filter and FM mono/stereo selector
- Optional features for European market
- RDS (Radio Data System) on PI, PS and CT for station name and clock time
- Size in mm: 215 x 133 x 37.5
- Weight: 850g without batteries

£169.95 + £5 P&P.
* Free batteries
* Free SW frequency book
* Free SW antenna
* Free headphones
Super Syncro 1100 – 1100mAh Nickel Metal Hydride (NiMH) AA size rechargeable cells. No memory effect. Twice the capacity of NiCds. £3.00 inc P&P.

Skyscan DX-V1300 base disconne – Most disconnes 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 DX-V1300 has both vertical and horizontal elements for maximum reception. Constructed from best quality stainless steel and aluminium and comes complete with mounting pole. £49.95 + £3 P&P.

Skyscan Desktop Antenna Model Desk 1300 disconne – Built and designed for use with scanners. Coverage: 25 to 1300MHz. Total height 36” and 18” wide at widest point. Comes complete with 4m of RG58 coax cable and BNC connector. High performance antenna, ideal indoor or as a car antenna when vehicle is stationary. £49.00 + £3 P&P.

Airband mini-mag antenna – Civil (108-137MHz) and military (225-400MHz) dual band receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. £24.95 + £3 P&P.

Wideband mini-mag antenna – Wideband (25-1300MHz) receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. £29.95 + £3 P&P.

Yaesu FRG-100 communications receiver – Award winning 50kHz to 30MHz base station AM, CW, USB, LSB, FM (optional) communications receiver. Features include two clocks and timer, 50 memories, FM option, remote control jack. Superb value at £449.95 + £7 P&P.

Radio shack DX-394 communications receiver – 150kHz to 30MHz base station AM, CW, USB, LSB communications receiver. Features include clock and timer, signal meter, 100+ memories, RF gain control and direct frequency entry. A steal at £149.95 + £7 P&P.

AKD Target HF3 communications receiver – 30kHz to 30MHz mobile or base station AM, USB, LSB communications receiver, Very simple to operate. Ideal for the novice, but with a performance more demanding listeners will appreciate. £159.95 + £5 P&P.

Commtel COM 206 – AM/FM handheld VHF/UHF scanning receiver. Covers 66-88MHz (FM), 108-137MHz (AM), 137-174MHz (FM), 380-512MHz (FM). Full civil airband coverage, comes complete with free case and rechargeable batteries. £129.95 + £5 P&P.

Realistic PRO-2042 – AM/FM/WFM switchable base station HF/VHF/UHF scanning receiver. Covers 25-520 and 760-1300MHz. Features 1000 memories, 100 monitor channels, backlit orange LCD display. Scan rate of 50 channels/sec. £249.95 + £10 P&P.

WE ALSO HOLD A LARGE RANGE OF SECOND USERS SHORTWAVE AND SCANNING RECEIVERS.

Please call with your requirements.
It came as a very pleasant surprise to receive a phone call from Fred, as I hadn't heard from him for some time. Fred had been a great help when Brenda and I were setting up our own business, and now he was having trouble with his FT-101E. The trouble was intermittent, in that occasionally it would not work on LSB, but - as with all intermittent faults - finding the trouble could prove difficult.

The fault could have been due to any component in the LSB oscillator circuit, but how does one prove which? The ideal way of tracing intermittent faults is to exchange parts and panels between rigs, but spare identical rigs are not usually available. In quite a few stages, however, in many rigs there are similar circuits using the same values of components. For instance, some pieces of equipment have four or five almost identical VCO circuits. In the case of the FT-101E, the LSB and USB oscillator circuits are identical, except for the frequency of the crystal. Interchanging parts can be a very good way of sniffing out intermittent components, when the usual methods of applying vibration, heat, cold, and choice words have failed.

I suggested to Fred that he interchanged parts between the USB and LSB oscillators one at a time, then when the fault moved over he would know which had been faulty. Fred did this, starting with the crystals, so that the LSB position on the switch became USB, and the USB position became LSB. Fred operated the rig for a few days like this, when suddenly the fault reoccurred. He was in the USB position on the mode switch (i.e., using the LSB crystal) and so he knew that the fault had followed the crystal. Fortunately, I was able to find him a good LSB crystal from a scrap rig, and so Fred was able to solder this in and cure the fault permanently.

**deaf and noisy ft-107**

Claude turned up with his FT-107 that he had had from new. "I know it's a bit long in the tooth, but do you think it is worth bringing up to scratch? The receiver has become rather noisy of late, and the attenuator switch is intermittent.

I was happy to assure him that it was well worth repairing, and to advise him that he would have difficulty purchasing a receiver that was much better than the FT-107 (it doesn't seem that long ago that the Ham Radio Today Technical Consultant was using one as a standard of comparison). Nothing improves with age, however, not even the writer, and so I booked the rig in for the standard attention.

**ft-102 band switch**

Alan was quite happy with his FT-102, as apart from the usual FT-102 intermittent relay problems, it had given him good service. Now, however, he was in trouble - the power output had dropped to about 5 watts, and the PA would not resonate. There was plenty of drive, and a quick whistle into the mic would produce an I/C reading of around 400mA. He had tried fitting a new PA choke, thinking that this might have short circuit turns, but all to no avail, and so he dropped it into my workshop. Fortunately, this is a stock fault on the FT-102, and is quite easy to cure. The band switch on the FT-102 is made up of three sections.
The front section switches the frequency display, the next the RF section, and the rear the PA stage. These sections are joined together by flexible couplers that are attached by set screws. A careful examination of the switches turns up the surprising fact that the indexing on the rear section is not quite the same as the indexing on the front two sections. Also the couplers often slip, resulting in the PA section being switched to a different band to the rest of the wafers - hence the inability to tune the PA stage. Even when the rear wafers have not slipped, indexing is rather 'hit and miss' on some bands, due to flexibility in the spindle couplers, and the switch mismatch. The whole system gives the distinct impression of a marriage that was certainly not made in heaven.

The problem can be 'cured' to some extent by reseting the spindle couplers so that the correct switch contacts line up. As a result of the play in the couplers this can only be done if it is decided which direction the switch is going to be rotated, and most FT-102 owners have opted for clockwise rotation. Even when this is done, it is sometimes found that the rear section of the switch lines up on some bands, but is on the edge of the contacts on others. The trick here is to warm the offending contact with a soldering iron, and then to swing it slightly onto the rivet which attaches it to the wafer until it is central on the rotating contact.

The other problem with the switch on the FT-102 occurs when the first section, which determines the frequency, gets out of sync with all the other sections. The effect of this spindle coupler slipping is that both receiver and transmitter are dead, except for a few weak and unrecognised signals on one or two bands. To cure is to slip the front switch section round until, say, the rig reads 14.02MHz, and then to rotate the rest of the switch until the receiver comes to life on the 20 metre band.

In the case of Alan's rig I lined up the PA section of the switch, tightened all the spindle couplers, told him to always rotate the switch clockwise, and he was back on the air.

**Hard work for simple job**

Hilary's FT-757 had given her years of good service when, all of a sudden, the digital display disappeared. Her boyfriend Tony, who was professionally into electronic servicing, took it away to have a look, and decided that a new fluorescent digital display module was required. This he eventually obtained and fitted, but the fault was still prevalent, and so he brought it to me with a full account of what had been done.

Many weird and wonderful faults on the FT-757 display are caused by the microprocessor having become corrupted, and my first move was to do a processor reset. This involves pressing both the marker and TX inhibit buttons at the same time, and then switching on and off the rig two or three times when it is not connected to the 12 volt supply. Having done this I tried the rig and it worked perfectly!

Curiosity, however, got the better of me and I had a look inside. The main display had been replaced, by someone who had done an extremely neat job. Replacing the display on the 757 is difficult, as the PCB is soldered on both sides, and I much admired Tony's skill. I am 99% certain, however, that his work was totally unnecessary!

**Vertical Antennas**

Gerald came in with a furrowed brow, and questions about antenna systems. He had been using a half-size G5RV for some time, but it was very bent to fit in the available space. 'What do you think about verticals?', he asked.

Commercial multiband vertical antenna systems as advertised look very simple and attractive, but this can be deceptive. In particular little mention is often made of the tremendous variation in performance made by differing earthing arrangements, ground planes, and the local soil conductivity. As a test I once took an 18ft multiband vertical and set it up in a field with a normal set of radials. The SWR was excellent, and everything seemed to work well. I then compared it with a 6ft mobile whip mounted on my car. I found it very hard to believe, but on every band the mobile whip was about one S-point better. The only explanation possible was that the roof of the car made a much better ground plane than did the radials. I must explain that I carried out the tests with the idea of finding out how much loss I had on the mobile whip. The results I obtained showed that I was gaining, not losing.

A quarter-wave vertical is a natural low-angle radiator, and as such it should be good for DX contacts. When trying to work stations just a few hundred miles away, however, a low angle of radiation is the last thing that is required. An antenna that has a low angle of radiation, does also tend to create a strong local signal on transmit, and also picks up local noise on receive. The efficiency of radiation with a vertical, as we have seen, also very much depends on local conditions. The only real answer to Gerald's question was to try one, and see what happens.

What, pay a few hundred pounds for a system that might not work?", you say. No, there is a very easy and cheap way out of the problem. I made a rough sketch (Fig 1), and told Gerald to go round to the local garden centre, and invest in a couple of 8ft garden canes. A one-band homemade vertical might not look very flashy, but it will work at least as well, if not slightly better, than a commercial multiband unit. Gerald was able to try out the homebrew version for a few weeks on 20m, and found that it worked very well indeed. No-one came knocking on his door, and it was reasonably quiet on receive. Working on the principle of what worked on 20m would probably be OK on the other bands, Gerald then felt safe to spend his money on a commercial multiband version.

Quite a number of people have had just the opposite results. At a previous location I tried a vertical on the chimney stack. On receive it brought in every vacuum cleaner within a hundred yards, whilst on transmit it flattened most of the local TV sets. Verticals seem to be totally unpredictable, hence it is far better to make a few simple tests before parting with money.

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**All in a Day's Work**

And advice on trying out a **Vertical** from Harry Leeming, G3LLL
RSGB HF/IOTA Convention

9/10/11 October, 1998
Beaumont Conference Centre, Old Windsor, Berks

- Friday - IOTA Drinks reception and buffet
- Saturday - Full lecture programme, including IOTA; 9M0C DXpedition slides and video presentation; Practical HF Linears (GW3NWS); “In Practice Live” (G3SEK supported by G4JNT and G0STU); HF Contest Trophy Presentations; HF Contest Forum; How to make DSP devices work - a newcomer’s guide (G4JNT); LF Forum (73 and 136kHz bands) G3WKl; DX Dinner
- Sunday - DXCC 2000 Programme; K5UV; IBP/NCDXF Beacon Receiver Design (G3PJT); Current developments and trends in HF radio design (Martin Lynch & Son); 3B7 DXpedition presentation (HB9JAI); RSGB HF Committee Forum (G3NUG & G3PSM); Towers: Safety & Maintenance (David Rowley, Strumach Engineering); Solar Cycle 23 (G4FKH); Solar Eclipse ‘99 propagation Experiment (Dr Ruth Banford, Rutherford/Appleton Laboratory); Sunspots (G3ZAY)
- Partners' programme - Windsor Castle trip • DXCC card Checking • Morse Tests

For further information contact Fay Huxley, 2E1EUA, or Marcia Brimson, 2E1DAY, on tel: 01707 659015, fax: 01707 645105, e-mail: sales@rsgb.org.uk

YAESU

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We put you, the radio amateur and short wave listener first - help us to fight your cause, protect your amateur radio bands, and keep this hobby alive.

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To: Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: 01707 659015, Fax: 01707 645105. Web: www.rsgb.org. E-mail: Sales@rsgb.org.uk
I would like to join the RSGB. My payment for £36 is enclosed with this form (Over 65 years of age - £27).

Name ___________________________________________ Callsign (if licensed) __________________________
Address __________________________________________ Post/Zip Code: __________________________

Credit card number: ________________ ________________ ________________ ________________
Expiry date: ____________ ____________ Switch Issue No: ____________ Start date: ____________

Signed: __________________________ Date: ____________

Please send Direct Debit form for my 3 FREE months

Ham Radio Today

September 98
Do you have something constructive to say on the state of amateur radio today? Perhaps you'd like to put your viewpoint to the readers, get some discussion going, or give an answer to one of the issues raised?

We'll pay £10 for the best letter we publish each month (paid 6-8 weeks following the publication date). So write in with your views to: Letters Column, Ham Radio Today, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE or send an e-mail to hrt@rsgb.org.uk. We reserve the right to edit letters for length, grammar and clarity for publication. Letters must be original and not have been sent to any other magazines, and must include name and address plus callsign if held (name and callsign will be withheld from publication if requested). Reader's views published here are not necessarily those of the magazine.

---

Dear Ham Radio Today,

In March, I met briefly met Steve, G6A0S, keeper of the GB3FC 70cm repeater in Blackpool, at the rally there. I mentioned that I was interested in a particular type of ex-PMR equipment, and thought nothing more of it, until just recently when he sent me a message out of the blue to say he'd found me at least one.

It so happened that I needed to go to Blackpool in any case to visit a specialist shop in the town centre so I arranged to travel to Blackpool from Tynside and to pick up the equipment from Steve at the same time. When I got there I found that he had not only checked the equipment over himself, but had even carried out minor repairs on it for me. Furthermore, when I then asked him how to get to the shop in Blackpool, he taxied me there himself, saving me a difficult journey into unfamiliar territory.

I would just like to thank him publicly for his kindness and generosity towards someone he had previously only met for about two minutes. As long as there are people like Steve around, the spirit of Amateur Radio will live on. Thanks, Steve.

Graham Galbraith, MOADR

---

Dear Ham Radio Today,

I have just passed the RSGB 5WPM Morse code test and am studying for the 12WPM test. I agree with the RSGB policy on the mandatory Morse test for access to the HF bands; I think it should be scrapped. I also agree with the idea of the new licence for class B licence holders, with a 5WPM Morse pass for full access to the HF bands. I think that reducing the speed from 12WPM to 5WPM for full access to HF will encourage more class B holders to learn Morse and increase the use of the HF bands. It would also increase the number of CBers and electronic hobbyists etc to enter the Amateur Radio hobby and thus increase the number of licensed operators - also possibly increase the number of RSGB members?

Paul Bowker, M1ACH (and 2EOASx?)

---

Dear Ham Radio Today,

I noted an item in the July HF Happenings column which said that "there are many sites on the web which carry contest rules". I thought I'd jump in and say that, in the case of the rules for the BARTG (British Amateur Radio Teledata Group) contest, there may be one too many.

You see, I found one site which carried the BARTG contest rules, complete with the BARTG logo at the top of the page - but those rules were at least two years out of date.

Unfortunately, with no indication of the person responsible for that web page, BARTG has been unable to get the page either updated or deleted. Anyone can easily be found via a search engine and thus attempt to enter the BARTG contest using out-of-date rules (and probably not reap their maximum score). I acknowledge that there are some sites which do carry correct rules but the visitor to web sites can't always tell which are accurate and which are not.

For what it's worth, BARTG's own web site at http://www.bartg.demon.co.uk and carries much more about BARTG than just our contest rules.

Regarding the letter in the August Ham Radio Today from GOHBC on the page title being in the centre of the page, I found it a little awkward to perceive at first - because, like most people, I'm used to seeing the title at the head of the page. Now I have become used to the layout I don't find it a problem.

73 and thanks for a very pleasant magazine.

Ian Brothwell, G4EAN

Secretary, British Amateur Radio Teledata Group
6 September
Bristol Radio and Computer Rally takes place at Brunel Centre, Temple Meads Station, Bristol, from 10.30am to 4.00pm (disabled entry from 10.15am). The event features around 150 traders, a large bring and buy stand and refreshments. Admission is £1 (children under 12 free). Details from Muriel Baker, 62 Court Farm Rd, Whitchurch, Bristol BS14 0EG, tel: 01275 834282 (24hr answerphone).

Coleraine and District Amateur Radio Society will be holding their annual radio rally at the Bohill Hotel and Country Club, a short distance outside Coleraine on the main road to Bushmills and the Giant's Causeway. Please note this is a new venue. Doors open at 12.00 noon and admission is £1.50. For further information contact John, M10AZ, tel: 01265 54930 or e-mail: John@m10az.force9.co.uk.


