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● Carolina Windom antenna

plus: ● build a CTCSS
encoder unit



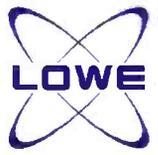
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Ham Radio TODAY

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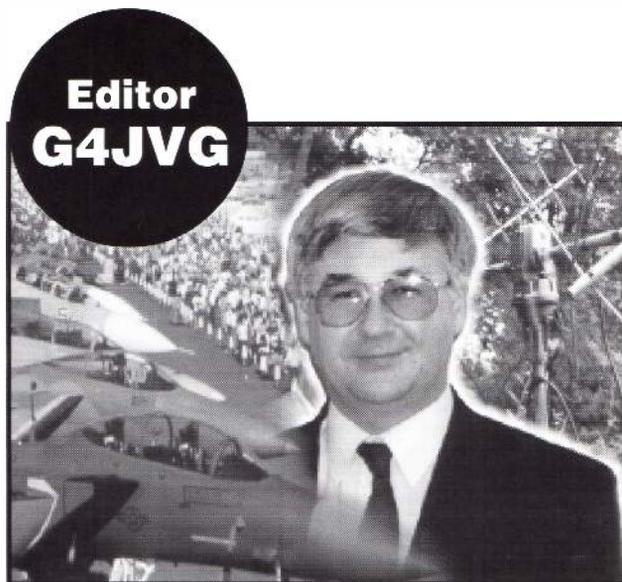
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Morse code: the Great Debate is turning out to be rather a damp squib. When I wrote in the *Ham Radio Today* July Editorial that the RSGB change of policy on mandatory Morse testing was "a courageous move", I fully expected to receive a deluge of letters 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, G8AYZ / M0AYZ, 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



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

test - should they *not* then be allowed to use Morse on HF?

It will be interesting to see how this question is tackled, and what else is discussed, at the RA's Open Forum meeting at the NEC in Birmingham. News of this came too late for inclusion in last month's *Ham Radio Today*, and the meeting will be over by the time this issue is on the bookstalls. We will of course report on the meeting in next month's issue.

I believe that in a few year's

What is all the Fuss About?

Ham Radio Today Editorial by Steve Telenius-Lowe, G4JVG

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

throughout the country. It is now clear that there is majority support for the RSGB's stance on the Morse question. Frankly, I find this both surprising and very encouraging. One thing is clear: it shows that the RSGB is far more in tune with today's Radio Amateurs than many give it credit for. For many years the RSGB was run by 'traditionalists' who would never have come up with these proposals. The present Council is to be congratulated for its progressive and forward-looking stance.

Here at *Ham Radio Today*, we have received very little feedback from readers on the Morse test proposals. Is this because you are happy with the way the RSGB is tackling the matter?

latest news

The latest development is that a proposal has been received from the RA for an all HF bands, voice modes *only*, licence which would require an 8WPM Morse test. To me, this seems an illogical move. After all, class B amateurs - who have not taken a Morse test at all - are allowed to use Morse code on the VHF / UHF bands, so why - after having passing an 8WPM

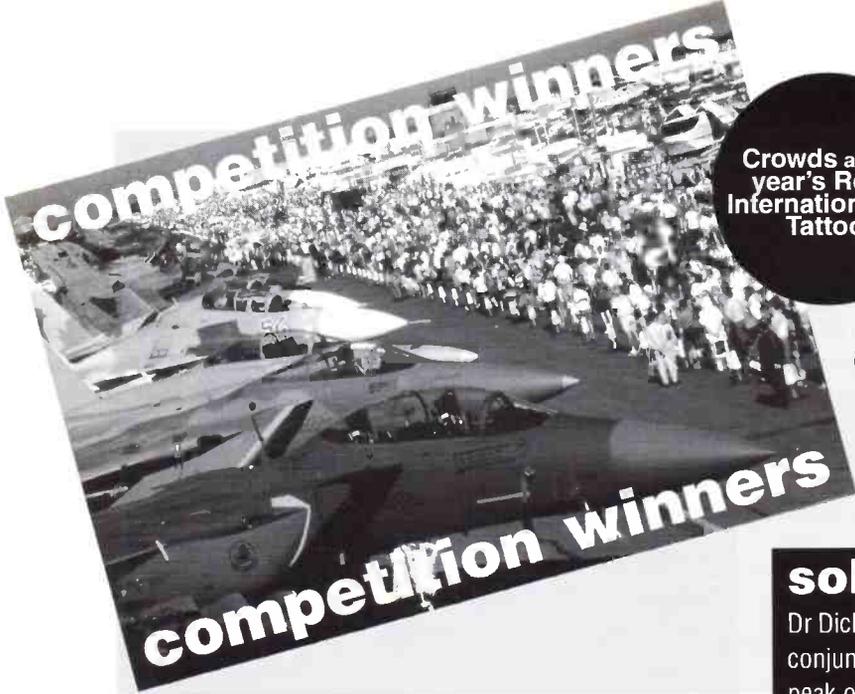
time, when there is only *one* class of Amateur Radio licence in the UK, we will look back on the 1990s and say, "what was all the fuss about?"

on the road

It is always good to meet *Ham Radio Today* readers and hear from them first-hand what they like about the magazine, what they dislike, and how they feel it can be improved further. There are three opportunities to meet *Ham Radio Today* representatives in the next few months: we will be having stands at the Leicester Amateur Radio Show at Donington on 25 / 26 September, at the M L & S open days at the Martin Lynch 'emporium' in Ealing on 31 October / 1 November, and at the London Amateur Radio and Computer Show 2 on 28 / 29 November.

I will be attending all three events and look forward to meeting as many of you as possible.

The feedback we get is very useful and does lead to changes. For example, *The Help Files* on page 49 came about as a result of talking to readers at shows and from comments in letters.



Crowds at last year's Royal International Air Tattoo.

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.

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.

solar peak next year?

Dr Dick Altrrock 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 Altrrock believes that the solar maximum earlier thought to be expected in the year 2000 may now occur next year instead.

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latest news on ham radio today

the bird won't fly this year

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 Tynan, 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.

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

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.

in slovenia

new cept country

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*.

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 T 002601, 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.

The 6m beacon GB3NHQ will not be returning to the air from RSGB HQ in Potters 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.

gb3nhq qrt

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latest news on ham radio today

rae courses

An RAE course commences at Newstead Woods School, Avebury Road, **Orpington, Kent** on Monday 14 September. For further details contact the course tutor, Alan Betts, G0HIQ, on 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 Balwearie High School, **Kirkcaldy**. Both course 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, Greythorn 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.

And an RAE class is to be held at **Sawston** Village College, **Cambridge**, in September. For more information tel: 01223 834492.

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; "Much 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 question of class B amateurs not being allowed to purchase transceivers such as the Yaesu FT-847 or Icom IC-706.

ra clarifies legality of equipment

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.

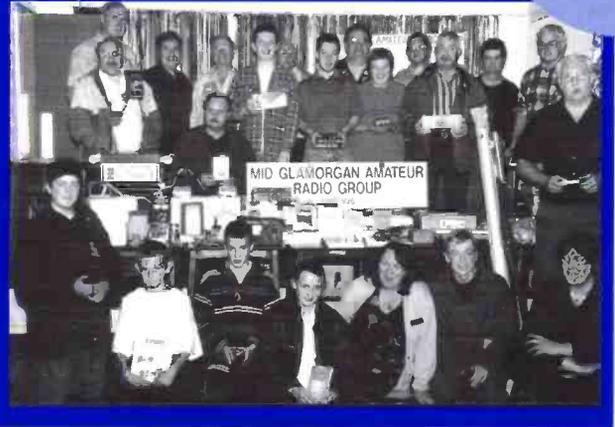
Since its inception three years ago, around 40 people have passed the Novice RAE through the group, with many going on to receive their full Amateur Radio licences. In the past, the group has struggled through lack of funds, but the grant should certainly help to ease the strain on its budget.

Another free RAE course commences in September. Anyone interested in joining should contact Roger Luke, GW3XJC, tel: 01656 733729.

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

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.



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new cdxcc 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, G3XTT; 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



The CDXC AGM took place under canvass 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 Brimson, 2E1DAY, at RSGB HQ; tel: 01707 659015 as soon as possible to reserve a space.

posh nosh

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.



trade topics



ft-100 soon?

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.

new g2dym antennas

Four new versions of the 'E-type' G2DYM 'anti-interference, anti-TV' 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.

noise reduction filter

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 adapters 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.



trade topics trade topics
the following information is based upon submissions by suppliers
we cannot be responsible for false or misleading information

g3lll closes down

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.

timewave files for bankruptcy

The American Amateur Radio equipment manufacturer, Timewave Technology, has filed for Chapter 11 bankruptcy. Timewave President Randy Gawtry, K0CBH, 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*).

watson psus

There are five brand new models in the popular range of Watson PSUs. All of them comply with CE and LVD legislation and have highly competitive specifications and prices. They are: the W-3A (3A continuous / 5A peak, fixed voltage) at £22.95; the W-5A (5A / 7A, fixed) at £29.95; W-10AM (10A / 12A, variable, with V / A meter) at £59.95; W-25AM (25A / 30A, variable, with meters) at £94.95; and the W-30AM (30A / 35A, variable, with meters) at £119.95.

All Watson products can be ordered from Waters & Stanton PLC, Spa House, 22 Main Road, Hockley, Essex SS5 4QS; tel: 01702 206835; fax: 01702 205843; e-mail: sales@wsplc.demon.co.uk; Internet: www.waters-and-stanton.co.uk





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

wrth comes to uk

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*.

m l & s open days

The M L & S open days take place at the Martin Lynch emporium at 140 - 142 Northfield Avenue, Ealing, London W13 9SB on **31 October** and **1 November**. Yaesu, Icom and Kenwood will be there, as will *Ham Radio Today*, so come along and say hello. The open days celebrate eight years of trading at the Northfield Avenue shop, as well as young Henry's (the 'son' in Martin Lynch & Son) third birthday. Food and drink will be provided.

sgc auto tuner

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.



trade topics **trade topics**
 liers, and is not necessarily endorsed by ham radio today.
 misleading claims by suppliers.

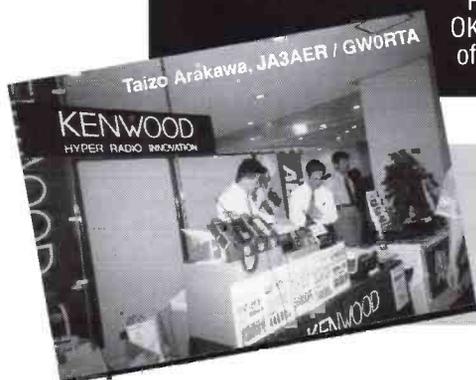
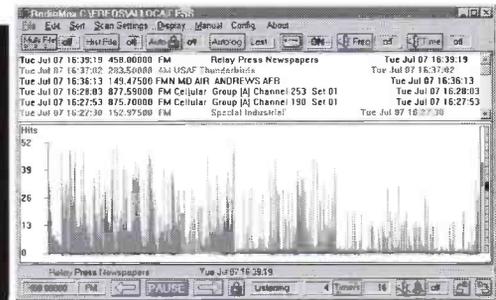
future scanning radiomax software

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 BC895XLT 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).

Weekend Project - a

Chris Lorek, G4HOL, shows how you can build a simple sub-tone e

CTCSS, short for 'Continuous Tone Controlled Squelch System', employs a low-frequency tone in the range of 67 - 250.3Hz, 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 CTCSS access facilities and UK 6m repeaters rely solely on CTCSS for access.

In the UK, CTCSS 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 CTCSS, and if so which tone frequency, as these repeaters suffix the appropriate CTCSS tone letter designation to the end of the repeater's Morse or speech callsign identification. Note the tone letters shown here are those in current UK use: different tone letter designations have been proposed for pan-European repeater use. We just use the lower frequency set of CTCSS tones here in the UK, those elsewhere using the fuller range of available CTCSS tone frequencies.

Many modern 'black box' transceivers already have CTCSS 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-PMR and homebrew rigs? The simple project described here can add CTCSS encode to your transceiver for a component parts cost of less than £8.

The circuit is shown in Fig 2. It's centred around 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 CTCSS 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, al-

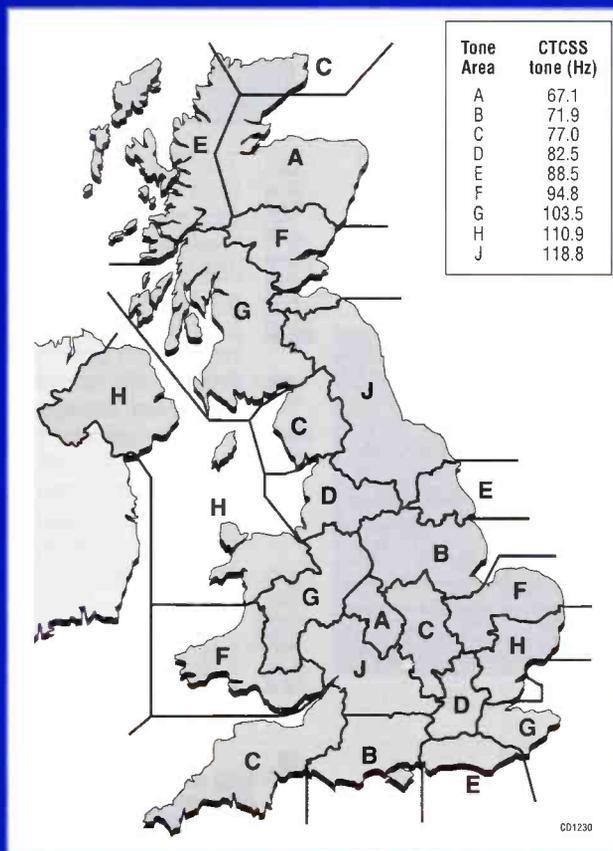


Fig 1: map of the UK CTCSS repeater areas and the tone frequencies.

though 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 CTCSS tone frequencies are generated. This oscillator requires an external 1MHz crystal, so if you have one

Fig 2: circuit of the CTCSS encoder unit.