Bury Radio Society Annual Rally at Castle Armoury, Castle St, Bury. The event features traders, a bring and buy stand and Morse code tests. Details from Alan, tel: 01706 521263, or e-mail: g8goj@zen.co.uk.

Andover Radio Amateur Club radio and computer boot sale, Middle Wallop Airfield, near Andover, on the A343. The event opens at 9.00am for sellers (£5 per 'boot') and 10.00am for buyers. Further details from Jack, GOLUW, tel: 01264 391383.

12 September
The 4th Northampton Radio and Computer Rally, Shires Shopping Village, Dunchurch, Rugby, Coventry, CV21 1QG. Details from Alan, G4ILA, tel: 01788 555055.

Reddish Rally, St Mary's Parish Hall, Reddish, Stockport. Doors open 10.00am. Details from John McKae, G4ILA, tel: 0161 477 6702.

13 September
The Lincoln Hamfest, Lincoln Showground, on the A15, 5 miles north of Lincoln (extensive parking). Doors open 10.30am. Event features trade stands, flea market, bring and buy stall, car boot sale, Morse code tests, licensed bar and catering. Talk-in on 2m and 70cm. Overnight for tents and caravans on 11/12 September. Contact John or Sue on tel: 01522 525760.

The Milton Keynes and District Amateur Radio Society boot sale and rally will be held in historic Bletchley Park, home of permanent special event station GB2BP. The event features Morse tests on demand. Details from Dave White, G3ZPA, tel: 01908 501390.

The BARTG (British Amateur Radio Teledata Group) Rally takes place at Sandown Park, Esher, Surrey. 'DataStream 98', a lecture stream covering various aspects of amateur radio data comms, forms an integral part of the rally. One of the lecturers this year is Ham Radio Today 'Data Connection' columnist Chris Lorek, G4HCL. The rally caters especially for the data comms enthusiast and the home constructor. Details from Alan Hobbs, G8GOJ, tel: 0181 688 2564, or on the web at: http://www.bartg.demon.co.uk/rally.htm which includes maps.

19 September
RSGB Headquarters Summer Saturday Opening, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. GB100AR station for World Amateur Radio Day, RSGB bookshop, National Amateur Radio Museum and Library. Morse tests on demand (11.00am to 12.30pm only). Doors open 10.00am - 2.00pm. Details: Marcia Brimson, 2E1DAY, tel: 01707 659015 (office hours).

20 September
RSGB Scottish Convention, Springwood Park Showground, Kelso. This event features a massive trade exhibition with large RSGB stand, bring and buy stall, lecture programme (details to be announced). RSGB Morse code tests on demand (don't forget: two passport-size photos and the fee are required) and catering facilities. Accommodation is available at attractive rates. Doors open 10.30am (10.00am for disabled visitors) and talk-in on 145.550 and 433.550MHz. Further details from Gavin and Margaret Chambers, Kelso Amateur Radio Society, tel: 01573 226372.

Mansfield Amateur Radio Society radio, computer and electronics car boot sale at Debdale Park Sports and Recreation Club, Debdale Lane, Mansfield, Woodhouse, Nottinghamshire. Flea market and car boot sale, licensed bar. Starts 10.00 am, talk-in on 145.550MHz. Further details from Angela, G1DZH, tel: 01623 429218.

Cambridge and District Amateur Radio Club Amateur Radio car boot sale, in the Reindeer Pub grounds, Saxon Street, near Newmarket. Pitches cost from £5, depending on vehicle size, and entry is just 50p. Talk-in on 145.550MHz and the event is from 11.00am to 3.00pm. Details from Michael Addlessee, tel: 01223 872258.

Mansfield Amateur Radio Society radio, computer and electronics car boot sale. Doors open 10.00am, talk-in on 145.550MHz. Details from Angela, G1DZH, tel: 01623 429218.

South Yorkshire Aircraft Museum 'Electro-Jumble 1998', at the South Yorkshire Aircraft Museum, Firbeck, near Melton, Nottinghamshire. Radio, radar and electrical (up to 50s / 60s). A pitch costs £6: vendors to supply their own tables, chairs and awnings. The event opens at 10.00am, and admission and parking are both free. Details from Mike Diprose on tel: 0143 363 1296.

25 / 26 September
Leicester Amateur Radio Show at Donington International Exhibition Centre, Donington Park. See 'Rally of the Month' over the page.

To include your rally in this section, please make sure you send us details of your event in time: the deadline for the November issue is 10 September; for December, 9 October, and for the January 1999 issue, 10 November. The address for submissions is: The Editor, Ham Radio Today (Rallies), RSGB Publications, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE; fax: 01707 645105. We would be grateful if Ham Radio Today readers would ask their local rally organiser to send information on their rally to this address. If you're travelling a long distance to attend rallies, we recommend you contact the organisers of the events first, to check if there has been any changes since this magazine went to press.
This issue's "Rally of the Month" is the Leicester Amateur Radio Show. The 1998 event is the 27th annual Leicester show, but this year it takes place at a new venue: Donington International Exhibition Centre, Donington Park, just a few minutes from junction 23A of the M1. The organisers say that "the change of venue will make the Leicester Amateur Radio Show at the International Exhibition Centre at Castle Donington the biggest and best show of its kind in the Amateur Radio calendar." It takes place on Friday and Saturday, 25 and 26 September.

New facilities
The event features 150 stands in a purpose-built hall with a floor area about one-third larger than the two old Granby Halls (the previous venue) combined. This year, there are many new features, including camping and caravanning on site, a convention, and meeting rooms for clubs and societies.

The main facilities are: Purpose-built exhibition hall all on one level, for easy disabled access; Morse tests on demand; Talk-in station (145.550 and 433.550 MHz); Flea market; Bring and buy stall; Lucky programme number prize draw; Camping and caravanning facilities immediately adjacent to exhibition hall; Disabled parking adjacent to main building; Demonstration HF station; Raffles; Meeting rooms; Better catering; Bar; Concessionary prices on other attractions at Donington Park; The Motor Racing Museum; British Super Bikes championship.

Donington is, of course, most famous for its motorcycle and sports car racing - as our cover this month shows (as well as the 'monsters of rock' heavy metal music concerts)! There is a great motor museum and exhibition, the Donington Grand Prix Collection, on site, so make sure you leave enough time to see this too.

Attention clubs
National clubs and societies are invited to book a table in 'Club Land'. Due to the increasing number of clubs attending the show, and also as a result of moving to the new venue, the organising committee has had to formalise arrangements with attending clubs. It's now necessary for attending clubs to book-in in advance and to pay a small charge to cover costs. This has been fixed at just £5.00 stand charge, plus £4.00 per table (max two). So the total cost for one table would be £9.00, or £13.00 for two tables, both for the two days.

There is a separate conference room in the motor museum.
adjacent to the Exhibition Hall, for the period of the show. The cost of hiring the room is £25.00 per hour and it is available on a first-come, first-served, basis. Refreshments can also be arranged at cost. Please contact John Theodorson, G4MTP, on tel: 01604 790966 or e-mail: G4MTP@lars.org.uk

At the time of going to press, over 100 exhibitors and clubs as disparate as the Worked All Britain Group, Maxpack, Medium Wave Circle and British Railways Amateur Radio Society have already confirmed that they would be attending the Leicester show. Get next month’s Ham Radio Today (published on 9 September) for an up-to-date listing of those attending the show, and a floor plan to help you find your way round!

getting there
Donington International Exhibition Centre is located just three minutes from East Midlands International Airport (see map opposite), from where a free shuttle bus runs to the exhibition. Buses from Derby, Leicester, Loughborough and Nottingham run to the airport. The closest train station is Loughborough, on the Midland Mainline. If you’re driving, Donington International Exhibition Centre is less than five minutes from junction 23A on the M1 and the free car parking is virtually unlimited and immediately adjacent to the exhibition hall.

Concessionary tickets are available to clubs for groups of 20 or more visiting the show, if booked in advance. For general enquiries please contact Geoff Dover, G4AFJ, on tel: 01455 823344; fax: 01455 828273.

8 / 9 August Special event station GB350BOP, 350yrs English Civil War. Details: Peter, G3UCA, tel: 01772 494474.
9 August RSGB 70MHz Trophy Contest (0900 - 1500UTC).
9 August Derby Mobile Rally & Computer Fair, Littleover Community School. Details tel: 01332 566878.
15 August RSGB HQ Summer Saturday Opening, Lambda House, Cranborne Road, Potters Bar, Herts. Details tel: 01707 659015 (office hours).
15 / 17 August Special event station GB350BOP, 350yrs English Civil War. Details: Peter, G3UCA, tel: 01772 494474.
18 August Strood Radio Society radio rally, Main Hall, Archway School, Paganhill, St Roald, Glos. Details tel: 01453 752411 (24hrs).
17 August RSGB 144MHz CW Cumulative Contest (2000 - 2230 local time).
20 - 24 August Svalbard Polar YL '98 Convention, Longyearbyen, Svalbard (details: Ruth Tollefsen, PO Box 17, Tveita, N-0617 Oslo, Norway; tel: +47 2226 9712; e-mail: jettoo@sn.no).
22 / 23 August International Lighthouse and Lightship Weekend, details from OZ7DAL, DK-8400 Ebeltoft, Denmark.
23 August RSGB 432MHz Fixed Station Contest (1700 - 2100UTC).
23 August Telford Rally, Telford International Centre. Details tel: 01952 644173.
28 August German-Dutch Radio Amateur Festival, Bad Bentheim, Germany.
29 August Re-enactment in costume of first use of wireless by Royal Family, Osborne House, East Cowes, Isle of Wight. Details: Douglas Byrne, G3KPO, tel: 01983 567665.
30 August Galashiels & District ARS open day / rally, Volunteer Hall, St Johns St, Galashiels. Details tel: 01896 850245.
30 August Torbay ARS rally, Churston Grammar School, nr Brixham (please note: new venue). Details tel: 01626 369212.
31 August Huntingdonshire Amateur Radio Rally, Ennet Community School, St Neots, Cambs. Details tel: 01480 431333 (9.00am - 9.00pm).
1 September RSGB 144MHz CW Cumulative Contest (2000 - 2230 local time).
9 September RSGB 144MHz Trophy Contest (1400 - 1400UTC).
5 / 6 September IARU Region 1 SSB Field Day (10 - 80m, 1300 - 1300UTC).
6 September RSGB Sth 144MHz Backpackers Contest (1100 - 1500UTC).
9 September Ham Radio Today October publication date.
13 September WAB 144MHz Phone Contest (0900 - 1700UTC). Details from GB9YO OTHR.
18 September RSGB 144MHz CW Cumulative Contest (2000 - 2230 local time).
18 September Edgware 80RSR 17th annual 'Straight Key Evening' on 3500kHz and up, from 7.00pm BST. GB2SKE and GX3ASR on air. Details from: John Bluff, G3SJE, tel: 0181 204 1034.
19 September World Amateur Radio Day. GB100AR on the air.
ne problem with HF band operation is that, with few exceptions, antennas generally only work on a single band. If you want to operate all bands 80 - 10m (or even 160 - 10m), you may need to erect up to eight or nine different antennas. This is, of course, impractical for many people.

In my own particular case, when I moved to a new house a couple of years ago, I put up a multiband vertical, only to receive a visit from the council planning officer, who informed me that it required planning permission. Fortunately, I had also put up a 20m dipole and I was told that this was not subject to planning permission.

On the grounds that wire antennas were acceptable, but aluminium ones weren't, I replaced the vertical with a quarter-wave sloping wire for 40m. But as sunspots gradually returned, I felt the urge to move higher in frequency and so also put up 17m and 15m dipoles. I now had four separate wire antennas and was beginning to fear a return visit from the planning officer. When 10m and 12m began to open up, rather than add yet more single-band dipoles, I felt the time had come to replace my yet more single-band dipoles, I felt being very impressed several Carolina Windoms. The Carolina Windom is an off-centre fed wire antenna made by a firm called The Radio Works, located not, as you might imagine, in one of the Carolinas, but in Virginia, USA. The antenna reviewed is 133ft long (there are other versions, see later). 50ft from one end is a matching unit, from which is dropped a 22ft vertical radiating element made of coax (see Fig 1). At the bottom of the 22ft vertical radiator is the line isolator, from where you run 50ft coax back to the shack.

The antenna is supplied with two coils of stranded copper wire, 50ft and 83ft long, already attached to the matching unit. One end of the 22ft coaxial vertical radiator is attached to the line isolator and the other is terminated with a PL-259 plug for connecting to the matching unit. Large complete catalogue of The Radio Works' products.

Two small packets of Coax- Seal sealant are provided to weather-proof the connections, as is a single plastic cable tie, to act as a strain relief. Obvious perhaps that weatherproofing and strain relief should be used, but going as far as to provide them with the antenna shows great attention to detail and is a nice touch.

The quality of construction throughout is excellent. The matching unit and line isolator are both suitably 'beefy' and look perfectly capable of handling the quoted 1500 watts rating.

**Installation**

The instruction manual gives numerous examples of ways the antenna may be installed. Almost any configuration is possible - flat-top, inverted-V, as a sloper, and with the ends bent up, down or sideways! The recommended height of the antenna is at least 35ft, but the specifications say it is usable at 30ft. If configured as an inverted-V, it is recommended that the ends be at least 8ft high. The manual says "The Carolina Windom will work satisfactorily at low heights above ground. If you have any choice, support the matching transformer and vertical radiator as high as possible. Most of the antenna's radiation comes from part of the antenna. The ends of the antenna radiate less and can be closer to the ground."

The vertical radiator should be kept as far away from any conductors as possible. A reasonable minimum is 8ft, but 16ft or more is preferred, say the manufacturers. If a metal mast is used as a support, it is recommended that the wire should be suspended from a 6 to 10ft stand-off pole, with the vertical section of the antenna at least 15ft away from the mast.

**how it works**

The Carolina Windom works in a somewhat unconventional fashion. Unlike most antennas, where the air and free of ground losses. It is a very efficient vertical antenna", says the booklet.

**in practice**

So much for the theory. What about the practice - first of all of installation, and then on the air? I'm fortunate in having a garden which can easily accommodate this antenna, so did not have to resort to bending the ends. I have two trees some 150ft apart in which I have installed pulleys at a height of about 30ft. The house is roughly in the middle, and a short pole on the chimney provides a third 30ft-high support. Initially I installed the Carolina Windom with the shorter leg in the back garden, with the longer leg going over the roof to the tree in the front garden. However, this meant that the vertical radiating section dropped down over the conservatory and I had to pull it out at an angle to clear the building. Far from being 16ft or even 8ft from any object, it virtually touched the house, nor was it properly vertical. The antenna was
tried in this configuration and although it certainly ‘got out’, the performance was, perhaps not surprisingly, not as good as I felt it should be.

My next step was to reverse the antenna, so that the vertical radiator dropped down in the front garden. Here, it was much more in the clear, although the bottom few feet were quite close to some (presumably non-conducting) conifers.

The combined weight of the matching unit, line isolator and coaxial vertical section caused the antenna to ‘sag’, so that the bottom of the vertical section was only about 1ft above ground. This is well below the recommended height of 35ft minimum at the feedpoint, but was the best I could do in my circumstances.

Other than on 80m, the Carolina Windom is not a resonant antenna: so it is necessary to use an ATU. SWR readings are therefore largely meaningless and are fairly ‘flat’ across all bands, except for 80m. However, for the record they were 2.1 or below on 10, 12, 17, 20, and 80m, and between 2.1 and 3.1 on 15, 30 and 40m. On 80m the minimum SWR was 1.6:1 at 3550kHz, rising to 2.4:1 at 3800kHz. This rather low resonance was almost certainly because the antenna was installed lower than the specified minimum height. I believe that if I had been able to raise the antenna a further 10ft or so the resonant frequency would have been closer to the middle of band.

The instruction manual makes it clear that an ATU must be used and suggests that the built-in automatic ATUs in many modern rigs may not be adequate for this job (external manual ATUs are normally capable of handling a much wider range of mismatches than built-in units). However, the automatic ATU in my Yaesu FT-890AT transceiver was easily able to match the Carolina Windom on all bands, and proved unnecessary to use an ‘outboard’ ATU.

As an added bonus, it even matched the Carolina Windom on wave sloping wire in situ so as to be able to do some direct comparisons with the new antenna. The 40m quarter-wave wire also works after a fashion as a three-quarters wave on 15m.

Comparing the Carolina Windom with the 40m wire on 40m showed immediately that the new antenna was a great performer. On receive, almost all signals were at least 1 ‘S’ point up on the Carolina Windom. On transmit, I found only one station who reported that the wire was better: this was a G station at some 100 miles distance.

It was the same story on 15m, with the Carolina Windom outperforming the wire by a large margin: two to four ‘S’ points on average. I could not find a single station which was better on the wire. In the IARU HF Contest on 12 July I worked several DX stations, one of which, 6Y1C in Senegal, West Africa, came back to my first call whilst using 100 watts, despite a large pile-up of European stations calling him. This was impressive performance!

(AP2WAP, TM3X, F900, SP3FDO), I could detect no difference between the two antennas, but I could not find any which were better. On the Carolina Windom. Again, it should be pointed out that I had put up the antenna at a height some 7 or 8ft lower than the absolute minimum recommended. Despite this, it still worked, and worked very well.

I also made a small number of contacts on 10, 12, 17 and 80m, to prove that it worked on these bands, although I had no reference antennas to compare it against.

conclusions

The Carolina Windom is an all-band antenna with performance roughly equalling a single-band dipole, but on all bands. The vertical radiating section should provide enhanced low-angle (ie ‘DX’) radiation compared with a dipole at similar height, particularly on the lower-frequency bands. The manufacturers claim “as much as 10dBd gain” and this could certainly be justified if my experiences on 40m are typical.

Its biggest advantage, for me, is that it allows the luxury of all-band operation without having multiple wires draped around the garden, and I would certainly recommend it to anyone in similar circumstances. Its performance would undoubtedly be better still for those able to achieve the recommended minimum height, nevertheless I liked the antenna so much I bought it!

The positioning of the vertical radiating section of the antenna appears to be quite critical, and it probably would not be suitable, for example, to mount the matching unit on a chimney and run the vertical radiator down the side of the house.

The Carolina Windom costs £84.95 and it is available from Waters & Stanton PLC, tel: 01702 206835. W&S also stock the Carolina Windom 160 (160 - 10m, 25ft horizontal, 22ft vertical) at £109.95 and the Carolina Windom 40 (40 - 10m, 66ft horizontal, 10ft vertical) at £82.95. The manufacturers have a web site at: http://www.radioworks.com
HAMCALC version 35

HAMCALC is described as "Painless Math [sic] for Radio Amateurs". Written by George Murphy, VE3ERP, it's a collection of over 200 free programs of interest to both Radio Amateurs and professionals.

Basically, whatever you'd need to calculate the 'long way', such as coaxial trap dipole calculations, filter component values, antenna field strengths and so on, this program is very likely to help you.

installation

It's a DOS-based program collection which fits on to a single 1.44Mb disk, and I found it'll also happily run in a DOS window under Windows (make sure your Windows font and language settings are correct though).

To use HAMCALC you'll need to have GWBASIC already installed on your hard drive C: and stored in a 'BAS' sub-directory. If it isn't, you can't run the program, this is a very important point to note. If you've installed an earlier version of HAMCALC (ie earlier than v35) you'll already have this, otherwise you'll have to ensure it's separately installed on your PC (it does not come with HAMCALC v35), and many new PCs don't come with it in the bundled operating software.

Because all of the programs on the disk are stored in standard non-compressed form, HAMCALC can be run either from the floppy disk or from your PC's hard drive. A 'COPY' option on the program's menu can be used to install it on a hard drive.

in use

Running the program, by typing 'VE3ERP' at a DOS prompt or by double-clicking on VE3ERP.BAT in Windows Explorer, first brings up an introductory screen, and pressing any key then brings up a menu screen. From this you can select either a further sub-menu, A - E, which gives you access to the many programs (or further options such as information files, the hard disk copy utility, and a DOS based 'screensaver' clock.

To select and run a program from the large collection, these being stored alphabetically, pressing the appropriate menu letter takes you to the relevant program menu screen, and entering the appropriate program number automatically launches that program for you.

I tested a number of the programs, finding each simple to use. Most of the programs do what you'd otherwise probably be able to do with a collection of radio data reference books and a scientific calculator, but HAMCALC makes it much, much quicker!

The individual programs aren't packed with 'bells and whistles', and any graphics are naturally limited to DOS-based characters. But this means that HAMCALC will run on virtually any PC, even an XT type with a mono monitor.

As well as the many calculation programs, there are also a few handy utilities. For example there's a 'Local Repeater' database, to which you can add the data for repeaters in your area or country. It will then list repeaters within a specified range of any base station, and even give a 'radar screen' display of distance and bearing.

There's also a meteor scatter prediction program, useful for the VHFI DX enthusiast or even for those who just fancy having a listen to tell you when and where to listen out for activity.

updates

The program author says that HAMCALC is upgraded frequently, and that versions you may find on the Internet are usually outdated. Version 35, reviewed here, was released on 11 June 1998.

Over the past 12 months (ie since version 29, which was released in June 1997), there have been a large number of new programs and program upgrades, including those of Trap Dipole Design, Constant Phase Diversity Networks, Code Trainer, Coil Tap Calculator, G5RV Multiband Antenna, Impedance Antennas, Short Multiband Dipole Array, Trap Dipole - Dual Band, Coil Equation Calculator, Numbered Drills and Taps, SWR Calculator, Toroid Baluns, Inductance of Single Loop Tracker, Toroid Antenna Traps, Toroid Inductors, Wave Trap Filters, Impedance Bridge (3 Meter), G55 Timer, Impedance Meter, Capacitor Standard Values, Impedance Measurement, Antennas, Capacitors - Telescoping Variable Inductance of Single Loops, Code Trainer (Morse Code), Thermal Resistance, Coil Equation Calculator, Equivalent Values, G5RV Multiband Antenna, Grid Square Locator, Harmonic Frequencies, Latitude / Longitude Data Base, Local Repeaters, Moon Tracker, True North via the Sun, Zep EDZ Antenna, Coil Equation Calculator, Equivalent Values, Short Centre Loaded Dipole, Sloper Antenna Dimensions, Transmatch Design (ZL1LE), Trap Dipole - 3-Band Single Trap, Discone Multiband Antenna, Equivalent Values, Great Circle Paths and Distances, Grid Square Locator, Harmonic Frequencies, Helical Windings, Lamp Life Expectancy, Trap Property Estimator, and the Windom Antenna.

obtaining a copy

The latest version at any time is available on disk from VE3ERP for US$5.00 (not stamps or IRCs) to cover the cost of materials and airmail to anywhere in the world, from George Murphy, VE3ERP, 77 McKenzie Street, Orillia, ON L3V 6A6, Canada. Our thanks go to George ('Murph' to his friends) for providing the review copy.

Chris Lorek, G4HCL
HF Radio in Congo

Three UK members of WACRAL travel to central Africa to provide

and agricultural projects spread along 1200 miles of the River Congo which are supported by the UK Baptist Missionary Society (BMS). For these projects to function, some form of communication is necessary. The journey of 1000 miles down the river takes weeks for a person carrying a message, so radio communication is the answer - indeed a necessity. Hence it became necessary to improve and extend the BMS HF network.

So I made my first visit to Zaire for two months in 1980, to install the first transistorised transceivers. The type selected was the AEL-3030, which is a four-channel, crystal-controlled, 100 watt PEP transceiver, operating from 12 volts DC or 230 volts at 50Hz. The transceiver is constructed using plug-in circuit boards, and whilst I would normally avoid such, this type of construction is invaluable for servicing in remote jungle locations.

A maintenance visit for two months occurred in 1983 when the network was further extended and a transceiver installed in a Land Rover. By 1986 it was clear that the network could not be maintained remotely with short visits from the UK, so I took two and a half years leave from the Civil Service and lived in Zaire with my wife Margaret, G3TWS. During this period we further extended the HF network and installed solar panels, with regulators, to charge the radio batteries and fitted more transceivers into Land Rovers.

Amateur licences were not generally available in Zaire at that time, but our friend Duncan Aird, G3MFE, was 9Q5DA, so we were able to have some contacts with amateurs in the UK. The knowledge gained whilst in Zaire could not be found in textbooks. When you are half way up a palm tree the professional approach is not always relevant. We were able to visit Kenya and Tanzania, where they used Australian pedal-powered radios, to study their experience using HF networks in isolated regions. As a result of these visits I wrote a handbook on shortwave radio communications for aid agencies in developing countries. Where

There is no Telephone.

When we returned from Zaire in 1988 we left a solar-powered HF network which satisfied the need at that time. Then a six-week maintenance visit was made in 1994 when most of the necessary repairs were carried out. The work was limited due to fuel shortages and the deteriorating conditions in the country.

During 1997 a rebellion began, led by Kabila, against Mobutu. As the conquering rebel army marched across Zaire, Mobutu's retreating army looted the towns and villages, and some of the HF transceivers were taken into the forest and buried for safety.

In 1997 the new government of Congo under President Kabila started issuing Amateur Radio licences, but at a cost of US$500. This is considered too expensive by the Americans of MAF who are negotiating for a reduction for expatriate aid workers.

As a result of the rebellion, some hospitals were without radio communications, having lost their battery or solar panel. By September last year it had become necessary to restore the HF voice network along the River Congo.

return to congo

So my wife, Margaret, and I, as well as David Palmer, G4PFX, left the UK for Congo in September. As well as being a Radio Amateur, David has recently gained a Ph.D. in satellite engineering from University of Surrey. We are also members of the World Association of Christian Radio Amateurs and Listeners (WACRAL). David is succeeding me as the BMS radio communications engineer, so another reason for our visit was to introduce David to life in the Congo, as this cannot easily be described or simulated! The civil war in the 'other' Congo (the Congo Republic) had been raging since April 1997.

The day before we arrived in Kinshasa a battle had started between Brazzaville, a mile away on the opposite bank of the river, and Kinshasa. We arrived by car, which was being shelled and under rocket attack. We jumped every few minutes of the day and night as the Kinshasa artillery, located half a mile from our position, fired back across the river.

Six transceivers had been brought to Kinshasa for us to repair. We had a good stock of spare
HF Radio Along the communications infrastructure for hospitals, schools, church centers

John Corbett, G3TWS, testing out the satellite system.

One of the MAF pilots and John Corbett, G3TWS, loading radio equipment into the plane.

More delay in getting up country as the Land Rover wheels slip between the tree trunks of a river bridge.

boards and components, so with mains electricity, some test equipment, and a fan to keep us cool, we soon repaired the transceivers. But we used up all the spare audio boards, because one particular capacitor had failed on several boards.

Most of the HF transceivers are powered by 12 volt car batteries, charged from solar panels. As these batteries are the only non-flat batteries in a village, they have been borrowed to try and start Land Rovers! I had stopped this temptation by sawing off the battery lugs, but even then we found that the wiring to the solar panels had been ‘improved’ and was not working. So on this visit we tried a more sophisticated solution. Metal boxes were fabricated from sheet steel and these housed a ‘sealed for life’ 80Ah battery and a solar regulator. Different polarised sockets for the solar panel input, and power output to the transceiver, were fitted to the lid, which was pop-riveted on to the box.

It was good to leave Kinshasa, where there was the continuous noise of artillery, rockets and small arms fire, and go up the river to the villages. This involved flying in dismantled and heavily-loaded aircraft of African airlines, but with excellent pilots who skilfully landed and took off from the dirt airstrips.

up country

Outside the capital, the army was out of control. We were held at gun-point by aggressive unpaid teenage soldiers who demanded money. We travelled hundreds of miles in ancient Land Rovers, getting stuck in tree-trunk bridges as the rotten wood collapsed and experiencing delays due to water in the diesel fuel. We flew for 600 miles up the river from Kinshasa, we were due to return to Kinshasa on the Saturday, but the plane was a day late arriving. The next morning, when we were getting ready to go to breakfast, the villagers brought their solar panels to the house. I said, “You have just arrived?”, they replied that they had arrived the previous afternoon and had come over to the house. They thought we looked sad (no aircraft!) and went away, as they did not want to trouble us. We were able to rewire their panels, have breakfast and reach the air-

We travelled 200 miles down the river to the 240-bed mission hospital at Kimpese. Here we got a packet link going to Kinshasha. This packet system was developed by Dr Steve Chandler of Warwick University. As well as packet messages, this system acts as a ‘telephone calling’ system, whereby a telephone ‘beep’ sound comes from the loudspeaker when a distant station requests a voice contact. The unit contains a solar battery charging regulator and monitors the battery voltage and solar charging current every 15 minutes. Two days of data can be stored and transmitted upon request to a distant station. Also, a unit in the antenna feeder measures the VSWR and power output and this measurement can be initiated by, and results transmitted to, a distant station. The value of this system is that it permits remote monitoring of the condition of distant stations.

We returned one way by the only railway line into Kinshasha in the first train to travel for a week following a fatal rail crash. We also came down the Congo at night in a leak-

feature

again evacuated, with the transition of Zaire to Congo, they left their solar panels for the church. The solar charger comprised three 18 volt panels connected in series to give 54 volts. However, the Congolese did not realise this and connected them to the 12 volt battery, resulting in damage to the charger’s regulator and no charge into the batteries. We were able to connect the three panels in parallel which then charged the battery at 2 amps. When the news of our repairs reached the next village down the river they said they would bring their solar panels up by canoe for us to fix. Our departure day arrived but no solar panels, then the plane was a day late arriving. The next morning, when we were getting ready to go to breakfast, the villagers brought their solar panels to the house. I said, “You have just arrived?”, they replied that they had arrived the previous afternoon and had come over to the house. They thought we looked sad (no aircraft!) and went away, as they did not want to trouble us. We were able to rewire their panels, have breakfast and reach the air-

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"To travel for a week following a fatal rail crash. We also came down the Congo at night in a leaky..."
the outside world

In addition to the HF network which provided a means of rapid communications along the 1200 miles of the River Congo, a need had arisen to link this network to the outside world.

MAP provide a hub with an Internet e-mail facility into and out of Kinshasa. You can connect to this hub either over a VHF 9600 baud radio link or using the commercial Telecel mobile phone system in Kinshasa. MAP then use the international telephone facilities to get the e-mail to the USA for connection to the Internet.

For our particular need the most economical method was to use the facility provided by the Volunteers in Technical Assistance (VITA), originally through the Volunteers in Technical Assistance (VITA), originally through the University of California. This method uses the 'store and forward' principle with LEO satellites. The equipment and protocols are those used by amateurs on the 9600 baud satellites, eg UO-22, KO-23, KO-25 etc. Hence it was valuable experience to be able to test a VITA ground station on the amateur satellites before sending it to what was then Zaire.

In 1995 the ebola virus appeared in the Kikwit area, and the equipment was rushed out at the request of Zairean authorities and loaned to the American Baptist Missionary Society to provide much needed international communications. The equipment was returned to us and during our visit we got the equipment working and uploaded e-mail to POSAT, which was downloaded by VITA in USA and forwarded on to the Internet. Although the antennas were disconnected and the mains protected, during our absence from Kinshasa a massive lightning strike damaged the equipment and many other computers and modems in the same district. At the present time the ground station is not working.

the future

When we left the Congo in November 1997 the HF network was again working, solar panels were charging the batteries and communications had been restored, but there is still much work to be done.

Back in the UK, David is developing a small satellite ground station, for use with the digital LEO satellites of VITA and Healthsat, to deploy at the hospitals at a future date. David will be returning to Congo to install the satellite equipment and to do further improvements on the HF network during the next two years.

further reading

Where There is no Telephone, by John Corbett, G3TWS, is a handbook on shortwave radio communications for aid agencies in developing countries which was first published in 1988. It is available from the Baptist Missionary Society, PO Box 49, 129 Broadway, Didcot OX11 8XA; tel: 01235 512077; fax: 01235 511285; e-mail: mail@bms.org.uk. The book has been twice reprinted, then revised in 1997 and chapters added covering packet, store and forward low earth orbit (LEO) satellites, and disaster and relief communications. The United Nations Department of Humanitarian Affairs has converted the book to html and the text is available on the internet at: http://www.reliefweb.int/library/dc1/.

A companion book, Disaster Communications, has been written by Mark Wood, G4HLZ, and this is also available on the UN web site at: http://www.reliefweb.int/library/dc1/.

Before the days of modern communications in the Congo, talking drums provided a local network by which villages could communicate with each other, up to a range of some 8km. Messages could be relayed through several villages, within their own language area. These drums are still in use today, mainly in the upper river region of the Congo.

As a communications system, the talking drums have a low data rate and much redundancy. The hollowed-out tree trunk drum produces a high and low note which lends itself to imitating the tonal languages such as Lingala, of the Congo jungle.