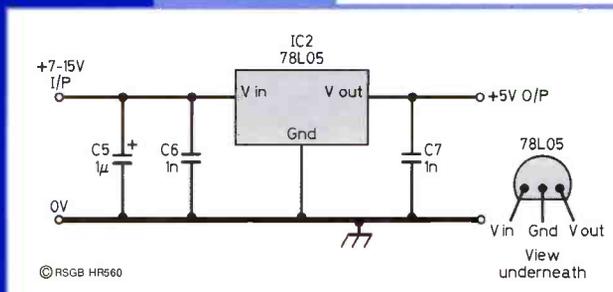
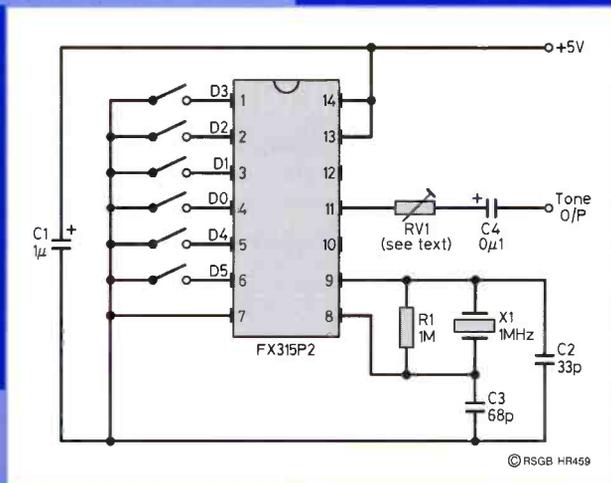


Fig 3: circuit of the optional regulator circuit.

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 CTCSS 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 CTCSS 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 0V, ie IC pin 6 to 0V, 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

encoder for repeater access - with just eight components

a small area such as inside a handheld transceiver case. A hint here: bending the IC pin legs out horizontally and then soldering the component leads, suitably trimmed short, to these pins aids construction and achieves a thinner overall assembly, which could fit into spaces where there 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 78L05 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 tone output to 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 tone injection point - it's usually marked 'TX sub-tone' or similar. In the case of the Pye / Philips M290 and MX290 series of equipment, this is an easily-accessible pin on the front PCB-mounted facility connector.

The circuit shown generates the CTCSS tone whenever voltage is applied to it, so you can usefully link it to the +5V TX rail. If you connect it permanently, ie so that it's active also on receive, in rare

cases and depending on your radio's circuitry, you may possibly find received signals are modulated with the sub-tone as well if the set's VCO is modulated with the tone. If you only have a negative-going line on PTT rather than a switched positive voltage line, then to make the CTCSS unit only generate a tone on transmit PTT, leave the FX315 pin 13 open circuit, and instead use a switched connection to ground on pin 12 of the FX315, ie the PTT line, to initiate tone generation (**Fig 4**). I'd advise adding a series diode on this line to prevent any voltage greater than 5V from your PTT line being fed back to the unit.

level adjustment

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-between' 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

CTCSS Encoder:

- IC1 FX315PJ
- C1 1µF 10V electrolytic
- C2 33p
- C3 68p
- C4 0.1µF 16V electrolytic
- R1 1M
- RV1 47k typical (10 - 100k)
- X1 1MHz ceramic resonator or crystal

Optional regulator circuitry:

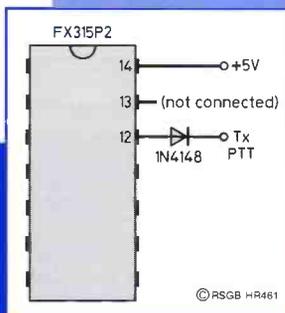
- IC2 78L05 5V regulator
- C5 1µF typical (0.1 - 10µF)
- C6 1nF typical (1 - 10nF)
- C7 1nF typical (1 - 10nF)

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

CTCSS Freq (Hz)	D0	D1	D2	D3	D4	D5
67.0	1	1	1	1	1	1
69.3	1	0	0	1	1	1
71.9	1	1	1	1	1	0
74.4	0	1	1	1	1	1
77.0	1	1	1	1	0	0
79.7	1	0	1	1	1	1
82.5	0	1	1	1	1	0
85.4	0	0	1	1	1	1
88.5	0	1	1	1	0	0
91.5	1	1	0	1	1	1
94.8	1	0	1	1	1	0
97.4	0	1	0	1	1	1
100.0	1	0	1	1	0	0
103.5	0	0	1	1	1	0
107.2	0	0	1	1	0	0
110.9	1	1	0	1	1	0
114.8	1	1	0	1	0	0
118.9	0	1	0	1	1	0
123.0	0	1	0	1	0	0
127.3	1	0	0	1	1	0
131.8	1	0	0	1	0	0
136.5	0	0	0	1	1	0
141.3	0	0	0	1	0	0
146.2	1	1	1	0	1	0
151.4	1	1	1	0	0	0
156.7	0	1	1	0	1	0
162.2	0	1	1	0	0	0
167.9	1	0	1	0	1	0
173.8	1	0	1	0	0	0
179.9	0	0	1	0	1	0
186.2	0	0	1	0	0	0
192.8	1	1	0	0	1	0
203.5	1	1	0	0	0	0
206.5	0	0	0	1	1	1
210.7	0	1	0	0	1	0
218.1	0	1	0	0	0	0
225.7	1	0	0	0	1	0
233.6	1	0	0	0	0	0
241.8	0	0	0	0	1	0
250.3	0	0	0	0	0	0

Table 1: IC program input links to select the required CTCSS tone frequency.

Fig 4: modification for transmit PTT switching.



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 682 7045; fax: 0121 681 1329.

review

Yaesu Quadra VL-1000

The UK's first review of this new top-of-the



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 (9MOC) 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

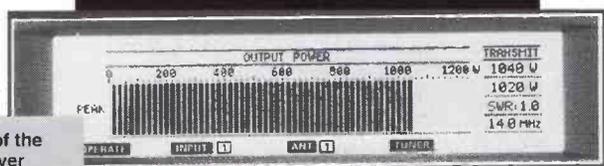
The amplifier is designed to provide a full 1kW PEP SSB output on all HF bands, with 500 watts PEP on 50MHz. The Quadra comes in two cases, the amplifier itself, the VL-1000, and a separate power supply unit, the VP-1000. The amplifier and power supply weigh together some 21kg with, surprisingly, the 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-

ceiver has become a favourite with DX operators since it was released a few years ago. Connecting the VL-1000 to the FT-1000MP requires four cables. The RF drive cable, the band data cable, the



VL-1000 display as the automatic ATU is adjusting the match. This shows an SWR of 1.6:1



The main display of the VL-1000, showing over 1000W output (into a 1:1 SWR dummy load!)

panel circuit breaker. The power supply can be located a few feet from the amplifier, for operating convenience.

operating aids

The amplifier is provided with some useful aids for the DX operator. It is possible to connect two transceivers to drive the amplifier (using only one at a time!) through two RF input sockets. The amplifier automatically selects the input which is providing RF drive. There are also four antenna outputs from the amplifier, which are pre-selected during the installation and set-up phase. This allows differing antennas to be selected automatically for the various bands. For excitors that are not of the Yaesu range, the amplifier 'sniffs' the RF exciter frequency and then sets the band accordingly, controlling the exciter drive power through the ALC line.

Use of the amplifier is straightforward, but reading the instruction book (which only runs to 16 pages) is a necessary preliminary. After connecting the various leads, and setting a back panel switch to allow the FT-1000MP to control the power on / off to the amplifier, it is time to set the ALC

gether with antenna selection. The amplifier is designed to operate with any modern transceiver, but is best with the current Yaesu range of transceivers, in particular the FT-1000MP. This trans-

ALC cable and a line to the FT-1000MP 'Remote' socket for control of the transceiver during tune-up. The linear is connected to the power supply by a heavy duty power cable and by a multi-core control cable.

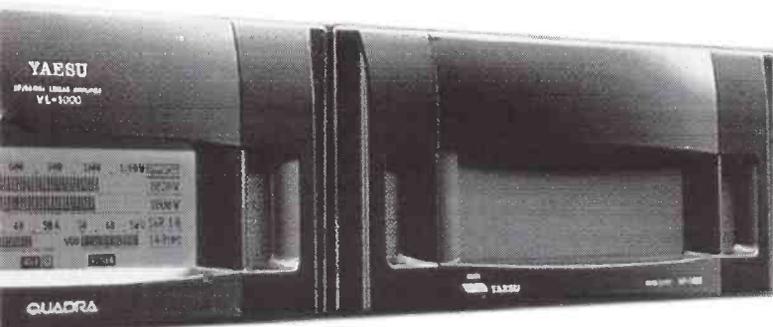
The appearance of the amplifier is unusual. It bears more resemblance to a hi-fi power amplifier than to a piece of Amateur Radio equipment. There are no knobs. All the controls (used only for setting up the amplifier initially) are behind a drop-down panel along the bottom of the amplifier front panel. When this panel is closed, the only control visible is the on / off push button. The front panel of the amplifier is then dominated by a large orange-glow LCD screen, whose function changes during the use of the amplifier, as described later. The power supply is equally straightforward, with a front panel on / off switch and a rear

The VP-1000 power supply sitting on top of the VL-1000 amplifier (shown with the drop-down panel open).



HF / 6m Linear Amplifier

Wide-range HF / VHF amp, by Don Beattie, G3OZF



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 FT-1000MP returns to receive in the originally selected mode. If the antenna feedline SWR is less than 2:1, the ATU can be left out of circuit, but for SWRs of between 2:1 and 3:1, the ATU must be used. This choice is made on a band by band basis, and memorised by the amplifier's microprocessor. Should the wrong antenna be selected, resulting in high SWR, the amplifier immediately beeps, the protection circuit shuts the RF power down, and the LCD screen flashes a big warning message. Where the antenna SWR exceeds 3:1, an external ATU will be necessary.

Whilst the ATU is adjusting the matching to the antenna, the LCD display changes to two rotating tuning capacitors and an SWR bar graph. Once the message 'Complete' appears, the display returns to one of several selectable displays for normal operational use. These range from simple mean and peak power bar graphs to a clever graphical display showing the SWR with and without the ATU

across the whole of the band in use.

in operation

On turning on the amplifier, one of the fans starts running, and the amplifier goes through a number of self-tests, the results of which are shown on the LCD screen. Once these are complete (which takes about 10 seconds) the amplifier automatically switches to the band selected on the FT-1000MP and is ready for action. Output power is a comfortable 1kW PEP on SSB and 500 watts on RTTY and other continuous modes. The manual says 500 watts for one hour continuous. There is little heat noticeable from the amplifier. When the unit goes to transmit, the main fans start up, but they are quiet, and the air coming out of the vent grills is cool. I have yet to find a way to cause the amplifier to heat up!

Using the amplifier in the RSGB Commonwealth contest, it was a dream to be able to change bands 'instantly' (in less than one second!) and to be ready to transmit on the new frequency instantly. On both SSB and CW, the amplifier is virtually invisible to the operator. The protection circuits seem very comprehensive, so that any operator error is trapped before any damage can be done to the solid state power stages. It really is a 'point and shoot amplifier' with many of the advantages of the legendary Alpha self-tuning valve amplifier, but with a much shorter warm-up time and a lower heat output on standby.

On SSB the quality reports are good, although the specified third order intermodulation is not quite as good as the very best valve amplifiers. The manual quotes -30dB at 1000 watts PEP.

The only drawback which I have found with the amplifier is that

General

Frequency range	160 - 6 metres
Power output (with 220V AC input)	HF 1000 watts (SSB/CW) 500 watts (FSK-RTTY / FM) 250 watts (AM carrier)
	50MHz 500 watts (SSB / CW / FSK-RTTY / FM) 125 watts (AM carrier)
Power output (with 117V AC input)	500 watts (SSB / CW / FSK-RTTY / AM) 125 watts (AM carrier)
Input voltages	DC +48V, DC +12V, DC -12V
Current consumption	48A (DC +48V), 2.8A (DC +12V), 0.1A (DC -12V)
Dimensions	413W x 151H x 451Dmm (inc feet, switches)
Weight	21kg (46.3lb)

Linear Amplifier Section

Input power	2100 watts max
RF drive power	80 watts (max) for full output
Spurious emissions	Better than -50dB HF Better than -60dB (50MHz band)
3rd-order intermodulation products	At least -30dB
Input impedance	50Ω unbalanced
Output impedance	50Ω unbalanced

Automatic Antenna Tuner

Matching range	16.7 - 100Ω (1.8MHz band) 25 - 100Ω (50MHz band) 16.7 - 150Ω (all other bands)
Maximum power	1200 watts
Insertion loss	1.5dB
Matched SWR	Less than 1.5:1

VP-1000 Power Supply

Input voltage	AC 100 - 234V (automatic switching)
AC current drain	14A (AC 220V @ 1kW output) 14A (AC 117V @ 500W output)
Dimensions	413W x 151H x 381Dmm (inc feet, switches)
Weight:	14.6kg (32.2lb)

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



The VL-1000 in use on the Spratly Islands, Mike, G3SED, operating.

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 linear mains on / off manually. In this way the antenna is fed through to the trans-

ceiver 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: 0181 566 1120) and Nevada (tel: 01705 662145) at £3995. There is an option, the MR-1000 19in mounting rack for the amplifier and power supply, which costs £229.

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SRP TR

**(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.



**(COM215)
200 CHANNEL SCANNER**

A highly-featured desktop scanner offering 200 channels arranged in 10 scanning banks, with one Priority Channel in each bank. For ease of use it offers Turbo Scan at 100 channels per second max with Autosort for maximum scan speed and Turbo Search at up to 100 steps per second. Other features include direct search programmable band search, auto station program mode, lock-out for up to 10 frequencies, manual frequency sort, programmable auto-recording and optional CTCSS tone squelch. The unit is powered by AC mains or 13.8Vdc. 66-88, 108-174, 216-512, 806-956.

£219.99 + £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 (261 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
- E2 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.

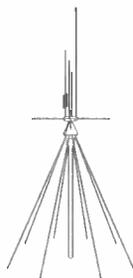
- ★ Free batteries
- ★ Free SW frequency book
- ★ Free SW antenna
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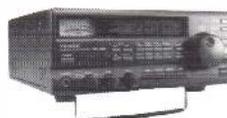
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WE ALSO HOLD A LARGE RANGE OF SECOND USERS SHORTWAVE AND SCANNING RECEIVERS. PLEASE CALL WITH YOUR REQUIREMENTS

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 vi-

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.

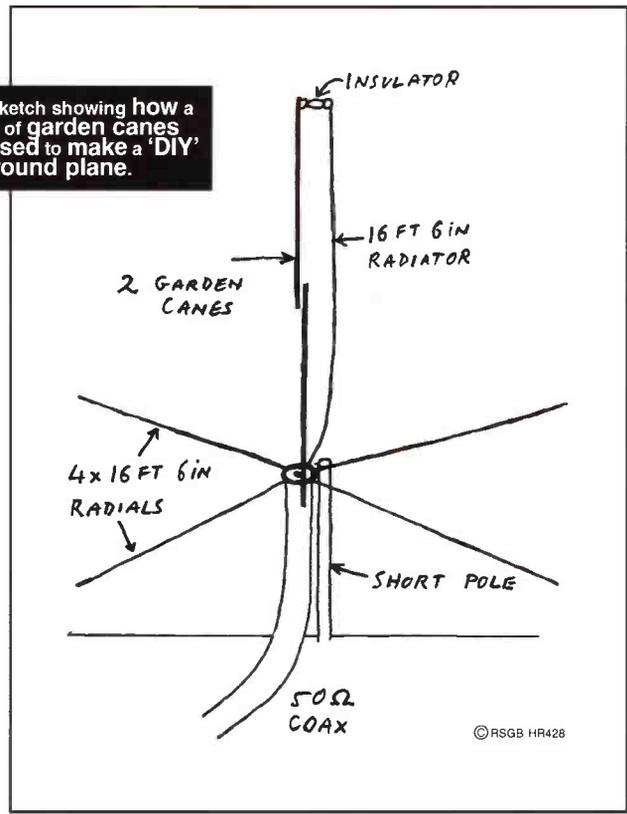
deaf and noisy ft-107

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.