An example of how the drum language can produce errors in messages was when a message was received saying, "The doctor is dead". This caused much concern. The doctor was away from the hospital visiting village clinics in a Land Rover. Later when the doctor walked back into the hospital it was discovered that the message should have read, "The doctor's Land Rover is dead".

It was in an attempt to increase the data rate and make the drum system independent of language that I suggested the use of the Morse code on the drums. The high note was to be the dot and the low note the dash, with a few additional characters added to complete the alphabet of the other languages. Hence the drummer only had to learn the Morse code to enable him to send messages in a language, eg French or English, which he does not understand. Whilst the younger drummers were very interested in the method, the older drummers who controlled the drums would not agree to its use.

Talking Drums

Ham radio today

Talking drums

Ham radio today feature

talking drums

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4 x AA cells (ready charged)
8 x AA cells (ready charged)
4 x AAA cells (uses standard charger)

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Masport PX-200 Mobile

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Antron J2000W 80W

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FTI 2000 Dual band

¥399

Plus Airband AM Receive!

¥259

IC-T22E

ICOM new transceiver that is earning a reputation for offering one of the best receivers in the business. If you are looking for a hot little number that is not too expensive (Radio we mean!), send for brochure.
I couldn't get to Friedrichshafen this year? Here's the next best thing. Ham Radio Today was there and brings you this pictorial taster.

The giant Friedrichshafen Ham Radio 98 exhibition took place from Thursday 25 to Saturday 27 June. This year, for the first time, Ham Radio Today was represented on the RSGB stand. Hundreds of copies of the magazine were sold at DM2.00 each - a real bargain! - and we have already received subscription enquiries from some of our Continental friends who bought the magazine at Friedrichshafen.

Nearly 19,000 amateurs from all over Europe and further afield attended the exhibition, with the organisers saying that "a strikingly large number of Italian radio enthusiasts" made the journey. Over 65% of visitors had travelled more than 100km to attend the exhibition.

This was the 23rd annual show, and - against expectations - many of the 300 exhibiting firms from 40 countries reported better sales than in previous years. In particular, the organisers say, there was heavy demand for measuring equipment, antennas and accessories. This year, again for the first time, the exhibition had the added bonus of the separate Hamtronic computer hardware and software exhibition.

Make a note in your diary for next year - Thursday 24 to Saturday 26 June - and try to get to Friedrichshafen for Ham Radio 99!

Even the car park is interesting at Friedrichshafen!

As usual, the RSGB stand attracted many visitors.

As usual, the RSGB stand attracted many visitors.

An overview of the giant Hall 7, which mainly devoted to components, computer equipment - and lots of junk.

Close-up of some of the German ex-DRG- equipment on sale in the flea market. This giant valve amplifier and power supply was on sale for DM350 - around £120.

Friedrichshafen is a good place to meet up with DXpedition team members and hear their stories first hand. This is the Swiss group who activated 3B7RF from St Brandon in the Indian Ocean earlier this year.

The Egyptian Amateur Radio Society had a stand. Here Ahmed, SU3AM, is seen selling Egyptian souvenirs!

It is often said that Amateur Radio crosses all barriers - social, political and religious. To prove the point here are YI1 US and YI1AFT, both operators of the YI1BGD club station in Baghdad, who represented Iraqi Radio Amateurs at Friedrichshafen.

An overview of the giant Hall 7, which mainly devoted to components, computer equipment - and lots of junk.
Radio Amateurs Examination Manual

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- Completely revised to May 98 changes
- Two books in one: Now incorporates advice and sample questions from How to Pass the RAE
- 30% more pages
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This book is recognised as the standard textbook for courses leading up to the Radio Amateurs Examination. It is presented in an easily understandable format and takes the candidate step by step through the syllabus topics, including:

1. Licensing conditions
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4. Receivers, transmitters and transceivers
5. Transmitter interference
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7. Propagation and antennas
8. Measurements

All those studying for the RAE in classes or at home will find this book indispensable.
which contains articles on last year's expeditions and IOTA contest, and contains useful guidance on how to prepare your first official submission. It is available for £8.95 from Ham Radio Today Sales (see Book Browser on page 18 - Ed).

The IOTA Checkpoints for UK stations are Ray Small, G3IAL, who handles all G and M (ie English) call numbers except zero, and John Hall, G3TOK, who handles all other British stations. For initial applicants in the UK the charges are:

Registration Fee: £2.00
Checking Fee (up to 120 cards): £8.00.

**1.8MHz**

Although summer is still with us, it is not too early to be thinking of making preparations for 160 metres, as some of the best conditions for working New Zealand, ZL, on that band occur at sunset and sunrise every year around mid-September. A quarter-wave vertical with lots of ground plane radial elements is close to the ideal antenna, but few people can manage the necessary 120-foot vertical element. A good substitute is an inverted L - a quarter-wave length of wire with the feedpoint at the base, going vertically as far as possible and with the remaining wire run parallel to the ground. This still needs a good ground plane, unless you are lucky enough to live in a swamp, but is capable of excellent results with even a modest number of radials. Why not try 160 this autumn and winter and let me know how you get on?

**IOTA time**

For those of you who dabbled in the IOTA Contest at the end of July but have not yet sent in an entry for the main award programme itself, the long afternoons and evenings could be a good time to prepare the paperwork. The first certificate is available for contacting just 100 island groups. You will need the QSLs, but there can be few HF operators who can't find the first 100 in their collections after a year or two of activity. All participants must have a copy of the IOTA Directory, which gives a full listing of the rules and the island groups. This is now combined with an annual Yearbook which contains articles on last year's expeditions and IOTA contest, and contains useful guidance on how to prepare your first official submission. It is available for £8.95 from Ham Radio Today Sales (see Book Browser on page 18 - Ed).

The IOTA Checkpoints for UK stations are Ray Small, G3IAL, who handles all G and M (ie English) call numbers except zero, and John Hall, G3TOK, who handles all other British stations. For initial applicants in the UK the charges are:

Registration Fee: £2.00
Checking Fee (up to 120 cards): £8.00.

Martin Atherton, G3ZAY, announces some new opera

HF Happenings

The charge for the 100 certificate is included in the registration fee. There is a 15% discount for RSGB members and a 35% discount if the entry is prepared using the RSGB's IOTAMEM recordkeeping software. The IOTAMEM programme is available from your club for £5.00 inc P&P.

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If your club entered the IOTA contest, please remember that there is now a club category for the main award programme - including a separate section in the annual listing / honour roll. Why not get some friendly rivalry going with your neighbours and see who can move up the list most quickly?

**Dayton**

Last month I was pleased to be one of the British contingent at the Dayton Hamvention in the USA. This is one of the largest gatherings of ham operators anywhere in the world with nearly 30,000 visitors dropping in over the weekend and rivalled only by the Friedrichshafen convention in Germany. Hotels and motels were fully booked for miles in all directions. There was a massive indoor exhibition area in a linked group of sports halls and a truly vast flea market in the surrounding car parks. The DX and contest forums were moved this year from a corner of one of the sports halls to a nearby school, but the jury is still out on whether this was a success. Those who made the trip by shuttle bus to the school lecture room found the venue a considerable improvement - but a large number of people who in the past dropped in and out of the sessions according to whatever interested them were unable to leave the main site and thus missed all the presentations.

Dayton is a great place to meet famous DX operators. Mats Persson, SM7PKK, a speaker at the RSGB HF Convention some years ago, dropped by the Ham Radio Today stand quite early on. Mats made a name for himself as a teenager touring the Pacific islands and is active as A61AD.

**Forthcoming expeditions**

For those of you still needing FP - St Pierre et Miquelon - the Prairie DX Group, N9PD, has announced a DXpedition to Miquelon Island (IOTA NA-032) from 26 August -
off down-slope from St Pierre to the UK was excellent and I made a large number of contacts in a few hours’ operating time, but my skeds with Japan on 20m CW were all a failure.

Steve, G3VMW; Alan, G3XAO; and Andy, G4ZVJ, will be active from Addis Ababa, Ethiopia, between 18 and 27 September. Activity from ET3AA, the club station of the Ethiopian Amateur Radio Society, will be on all bands from 10 - 160m, but with emphasis on the LF and the WARC bands. The operation will be mainly CW with some SSB and RTTY if there is sufficient demand. Operating frequencies will be as follows: 1829, 3508, 7008, 10108, 14026, 18076, 21026, 24896 and 28026kHz. Always split frequency, listening up between 1 and 5kHz. QSLs via Steve Wilson, G3VMW, 3 Crag Gardens, Bramham, Wetherby, West Yorkshire LS23 6RP. More details of the ET3AA DXpedition are available on G3VMW’s web page at http://www.bramham.demon.co.uk

There will be an on-line log search utility immediately after the operation. During the visit to Addis Ababa, it is hoped to obtain personal callsigns from the Ethiopian government in readiness for a sustained two-week DXpedition during 1999.

difficult areas

Two of the hardest DXCC entities to work from the UK are the JD1 islands of Ogasawara and Minami Torishima. Most operators there are Japanese nationals who tend to focus on openings back home rather than on working large DX pile-ups. Ogasawara is an accessible tourist destination - at least for the Japanese - with regular ferry services from Tokyo, but Minami Torishima is essentially a military base and access to it is strictly controlled. J1KFRUD1 has been active from Minami Torishima for the last few months, but there is clearly a case for a major multi-operator expedition to both these spots. There was once a third JD on

of them are reasonably easy to find on the air but there are very few times when all are around. TJ, TR, and TU are usually no problem, but it is worth grabbing a contact with any of these prefixes if you hear them - you never know when there might be a Terrible T famine.

awards

Worldradio magazine has just launched its 100 Nations Award for contacting permanent stations in 100 distinct countries with permanent native populations. The purpose of this award is "to demonstrate the unique opportunity Amateur Radio offers for communications between international borders to further worldwide understanding." All contacts must be with fully-licensed, land-based, residents and be made after 1 January 1978. Reciprocal calls, like W3/G3ZAY, and mobile calls don't count. QSL cards do not have to be submitted but must be checked by two other amateurs. Full details are available from the

Another new award, the WARC Bands Century Award, is sponsored by The 59(9) DX Report. The WARC Bands Century Plaque and WARC Bands Century Certificate are available to all licensed amateurs and SWLS for contacting / receiving 100 countries on each of the WARC bands (10, 18 and 24MHz) for a total of 300 'current' entities ('deleted countries' do not count). All that is required is the standard log extract (GCR) signed by two other amateurs verifying that the cards are in your possession. The application form is available at $1.00 or 2 IRCs from The 59(9) DX Report, PO Box 73, Spring Brook, NY 14140, USA.

That's all for this month. Please let me know what you would like me to cover in the future. Historiical recollections, DXpedition summaries, award and contest information are all possible and I will do my best to make the column an interesting mix of the most popular items. 73 de Martin, G3ZAY.
Propagation reports

The end of May offered a little more in the way of 6m DX for many in the UK. On 30 May, GOJHC in Lancashire, and I worked the first transatlantic report of the year. Alan, G3CJL, in Equatorial Guinea was reported coming into Europe on 23 May. His 50 MHz signals were copied in DL, PA, ON, LX and GJ. Also, Peter, G3IBI (1090), heard Alan's signal but was unable to complete the contact. Alan is very active on 50 MHz from Equatorial Guinea, he is stationed there on behalf of Mobil Oil and I feel very sure that the next year he will be workable with ease in Europe on 50 MHz and as the cycle progresses.

On that same day Chris, G3WOS, reported that he copied a 256 calling GO on 50 MHz.

Eric, TT8JE/F5JKK, e-mailed his latest 50 MHz report and total number of countries worked on 50 MHz by G3WOS who was part of the group that eventually gained the 50MHz allocation for Poland.

Also, last year Jimmy Treybig, W6JKV/J6, from St Lucia worked into Poland and other European countries at over 8200km. Personally I think the biggest problem here is the time difference, as all the west coast stations are just going to work as the band opens up. This is a similar situation to the UK going to work when the band opens up to VK. 57K, W6JKV in DK16AB (if he was there?) was worked via Es on 24 June 1989 by G4UPS.

west coast via Es?

There is also no reason why the west coast could not be worked via multi hop Es (Sporadic E) during the summer Es season. It makes the distance under 8500km and the record Es distance (east to west) stands at over 9800km.

Chris, SP4TKK, who was part of the group that eventually gained the 50MHz allocation for Poland.

Hatsou, JA1VOK, was delighted with this DX worked on 144MHz in a mail to me he stated, "I worked on 24 May JA5/JO1UQWI in Minami Torishima by Es. The distance is 2000km and it was a new country!" Her's a thought: imagine if you lived in Japan, how many countries could you work on 144MHz compared with from Europe? It's no wonder he was excited.

Costas, SV1DH, the famous VHF man in Greece, pulled off a new country on 50 MHz in late May with EK6AD (LN20) in Armenia. This contact brought his total country score to 156 since coming on the band in 1986.

Brian, G8YBC, in Yorkshire had a 20-second opening on 29 May to Armenia on 50 MHz. This multi-hop opening gave Brian the first ever G to EK contact.

Jean, F3RMPW, reported a very nice 144MHz FAI opening on 31 May to southern Europe - S5, 9A, 11, 2, 3, 5 and YU1-7 - between 2000 and 2100UTC.

The first week of June always produces good DX via Sporadic E, and people even book their holidays to be at home. The 1st was no exception, when Jim, G0HCR (GB1), in Dorset worked UT1PA (K021) on 50 MHz, and yours truly pulled off UN3G (NW83) in Kazakhstan at over 5800km. If you're lucky enough to work him, QSL to: Valery Petrov, UN3G, 480000 Almaty, PO Box 47, Kazakhstan. Jim also reported the SBAC4 beacon on 50 499MHz the next morning although no 144MHz Es was reported during this massive opening. At lunch-time on 2 June Tony, A46ZRN, in Oman was worked on 50 MHz by G3HBR and Nick, G3KDX, truly fantastic DX!

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Later that day, Roger, G4HBA, in Devon also had a three-minute opening on 6m to Valery, UN3G, who is located very close to the Chinese border. A good point to note here is that all the contacts with UN3G were via CW, so if you do not operate CW you will miss out on that new country!

Erol, TA7V, in Turkey reported that his 50MHz score after just two days of operating on the band was 143 contacts with 25 different countries in Europe!

Peter, G3ZBS, reported working nine new countries on 50MHz during the massive opening on 3 June. A total of 39 countries were logged coming into GJ that day, including rare ones like 9Q7, 4X and many U/Rs / U/Ys. It was also reported that stations in the south east of the UK (eg J001) worked two 4X stations via Es on 144MHz.

On 4 June, O05RAK in Lebanon was reported into the UK on used SSB. This opening was via F2 with Es on the European end. 5 June was another exceptional day, when John, 9G1BJ, in Ghana was worked in the UK between 1800 and 1845UTC. John worked G3s WDS, FPQ, KX2, G4ZC2, and many more Gs even in the North of England. Also worked was G4GCD for country number 162. At 1330UTC on the 6th, G0HNO made a trans-Atlantic contact with VE1PZ on 50MHz. This was the first 1998 report of trans-Atlantic DX. Later in the day G4DOL (1080) had a 144MHz opening into 9H, and here in Jersey 1Ts were logged also on 2 metres.

7 June was reported by many as an "unbelievable" day on 50MHz, with reports of stations from all over Europe. Conditions were so good and it was a contest day tool, N6BV on the IS of Man.

Peter, G3IBI, in London heard EK6AD (LN20) in Armenia during the morning, and later in the day the band just went mad. Stations in Moldova, Bulgaria and Lebanon were coming into the UK. Chris, G11D0V, worked O05RAK (KM74) on SSB, the SB4CY beacon on 50.499MHz was coming into the UK continuously throughout the day, and it was also heard on 70MHz.

At 1515UTC I started to hear the video vision carrier on 48.2504MHz (zero beat USB), transmitted on 50.105MHz. This is a very good indicator for an African opening, it has a 'raspy' sound to it, so can easily be identified. I knew Alan, 3C51, was active with 100 watts and a phased antenna system and that he monitored and transmitted on 50.105MHz. Alan has a severe problem with his local TV transmitter causing QRM on the band. I tested (by moving his beams to 10 degrees and using 30.105MHz he can reduce the local QRM to about 78.075MHz. He plans to use a rhombic antenna covering QRM on the band, but no information is available at this time. More reports on June next month.

building a vhf amp?

Dorin, YO4BZC, sent in information which may be of help to builders of VHF / UHF amplifiers. He has a quantity of those famous 'GU' type Russian tubes for sale. There are various triodes and tetrodes, including the Swavlik 4CX300 and the Miller type triodes such as G3MY which has used in his VHF amplifier design for 6m. Some of these triodes can even be used at 23cm and above and are available at a fraction of their original cost. E-mail Dorin at: dorinmamut@mailcity.com for further details, or his address can be found in the international callbook.

lander news

More new beacons are appearing on the VHF / UHF bands. However, we will only list the ones that are active 24 hours a day, otherwise you will not know if they are on or not!

Pete!. 03

The Impression VHFQO station of Costas, SV1DH, who has worked many UK stations on 50 and 144MHz.

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In my last column I wrote about Dayton and the wonderful time we had by all those attending. I often wonder why some people travel so far to be there. George, G3RJV, and I travel some 12 to 14 hours in total from our homes to the house of Bill, N8ET, where we stop over for a day or so prior to the Hamvention itself. Many friends over there have commented over the years about our reasons for travelling so far.

Our travel time pales into insignificance when we met three guys, Chris, Jerry and Tom, who drove for 42 hours across the USA from California to Ohio for the gathering! They told me they only stopped for fuel, food and calls of nature, sleeping in turn in the back of the car and taking turns driving too. I first thought that this was normal, after all, Doug, K6DS, thinks nothing of driving 100 miles for a chat with a friend before driving home in the same evening. Distances in the USA are not thought of as a limit, as we tend to do here in the UK. During my talk at the QRP symposium I mentioned this elongated trip and to my surprise the audience of 150 or so burst into applause for these guys. It makes my drive to Friedrichshafen via Prague this year look like a short shopping trip.

Each visit to Dayton has special memories. In 1990 I met the legendary Doug DeMaw, W1FB, for the first time and the following year I stayed with him at his farm in Michigan. This year my enduring memory will be of George, G3RJV, wearing a 'cowboy' hat. Graham Firth, G3MFJ, had been given one. Now Graham has a large-sized head (no, he is not big-headed). George took the large hat and put it on his head. It was a good job he has ears, as it dropped straight down to his nose and all we saw was the inevitable pipe sticking out of the bottom.

Being a limit of 30WPM for the Hamvention, I was aware that hotel booking is essential, as almost every spare room for over 50 miles around is sold out, usually the year before. Another reminder here for any G-QRP member interested in coming next year, contact me for details.

Friedrichshafen

Peter, DL2FI, from Berlin and I often meet at Friedrichshafen and exchange notes. Peter writes the QRP column for the German magazine Funk Amateur. This year they paid for him to visit Dayton and the QRP gathering. (A hint to the editor here!) No way, I don't even get to go to Friedrichshafen! - Ed. Peter even spent some time helping out on the G-QRP club booth in the arena (see photo).

I have sometimes mentioned Dayton and Friedrichshafen in the same sentence, but they are totally different events. There are no special QRP-related events at the latter, and part of the difficulty is the large number of different languages spoken by visitors. But hopefully one of the local German QRPers will take up the challenge and start something. If not, perhaps Peter, DL2FI, may be tempted, after his visit to the hospitality at Dayton this year.

dallas

There are several large rallies held throughout the USA at various dates during the year. Many have QRP-related events running alongside them. One of the other bigger ones is held in Texas and called 'HamCom'. This takes place just three weeks after Dayton and reports are now trickling in.

The following is a report from Paul, NASN: "It was my first time in Dallas, and a great event. It is always neat meeting QRPers you have worked in the contests, or our QRP-L friends for the first time. "Some good QRP talks and Chuck's, K5F0, trial run of the CW contest was fun. I would say the majority of the room did quite well to 25WPM, and a surprising number at 35WPM. One OSO ended with 'BCN YOU' (= 'be seeing you') to throw the crowd, at 1 think 30WPM, and darn if several guys didn't inform Chuck he made a 'typo', as the CW really said 'BNC YOU'." Yup, CW is dead!

"HamCom is no Dayton (thank goodness), but of fairly good size, plenty of manufacturers, lots of tables, tailgaters, etc. I was particularly impressed with the quality and reasonable prices on most everything. Very little computer rubbish, lots of good old ham radio rubbish. No $50 HW-9s though.

So, if you're in Texas during the first weekend in June, Dallas and HamCom is the place to head for. Reports from Tony, G4WIF, and the wonderful time we had by all those attending. I often wonder why some people travel so far to be there. George, G3RJV, and I travel some 12 to 14 hours in total from our homes to the house of Bill, N8ET, where we stop over for a day or so prior to the Hamvention itself. Many friends over there have commented over the years about our reasons for travelling so far.

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so is very up to date.

There are four section covering electronics, mechanics, sources and miscellaneous. The electronics section is the one of main interest, it covers Ohm’s law, giving resistor and capacitor colour codes etc. These are covered elsewhere of course, such as George’s book mentioned above.

This book also covers (US) wire gauges, fuse wires, current rating and much more. There are several ideas given on the use of the NESSS timer, various methods of setting up power supplies and the use of zener. It also has a good section on nicad batteries and building chargers and a nice piece on the Colpitts circuit.

Most of the simple Amateur Radio rigs found in the QRP arena use the simple Colpitts VFO. Certainly those circuits requiring a section on nicad batteries and setting up power supplies and the general ideas given on the use of the and much more. There are several diagrams showing variants of circuit the better one to use. The crystal oscillator may find this circuit the better one to use. The Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO. Certainly the simple Colpitts VFO.

In Fig 1 we can see the VFO using a crystal as the base of the oscillator. Fig 2 shows the same circuit, this time as a free-running VFO with the frequency controlled by the LC tuned circuit. Finally, Fig 3 shows the varactor diode in place of the variable capacitor. The capacitance of this varactor changes according to the voltage applied to it. The 47k pot in the supply line controls this voltage.

This book is available direct from the author who can be contacted by e-mail at: torremet@ohio.net The G-QRP club is also looking at importing some for members, although no price is available yet.

The k2
Wayne Burdick is an avid high-quality builder. He has taken many of the quotes from the qrp-l reflector and comments made to him over the years and designed what we think may be the ‘best knees’ in quality QRP transceivers, the Elecraft K2 all-band SSB/CW transceiver kit.

I have followed lots of Wayne’s work over the last couple of years and found his ideas exciting and often of exceptional quality. The K2 promises to become a standard, judging by the comments and the 300 names listed for the rig when it actually finishes testing and starts production. I have put my name on one for testing over here, so hold fire. This is the one that might replace the older Heath series of rigs, but in much better way.

It is stated to be a ‘full featured’ HF transceiver, with twin VFOs, split Tx/Rx, RIT, XIT, full break-in, memory keyer, narrow IF crystal filtering, and much more.

Watch this space for more details when I get my hands on one.

I regret to announce the death of Nick Carter, G2NJ, on 4 June. Nick was G-QRP Club member number 2, and one of the founders of the club. He was a former sports journalist and an avid CW operator on 80m. In many ways he was instrumental in the formation of the club: it was after several 80m contribution to the club or to QRP many years ago - in fact the club’s first award. It is offered here, so hold fire. This is the one that might replace the older Heath series of rigs, but in much better way.

When we later added membership numbers, as the club grew, because of Nick’s early involvement and motivation, he became number 2. His call will live on through the ‘G2NJ Trophy’, an award he presented to the club many years ago - in fact the club’s first award. It is offered each year to the person thought to have made the best overall contribution to the club or to QRP operation during the previous year.

Well, that’s it, news and views to me via the editor, direct via ‘snail mail’ to Seaview House, Crete Road East, Folkestone CT18 7EG.

Fig 1: the Colpitts crystal oscillator.

Fig 2: free-running Colpitts VFO with the frequency controlled by the LC tuned circuit.

Fig 3: Colpitts oscillator using a varactor diode in place of the variable capacitor in Fig 2.
The AMSAT Phase-3D (P3D) satellite will not be launched on the third test flight of Ariane 5. The bad news reached Karl Meierer, DJ4ZC, Phase-3D Project Leader and AMSAT-DL President on Monday, 15 June.

It is important to point out that the decision was actually made by Arianespace, not ESA. ESA is the European Space Agency, similar, but not equal to NASA in the United States except that it is multi-national; Arianespace is the organisation set up to market Ariane launches so, naturally, its prime interest is money.

Because of the failure of the A-501 in June 1996, and the less-than-expected performance of the A-502 last October, all concerned have been understandably anxious to complete a fully-successful test as soon as possible. Arianespace cannot begin to sell Ariane 5 launches until a successful test actually takes place.

The failure of 501 and the lower-than-expected performance of 502 have caused an extension of the programme and hence have increased the cost of the development phase. As a result, ESA asked Arianespace to try very hard to find a paying customer for A-503; a figure of somewhere around $35,000,000 was mentioned (this is about half of the amount usually paid to launch a present-day commercial satellite on an operational launcher).

Arianespace, apparently in order to get the A-503 flight off as soon as possible, and so that they could begin to sell future Ariane 5 launches, agreed to pay ESA some $40,000,000 in order to control the payloads on the mission and get A-503 launched as soon as possible.

The Ariane 503 payload will therefore consist, in addition to the ARD (Atmospheric Research Demonstration) of a representative mock-up of the Eutelsat W2 satellite (because Eutelsat had some problems and had to cancel their flight). Launch is planned for 23 October.

Karl Meierer says that it is clear that P3D will not fly this year - but he thinks that the chances are not bad that AMSAT will find something next year on an Ariane-5, but they will also pursue other launch options in parallel.

After the publication of the report of the launch situation, DJ4ZC received about 400 letters. He would like to express his appreciation for the support and suggestions which were mailed to him.

Of course, the longer P3D stays on the ground the more it costs AMSAT-World, so there is another funding scheme going on: putting your QSL cards into orbit. AMSAT-NA are now collecting OSL cards, which will be scanned and converted into digital images. These images will then be saved on CD-ROM, which will be fixed to, and launched with, P3D. AMSAT-NA is suggesting cards be sent in as soon as possible. They suggest a minimum donation of US$25.00.

Send your QSLs and donations to: Fly Your QSL on Phase-3D, c/o AMSAT-NA, 850 Sigo Avenue, Suite 600 Silver Spring, MD 20910-4703, USA. Cheques or money orders should be made out to 'AMSAT', but please do not send cash.

By the way, few people are aware that the Phase-3D integration lab has a web site for some time. This is fortunate since there was nothing there worth seeing. The site has now changed with some interesting additions. If you would like to share the progress a little more closely join them at: http://www.magicnet.net/~phase3d/ Picture our pictures this month are taken from their excellent 'photo of the day' pages, which are updated nearly every day with photographs of the assembly work, generally taken on the day they are posted.

**Oscar 10**

Oscar 10's downlink signals have improved considerably in the last few weeks. OSOSs are now taking place again and the solar illumination should continue to improve. The low point of this illumination cycle appears to have been around late March, although the beacon could still be barely heard with deep QSB at that time. Command station W4SM has revised the guesstimated ALON / ALAT to approximately 100 / 25 based on these observations.

W4SM has more information about the satellite on his AO-10 web page, with the following URL: http://www.cstone.net/~w4sm/AO-10.html

AMSAT Oscar-10 was launched on 16 June 1983 so it is now 15 years old and the 2m / 70cm transponder is still working well. AMSAT Oscar-13, launched in 1988, would have been 10 years old by now.

**Russian satellites**

G3IOR reports that RS-15 has lost its TLM beacon but the transponder remains on and is working perfectly. The remaining crew on board Mir apparently speak and read Russian only. Therefore, any messages addressed to ROMIR will not be understood by any of the crew members - unless it is in Russian. Latest word indicates that the PMS has been shut down and may remain so for several months.

**Short bursts**

The Russian RESURS launch scheduled for June has been delayed. This RESURS also carries TechSat-1A, TM-Sat, and FA-Sat-Braço. Multiple payload launches by the Russians are somewhat different from their Western equivalents, in that the piggy-back payloads are mounted on the main satellite and deployed later,
VISAT-UK News from Richard Limebear, G3RWL

Satellite Bénévoles

(Several hours or even days) by ground command, rather than being individually deployed from the launch vehicle.

The launch on a Zenit booster was re-scheduled for early July. As UoS understand it, the problem has been located in the guidance unit of the Zenit and Resurs is being de-mated in order to get access to be able to fix the problem. The microsatellites will not be de-mated from the Resurs.

The orbit will be 821 km sun synchronous (similar to UO-22) with a local ascending node time of approximately 12:37.

The Israeli TechSat is a digital store-and-forward satellite using 9600 baud, much like UO-22, KO-23 or KO-25. A telemetry decoding program for the satellite is to be made available. The spacecraft is identical to the one which had a launch failure in March 1995. The frequencies are: downlink: 435.225MHz 1200 bpsk and 9600 fsk (G3Rhu); uplink: 145.850, 145.890, 145.930MHz. There is also 23cm equipment on board, but only for command purposes. There is a web site at: http://www.techtronix.co.il/asronen/techsat/new.html Communication will be carried out using the 9600 bps downlink, so stations equipped to receive the present 9600 bps amateur spacecraft will be able to listen to TechSat on 435.325MHz using a terminal program. After the first phase of testing and stabilising the satellite in orbit, both programs will be distributed; one to download the telemetry and the other to decode it. The download telemetry will also have a version to go with WISP. Once Techsat-1A is stable and all tests are completed the BBS will be uploaded; this is the same as the other Pacsat.

TM-Sat is Thailand's first microsatellite and has been constructed by Thai engineers with the aid of SSTL at Surrey. Payloads include a digital signal processing (DSP) system to investigate ways of enhancing satellite communications, in addition to wide and narrow angle cameras capable of taking 100 metre resolution, multi-spectral images of the earth's surface.

A brief overview of the TM-Sat commissioning plan is available at http://www.ee.surrey.ac.uk/CSER/UOSAT/amateur/tmsat/commissioning_plan.html

All initial commissioning will be carried out using the 9600 bps downlink, so stations equipped to receive the present 9600 bps amateur spacecraft will be able to receive TM-Sat on 435.95MHz. TM-Sat will later speed up to 36,400 bps.

The TM-Sat1 telemetry configuration file for DTLM is available on the UOSat web site at: http://www.ee.surrey.ac.uk/CSER/UOSAT/amateur/tmsat/index.html

FASat-Bravo is an identical replacement for the UO-22a spacecraft which was launched on 31 August 1995, but became stranded in space when it failed to separate from the main Ukrainian satellite to which it was attached. It has been constructed under a Technology Transfer Programme between the Chilean Air Force and SSTL. FASat does not carry an amateur radio payload. SEDSat-1 is now scheduled for launch sometime in October of this year (23 October has been mentioned). The spacecraft is now complete and is in the final stages of testing. It will carry a Mode-L digital transponder as well as a Mode A analog transponder. The planned orbit is 500 x 1000 km at 28.5 degrees inclination.

The frequency plan was at the time of publication still undefined: Mode A: up 145.915 to 145.975MHz; down 29350 to 29410kHz. Linear Transponder Mode L: up 1268.250 to 1268.100MHz; down 437.850 to 438.000MHz. FSK digital @ 9, 18, 2, 38.4 and 56 kbps.

SEDSat will fly as a secondary passenger along with the JPL 'Deep Space One' mission. The launch was to have taken place in July, but was postponed to October because of delays associated with the primary payload.

On 1 June, the command station of FO-29 re-activated a new status report that solar activity causes frequent two bit errors in the on-board computer of FO-29, and this brings about software hangups or malfunctions. So FO-29 will stay in mode JA for a while in order to investigate the frequency of these errors.

AO-27 TEPR states are currently: 4 = 36 = 18 Minutes 5 = 72 = 36 Minutes. This means AO-27's transmitter turns on 18 minutes after entering the sun and stays on for 18 minutes. AO-27's transmitter turns on at all other times during the orbit. These settings will cause the satellite to be on during the daytime at northern latitudes.

Have you ever wondered how to research a particular satellite? A good general source can be found in The Satellite Situation Report, which can be downloaded from: http://library.gsfc.nasa.gov/ The report details everything launched since Sputnik, and lists the current status of everything in orbit. The report is updated once a month.