Number one job was to replace

Fig 1: sketch showing how a couple of garden canes can be used to make a 'DIY' 20m ground plane.



All in a Day's Work

More cheap and simple fixes for the older 'FT' range, p

bration, 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 item was 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 (ie, using the LSB

the relay that was operated by the attenuator switch, and number two to replace the front end switching diodes. After cleaning a few controls the rig was as good as new, and the receiver much better than many more modern pieces of equipment!

Problems with front-end diodes and relays are very common with many different types of

rigs, and these parts are well worth swapping when a receiver gets below par.

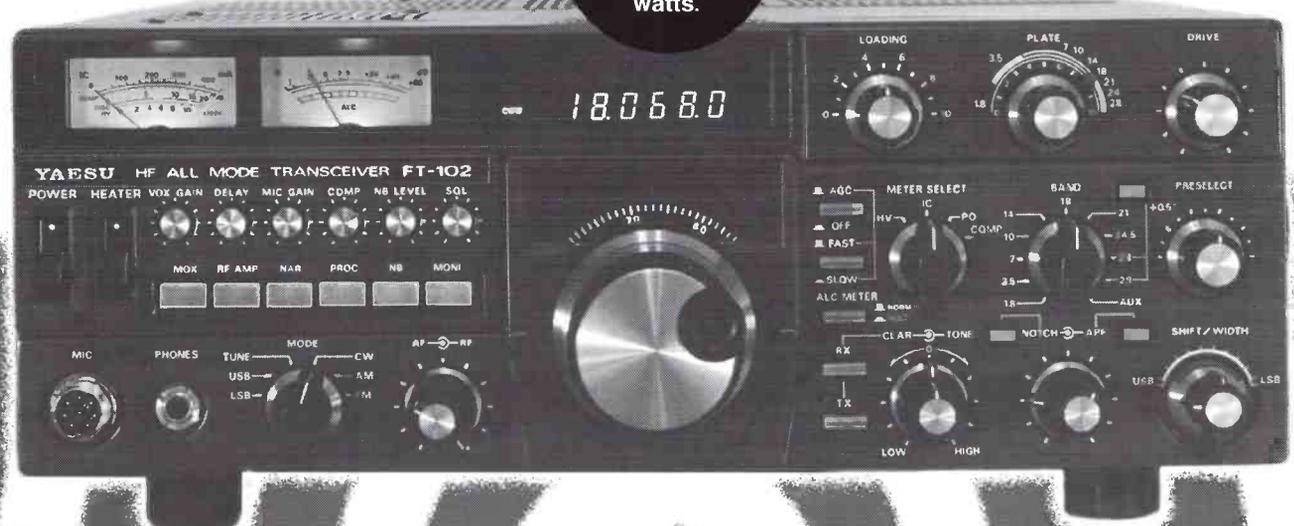
ft-102 band switch

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.

A common problem with the band switch on the FT-102 causes power output to drop to about 5 watts.

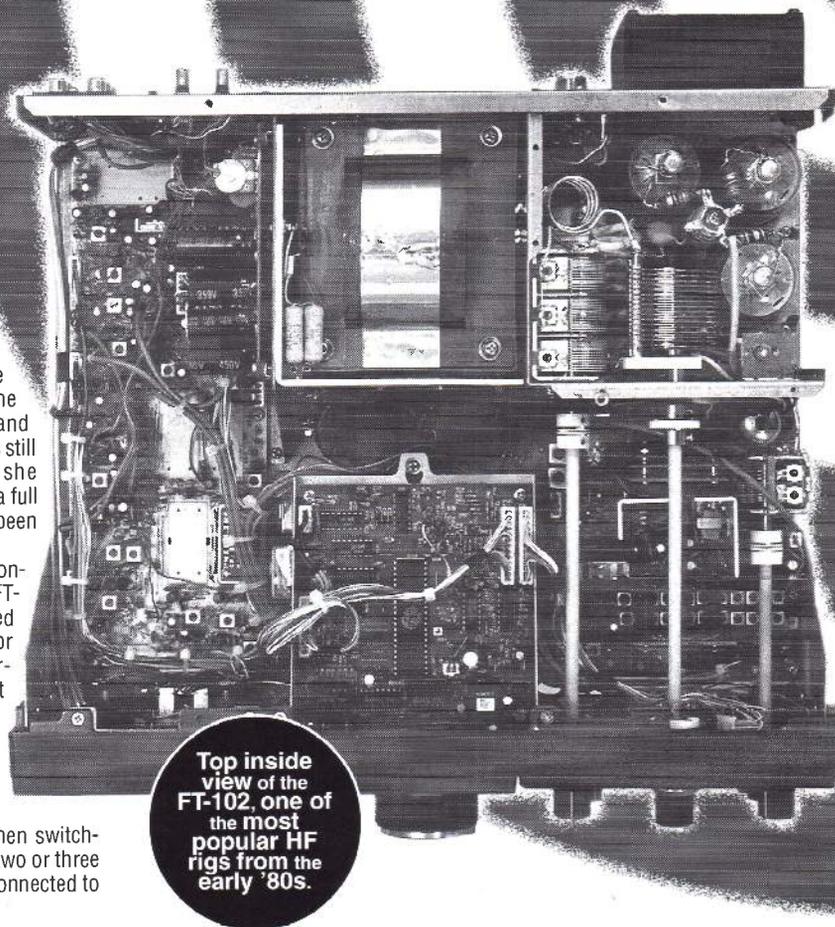


The front section switches the frequency display, the next the RF section, and the rear the PA stage. These sections are joined together by flexible couplers that are attached by set screws. A careful examination of the switches turns up the surprising fact that the indexing on the rear section is not 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 resetting 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

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 florescent digital display module was required. This he eventually obtained and fitted, but the fault was still prevalent, and so she 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



Top inside view of the FT-102, one of the most popular HF rigs from the early '80s.

All in a Day's Work

plus advice on trying out a vertical from Harry Leeming, G3LLL

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 on 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. The 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

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.

Book Browser

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edited by Dick Biddulph, G8DPS

A comprehensive guide to the theory and practice of Amateur Radio communication. If you're into Amateur Radio, this is the book to buy!

6th Edn, 763 pages £21.00 (plus P&P)

PMR Conversion Handbook

by Chris Lorek, G4HCL

Private mobile radio (PMR) equipment rapidly appears on the surplus market and can be acquired very cheaply at rallies. Often it can be converted to amateur bands quite easily and without expensive test equipment. This book tells you what to buy and how to convert it.

1st Edn, 192 pages £15.28 (plus P&P)

VHF / UHF Handbook

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Guide to the theory and practice of Amateur Radio reception and transmission on the VHF / UHF bands including antennas, EMC, propagation, receivers and transmitters, together with constructional details of many items of equipment. One of the most complete guides around for VHF / UHF operators. See the review in *Ham Radio Today* December 1997!

317 pages £18.80 (Plus P&P)

VHF / UHF DX Book

edited by Ian White, G3SEK

VHF / UHF DX is one of the growing points where Amateur Radio shows that it still has a real future - that's what this book is all about. See review in August.

1st Edn, 447 pages £18.00 (plus P&P)

Amateur Radio Operating Manual

edited by Ray Eckersley, G4FTJ

This book covers the essential operating techniques required for most aspects of Amateur Radio, taking the reader from the principles of basic contacts right through to the secrets of working DX and winning contests.

4th Edn, 249 pages £12.23 (plus P&P)

RSGB Yearbook - 1998

edited by Brett Rider, G4FLQ

Formerly known as the RSGB Callbook, the Yearbook has been enhanced to include a wealth of information for all Radio Amateurs. Includes all UK and Republic of Ireland callsign listings, plus over 120 information pages. Reviewed in *Ham Radio Today* December 1997.

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by Colin Redwood, G6MXL

How to set up a station and get on the air as cheaply and effectively as possible. It covers all bands, with special emphasis on VHF / UHF. A 'must' for everyone who has just passed the RAE or NRAE.

1st Edn, 124 pages £5.74 (plus P&P)

Your First Packet Station

by Steve Jelly, G0WSJ

How to set up a basic packet radio station and enter the world of data communications from your shack. Explanations are kept as simple and non-technical as possible, making this book an ideal choice for the beginner.

1st Edn, 76 pages £5.74 (plus P&P)

Radio Amateurs Examination Manual

by John Case, GW4HWR, and Hilary Clayton-Smith, G4JKS

This edition has been completely revised to take account of the changes in the RAE. In addition, it now incorporates many sample questions originally published in *How to Pass the RAE*. See review in August issue.

16th Edn, 172 pages £12.93 (plus P&P)

Practical Wire Antennas

by John Hey, G3BDQ

A 'down to earth' guide to the construction of many different types of wire antennas, ranging from simple dipoles to ingenious multi-wire systems. Boring and unnecessary theory is kept to a minimum - instead the author shares his years of experience, offering advice for beginners and enthusiasts alike.

1st Edn, 96 pages £8.92 (plus P&P)

Practical Receivers for Beginners

by John Case, GW4HWR

Contains a selection of easy-to-build receiver designs suitable for amateur bands, together with simple 'fun' projects and test equipment. The theory and practice of receiving techniques is outlined to help with understanding the circuits presented.

1st Edn, 165 pages £12.50 (plus P&P)

Ferrell's Confidential Frequency List

Compiled by Geoff Halligey

Including full reverse callsign list: aero; CW; coast; fax; fixed; embassy; military; Navtex; time; Volmet. Published by PW Publishing. See review in July issue.

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LF Experimenter's Source Book

edited by Peter Dodd, G3LDO

This book brings together source material from all over the world covering antennas, propagation, receivers, transmitters, special modes and test equipment. See review in July issue.

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RSGB IOTA Directory and Yearbook 1998 / 99

edited by Roger Balister, G3KMA, and Martin Atherton, G3ZAY

The Directory lists thousands of islands group by continent and, new this year, indexed by prefix. It also details the award rules and contains the application forms needed. See review in July issue.

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- **Sunday** - DXCC 2000 Programme; K5FUV; 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, Strumech Engineering); Solar Cycle 23 (G4FKH); Solar Eclipse '99 propagation Experiment (Dr Ruth Banford, Rutherford/Appleton Laboratory); Sunspots (G3ZAY)
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letters

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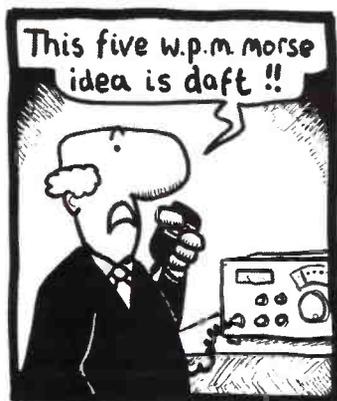
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"TONE" BURST



letters letters letters

£10 for letter of the month

Dear Ham Radio Today,

In March, I met briefly met Steve, G6AOS, 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 Tyneside 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, M0ADR

letter of the month letter of the month letter of the month

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 2E0ASx?)

letter of the month

letter of the month

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 leap 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 it 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

rallies

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, M10AAZ, tel: 01265 54930 or e-mail: John@m10aaz.force9.co.uk

Wight Wireless and Computer Rally, National Wireless Museum, Arreton Manor, Newport, Isle of Wight. Further information from Douglas Byrne, G3KPO, tel: 01983 567665.

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 621263, or e-mail: g0rfe@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, G0UJW, tel: 01264 391383.

12 September

The 4th Northampton Radio and Computer Rally, Shires Shopping Village Showground, on A5, two miles north of Weedon. Bring and buy organised by Northampton Radio Club. Admission £1. Doors open 9.00am. Details from Steve Hurst, M0ARZ, tel: 01604 632478.

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 first 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 Addelese, 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 Maltby, 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.

ham radio today event news

The Leicester Previewed

25 / 26



*Approximate travelling times



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 says 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 433.550MHz); 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,

Leave enough time to visit the Grand Prix Collection



Show September



adjacent to the Exhibition Hall, for the period of the show. This room is ideal for club AGMs or meetings, demonstrations, seminars and presentations. 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 will 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.



EXHIBITION & CONFERENCE CENTRE

other events

- 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 Flight Refuelling ARS Hamfest 98, Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. Details tel: 01202 691021.
- 9 August Derby Mobile Rally & Computer Fair, Littleover Community School. Details tel: 01332 556878.
- 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.
- 16 August Great Eastern Radio & Computer Rally, Wallington Hall, nr Kings Lynn. Details tel: 01553 765614.
- 16 August Cardiff Amateur Radio & Computer Fair, Star Sports & Recreation Centre, Splott, Cardiff. Details tel: 01222 613070.
- 16 August Stroud Radio Society radio rally, Main Hall, Archway School, Paganhill, Stroud, 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 9330; fax: +47 2226 9712; e-mail: jetpro@sn.no).
- 21 - 23 August 1998 Amateur Radio Festival, Tokyo, Japan. Probably the biggest Amateur Radio event in the world.
- 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 684173.
- 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, Ernulf Community School, St Neots, Cambs. Details tel: 01480 431333 (9.00am - 9.00pm).
- 1 September RSGB 144MHz CW Cumulative Contest (2000 - 2230 local time).
- 5 / 6 September RSGB 144MHz Trophy Contest (1400 - 1400UTC).
- 5 / 6 September IARU Region 1 SSB Field Day (10 - 80m, 1300 - 1300UTC).
- 6 September RSGB 5th 144MHz Backpackers Contest (1100 - 1500UTC)
- 9 September *Ham Radio Today* October publication date.
- 13 September WAB 144MHz Phone Contest (0900 - 1700UTC). Details from G8UYD QTHR.
- 16 September RSGB 144MHz CW Cumulative Contest (2000 - 2230 local time).
- 18 September Edgware & DRS 17th annual 'Straight Key Evening' on 3550kHz 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.

One 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

the Caribbean islands, which had used Carolina Windoms exclusively on all bands. Was this the holy grail I had been searching for? Let's find out . . .

description

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 50 Ω 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 weatherproof 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' (see photo) 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

people go to some length to *stop* the coax from radiating, a section of the coaxial feedline on the Carolina Windom is *designed* to radiate. The line isolator provides a means of determining the portion of feedline which acts as the vertical radiator. It also prevents RF from travelling back along the coax braid beyond the point where it is inserted into the feedline, thus minimising RF feedback and TVI.

According to the instruction manual, current in each of the two horizontal radiator sections of the antenna is severely out of balance. Coaxial cable will radiate when the voltage and phase relationships are not proper, thus part of the feedline is forced to radiate. The RF transformer used to match the transmission line to the antenna is a special design that enhances transmission line radiation. The coaxial cable serves not only as the antenna's feedline but also as an effective vertical radiator. The horizontal part of the antenna is the counterpoise for the vertical section. "The result is an inverted-vertical antenna located high in

The Carolina Windom

Ham Radio Today Editor Steve Telenius-Lowe, G4JVG, searches for the holy grail

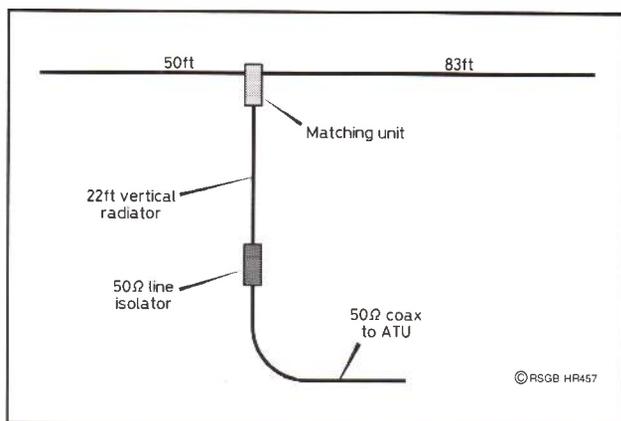


Fig 1: basic layout of Carolina Windom antenna.

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 many wires with a single all-band wire antenna.

Looking through the Waters & Stanton catalogue I spotted the Carolina Windom. I remember being very impressed several years ago by the excellent signals put out by a DXpedition to one of

plastic end insulators are attached to the two lengths of wire and an additional insulator is provided on the longer of the two legs (see photo) to help with installation on a tower.

The antenna comes complete with an excellent 80-page booklet with a cover price of \$7. Not only is it an instruction manual, but it also includes a series of general articles about antennas, earths, baluns, safety etc, as well as a

30ft. If configured as an inverted-V, it is recommended that the ends should 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 that 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

160m, where the antenna is not supposed to work at all! The antenna sounded 'lively' on all bands, including 160m - far more so than when receiving on one of the resonant antennas on the 'wrong' band.

In order to put up the Carolina Windom, I had to remove the 17 and 15m dipoles, although I left the 20m dipole and 40m quarter-

Comparing the Windom with the 20m dipole, however, showed what a good single-band antenna a dipole can be: most signals were 1 to 2 'S' points better on the dipole than the Carolina Windom. On some signals



The Carolina Windom comes complete with Coax-Seal weatherproofing.

Both the matching unit and line isolator are sturdy and fairly heavy (compared here with a 330ml drink can).

n Antenna Reviewed

all of HF antennas: a single antenna with great performance on all bands

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 it 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 only found 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, 6V1C 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, SP3FCO), 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 those 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 experi-

ences 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, 252ft 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>

The Ham Radio Today Software Review

Ham Radio Today takes a look at the latest Amateur Radio software

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 95 (make sure your Windows font and language settings are correct though).

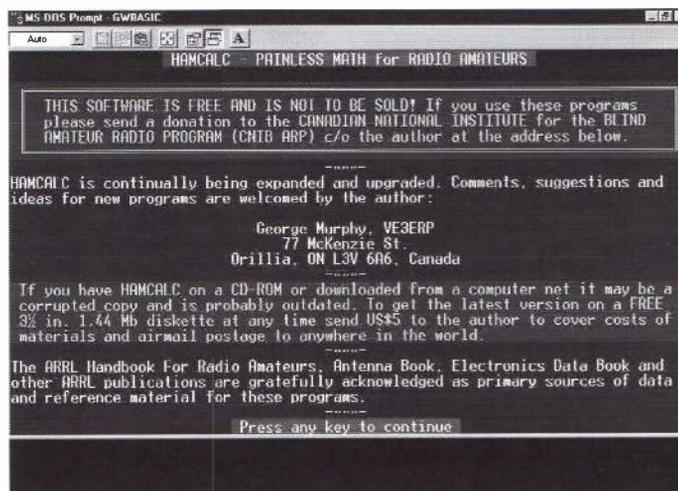
To use HAMCALC you'll need to have GWBASIC.EXE already installed on your hard drive C: and stored in a 'BAS' sub-directory. If it isn't, you can't run the program, this is a very important point to note. If you've installed an earlier version of HAMCALC (ie earlier than v35) you'll already have this, 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



3-ele Yagi program (above) and main menu screens.

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 VHF 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 28, 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 Difference 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 Loops, Toroid Antenna Traps, Toroid Inductors, Wave Trap Filters, Impedance Bridge (3 Meter), 555 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, Zepp 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 Window 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

To most of us, Amateur Radio is 'just' a hobby. Nevertheless, the skills and knowledge gained through being a licensed amateur can prove invaluable in the 'real world'. Here's the story of one group who put their Amateur Radio skills and experience to use in order to benefit people in the developing world. What better means of the licence being used "for the purpose of self-training in communication by wireless telegraphy"? - Ed

HF still rules in the Democratic Republic of Congo, formerly Zaire. Why? Because once you leave the capital, Kinshasa, there are few telephones. If you travel up the River Congo the first telephone is 300 miles away at the Post Office in Mbandaka. Sometimes the telephone is working, frequently it is not. Then it is another 700 miles to Kisangani, where there is hopefully a working telephone.

But who needs a tele phone in a mud hut in the middle of the rain forest? There are a series of hospitals, schools, church centres

contact with the aircraft of the American Mission Aviation Fellowship (MAF). The existing 7MHz band allowed operation on the inter-mission frequencies of 6997 and 7305kHz. This arrangement provided the 7, 14, 21 and 28MHz bands for Amateur Radio use - that is, two facilities for the price of one. This was the first BMS radio network to be established in the Congo.

The Congo became Zaire and under President Mobutu the communications infrastructure, dirt roads, river traffic, postal services and air services all gradually declined. 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.

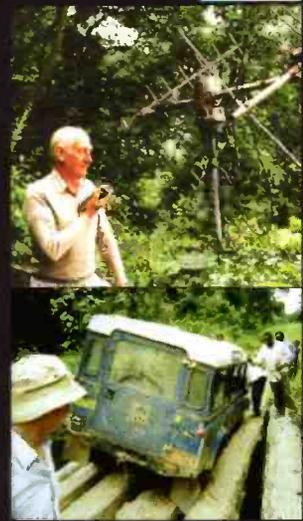
There is no Telephone.

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, so 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.



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. In addition to requesting medical supplies, doctors in remote jungle hospitals have performed urgent operations, of a type with which they are not familiar, whilst conversing over HF radio with a distant specialist. The advance information on a spreading cholera epidemic is an example of the invaluable service provided by an HF network.

the background

Back in the 1970s I used to have regular contacts with Lyn Collis, G4GJP, when he was 9Q5GI. During this period several KW2000CA transceivers - four-channel versions of the amateur KW2000 - were installed in BMS mission stations. Then I modified some Heathkit HW-100s, retuning the 3.5MHz band to 5.5MHz to enable

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, G8TWS. 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*

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 PhD in satellite engineering from University of Surrey. We are also all members of the World Association of Christian Radio Amateurs and Listeners (WACRAL).

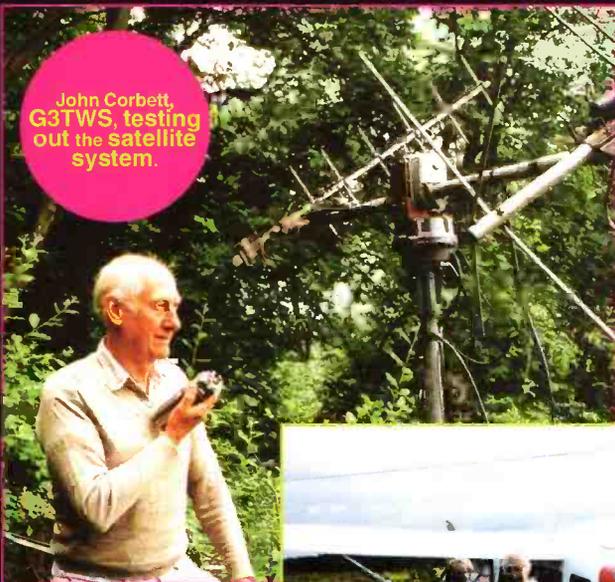
David is succeeding me as the BMS radio communications engineer, so another reason for our visit was to introduce David to life in the Congo, as this cannot easily be described or simulated! The civil war in the 'other' Congo (the Congo Republic) had been raging since April 1997.

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 to a city 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 mission, fired back across the river.

Six transceivers had been brought to Kinshasa for us to repair. We had a good stock of spare



John Corbett, G3TWS, testing out the satellite system.



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



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.

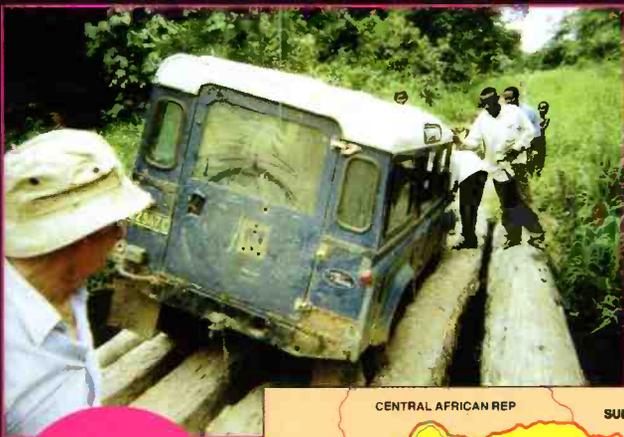
Most of the HF transceivers are powered by 12 volt car batteries, charged from solar panels. As these batteries are the only non-flat batteries in a village, they have been borrowed to try and start Land Rovers! I had stopped this temptation by sawing off the battery lugs, but even then we found that 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' 60Ah 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 dilapi-

again evacuated, with the transition of Zaire to Congo, they left their solar panels for the churches. These solar chargers 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 batteries, 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-

HF Radio Along

the communications infrastructure for hospitals, schools, church centres



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

dated 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 hours over the uninhabited rain forest in the single-engine Cessna 206 of MAF, whilst saying our prayers.

After a week's stay in an area some 600 miles up the river from Kinshasa, we were due to return to Kinshasa on the Saturday, but the plane was a day late. The airline had an HF radio link and the next day they informed us that the plane would land at 11.48am, which it did, exactly (although they omitted to say that only two seats would be available for our group of four).

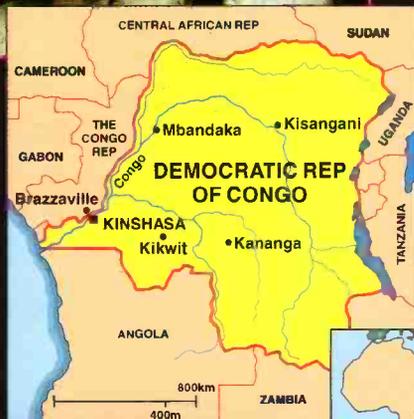
We had installed solar panels, for battery charging, on the roof of the single storey huts in 1987 and 1988. At that time none of the village inhabitants knew what a solar panel was used for but on our return last year we discovered that several solar panels had been stolen. So when the expatriates were

strip in good time.

packet links

We travelled 200 miles down the river to the 240-bed mission hospital at Kimpese. Here we got a packet link going to Kinshasa. 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 'bell' 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 is 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 on the only railway line into Kinshasa 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-



ing dugout canoe which was constantly being baled out to prevent it sinking. During our travels food was short but the Congolese Christians fed us whilst going short themselves; in their culture we could not refuse the food.

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.

MAF 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. MAF 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 UO-14 satellite and since its demise through POSAT. The system uses the 'store and forward'



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

talking drums

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.

the Congo River

res and agricultural projects, as John Corbett, C Eng, MIEE, G3TWS, reports

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 the Zairean authorities and loaned to the American Baptists 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

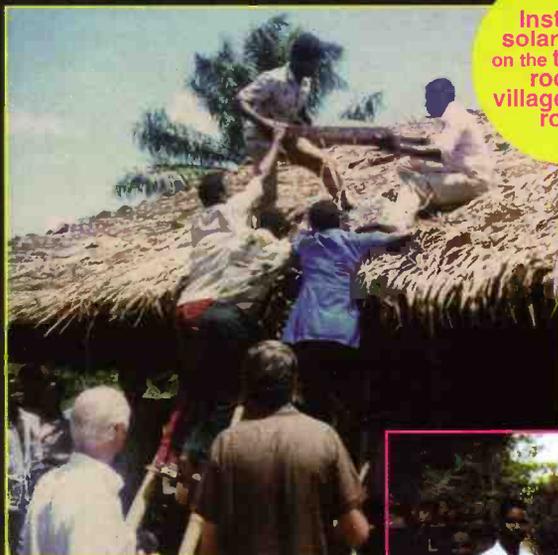
When we left the Congo in November 1997 the HF network was

maintenance and improvements on the HF network during the next two years.

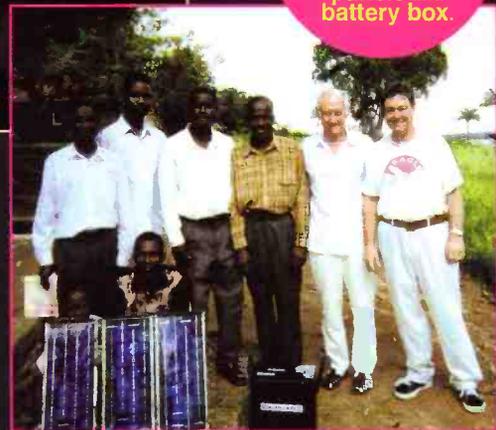
further reading

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 511265; 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/wtint/toc.html>

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/>



Installing solar panels on the thatched roof of a village's radio room.



Congolese helpers with John Corbett, G3TWS, and David Palmer, G4PFX, with the rewired solar panels and battery box.