Motorola's Iridium satellites have become popular spacecraft to watch streak across the night sky, due the brief and predictable -8 magnitude 'flare' that can be seen when sun angles are just right. The 'flare' occurs when an antenna on one of the satellites aligns correctly between a ground location and the sun. Several Internet web pages have been developed for those interested in Iridium flares: http://www.satelit.eu.org/sat/vsoh/iridium.html

UK amateurs who missed the first and second chances to obtain the Drake 2400MHz converter for about £25 will still be able to get it; a third (and final) batch is being ordered now: telephone (or e-mail) G3PHO for the latest information on 0114 2816701; e-mail: g3phohq@qsl.net or g3pho@geocities.com

Those who donated refunds from the last batch to AMSAT will be pleased to know that, at present, the total refund was over £100. Thanks for your support in this venture.

I have ten of these converters which I obtained for disposal at the AMSAT-UK Colloquium (31 July - 2 August). The offer is initially only open to people going to the Colloquium but if any are left over I will make them generally available; let me know if you're interested. The price will be £50 for units which have been converted to a 2m IF (2400.0 = 144.0MHz; feed power along the feedline); or £40 for modify-it-yourself kits (excluding crystal, connector adapter and instruction). Some of the (small) profits from this exercise will, of course, go to AMSAT-UK's P3D fund.

The ARRL and TAPR Digital Communications Conference is an international forum for Radio Amateurs in digital communications, networking, and related technologies, who meet, publish their work, and present new ideas and techniques for discussion. Presenters and attendees have the opportunity to exchange ideas and learn about recent hardware and software advances, theories, experimental results and practical applications. The Digital Communications Conference is not just for the digital expert, but for digitally-oriented amateurs at all levels of expertise.

This year's Conference will be held from 25 to 27 September at the Holiday Inn Rolling Meadows, just minutes from O'Hare Airport, in Chicago, Illinois. Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation at the conference is not required for publication.

amsat-uk news

AMSAT-UK's 13th Annual Colloquium took place at the University of Surrey, from 31 July to 2 August. This year's lecture program was enlarged, with an additional 90-minute session on the Friday evening, to accommodate the extensive response to the call for papers. Also this year there was a presentation by NASA astronaut Don Thomas, KCSVF.

In addition to the presentations, there were also the usual standard events, including satellite Command Station visits, the annual dinner and auction, the AMSAT-UK annual meeting, microwave equipment testing, and the Friday evening barbecue in the University grounds.

This year there was also a related event at University of Surrey during the two days prior to the Colloquium - the International Space Station gathering. This ISS meeting was also open to everyone.

The AMSAT-UK web site address is: http://www.amsat.org/ Note that the web site address changed earlier this year - this is the new address.
Many amateurs have built a packet modem, which uses software such as BayCom. Here, unlike a TNC where the PC is used just as an intelligent terminal, your PC is put to better use by also performing the data processing. Here the modem acts simply as a converter between RS-232 data levels and audio tones, and usually takes its power from the RS-232 connector by rectifying the data voltages present. The Badger Boards modem is one such example.

Over the years, many simple designs for such modems have evolved and they work fine on many PCs. But whereas the RS-232 circuitry of earlier PCs can often source 10mA or more, later generation PCs can sometimes have problems. A typical problem recently experienced by an amateur was concerning an upgrade from an Amstrad PPC512 to a Compaq 486SX/66, where the modem worked OK on transmit but not on receive, and I know several other users of newer and higher-grade PCs that have similar problems. One answer is to add a low-cost 'old generation' interface card, maybe one from an old discarded PC, to your super-whizzo multimedia Pentium 350MHz machine. If you're on receive, and I know several other users of newer and higher-grade PCs that have similar problems. One answer is to add a low-cost 'old generation' interface card, maybe one from an old discarded PC, to your super-whizzo multimedia Pentium 350MHz machine. If you're concerned that your modem isn't working correctly, use your multimeter to check the 5V rail on your modem PCB on both transmit and receive, especially after a period of receive-only use, as this may leave the RS-232 TX Data supply line in a low-voltage state.

A further interface problem I've heard of is that some modems may only drive the RS-232 CTS (Clear To Send) output at 0V/5V, ie TTL levels, rather than positive and negative-going RS-232 levels. Some PC interface circuits don't respond to this, the result being erratic reception of received off-air data. The simple one-transistor circuit shown in Fig 1 modifies such a modem so that the output voltage also swings negative, and my thanks go to Roger, G4IDC, for this information. A typical unmodified modem has a 2k2 resistor from pin 6 on the 74HC04 to pin 8 on the 93385A, but remember it's PNP and not NPN.

In your junk box, this transistor can be any similar PNP. The components you'll need are two 10k resistors and the transistor. If you don't have a BC213L in your junk box, you can modify the PC using a 2k2 resistor in the diagram, this means that the only component you'll need is a BC213L transistor. Remember to change the resistor to 1k to change the relay to 2.7V.

For basic APRS you need:

<table>
<thead>
<tr>
<th>Type of APRS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APRS UK</td>
<td>For example, you can use APRS on a PC or a handheld device.</td>
</tr>
<tr>
<td>APRS US</td>
<td>For example, you can use APRS on a smartphone or a laptop.</td>
</tr>
<tr>
<td>APRS on a cell phone</td>
<td>For example, you can use APRS on a mobile phone.</td>
</tr>
</tbody>
</table>

Take a look at the APRS web site for more details.

The Badger Boards modem is a popular kit which can use BayCom software.
dx data

Further afield for DX enthusiasts, Matt, 7J6CAT, has just become operational from Tokyo and is running an APRS Gateway, 7J6CAT-7, on the BY4BHP BBS frequency of 21101kHz. If you connect to the gateway, you’ll also find an English language BBS, 7J1YAB on port 2 of the system, and there’s Matt’s personal mailbox on 7J6CAT-1. So, when conditions are right (or even if the band seems otherwise dead) why not give it a try?

Also further afield, the VK7PU PacTOR gateway is operational on 14080kHz, with its VHF port accessible by typing “NODE” (in upper case), a “<” command then gives you a listing of recently-heard VHF stations. More information from VK7PU @ VK7PU #BUR.TAS.AUS.OC Incidentally, VK4GKM - who is on the same mark frequency - also has a facility, so you can even try both.

maxpak news

MAXPAK is the Midlands AX25 Packet User group, who run and support a number of BBSs and Nodes in the area. The G37WV nodes now have a 2m 9600 baud port on 144.825MHz for linking into GB7MAX, although GB7MAX is due to close down temporarily for maintenance work in the near future, so don’t worry if it disappears for a short while. The GB7BL call is now officially used for the BLOX nodes, which have two 1200 baud users ports, on 144.9375MHz and 432.675MHz, reports are welcomed by the SysOP, Chris, G0CNG. The DY83 node has been successfully scalable tested and will be installed in use soon, possibly by the time you read this. DY83 will link DY to WV reducing traffic to GB7MAX on the DY71 frequency.

MAXPAK run regular meetings, for example September 2 brings a talk and demonstration on HTML by G7OCW, and 5 October has a talk by G0CNG on “What do I require to run 9600 baud?” The group also publishes an excellent bi-monthly newsletter, Digicom, and attend several Midlands rallies. More information from Richard, G1NZZ @ GB7MAX or tel: 0374 826908. evenings / weekends.

news in brief

Ciemon, GO1TRT, is a name and callsign you may have seen in this column before, he’s a keen APRS user. Ciemon tells me he’s nearing completion of his web pages, which are dedicated to APRS operation in the UK. Take a look, you might find it interesting! It’s at http://freemacs.virgin.net/ciemon崇拜.html

WINPMail V2 is a program from Mike, GOOPC, to allow you to read and delete archived sent and received packet radio mail in Winpack. It also allows you to list and read bulletins that have been downloaded by Winpack. Winpack has a bulletin filtering facility that allows you to list a specific topic from your current Winpack Bulletin list, it also usefully lets you read bulletins and mail whilst Winpack is connected to a BBS or station.

WINPMail V2 can be REOIFIL’d from GOOPC via packet with a message sent to GOOPC@GB7FEN #22 GRB EU with the title of /:

There’s a new firmware upgrade available for the PTC-II PacTOR controller.

REGIFILWINPMAIL \WINPMAIL2.ZIP. Also available via packet REOIFIL is Mike’s WINPLOG program, a log viewer for Winpack. WINPMLOG WINPLOG.ZIP. Not content with that, but finally WINPCAPT is also available, which is a viewer to allow you to view and delete or print captured text, for this the messge title is REGIFILWINPMAIL WINPCAPT.ZIP. For users of the SCS PacTOR-II Controller, there’s been a recently issued firmware upgrade. The firmware version 2.5 is basically a debugged and corrected version 2.4h, but with the addition of more commands, one of these is that the PTC-mailbox now accepts the command ‘Bell’, which sounds an 800Hz tone for around 14 seconds from the built-in speaker. A new algorithm also detects the frequency deviation of the distant station with a resolution of 0.1Hz (in the past the resolution was 0.5Hz). This enhancement improves the performance of the 16-psk (MaxSpeed) where an increased data throughput can now be achieved, so an upgrade could be well worthwhile. You should be able to get an update from your PTC-II supplier, or contact the PTC team direct (contact details are given in your PTC-II handbook).

ctrl-z, end of message

A recent bulletin from a UK amateur (I’ll spare his details to save his embarrassment) asks why he can’t get the PMS working on his copy of WINTNC. Other users of this program, which was included on the free front cover CD-ROM of the June issue of Ham Radio Today, may also be using this. The answer here to read the documentation contained within the program - it’s a shareware program, and registration is needed to activate the PMS. If all else fails, read the instruction manual!

I’m often asked for sources of packet and data software, so if you missed the June issue of Ham Radio Today it came with a free front cover CD-ROM packed full of packet and data programs. Back copies are still available for a limited time - see the ‘Back Issues’ section on page 58 of this month’s magazine for details of how you get your hands on one!

I’ll be at the BARTG rally at Sandown Park in Esher, Surrey - an event not to be missed for data enthusiasts - on 13 September. Following the success of last year’s ‘DataStream’, an even larger lecture stream is planned this time and I’ll be presenting one (or maybe two?) at the rally, see you there? More information on this event from Alan, G8GOJ, tel: 0181 688 2564 evenings.

I’m always pleased to hear from readers, so do get in touch. My contact details are given in the ‘Regular Contributors’ section of the magazine on page 58 each month.

Fig 1: simple add-on circuit for packet modems (see text)
A.F.K.4's MODIFICATIONS FOR AMATEUR RADIOS

I need your help... I am having problems with my K7ON FT-212RH. The unit was purchased new in December, 1987, and, as far as I could see, is in excellent working condition. The wife purchased it for Christmas, and I have used it extensively in the past. We are both ham radio operators, and the unit has been used primarily for basic communication needs, with no major modifications or upgrades to date. However, I have noticed some issues with the unit that have led me to consider making some changes.

The issues I am facing include:

1. Weak signal reception: The receiver performance seems to be below expectations. I am planning to read the manual thoroughly to understand the radio's capabilities and limitations.

2. Limited range: I am considering adding an external antenna to improve the range.

3. Interference: I have noticed occasional interference from other sources, which I believe can be mitigated by changing the frequency or adjusting the settings.

I am looking for advice on how to address these issues and improve the overall performance of the K7ON 212RH. Any suggestions or recommendations would be greatly appreciated.

Bucher Scanner & Ham Radio Mods

Making a start

Defying then all better advice, let us turn our attention to what good or bad advice we can pick up on the Internet. As usual I take the G7KPF pages as a first reference, and the Equinox pages, and come up with some leads (the URLs of all sites mentioned are given in Table 1).

The best known sources you will undoubtedly invalidate the guarantee and if the modification is unsound, you could do some very nasty - not to say expensive - damage. So, without wishing to labour the point, look at these pages with extreme care.

Text rules, OK

Another disappointment for me is the fact of the pages relative dullness. I hoped to find step by step 'how to' pages, but most are text descriptions. Some of the foreign ones are quite hilarious: "When you have unscrewed the box, please to not touch the big wire..." and the like. I looked at one mod to my own FT-767GX, hoping to make it run off 12 volts, perhaps. All I found was not so much a mod but a switch which makes it transmit on all frequencies. Not very exciting.

A more typical one, from the Ham Radio Associates page is for the FT-212RH extended frequency coverage mod, submitted at some time by SV0DR and picked off packet. The article is well-written and clear: "The radio is now programmable to operate from 132 to 180 MHz.

Don't forget," he adds, "that transmitting outside the amateur band is not allowed, so please consult your local authorities for a special permit." Yes, indeed, and I can imagine what ours would say if you asked:

Various pages

Bry's (A.F.K.) Radio and Hockey page - not a combination that springs readily to mind - is a useful set of mods links. It does more than rehash the old text files, but provides 60 or so other sites. As in all those things, you have to be prepared to hunt around. This subject certainly doesn't seem to present itself on a plate. I never did read his hockey pages.

Bucher Scanner & Ham Radio Mods seemed a good jumping off point and so it proved to be. "My goal is to be the first and last stop for those of you that are looking for mods on the Internet," he announces. I am not sure he succeeded; although the files
updated to August 1997, of the very latest modification files available for transceivers, receivers, scanners, packet TNCs and accessories. Including manufacturers' update files, user-derived modifications, and plenty of details for getting the very best out of your equipment including wideband receive modifications. But you'll have to send for the CD-ROM or the programs. Anyway, I liked the design of the pages.

The Hamster's Radio Modification Database sounds like something the Animal Rights people would have something to say about. It is in fact a large database but with an unusual front end. You enter what you are looking for and get the result, much as you would in any other search engine. I entered "FT767 AND general coverage" and got the info about the internal general coverage switch in any other search engine. I entered what you are looking for and get the result, much as you would in any other search engine. I entered "FT767 AND general coverage" and got the info about the internal general coverage switch pretty quickly. The only snag is on the output of the filter, and eventually appear at the strong signal are still stable. This reminds me of how AGC loop. The AGC detector fusing? Well, the mod ".

Table 1: the URLs of sites mentioned in the article.

<table>
<thead>
<tr>
<th>qrp</th>
<th>G7KPFs Pages of Ham Links: <a href="http://www.users.zetnet.co.uk/karma/hamlinks.htm">http://www.users.zetnet.co.uk/karma/hamlinks.htm</a></th>
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<tr>
<td></td>
<td>GJ4ICD Equinox Pages of Ham Links: <a href="http://user.it.net/equinox/">http://user.it.net/equinox/</a></td>
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<td></td>
<td>Kenwood Mods: <a href="http://rak.oakland.edu/pub/hamradio/mods/kenwood/">http://rak.oakland.edu/pub/hamradio/mods/kenwood/</a></td>
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<td>icom Mods: <a href="http://rak.oakland.edu/pub/hamradio/mods/icom/">http://rak.oakland.edu/pub/hamradio/mods/icom/</a></td>
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<tr>
<td></td>
<td>Yaesu Mods: <a href="http://rak.oakland.edu/pub/hamradio/mods/yaesu/">http://rak.oakland.edu/pub/hamradio/mods/yaesu/</a></td>
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<tr>
<td></td>
<td>Bry's Ham Radio and Hockey Pages: <a href="http://www.msninc.com/bry/hamradio/hamhtml/">http://www.msninc.com/bry/hamradio/hamhtml/</a></td>
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<td></td>
<td>Ham Radio Associates: <a href="http://www.radioamateur.net/">http://www.radioamateur.net/</a></td>
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<tr>
<td></td>
<td>Bucker Scanner &amp; Ham Radio Mods: <a href="http://members.aol.com/bucker/mods.html">http://members.aol.com/bucker/mods.html</a></td>
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<tr>
<td></td>
<td>K7ON Pages: <a href="http://www.qsl.net/k7on/madmrads.htm">http://www.qsl.net/k7on/madmrads.htm</a></td>
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<tr>
<td></td>
<td>QSP73 Services: <a href="http://www.qsp73.clemson.co.uk/main/software/index.html">http://www.qsp73.clemson.co.uk/main/software/index.html</a></td>
</tr>
<tr>
<td></td>
<td>Hamster's Radio Modification Database: <a href="http://hamster.let">http://hamster.let</a> uwo.ca/mods/</td>
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<tr>
<td></td>
<td>Old Time Radio: <a href="http://www.old-time.com">http://www.old-time.com</a></td>
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<td></td>
<td>QRP Internet Club Pages: <a href="http://qrp.cc.nd.edu/QRP-U/">http://qrp.cc.nd.edu/QRP-U/</a></td>
</tr>
<tr>
<td></td>
<td>Newsgroup: rec.radio.amateur.misc</td>
</tr>
</tbody>
</table>

Finally, there is the Newsgroup rec.radio.amateur.misc but there are messages all over the ham groups. Like much else, it's spotting them which is difficult. This is why the collections in the pages we have been looking at are so useful. There are other pages I haven't touched on. But I think there is more than most perhaps, but some roads just lead to the credit card, which sort of spoils things.