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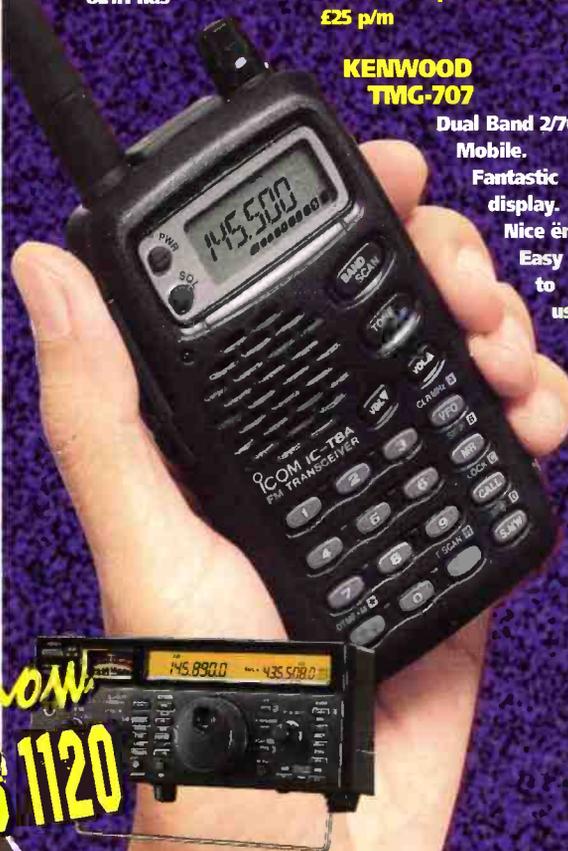
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Friedrichshafen HamRadio

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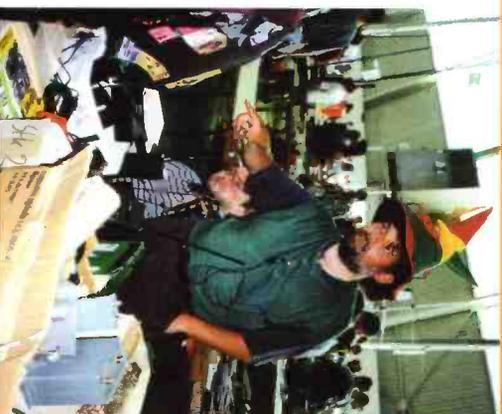
The giant Friedrichshafen HamRadio 98 exhibition took place from Thursday 25 to Saturday 27 June. This year, for the first time, *Ham Radio Today* was represented on the RSGB stand. Hundreds of copies of the magazine were sold at DM2.00 each - a real bargain! - and we have already received subscription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



Photo: Martin Atherton, G3ZAY

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.



"How much? You must be jesting!" The silly hat helps to make a sale in the bring and buy section.



Photo: Martin Atherton, G3ZAY

It is often said that Amateur Radio crosses all barriers - social, political and religious. To prove the point here are Y1IUS and Y1AFT, both operators of the Y1IBGD club station in Baghdad, who represented Iraqi Radio Amateurs at Friedrichshafen.



Photo: Martin Atherton, G3ZAY

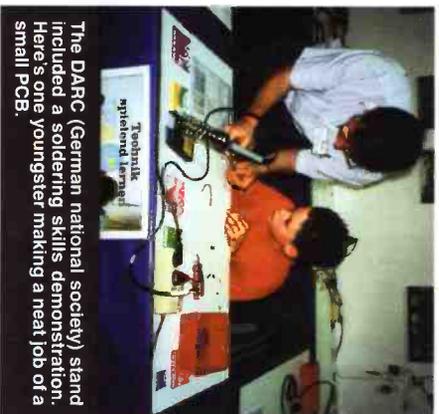
The Egyptian Amateur Radio Society had a stand. Here Ahmed, SU3AMW, is seen selling Egyptian souvenirs!



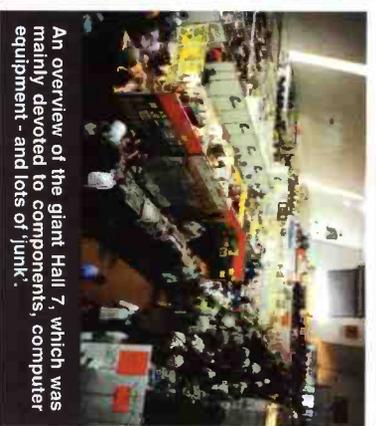
Even the car park is interesting at Friedrichshafen! A 2m / 70cm satellite system and an HF loop antenna all on one pole.



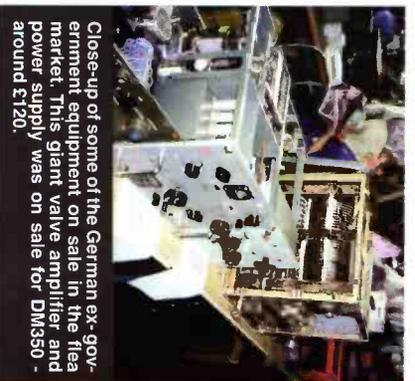
As usual, the RSGB stand attracted many visitors. A lot of interest was shown in the RSGB VHF/UHF Handbook (left) and in *Ham Radio Today* (right).



The DARC (German national society) stand included a soldering skills demonstration. Here's one youngster making a neat job of a small PCB.



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



Close-up of some of the German ex-government equipment on sale in the flea market. This giant valve amplifier and power supply was on sale for DM650 - around £120.

Radio Amateurs Examination Manual

16TH EDITION

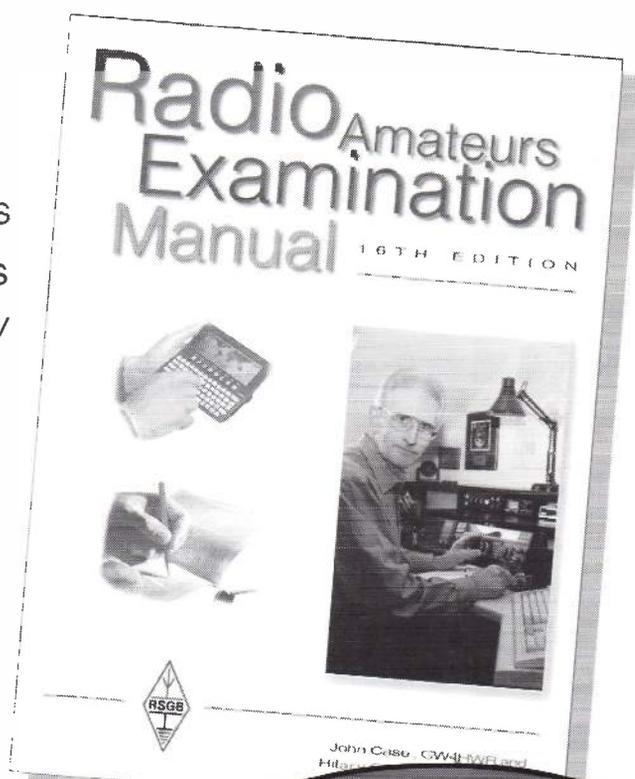
by John Case, GW4HWR and
Hilary Claytonsmith, G4JKS

- Completely revised to May 98 changes
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- Larger, easier to read page format

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:

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- ② Operating procedures and practices
- ③ Electronic principles and practice
- ④ Receivers, transmitters and transceivers
- ⑤ Transmitter interference
- ⑥ Electromagnetic compatibility
- ⑦ Propagation and antennas
- ⑧ Measurements

All those studying for the RAE in classes or at home will find this book indispensable.



£12.93
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The summer conditions continue through August and into September, with good evening openings on the higher bands and 20m remaining usable for much of the night. Early morning openings to the north-west have also been quite impressive, with good 20m signals from Hawaii and Alaska, as well as the new DXCC entity of the Marquesas Islands. Daytime conditions can be reasonable, but with flux levels hovering around the 100 mark, the 21 / 24 / 28MHz bands have yet to display their full potential.

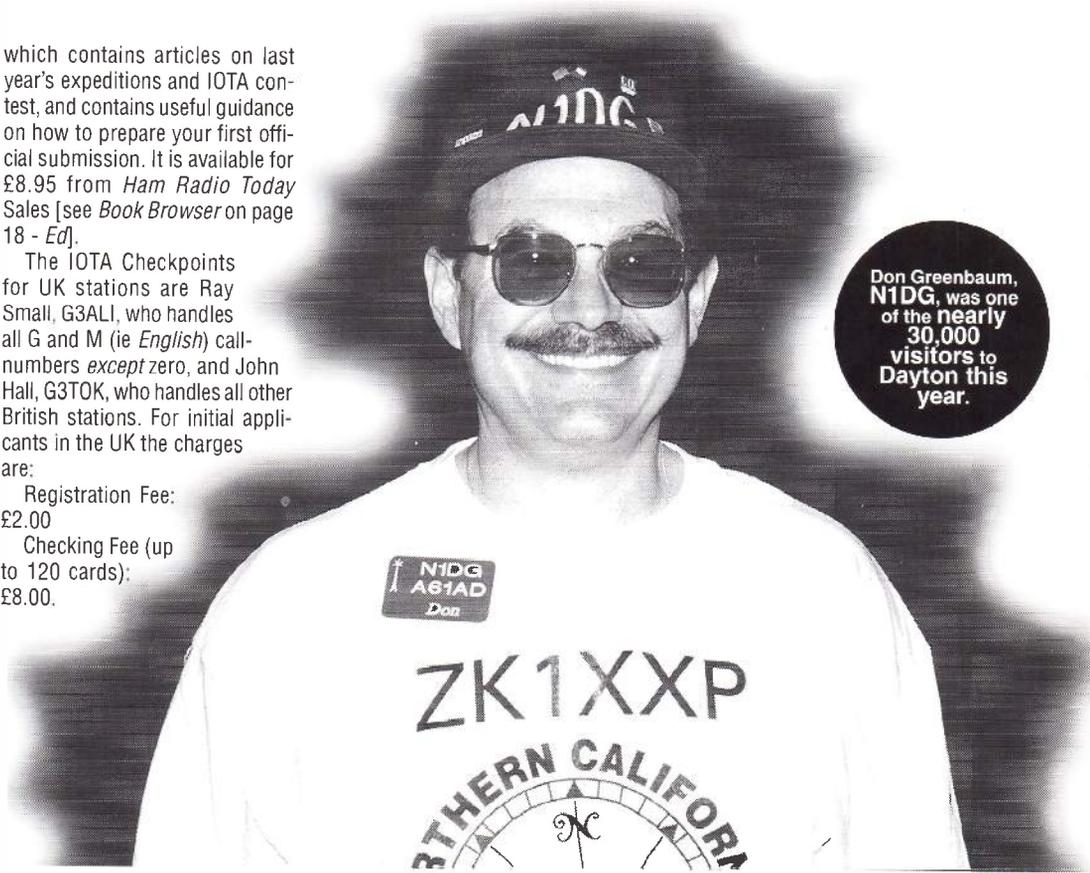
1.8MHz

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 substi-

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, G3ALI, 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.



Don Greenbaum, N1DG, was one of the nearly 30,000 visitors to Dayton this year.

HF Happenings HF Hap

Martin Atherton, G3ZAY, announces some new opera

tute 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*

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 record-keeping software. The IOTAMEM programme is available from your checkpoint for £5.00 inc P&P.

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 direc-

tions. 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 on a minimal budget, staying with local families, and carrying an HF transceiver in his backpack. After going on a number of major DXpeditions, Mats has now

taken a job with UN relief organisations in Africa and is active as 5X1Z from Uganda. His QSL manager is SM6CAS. A full list of Mats' operations can be found at <http://home1.swipnet.se/~w-17565/>

Also at Dayton was Don Greenbaum, N1DG, one of the dedicated group of volunteers running DXpedition log servers on the Internet. These are a recent innovation and allow people to check that their QSOs have been correctly logged - often whilst the DXpedition is still running and whilst there is time to make a repeat contact if it transpires that there was a problem with the first one. Don is an active DXer from his home QTH and on frequent business trips to the United Arab Emirates, where he 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 -

1 September. The call will be FP/N9PD and the group will be operating multi-band 10 - 80m and possibly also 6m. Further information can be obtained from their web page at <http://www.prairiedx.com>

St Pierre et Miquelon is one of France's overseas territories and lies a few miles south of Newfoundland, Canada. The economy for several hundred years was based on cod fishing but has since diversified into tourism. During the US prohibition era it was a major centre for liquor smuggling, and Al Capone is still celebrated as an island benefactor. St Pierre town unfortunately lies on a steep hillside which obscures propagation to the north-west, so most expeditions move across to the island of Miquelon where the village is on a low-lying isthmus of sand and has a much better radio take-off.

I had an opportunity to spend two days in 'FP-land' a few years ago and persuaded my B&B landlady to let me erect my Butternut vertical in her garden. The take-

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, G3XAQ; 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 call signs 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. JL1KFR/JD1 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

penings HF Happenings

ting awards and takes you on a tour of the Terrible Ts

Mats Persson, SM7PKK, visited the Ham Radio Today stand at the Dayton Hamvention



the DXCC list: Okino Torishima (or Parece Vela on old maps).

This was deemed to be too insubstantial to count and was removed some time ago, but it remains a valid IOTA counter and is visited at least once a year by JF1ST to service the automatic weather station. Okino Torishima today is just a concrete platform built on top of a few above-water rocks. Early operations took place from bamboo scaffolding erected on the reef.

Closer to the UK, but also a problem to work, are 'The Terrible Ts'. These are the African countries of T5, TJ, TL, TN, TR, TT, TU, TY, and TZ [Somalia, Cameroon, Central African Republic, Congo Republic, Gabon, Chad, Ivory Coast, Benin and Mali - Ed]. Some

W-100-N Award Manager, *Worldradio*, 2120 28th Street, Sacramento, CA 95818, USA.

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. Historical 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.

VHF / UHF Message

A new band at 40MHz, a new country on 4m, and superb Sp o

Here's an interesting comment that came via Ian White, G3SEK, outlining proposals from Art, KB7WW, for forthcoming F2 openings on 50MHz with the West Coast of the USA. Art comments: "Might I ask you to do a favour for us here in the North West part of the US? All of the active 6m stations that were around for the last F2 cycle still need Europe for WAC [the Worked All Continents award - Ed]. During the last cycle we noticed that most European operators would leave the band too early. By that I mean that as the opening would come across the US we would hear stations working Europe on backscatter, but as the opening would get further west into Arizona and California it is still not west enough for Oregon and Washington. There are very few 6m operators between here (near Portland, Oregon) and San Francisco, especially during peoples' working hours. So what I would like to ask you to do is spread the word to stick around a while and listen and make some noise *after* you think the band has gone dead. We will be doing the same. Most of us are prepared to go just below 50.1 and call on CW to get through and to get away from the QRM from the East Coast stations. I am planning to either take vacation or change shifts during the peak times that we believe will produce F2 to Europe."

My personal comments on this that may help both Europeans and the west coast is as follows. 1700 - 1830UTC was the time slot Neil Carr, G0JHC in Lancashire, and I worked W7 during the last cycle via F2, and furthermore it will have to be via CW. 50.080 - 50.100MHz was used and split frequency was not needed. The Gibraltar beacon (still not active) has been heard on the west coast via F2 and I suspect that EA / GT stations will have the best shot at the west coasts. However, saying that, if Europeans can work into Japan and Australia at the 16,000km mark, why can't the west coast of the USA be worked with ease? Maybe we *were* thinking the band had closed!

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. I make the distance under 8500km and the record Es distance (east to west) stands at over 9800km.

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. K7KV, in DN16AB (if he was there?) was worked via Es on 24 June 1989 by G4UPS.

propagation reports

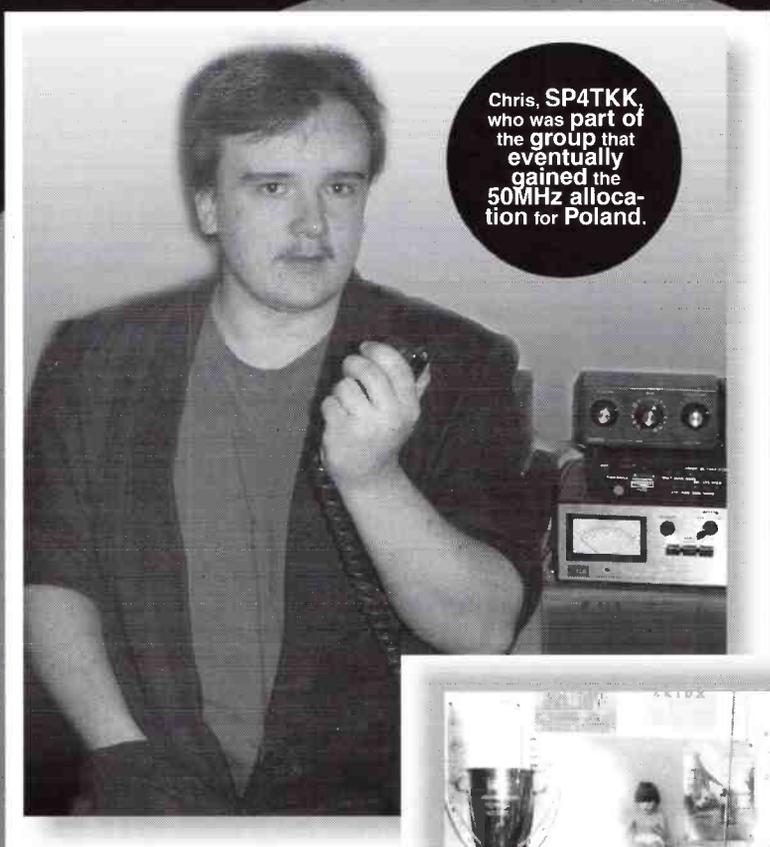
The end of May offered a little more in the way of 6m DX for many in the UK. On 20 May Norman, G3NVO, worked Dudley, Z22JE, in Zimbabwe at 1700UTC. Dudley was also 59++ in GJ and so I asked him what was happening to the old Z21SIX 50MHz beacon that had been taken out of service following the passing away of Mal, Z23JO. Dudley responded that the beacon was active again from a site in Harare, but was not operational 24 hours a day because it was installed in another 50MHz operator's shack and was switched off during openings. This is not an ideal situation, but at least it is active for the forthcoming cycle.

On the 22nd news came in that EH8BPX worked KP4EIT via Es on 50MHz at 1925UTC. This was the first trans-atlantic report of the year.

Alan, 3C5I, in Equatorial Guinea was reported coming into Europe on 23 May. His 50MHz signals were copied in DL, PA, ON, LX and GJ. Also Peter, G3IBI (I090), heard Alan's signal but was unable to complete the contact. Alan is very active on VHF from Equatorial Guinea, he is stationed there on behalf of Mobil Oil and I feel very sure that during the next year he will be workable with ease in Europe on 50 and 144MHz as the cycle progresses.

On that same day Chris, G3WOS, reported that he copied a ZS6 calling CQ on 50MHz.

Eric, TT8JE / F5JJK, e-mailed his final 50MHz report and total number of countries worked from Chad during his military exercises there. Eric managed a massive 43 countries, mostly in Europe, via some very strange propagation modes, but Es was involved in many of the openings on the 'top end'.



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 JA0SUQ/JD1 in Minami Torishima by Es. The distance is 2000km and it was a new country!" Here'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 6m 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, G3SYC, in Yorkshire had a 20-second opening on 29 May to Armenia on 50MHz. This multi-hop opening gave Brian the first ever G to EK contact.

Jean, EA3ADW, reported a very nice 144MHz FAI opening on 31 May to southern Europe - S5, 9A, I1, 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, G00FE, (I090) in Dorset worked UT1PA (K021) on 50MHz, and yours truly pulled off UN3G (MN83) 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 5B4CY beacon on 50.499MHz the next morning although no 144MHz Es was reported during this massive opening. At lunch-time on 2 June Tony, A45ZN, in Oman was worked on 50MHz by G3HBR and Nick, G3K0X: truly fantastic DX!

VHF / UHF Message

radio E. Geoff Brown, GJ4ICD, reports on a busy VHF month

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, G3ZSS, 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 T72, 4X and many URs / UYs. 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, OD5RAK 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 WOS, FPQ, KOX, G4CCZ, and many more Gs even in the North of England. Also worked was GJ4ICD for country number 162.

At 1330UTC on the 6th, G0HVQ made a trans-atlantic contact with VE1PZ on 50MHz. This was the first 1998 report of trans-atlantic DX. Later in the day G4DOL (I080) had a 144MHz opening into 9H, and here in Jersey IT9s were logged also on 2 metres.

7 June was reported by many as an "unbelievable" day on 50MHz, with reports flying in from all over Europe. Conditions were so good and it was a contest day too! MD8V on the Isle of Man

Peter, G3IBI, in I091 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 booming into the UK. Cliff, G1IOV, worked OD5RAK (KM74) on SSB, the 5B4CY beacon on 50.499MHz was coming into the UK continuously throughout the day and was also heard on 70MHz.

At 1515UTC I started to hear the video vision carrier on 48.2504MHz (zero beat USB) from Equatorial Guinea. 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, 3C5I, 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, but by moving his beams to 10 degrees and using 50.105MHz he can reduce the local QRM to about S5. At 1644UTC I completed a contact with Alan for his first 'G' callsign in the log. It was very hard going and the contact was on CW for country number 163. At 1800UTC I had to close down after spending much of the day on the band hunting out new squares. To my shock, in came 9G1BJ again, along with EH9IB!

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 Svetlana 4CX800 and the smaller type triodes such as G3MY has used in his VHF amplifier design for 6m. Some of the triodes can even be used at 23cm and above and are available at a fraction of their original cost. E-mail Dorin at: dorinatan@mailcity.com for further details, or his address can be found in the international callbook.

beacon news

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

Tim, V73AT, reports that V73SIX is on the air from the Marshall Islands on 50.006MHz. It runs 10 watts to a loop antenna and is located in grid square RJ38. Also PY3ARL is now active on 50.030MHz (it clashes with CT0WW!). This one runs 5 watts to a quarter-wave ground plane antenna, but no information is known of its location.

Despite nobody hearing the Azores beacon on 50MHz, I am assured it is active: CU3URA is on 50.013MHz and runs 5 watts.

A new Slovenian beacon band on 40.660 - 40.700MHz came on air as of 13 June. The beacons must use narrow-band FSK with a power limit of 10dBW ERP. This, by the way, is part of an IARU Region 1 initiative to obtain spectrum at 40MHz for DX beacons as an aid to propagation investigation. This information was supplied by David, G4ASR.

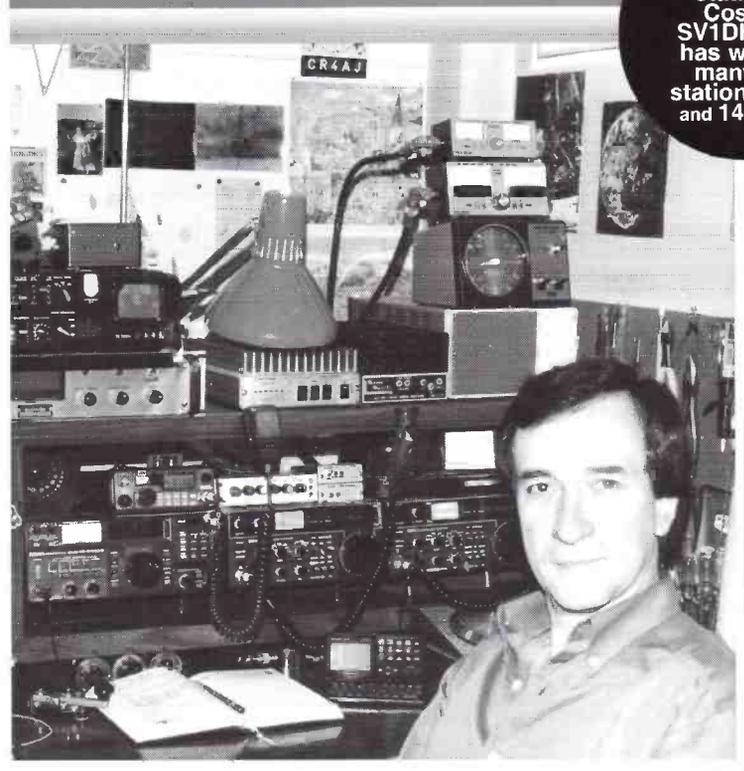
future activity

Sajid, A22EW, will hopefully be active on 50 and 144MHz in a couple of month's time, which will be the start of the TEP / F2 season. He plans to use a rhombic antenna system pointing to Europe and North America. Sajid's QSL manager is KB2MS / KB2UCO.

Slovenian amateurs can now work on 70MHz as of 13 June. It has been known for some time that other countries in Europe were going to receive this allocation, but a request was made to keep things quiet during top level negotiations. The first reported 4m contacts between the UK and Slovenia took place on 18 June, when S57A, in JN65, worked G6WZA at 1329UTC, followed by GW6ZMN, and later EI7GL, all on SSB. The following day S57A was again working into the UK on CW. S57A was running 5 watts to a modified TV antenna. The S56A beacon in JN76 on 70.030MHz, has also been received in the UK. Thanks to Derek Thom, G3NKS, for this information. CT1DHM also hopes to have a special permit for 70MHz for experimentation purposes.

Sorry, we ran out of space this month. The 70MHz 'Firsts' table is postponed because of the massive amount of input on the summer Sporadic E propagation. More on the wonderful June DX next month. News, views and photos please to Geoff Brown, TV Shop, Belmont Rd, St Helier, Jersey JE2 4SA, or e-mail: equinox@itl.net

The impressive VHF / UHF station of Costas, SV1DH, who has worked many UK stations on 50 and 144MHz.



50MHz at 0830UTC and 144MHz Es was reported from 9A to 5B4, and YO to SV9. At 1400UTC Ted, G4UPS, and Nick, G3KOX, reported KP4EIT on 50MHz via multi-hop Es. He was also copied in GJ on a dipole at 100ft at my shop premises. Later, at 2000UTC, Peter, PY5CC in GG54, was copied all over Europe on 6m. The opening lasted about an hour with signals so strong that Peter

recorded over 750 QSOs and worked exotic DX like 9G1BJ in Ghana and TR8 in Gabon early in the morning via Sporadic E.

Neil, G0JHC, in I083 also made a contact with TR8XX. Using just 100 watts he made it through the massive pile-up. Chris, G3WOS, also reported 9G1BJ into I091, whilst 3C5I in Equatorial Guinea was reported in Belgium, although nothing was heard in the UK.

In my last column I wrote about Dayton and the wonderful time had by all those attending. I often wonder why some people travel so far to be there. George, G3RJV, and I travel some 12 - 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.

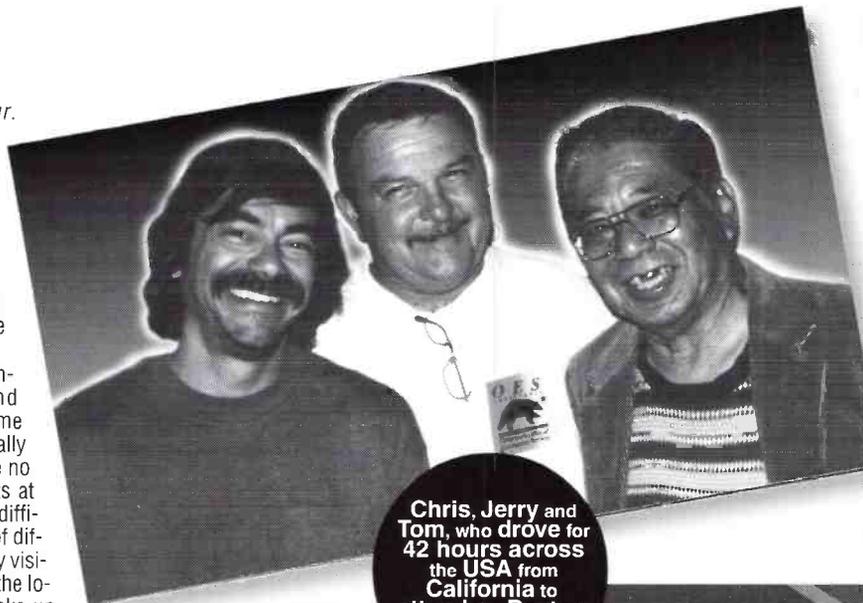
Our travel time pales into insignificance when we met three guys, Chris, Jerry and Tom, who drove for 42 hours across the USA from California to Ohio for the gathering! They told me they only stopped for fuel, food and calls of nature, sleeping in turn in the back of the car and taking turns driving too. I first thought that this was normal, after all, Doug, K16DS, 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

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

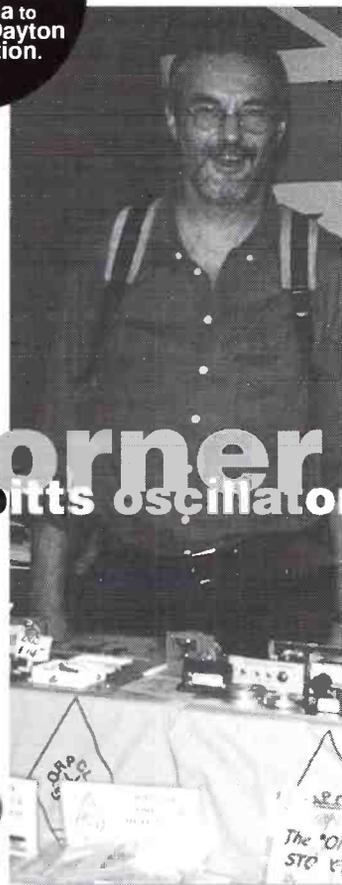
There are several large rallies held throughout the USA at various dates during the year. Many have QRP-dedicated events running alongside them. One of the other bigger ones is held in Texas and



Chris, Jerry and Tom, who drove for 42 hours across the USA from California to attend the Dayton HamVention.