Perhaps a little off-beam for your average ham, but I so enjoyed researching Old Time Radio for only $1! So that's what we are lacking in 1998...
RSGB SCOTTISH CONVENTION

- Large and Varied Trade Exhibition
- Lectures
- RSGB Books and information Stand
- RSGB Morse Tests on Demand
- Don't forget to bring two passport-size photos and appropriate fee with you
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Springwood Park Showground, Kelso
Sunday 20 September 1998
Doors open 11.00
(10.30 for disabled visitors)

Lecture Programme to be announced.
All enquiries should go to:
Gavin and Margaret Chalmers, of Kelso Amateur Radio Society.

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All hobbies have their own jargon, and Amateur Radio is no exception. This new feature is designed to help beginners understand some of the terms and unusual 'Amateur Radio-ese' used in Ham Radio Today. We hope you find it useful.

Page 10 - CTCSS Tone Encoder. CTCSS (Continuous Tone Coded Squelch System) tones are sub-audible tones (lower in frequency than the human voice) which are transmitted in addition to the usual signal. They are used by some repeaters (including all UK 6 metre repeaters) in order to 'open' the repeater. The correct frequency CTCSS tone, transmitted continuously, is required to access the repeater. By transmitting the appropriate CTCSS tone, only one repeater will be activated, rather than another on the same frequency, even if more than one repeater is within range.

Page 12 - 'Quadra System' VL-1000 HF / 6m Linear Amplifier Review. This high-power amplifier, unusually, works on both the HF (short wave) bands and the 50MHz (6 metre) band. It provides 1kW (one thousand watts) PEP SSB output on HF, and 500 watts output on 6 metres. PEP - peak envelope power - is a means of expressing the peak power output on SSB (single sideband), where the power output level varies all the time. The maximum power permitted in the UK is 400 watts PEP at the antenna. Those wishing to use this power level, however, must use an amplifier capable of higher output, for two main reasons: 1. the loss in the coaxial cable connecting the amplifier to the antenna ('feeder loss') may mean that 400 watts output from the amplifier results in only, say, 300 watts being fed into the antenna, and 2. amplifiers produce a cleaner signal if used below their maximum rating (in other words, an amplifier only just capable of producing 400 watts should not be used at 400 watts output, it is better to have some 'headroom').

A dummy load is a device made up of resistors which is used instead of an antenna when it is desired not to radiate a signal. The dummy load should have the same impedances the transmitter or amplifier (typically 50Ω).

SWR - standing wave ratio - is the ratio of voltages along a line, typically an antenna feedline, together with those being reflected from the end of the line. Any mismatch between the feedline impedance and the antenna impedance can be measured as an SWR. eg if a 75Ω antenna is fed with 50Ω feedline there will be an SWR of 1.5:1 (all other things being equal). A 'perfect match' is therefore 1:1 (note - not zero!).

ATU is the abbreviation for Antenna (or Aerial) Tuning Unit. It has numerous aliases, eg ASTU (Antenna System Tuning Unit, which is arguably a somewhat more accurate description); AMU (Antenna Matching Unit), 'transmatch' (the name often used in USA); and 'matchbox' (often used in Continental Europe). They're all the same. The ATU matches the impedance of the antenna system to the impedance of the receiver, transmitter, transceiver, or amplifier.

Page 16 - All in a Day's Work. A G5RV antenna is a wire antenna designed by Louis Varney. G5RV is 50½ long and fed in the centre by a length of open-wire feedline (as opposed to coaxial cable). It works as a three half-wavelengths-long antenna on the 14MHz (20 metre) band, and is very popular as it will also work, cycle, with a fairly rapid increase and a longer decile. At present we are about a year along the upward slope of cycle number 23 (since records began), and the peak is expected to occur in the year 2000. High solar activity is required for radio signals to be propagated over long distances on the higher HF bands and the lower VHF bands (eg the 21, 24 and 28MHz bands on HF, and 50MHz on VHF).

Radials are wires laid close to the ground, directly on the ground, or buried just below the ground, as part of an antenna system. Radials wires act as the 'earth' for the antenna system. They are required when using a quarter-wavelength long vertical antenna for the antenna to function efficiently. They are typically laid in all directions from the antenna, so extend radially (hence the name), like the spokes of a wheel from the vertical antenna at its hub.

A DXpedition is an expedition to a rare or remote location specifically for the purpose of making Amateur lower VHF bands (eg 28 and 50MHz) there is little or no F2 propagation except during periods of high solar activity. This may occur for one or two years during every solar cycle, which is about 10 - 11 years long. The higher the frequency, the more necessary it is for there to be high solar activity to allow F2 propagation. (See solar flux above.)

Page 42 - Satellite Rendezvous. Phase-3D is the working name of the largest and most sophisticated Amateur Radio satellite yet. It will have the most sensitive receivers and most powerful transmitters of any Amateur Radio satellite to date, which will make it easier to use than any other. It is funded entirely by amateurs, either individually or through groups such as the RSGB. Originally due to have been launched a couple of years ago, delays whilst waiting for a suitable launch slot have cost the project a lot of money. It is now hoped that Phase-3D will be launched in 1999.

The peak power output on SSB (single sideband), where the power output level varies all the time. The maximum power permitted in the UK is 400 watts PEP at the antenna. Those wishing to use this power level, however, must use an amplifier capable of higher output, for two main reasons: 1. the loss in the coaxial cable connecting the amplifier to the antenna ('feeder loss') may mean that 400 watts output from the amplifier results in only, say, 300 watts being fed into the antenna, and 2. amplifiers produce a cleaner signal if used below their maximum rating (in other words, an amplifier only just capable of producing 400 watts should not be used at 400 watts output, it is better to have some 'headroom').

A dummy load is a device made up of resistors which is used instead of an antenna when it is desired not to radiate a signal. The dummy load should have the same impedances the transmitter or amplifier (typically 50Ω).

SWR - standing wave ratio - is the ratio of voltages along a line, typically an antenna feedline, together with those being reflected from the end of the line. Any mismatch between the feedline impedance and the antenna impedance can be measured as an SWR. eg if a 75Ω antenna is fed with 50Ω feedline through an ATU, on all the HF bands from 80 to 10 metres. A half-size G5RV is precisely that - a 51½ long centre-fed wire antenna - and in this configuration it will work on all bands from 40 to 10 metres.

DX means 'long distance' radio contacts (it is also often used to mean particularly 'rare' or unusual contacts). To achieve long distance contacts on the HF bands a low-angle radiator is advantageous. This is an antenna which radiates signals at a low angle to the horizon. A very high-angle antenna would fire a signal almost straight up into the air and this would be reflected down from the ionosphere (if at all) a short distance away from the transmitter. An antenna with a radiation angle of 5 or 10 degrees would clearly be more suitable for long distance working than one with a radiation angle of 70 or 80 degrees. In practice most antennas have a radiation angle somewhere between these two extremes.

Page 36 - VHF / UHF Message. Beacon stations are amateur stations which transmit, usually for 24 hours per day, on specific and published frequencies. They usually identify themselves by sending a call sign (and often additional information, such as location) in Morse code. They are used to check when radio conditions may make it possible to make a contact over longer distances than usual. A full list of beacons can be found in the RSGB Yearbook [see Book Browser on page 18].

Sporadic E (often abbreviated Es) is a type of propagation which allows lower distances than usual radio contacts. By its very nature, it is difficult to predict, although it usually occurs for several days a month during the summer months (in the northern hemisphere). It affects the higher HF bands, particularly 10 metres (20MHz), and some lower VHF bands, particularly 6 metres (50MHz) and 4 metres (70MHz).

F2 is another form of radio propagation, caused by reflection from one of the layers in the ionosphere, the F layer. At the higher HF and A transponder is the device on board a satellite which receives a signal from earth on an uplink frequency (or band of frequencies) and retransmits it on another frequency (or frequency band) on its downlink. Whilst a terrestrial repeater will generally only retransmit a single frequency signal, a satellite transponder usually translate a band of frequencies.

Telemetry is the name given to data signals which are transmitted from a satellite in order to report on its operating characteristics (battery voltages etc); or signals sent from earth to the satellite for control purposes.

Page 44 - Data Connection. TNC - a Terminal Node Controller - is used with a transceiver to decode and encode data modes, such as packet radio. A computer monitor is used to display the received signals.

SSTV is slow scan television. Still pictures (black and white or colour) can be transmitted as data signals by Amateur Radio using a PC and a suitable software package.

BARTG is the British Amateur Radio Teledata Group, the club for enthusiasts of all modes of data transmission. Further details are given every month in This Month at the Clubs.
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Aberdeen ARS

Appledore &DARC
7.30pm 3rd Mon of month at the Appledore Public Club room. 17 Aug astronomy, 21 Sep Bee-keepin, Brian Jewell, 01277 473251.

Aylesbury Vale RS
8.00pm on 1st & 3rd Wed of month, but no meetings in Aug, at Hardwick Village Hall, 3 miles north of Aylesbury on A413. 2 Sep rig alignment, G8BH. 16 Sep discussion evening. Secretary Gerry, G7TVU: 01296 432234.

Barking Radio & Electronics Society
7.00pm Thurs at Westbury Centre, Ripple Road, Barking, Essex. RAE course commences Mon 14 Sep - enrol on 3 or 10 Sep. Course details from Bill Chatterton, 0181 478 4785. Sec Harry Coots, G7WUE: 01708 746731.

Braintree &DARS
8.00pm 1st & 3rd Mon. No detail of August or September meetings received. Details from Keith, ZEOARS, 01376 347736.

Bristol (RSG) Group
7.15 for 7.30pm last Mon of the month at Avon Combined Services Club, St Pauls Rd, Clifton. Bristol, 31 Aug video: Longleat Rally on BBC, 28 Sep practical antennas, Roy Powers, G8CKN. Robin Thompson, G3KTF: 01225 420242; e-mail: robinst@g3ktf.demon.co.uk.

Bristol (South) ARC
7.30pm Weds at Whitelchuch Folk House Association, Bridge Farm House, East Dundry Road, Whitelchuch, Bristol. 12 Aug HF workshop, Doug, G3KUL. 19 Aug BO repeater group, G8WERA. 26 Aug 160m evening. 2 Sep Bristol Rally preparation, Muriel, G4YZR. 9 Sep 10am activity. 16 Sep Bristol are construction & operating nights, Fri club meetings. RAEE / Morse courses start in Sept. John Burford, G40AZ: 01225 871903.

Burnham Beeches RC
8.00pm 1st & 3rd Mons at Farnham Common Village Hall, Victoria Rd, Farnham Common, Bucks. 7 Sep test evening, G4XDU. 21 Sep QRP, G4CVF, Secretary G4XDU. e-mail: bbc@argonet.co.uk.

Bury Radio Society
7.45 for 8.00pm Tues at Mosses Centre, Cecil Street, Bury, Lancashire. 11 Aug vehicle outing with radios. 8 Sep inter club quiz. Keith Rothwell, G8EAP, keith@gbap.demon.co.uk.

Buxton Radio Amateurs
2nd & 4th Tue of month. 25 Aug border hike discussion. 8 Sep junk sale. 22 Sep 1999 program. Derek Carson, G4HIO: 01298 255056. G4HIO @ GB7DAO.

Cambridge &DARC
8 Aug SHF, Dave, G6KWA. 21 Aug project evening. 28 Aug 2m 'foxhunt'. Details: 01223 872258. Web site: http://peach.cam- on.co.uk/darcweb/

Cardiff RSGB Group
Cardiff RSGB Group

Chelmsford ARC
1st Tue of month. 1 Sep amateur satellites, Pat Gowen, G3OR. Charles Shetton, G0OJS: 01245 256654.

Cheltenham ARC
7.45 for 8.00pm on 1st Fri of month at Prestbury Library, The Burgage, Prestbury, Cheltenham. 7 Aug Rob Mannion, G3XFD, Edi- tor Practical Wireless. 4 Sep Spratty Islands DXpedition, John Linford, G3WGV. Details from the Secretary, Mrs Patricia Thom, 7.30 pm Weds at the Pie Hall, 77 Torrington Dr, Potters Bar EN6 SHU or at GB7HSN.

Cockenzie & Port Seton ARC
5HU or at GB7HSN.

Corns
Corns

Cotswold ATS
7.45pm on 2nd Mon of month at St Swithun's Church Hall, Grove End, Burley, 10 Aug barbecue at G4RWW & G6LX. 14 Sep JL Baird 30-line TV, Jon Wellar. G6GHA. Alan Barte, G6HIC: 0181 684 0610.

Coventry ARS
8.00pm Fri at Binley Church Hall, Brinklow Road, Coventry. 7 Aug talk TBA. 14 Aug night on air. 21 Aug CW & computers. 28 Aug night on air. 4 Sep satellite TV (TBC). 11 Sep indoor DF. 18 Sep Paceport in Memorial Park. 25 Sep video. For further details contact the Secretary, Robin Tew, G4JDO: 01203 673999.

Crystal Palace &DRC
15 Aug BBQ on the air. V H Johnston, G1PKS; tel: 0181 653 2946; e-mail: vjohns653@aol.com.

Devon Dale (Pile Hall) ARS
8.00pm Weds at the Pile Hall, Denby Dale. 2 Sep talk on portable operation, Geral, G3SDY. Tony, G4LZL, 01484 664360.

City of London ARC
RAE and Morse courses com-
Derby &DARS
Weds. 12 Aug rally inquest. 19 Aug quiz night. 26 Aug DF run. 2 Sep junk sale. 9 Sep video. 16 Sep TBA. 23 Sep quiz. Details: 01332 556879.

Dover Radio Club
8.00pm Weds during term time at Duke of York's Royal Military School, Guston, near Dover (Novice & Morse training classes 7.00 - 8.00pm). 5 Aug mobile operating at St Margaret's Bay. 19 Aug mobile operating at Samphire Hoe. Brian Hancock, G4NPM: 01504 821007.

Dragon ARC
7.30pm 1st & 3rd Mon of month at Ebenezer Hall, Foel Graig Lane, Higher Village, Llanfairpwll, 17 Aug Q2E, Phillip Marriott. 7 Sep visit police HQ. Tony Rees, GWFO.MQ: 01248 600963.

Dunstable Downs Radio Club
8.00pm Fri at Chews House, 77 High Street South, Dunstable. The club has 'library nights' on 1st Fri of month, plus 28 Aug DF equipment check. 30 Aug DF hunt. 11 Sep quiz. 20 Sep club trip.

Exeter ARS
7.45pm 2nd Mon of month at Mouse International Centre, Blackboy Road, Exeter. 3rd Mon is committee / open meeting. 10 Aug visit to Stockland Hill transmitter. 14 Sep lfeboat visit. Theo, G3EOM: 01392 875498.

Felixstowe &DARS
8.00pm at Orwell Park School, Nacont, Ipswich. 10 Aug taking up Morse? 7 Sep night on air. 21 Sep quiz Paul, G4YQC: 01394 273507.

Gloucester AR&ES
24, Aug RF bridges workshop. Details: 01452 618930 office hours.

Goole R&S
7.30pm Fri at West Park Pavilion, Goole. 7 Aug quiz. 14 Aug contest. 21 Aug contest debrief. 4 Sep on air. 11 Sep junk sale. 18 Sep AGM. G6YYN: 01757 638539.

Guildford &DRS

Hambleton ARS
7.30pm at Allertonshire School, Northallerton. 3 Sep operating all bands. 17 Sep radio astronomy. John Hampson, G0VXH: 01845 537547, or packet: G0VXH @ G7TCYM.

Hambleton ARS
7.30pm on 3rd Tue of month at Tap & Spile Pub, Wards End, Hallifax, for committee & Morse tuition. 10 Aug junk sale. 21 Aug AGM. D Moss, GDLLM: 01422 202206.

Hastings Electronics &RC
7.30pm on 3rd Wed of month at West Hill Community Centre, Croft Road, Hastings. 19 Aug 'bring your thing'. 16 Sep ATV repeater. Doug Mepham, G4ERA: 01424 812550.

Hereford ARS
Fris. 7 Aug video, Eddie, G0UDF. Sep - no meeting, Eddy, G0UDF: 01432 263575.