Graham, G3MFJ, who stopped off for a short break on their way to Dayton with Glen, K5FX, were that the usual hospitality shown to visitors is doubly so in Texas.

Paul, NA5N, commented that the hotels even had hot water with working air conditioning (unlike some in Dayton this year). With the normal high temperatures of Texas I would hate to be there without any A/C.



QRP Corner QRP Corner

Dick Pascoe, G0BPS, takes a look at Colpitts oscillator

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.

For those thinking of heading for Dayton next year, be 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

called 'HamCom'. This takes place just three weeks after Dayton and reports are now trickling in.

The following is a report from Paul, NA5N: "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, K5FO, 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 QSO ended with 'BCN YOU' (= 'be seeing you') to throw the crowd, at I 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!

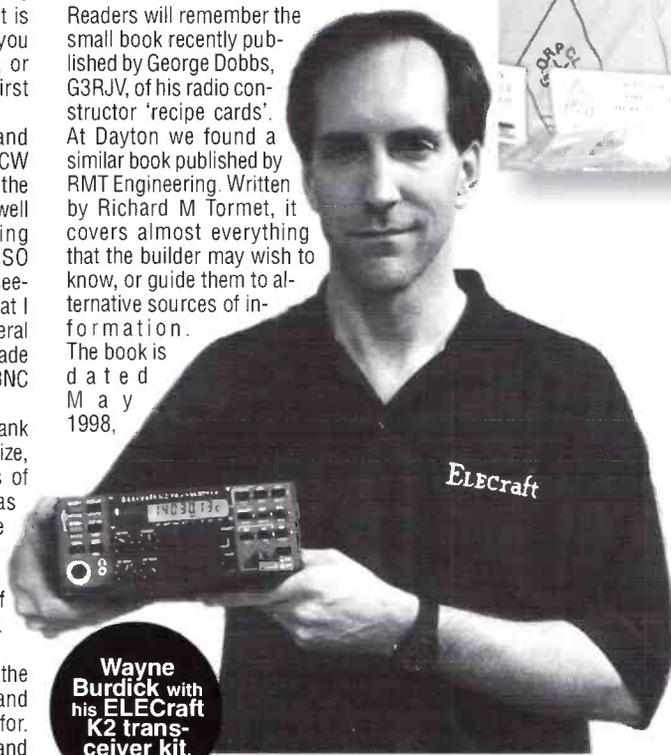
"HamCom is no Dayton (thank goodness), but of fairly good size, plenty of manufacturers, lots of tables, tailgaters, etc. I was particularly impressed with the quality and reasonable prices on most everything. Very little computer rubbish, lots of good old ham radio rubbish. No \$50 HW-9s though."

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

electronic bench reference

Readers will remember the small book recently published by George Dobbs, G3RJV, of his radio constructor 'recipe cards'. At Dayton we found a similar book published by RMT Engineering. Written by Richard M Tormet, it covers almost everything that the builder may wish to know, or guide them to alternative sources of information.

The book is dated May 1998.



Wayne Burdick with his ELEcraft K2 transceiver kit.

Graham 'the hat' Firth, G3MFJ.

so is very up to date.

There are four sections 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 NE555 timer, various methods of setting up power supplies and the use of zenors. 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 crystal oscillator may find this circuit the better one to use. The three diagrams show variants of this popular VFO that are currently in use. The loss of the variable air-spaced capacitor from the rally scene in the amateur market, and the high price of new ones avail-

able, now have to make us look over more closely to other ways of tuning our VFOs.

The way most go is the varactor diode, but the stability of the VFO may suffer slightly because of this change. Using short leads and quality components can offset this a little. The voltage applied to it controls the capacitance of the diode.

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: rtorment@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

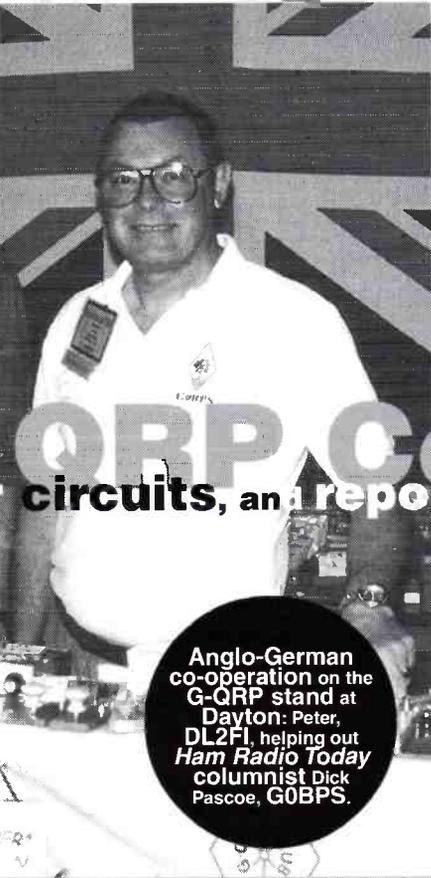
of the quotes from the qrp-l reflector and comments made to him over the years and designed what we think may be the 'bees knees' in quality QRP transceivers, the ELEcraft K2 all-band SSB / CW transceiver kit.

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 a 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.

g2nj sk

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



Anglo-German co-operation on the G-QRP stand at Dayton: Peter, DL2FI, helping out Ham Radio Today columnist Dick Pascoe, G0BPS.

QRP Corner QRP Corner
circuits, and reports from more QRP meetings

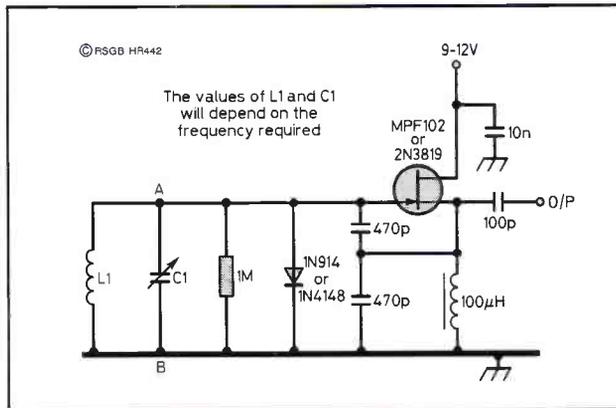


Fig 2: free-running Colpitts VFO with the frequency controlled by the LC tuned circuit.

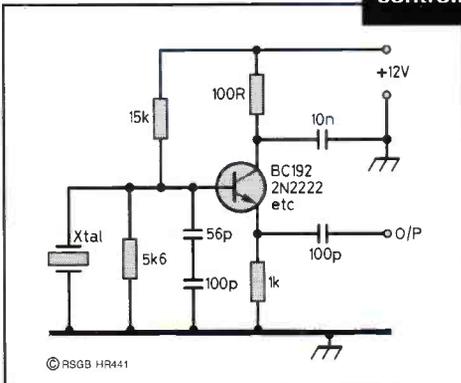


Fig 1: the Colpitts crystal oscillator.

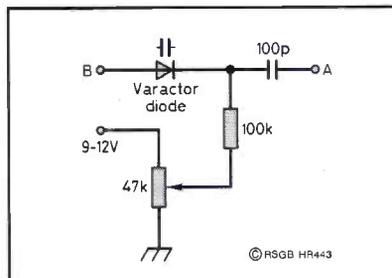


Fig 3: Colpitts oscillator using a varactor diode in place of the variable capacitor in Fig 2.

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 QRP CW skeds with Nick that George, G3RJV, decided to write to *Short Wave Magazine* asking for like-minded people to drop him a line about the possible formation of a QRP group. Naturally Nick was one of the first 30 or so people who made up the club.

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 packet to GB7RMS, e-mail to: Dick@kanga.demon.co.uk or 'snail mail' to Seaview House, Crete Road East, Folkestone CT18 7EG.

Satellite Rendezvous

The latest on Phase-3D and the rest of the AI



A full view of the Phase-3D satellite in the clean room.

Phase-3D Integration lab web site

The AMSAT Phase-3D (P3D) satellite will not be launched on the third test flight of Ariane 5. The bad news reached Karl Meinzer, 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 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 Reentry Demonstrator) 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 Meinzer 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 card into orbit. AMSAT-NA are now collecting QSL cards, which will be scanned and converted into digital images. These images will then be saved on to a 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 Sligo 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 had a web site for

some time. This was fortunate since there was nothing there worth seeing, but this 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/> 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. QSOs 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.

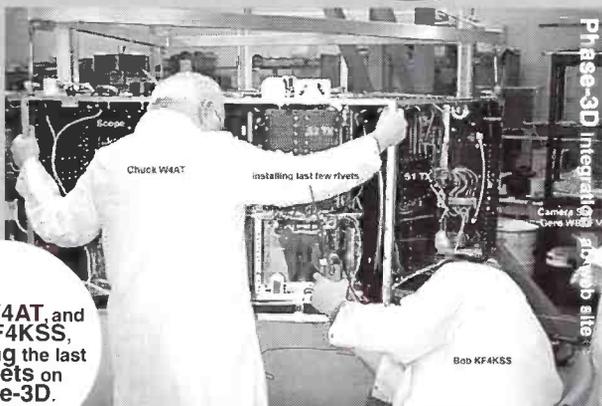
russian satellites

G3IQR reports that RS-15 has lost its TLM beacon but the transponder remains on and is working perfectly.

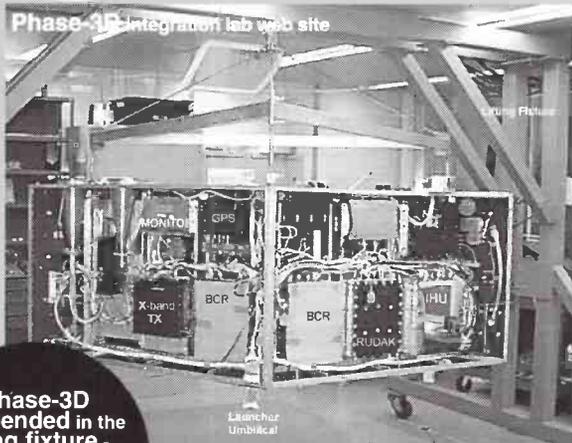
The remaining crew on board Mir apparently speak and read Russian only. Therefore, any messages addressed to ROMIR will not be understood by any of the crew members - unless it is in Russian. Late word indicates that the PMS has been shut down and may remain so for several months.

short bursts

The Russian RESURS launch scheduled for June has been delayed. This RESURS also carries TechSat-1A, TM-Sat, and FA-Sat-Bravo. 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

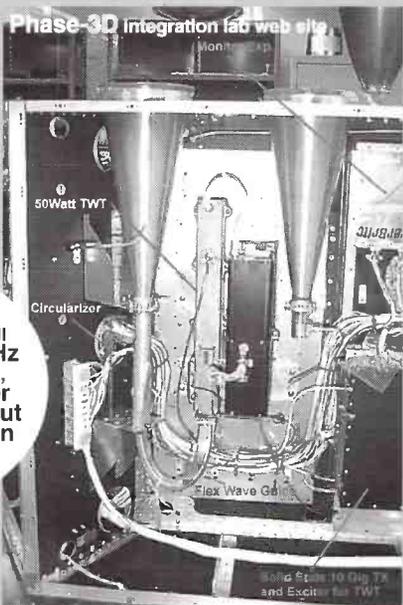


Chuck, W4AT, and Bob, KF4KSS, installing the last few rivets on Phase-3D.



Phase-3D Integration lab web site

Phase-3D suspended in the lifting fixture - only once before had the satellite left the security of its assembly cradle.



Phase-3D integration lab web site

Phase-3D will have two 10GHz transmitters, each with over 50 watts output into a high gain horn.

Satellite Rendezvous

AMSAT-UK News from Richard Limebear, G3RWL



(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 microsattellites will not be de-mated from the Resurs.

The orbit will be 821km sun synchronous (similar to UO-22) with a local ascending node time of approximately 21:37.

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 (g3ruh); 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.technion.ac.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, two 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 upgraded; this is the same as the other Pacsats.

TM-Sat is Thailand's first microsattelite 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/EE/CSER/UOSAT/amateur/tmsat/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 436.925MHz. TM-Sat will later speed up to 38,400 bps.

The TM-Sat-1 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 UoS FASat-Alpha 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.

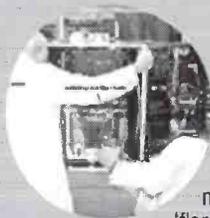
SEDSAT-1 is now scheduled for launch sometime in October of this year (23 October has been mentioned). The spacecraft is now complete and is in the final stages of testing. It will carry a Mode-L digital transponder as well as a Mode A analog transponder. The planned orbit is 500 x 1000km at 28.5 degrees inclination.

The following frequency plan was at the time of publication still unconfirmed: 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 @ 9.6, 19.2, 38.4 and 56 k/bps.

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 released 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 is turned off 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.satellite.eu.org/sat/vsohp/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: g3pho@qst.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 (including crystal, connector adapter and instructions). 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, KC5FVF.

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 barbeque 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.uk.amsat.org/> Note that the web site address changed earlier this year - this is the new address.



Data Connection Data Con

Chris Lorek, G4HCL, gives some helpful advice on using

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 486DX2/66, 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 multi-media 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.

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



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, G4IDE, for this information. A typical unmodified modem has a 2k2 resistor from pin 6 on the 74HC04 to pin 8 on the 9 pin 'D' (if your modem is different then this circuit obviously isn't for you!) Lift the end of the resistor that goes to the 74HC04 and it becomes the 2k2 resistor in the diagram, this means that the only components you'll need are two 10k resistors and the transistor. If you don't have a BC213L in your junk box, this transistor can be any similar PNP switching type transistor, but remember it's PNP and not NPN.

bbs news

GB7ZXN in Newcastle-upon-Tyne is now fully operational at 9600 baud on 144.825MHz. The SysOp Ernie, G3ZXN, says that several people offered him help in getting this 2 metre port operational - people who live outside of this area and who could derive no benefit from the serv-

ice themselves - an indication of the true spirit of Amateur Radio, and he acknowledges their contribution with thanks and gratitude. The new 2 metre 9k6 service from GB7ZXN should cover a wide geographical area, extending from Berwickshire in the Scottish Borders right down through Durham, Teesside and into North Yorkshire. It should also reach deep into the Tyne Valley and Derwent Valley areas. Ernie would welcome reception reports, to G3ZXN @ GB7ZXN.#18.GBR.EU and says that hopefully with GB7ZXN now operational at 9k6 on both 2 metres and 70cm, plus the availability of PCBs to build both L2PCX and YAM modems, this may encourage more people to have a go with 9k6 operation?