Horndean &DARC
7.30pm 1st & 4th Tue of month at Lovedean Village Hall, 160

Lovedean Lane, Lovedean, Hants. The 1st Tue is usually a social evening, 25 Aug TBA. 22 Sep solving environmental problems, Dr Andy Holton, Exxon. Stuart Swan, G0FYX: 01705 472846.

Hornshaw ARC
8.00pm on 1st Thu of month at Guide Hall, Denne Road, Hornshaw, West Sussex. 6 Aug debate, control access to HF. 3 Sep maritime mobile operation. 10 Sep test equipment. 17 Sep 'foxhunt'. 24 Sep quiz. 21 Sep coffee evening. 28 Sep car boot sale. T W Dabbs. GB7CYM.

Hornshaw ARC
8.00pm DF equipment check. 30 Aug DF band. The club has 'library nights' on Mons not otherwise shown above. John Alexander, G7GCK: 0116 231 3194.

Horsham ARC
7.30pm on 3rd Tue of month at Milford House, Eastgate, Horsham, West Sussex. 6 Aug video, 14 Aug contest. 21 Aug contest debrief. 4 Sep on air. 11 Sep junk sale. 18 Sep AGM. G6YYN: 01757 638539.

Ipswich Radio Club
Meets Weds: 5, 19, 25 Aug Otley operational evening. Ian, G0DZS, 01206 396419.

Ipswich Radio Club
273507.

Loughborough &DARC
at Science Lab, Hind Leys Community College, Forest St, Shepshed, on Mon evenings (when college open) for general chat / operating & on Tuesdays as follows: 11 Aug on air. 18 talk TBA. 25 Aug microwave. 1 Sep GBGCU. 1 Sep last DF of 98. 8 Sep junk sale. 15 Sep 'back to school'. 22 Sep on air. 29 Sep computer night. Ian, G8SNF, on tel: 01509 210259.

Loughton &DARS
11 Sep testing PCBs, John, G8DZH. 25 Sep HF night on air. 9 Oct quiz at Silverthorn club (TBC). Marc Lithcham, GOTO.C, 0181 281 0886 (evenings); g0toc@ondirect.co.uk

Lincoln Short Wave Club

Liverpool &DARS
8.30pm Tues at Church Club, Church Road, Wavertree, Liverpool. 11 Aug night on air. 18 Aug club meeting, G0DEY. 25 Aug surplus sale. 1 Sep operating procedures, G3XSN. 8 Sep night on air. 15 Sep soldering. 22 Sep construction contest. 29 Sep surplus sale. Publicity Officer, Ian Mant, G4WXX: 0151 722 1178.

Maidstone ARC
holds Morse tuition Tues and Fri and Novice classes Weds, plus: 9, 15 Sep: dummy Morse tests. 19 Sep RSGB Morse test. Mike Granger, GOV/8: 01634 856765.

Malvern Hills RAC
8.00pm 2nd Tue of month at Town Club, 30 Worcester Road, Malvern. Club call is G4MHC. 11 Aug VHF night on air. 8 Sep Dudley Folk Museum, 2E1AMT. Dave Hobro, G4IDF, 01905 351568 (evening / weekend), e-mail: DHober@oal.com

Mansfield ARC
September 98

Mansfield ARC
September 98

Mansfield ARC

Mid Cheshire ARS
8.00pm Weds at Cotebrook Village Hall on A49 north of Tarporley. 5 Aug construction & HF on air. 19 Aug activity night. 26 Aug construction & VHF on air. 2 Sep construction & HF on air. 9 Sep video night. 16 Sep informal. 23 Sep activity night. 30 Sep VHF on air, construction night. Ted Bannister, G0RBA: 01606 592207; e-mail: G0RBA@aol.com

Mid Sussex ARS
Meets Fri. 7 Aug on air. 14 Aug quiz. 21 Aug VHF on air. 28 Aug Working with VHF Derek, G3SRO. 4 Sep Resistors, Tony, G3NFP. 11 Sep junk sale. 18 Sep PW, Rob Mannion, G3XFD. Phillip Baldwin, G3LCF. 01273 557878.

This Month at the Clubs

Moray Firth ARS
RAE and Novice RAE courses available. Geoff Crowley, GM7SJC. 01542 828918.

Newbury &DARS
7.30pm on 4th Wed of month at Memorial Hall. Upper Buckelew, near Newbury. 15 Aug Skittles vs Basingstoke ARC. 26 Aug no meeting. 23 Sep 909400 Spratly DXpedition. G3WVG, G3XTT & G00P. Ian Trusson, G3RVM, 01635 826019, g3vrm@compuserve.com

Norfolk ARC
7.00 for 8.00pm Weds at Ugby Bug Public House, Colton. Informal evenings, including night on air, construction QRP, & Morse practice, on 1st, 3rd & 5th Weds, plus: 19 Aug social evening / buffet. 16 Sep RSGB General Manager Peter Kirby, G0TW. inc free buffet. Hon Sec. Sandra Simpson, 251FOF.

North Wakefield RC
8.00pm Thus at East Anderley Cricket Club, Wakefield. 6 Aug on air, QSL checking. 13 Aug rally Aug cable TV & fibre optics, Bob, GOWYD. 5 Sep amateur club open day. 8 Sep 2m SSB operating. 22 Sep surplus equipment sale. EJ Donaghy, G7WVA. 01722 334505.

Saltash &DARC
Normally 1st & 3rd Fri at Toc H Hall, Warraton Rd, Saltash, exc Aug & Sep, as follows; 7 Aug visit to Multi Media Studios (limited numbers, members only). 8 / 9 Aug field days at Landrake. 21 Aug VHF portable & BBQ at Kit Hill. Brian, M0BHG. 01752 844321.

Southdown ARS
First Mon of month. 7 Sep history of telephone network in Eastbourne area. John Vamplew. Brian Gauntlett, G4LYU. 01323 840530.

South Manchester ARCS

Northampton &DARC
7.30pm Mon (exc Bank Holidays) at New Street Community Centre, South Normanton, Derbyshire. Novice course starts 7 Sep. 10 Aug antenna maintenance. 17 Sep darts match. 24 Sep committee meeting. Further details: 0113 253 9087.

Plymouth Radio Club
7.30 for 8.00pm 1st & 3rd Tue. 11 Aug visit BBC studios. 18 Aug National Blood Transfusion Service. Fri 21 Aug visit HM Coastguard Brixham. 25 Aug visit Fort Bovisand underwater centre. 1 Sep Devon air ambulance. Den Perryman, G7NMA. 01752 346158 (before 9.00pm).

Poldhu ARCS
7.30pm 2nd Tue of month. 11 Aug operating practices & procedures. David. G3PLE. 8 Sep barbecue & antenna kite flying. David Barlow, G3PLE. 01262 247038.

Reading &DARC
8.00pm 2nd & 4th Thus at the Pavillion, Woodford Park, Woodley. Reading. 13 Aug frequency synthesizers, Ian Poole. Chris Nicholson, Woodford Park, Woodley. 8.00pm 2nd & 4th Thus at the Parsonage, Reading. 24 Aug modern Amateur Radio. John, G0HRF. 29 Sep video. Peter Bell, 2E1CRK: 01462 674505.

Salisbury ARC
2nd & 4th Thus. 11 Aug BBQ. 25 Centre, South Normanton, Derbyshire. Novice course starts 7 Sep. 10 Aug antenna maintenance. 17 Sep darts match. 24 Sep committee meeting. Further details: 0113 253 9087.

Stourbridge &DARS
8.00pm on 1st & 3rd Mon of month (except Bank Holidays & no meetings in Aug), at the Radio Shack, Oldswinford Hospital, Heath Lane, Stourbridge. 7 Sep on air. Gordon Bryant, G0TJV. 01384 395206.

Stourport RS
7.30pm alternative Weds at Minchinhampton Youth Club, nr Stour, Glos. Oio. 2 Sep video. Stuart, G0NLM. 27 Aug QRP, Bob G4ARL.

Stroud RS
7.30pm alternate Weds at Minchinhampton Youth Club, nr Stour, Glos. Oio. 2 Sep video. Stuart, G0NLM. 27 Aug QRP, Bob G4ARL.

Taunton &DARC
Informal meetings during Aug, no details received for Sep. Contact Bill Lindsay-Smith, G3WNI, e-mail: w.lindsay-smith@virgin.net for details.

Telford &DARS
8.00pm Weds at Community Centre, Bank Road, Dawley, Telford. 19 Aug practical filters, G8UPF. 26 Aug Black Flag evening. 2 Sep on air. No contact details provided.

Torbay ARS
7.30pm Fri at ECC Social Club, Highweek, Newton Abbot. Informal meetings most Fri & talk / event once a month. 21 Aug barbecues. 18 Sep Pacific islands slide show, John, M0BHF. Peter Tanner, G4VTO: 01803 864528 (working hours).

Trowbridge &DARC
8.00pm 1st & 3rd Wed of month (3rd Weds usually 'natter nights') at Southwick Village Hall, Southwick, on A361 Trowbridge / from road. 19 Aug open meeting. 2 Sep talk by GOAB. Ian Carter, G0GRI. 01225 864398 (evenings / weekends).

Verulam ARC
7.30 for 8.00pm at RAF Association HQ, New Kent Road, St Albans. 25 Aug junk sale. 22 Sep microwave bands, Bryan Harber, G8DKK. Walter Craine, G3PMF. 01923 262180.

Wakefield &DARS
8.00pm Tues at Community Centre, Prospect Road, Ossett, Wakefield. 7.30pm 1st Tue of month in Room 3 at Multi Media Studios (limited evenings / weekends).

Wimbledon &DARS
2nd & last Fri of month at St Andrews Church Hall, Herbert Rd, Wimbledon SW19. 11 Sep talk on use of Amateur Radio. 1 Sep bring & buy. Alan Elliott, MO4AJ. 01643 707207.

Wirral &DARC
8.00pm Weds at Irby Cricket Club 12 Aug DF hunt. 19 Aug D&W. 26 Aug mobile treasure hunt. 2 Sep D&W. 9 Sep VKOR Headland video. 16 Sep D&W. 23 Sep sur-
Membership Secretary Bill McGill, details about the group contact RTTY contest each year. For more Datacom, and holds a rally and HF has Teledata Group (BARTG) G7SDD, tel: 01963 250594.

20 Aug 'a glance at yesterday's Aug noise temperature, G8AWB. Aug DX crystal set, G7LNJ. 13 Centre, Gove Avenue, Yeovil. 6 7.30pm Thus at the Red Cross CW fun evening. 25 Sep visit RAF operating & construction. 18 Sep SSB field day antenna construction. 11 Sep computer, Chris, G7JIN. Joy 101 talk, Mike, G4BTE. 15 Sep Electricity Sports and Social Club. 8.15pm Tues at Wolverhampton Electricity Sports and Social Club, 11 Aug video, Geoff, G52GK. 18 Aug natter night, 25 Aug social. 1 Sep committee meeting, 8 Sep FT-101, Barry, G5ANQ. 15 Sep social. 22 Sep quiz, G5JK. 29 Sep computers, Chris, G7JIN. Joy Smith: 01902 751936.


Yarmouth RC 7.30 for 8.00pm Fris exc no meet- 1st Fri of month, at Bradwell GODX8, 14 Farquhar Road, Malby, Rotherham, S.Yorks S66 7PD, tel: 01709 814010 (Tues, Thurs & Fri. 7.00pm-9.00pm. Sat/Sun before 9.00pm), or via G7WWRG. Internet: http:// www.bartg.demon.co.uk British Amateur Television Club (BATC) produces a quarterly magazine, CO-IV, and holds its own rally each year. BATC has an Internet site at http://www.batc.org.uk For details: contact: Dave Lawton, GAOAN, Grenehurst, Pinewood Road, High Wycombe, Bucks HP12 4DD. CDXC (Chiltern DX Club) - the UK DX Foundation membership is open to all amateurs and SWLs who have worked (or heard) more than 100 DXCC countries. It is the UK's first and largest grouping of amateurs interested in HF DX / contesting. Internet site: http://www.cdxc.org.uk For prospects and further details please contact the Secretary, Barry Cooper, G4RKO, 1 Strouds Meadow, Cold Ash, Newbury RG16 9PD; e-mail: cooperb@g4rko.demon.co.uk G-QRP Club publishes a quarterly journal, SPRAT, devoted to low power communication, and holds regular get-togethers at their rally stands throughout the country. For membership details, contact their Secretary, Reg G Dobbs, St Alden's Vicarage, 498 Manchester Road, Rochdale, Lancs OL11 3HE; tel: 01706 31812 or see their web site at http://www.blinkernet.com/~g4wil/gqrp.htm

International Short Wave League (ISWL) who, as well as running an international OSL bureau for amateurs and SWLs, has a monthly magazine (Monitor) and regular get-togethers at their rally stands plus on-air nets on HF and VHF. For more details send an A4 sized SAE to: ISWL HQ, 267 Pelham Road, London SW14 1JU. Internet: http://www.aber.ac.uk/~srj5/iswl.htm

Irish Radio Transmitters Society (IRTS) publishes regular newsletters giving details of local activities, and collects surplus equipment for resale. Please contact Honorary Treasurer / Membership Secretary Mrs Shelagh Chambers, 78 Durley Ave, Pinner, Middx HA5 1JH. Web site address: http://www.gurney.co.uk/raibc Radio Amateur Relief Expedition (RAEB) is a registered charity which raises moneys for radio / computer equipment, and audio cassette courses for home study, for blind, deaf and disabled amateurs. The club attends rallies throughout the year, and also have the advantage of free G3RP, English language and young people to learn about amateur radio: it is not necessary to hold an amateur radio transmitting licence to join. Members of the RSGB receive a 100-page colour magazine sent to their home each month, and also have the advantage of free G3RP, automatic entry in RSGB contests, and help in obtaining planning permission for antennas, and much other technical support. A network of over 2000 volunteers is on hand to help the Radio Amateur and

Radio Society of Great Britain (RSGB) is the internationally recognised national society, which has been representing UK Radio Amateurs and short wave listeners for 85 years. Membership is open to all with an interest in Amateur Radio: it is not necessary to hold an Amateur Radio transmitting licence to join. Members of the RSGB receive a 100-page colour magazine sent to their home each month, and also have the advantage of free G3RP.

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Subscription Services Ltd (SSL) handles the issuing of amateur licence in the UK on behalf of the Radiocommunications Agency. SSL can help regarding enquiries concerning individual licences (rather than general licensing matters, which the RA handles, see above). Contact details: The Radio Licensing Centre, SSL, PO Box 884, Bristol BS99 5LF; tel: 0117 925 8333.

United Kingdom Radio Society (UKRS) is a new society for UK Radio Amateurs. They can be contacted at Box 100, Meadow Street, Northwich, Cheshire, CW8 1FA. tel: 01606 783270, or 0115 925 6597; packet: UKRS@GB7OAR; e-mail: admin@ukrs.org; Internet: http://www.ukrs.org

Plus equipment sale. 30 Sep D&W: Andy; 0151 677 4448; packet: CLUB @ GB7OAR; www.merseyworld.com/wadarc

National and International Groups British Amateur Radio Teledata Group (BARTG) has a quarterly magazine, Datacom, and holds a rally and HF RTTY contest each year. For more details about the group contact Membership Secretary Bill McGill, G-QRP Club publishes a quarterly journal, SPRAT, devoted to low power communication, and holds regular get-togethers at their rally stands throughout the country. For membership details, contact their Secretary, Reg G Dobbs, St Alden's Vicarage, 498 Manchester Road, Rochdale, Lancs OL11 3HE; tel: 01706 31812 or see their web site at http://www.blinkernet.com/~g4wil/gqrp.htm

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<thead>
<tr>
<th>Length</th>
<th>7.2 metres (23.5 ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>3.5-3.8 Mhz</td>
</tr>
<tr>
<td>Power Handling</td>
<td>800 Watts.</td>
</tr>
<tr>
<td>Connection</td>
<td>SO-239</td>
</tr>
<tr>
<td>Weight</td>
<td>3.5 Kg.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Length</th>
<th>11.5 metres (37.5 ft.)</th>
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<tbody>
<tr>
<td>Freq.</td>
<td>3.5-3.9 Mhz</td>
</tr>
<tr>
<td>Power Handling</td>
<td>2.5 Kw.</td>
</tr>
<tr>
<td>Connection</td>
<td>SO-239</td>
</tr>
<tr>
<td>Weight</td>
<td>12 Kg.</td>
</tr>
</tbody>
</table>

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