9600 baud mod

Although current VHF / UHF oriental 'black boxes' often have 9600 baud packet capability, most earlier sets as well as ex-PMR rigs usually need modification. There's a substantial amount of information, which have been collated over the past six years, readily available on the GB70AR BBS in the 'C:9600' directory. The BBS supports REQFIL, and the 'INDEX.9K6' file contains an index to the modification files available. To receive the index file, send a packet message addressed to SP REQFIL @ GB70AR with a subject of C:9600INDEX.9K6, leaving the message body blank apart from the usual /EX or CTRL-Z for the 'end of message'. My thanks go to Tom, G4BKF, remote SysOp of GB70AR, for this information.

hf pactor

Darek, TJ1GD, from Bertoua, Cameroon in Africa, says he's active and looking for contacts on PacTOR on the following frequencies and times: 14068kHz at 0500-0659UTC, 21073kHz 0800-1759UTC, and then back to 14068kHz from 1800-2159 UTC. For more information or a sked, you can contact Darek with a packet message to TJ1GD@TJ1GD.CMR.AF

Bravo, PY1BK, in Cantagalo, Brazil is active on 14072kHz PacTOR and looking out for contacts. For a sked send a message to PY1BK@PY4SM.MG.BRA.SA

2m & 10m sstv

There's a new SSTV repeater in western France, which you may be able to access from some parts of the UK, especially when conditions are good - it recently even relayed a signal from Italy. It's F6KSO in Cholet, QTH locator IN97NB, which runs 80W output and operates on 144.525MHz FM simplex, using MSCAN 2.21e software. It's operational 24 hours a day, and you access it with a 1750Hz tone followed by a transmission of your SSTV picture after the 'K': the repeater will then replay it. More information from the SysOp, Phil, F5TRO@F5KEQ.FPDL.FRA.EU or e-mail f5tro@aol.com

With the current Sporadic E conditions, the ON4VRB 10m SSTV repeater on 28700kHz USB run by Danny, ON4VT, has been on the air very frequently! It also runs MSCAN 2.21e software, so access is by the same method, and here your picture will be relayed on both 10m as well as 433.925MHz FM on 70cm from the repeater.

Take a look at Ciemon's, GIOTRT, APRS web site.



See you at the BARTG rally on 13 September?

Connection Data Connection

BayCom type modems with later generation PCs

dx data

Further afield for DX enthusiasts, Matt, 7J6CAT, has just become operational on HF packet from Tokyo, and he's 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 'J' 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 this 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 GB7WV 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 soak-tested and will be installed for 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 2 September 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 826085 evenings / weekends.

news in brief

Ciemon, G10TRT, 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://freespace.virgin.net/ciemon.d/aprsuk.htm>

WINPMail V2 is a program from Mike, G0OPC, 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 REQFIL'd from G0OPC via packet with a message sent to G0OPC@GB7FEN.
#22.GBR.EU with the title of /

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

REQFILWINPMAIL \WINPMAL2.ZIP. Also available via packet REQFIL is Mike's WINPLOG program, a log viewer and manipulation program for Winpack, which I

mentioned in this column a short while ago. For this send a message to the same address but with a title of /REQFIL WINPLOG/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 message title is /REQFILWINPCAPT /WINPCAPT.ZIP.

For users of the SCS Pac TOR-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!

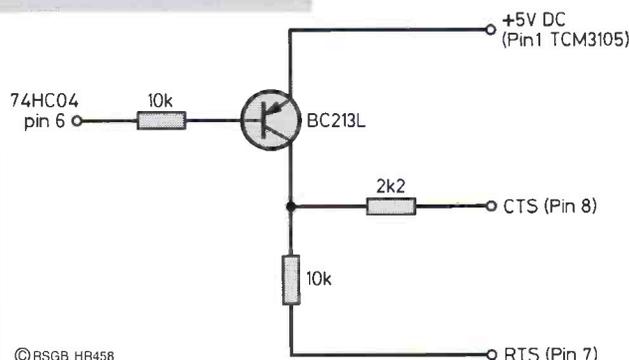
I'm often asked for sources of packet and data software, so if you missed the June issue of *Ham Radio Today* it came with a free front cover CD-ROM packed full of packet and data programs. Back copies are still available for a limited time - see the 'Back Issues' section on page 58 of this month's magazine 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, G8G0J, 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.



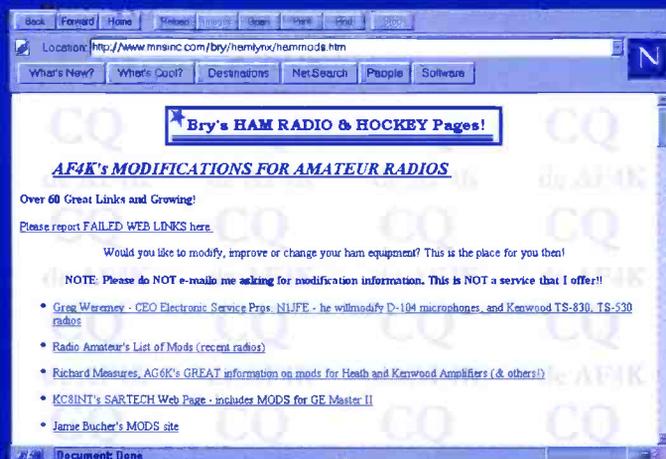
Fig 1: simple add-on circuit for packet modems (see text).



© RSGB HR458



MAXPAK have regular meetings, and attend a number of rallies in the Midlands.



Question: What do you do when your rig is working perfectly, there is nothing to complain about, people compliment you on the audio, and even the rarest of DX is coming through? Answer: Modify it! The nature of our hobby defies every advice to 'leave alone' or to follow that wondrous maxim: 'if it ain't broke, don't fix it.' So, accepting this fundamental flaw in our make-up, we seek



are probably the **Oakland University** site and the **QRZ** site. I had trouble getting to the Oakland site, but this was probably a temporary hitch. Modification pages throughout the Internet tend to be in fact an amalgam of sources, mainly from packet, I suspect, and the Internet News Groups. The greatest danger of any of these things is the inevitable risk in doing them at all. If the rig is new,

cle is well-written and clear: "The radio is now programmed 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 (AF4K's) 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 these 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

Net Communication

Jeremy Boot, G4KJH, explores how the Internet can help if you want

ways to improve the unimprovable and to try to get that handheld to receive the space shuttle chatter that some chap from Italy on packet said was possible, by entering in a meaningless formula into the keypad, that everyone said couldn't be done, or, worse, to snip a couple of wires very close to the processor, which will either ruin the rig forever or make it pick up Channel 4 TV - probably in preference to the local repeater.

making a start

Defying then all better advice, let us turn our attention to what good or bad advice we can pick up off the Internet on this subject. 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 two 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 do 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.

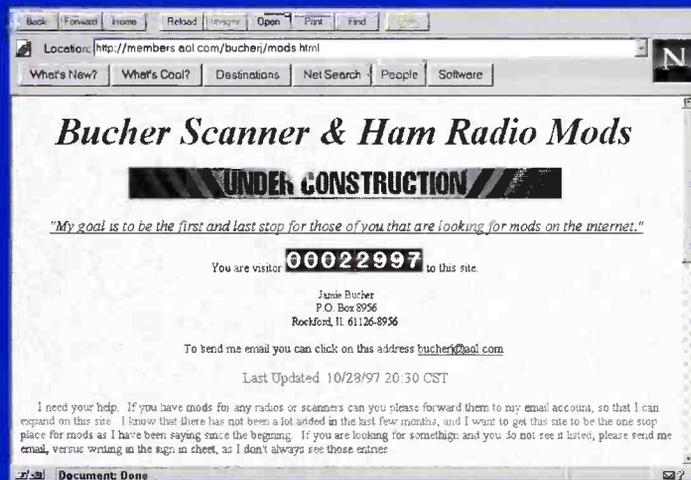
A more typical one, from the **Ham Radio Associates** page is for the FT-212RH extended frequency coverage mod, submitted at some time by SV0DR and picked off packet. The arti-

(mostly in .zip format) are there, I found them not that easy to find my way around. To be fair, the author does say the site is under construction.

For some reason I had great problems with the **K7ON** pages: they would not display as normal WWW pages on Netscape, but Explorer was happy with them. Apart from the text modifications, there are even manuals - displayed as ftp lists. It must have taken a considerable time to copy them. Want to know about the Alinco DJ-580? There's 55 pages of manual all about it. Likewise the DJ-600T. This site includes quite a lot more than simply mods. There are reviews and explanations too and an extensive library of even the most obscure manufacturers. I was impressed with the scanner and monitoring lists.

qsp73 services

Now where have I heard this before? Ah yes, *Ham Radio Today* of course! We read the following under Mods: "Rig Modification Database is a huge collection,



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 pretty quickly. The only snag about this sort of enquiry is that it's fine for a *specific* problem, but spoils the pleasure of reading through stuff that just might whet your appetite to look further.

age back to the IF amplifier, additional components of the strong signal are still making their way through the filter and eventually appear at the output causing the 'thump'." So now you know.

Other pages include mods to the **Ten-Tec Argonaut**: improving SSB and CW performance and stability. This reminds me of how much QRP is linked to home construction, and this will be the sub-

Not really a page about modifications - unless you want to add a tube to your old-time radio - for \$1!



them more than most perhaps, but some roads just lead to the credit card, which sort of spoils things.

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

Net Communication

Perhaps a little off-beam for your average ham, but I so enjoyed researching **Old Time Radio** a few months ago for this column, that my eye was taken with possible mods for old receivers. Not quite the latest scanner, but do have a look at this set of pages. "Bring your radio up to date: add a tube: Get rid of static, distortion, strong local interference. A 'new' radio for only \$1!" So that's what we are lacking in 1998 . . .

qrp

The **QRP Internet Club** pages contain some useful information in general, but on their 'Hints and Kinks' page, there is a good selection of modifications, including something called a QRP-Plus 'anti-thump' modification. Confused? Well, the mod ". . . considerably reduces the 'AGC thump' that can be very annoying on strong signals (both CW and SSB). The cause of the 'thump' is the delay through the SCAF audio filter, which is inside the AGC loop. The AGC detector is on the output of the filter, and by the time it detects a strong signal and feeds a control volt-

ject of a future article. We all rely far too much on black boxes (I include myself). Perhaps our QRP friends can teach us something here. Although I have not mentioned 'homebrew' under modifications, the two are clearly linked. There are some useful articles on both at these pages. I also liked the step by step approach with diagrams, circuits etc. Having just built some flat-

pack wardrobes with minimal instruction at home, I can vouch for the absolute desirability of 'idiot's guides', as well as pages of text.

"If it's a gadget, we've got it", says the **Gadgets Line** page. It includes many scanner mods, but then, having described them, expects you to order them. There are other pages in similar vein. There are some free lunches in the amateur world, and indeed we expect

enough here for you to get the picture and the point of these articles is to show how the Internet can be useful to us. I don't pretend to be well up in all the subjects I write on. Oh, you've noticed . . . ! Feedback is most welcome on any of the articles, by the way, by snail mail, e-mail or via my own pages.

More next month. Meanwhile, happy surfing.

- G7KPFs Pages of Ham Links:** <http://www.users.zetnet.co.uk/kama/hamlinks.htm>;
- GJ4ICD Equinox Pages of Ham Links:** <http://user.itl.net/~equinox>
- Kenwood Mods:** <ftp://oak.oakland.edu/pub/hamradio/mods/kenwood/>
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- Bucher Scanner & Ham Radio Mods:** <http://members.aol.com/bucherj/mods.html>
- K7ON Pages:** <http://www.qsl.net/k7on/mods/radmods.htm>
- QSP73 Services:** <http://www.qsp73.demon.co.uk/main/software/index.html>
- Hamster's Radio Modification Database:** <http://hamster.ivey.uwo.ca/mods/>
- Old Time Radio:** <http://www.old-time.com/>
- QRP Internet Club Pages:** <http://qrp.cc.nd.edu/QRP-L/>
- Gadgets Line:** <http://www.gadgets-inc.com/scanner/mod.htm>
- Newsgroup:** <rec.radio.amateur.misc>

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

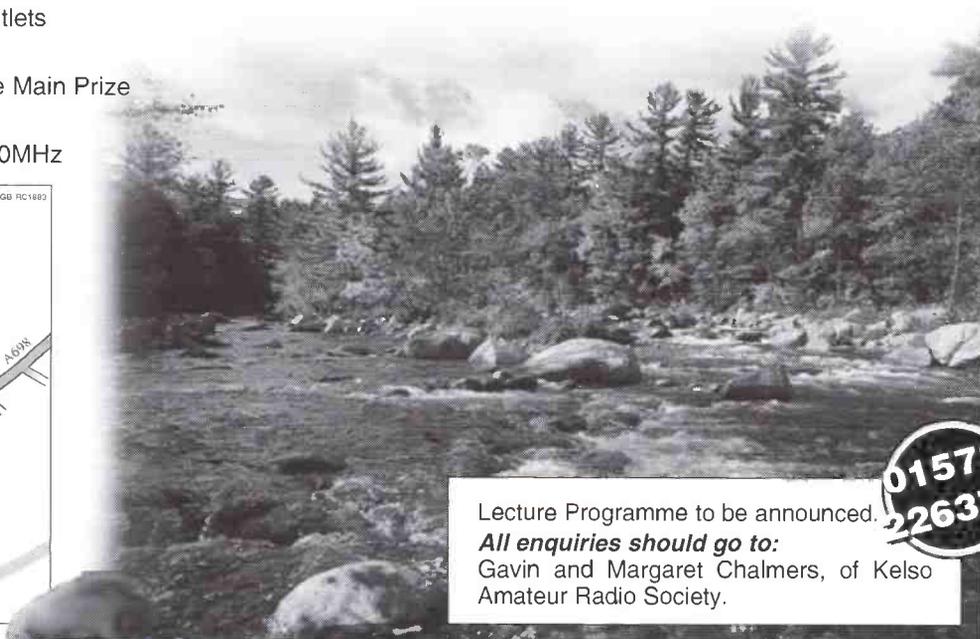
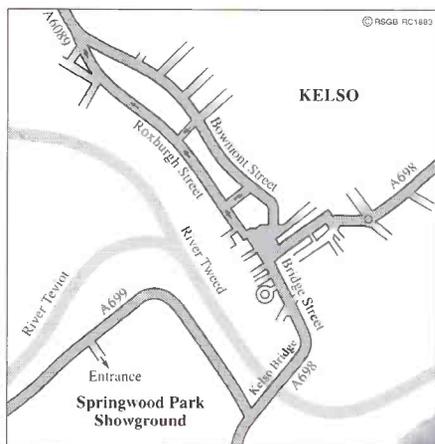
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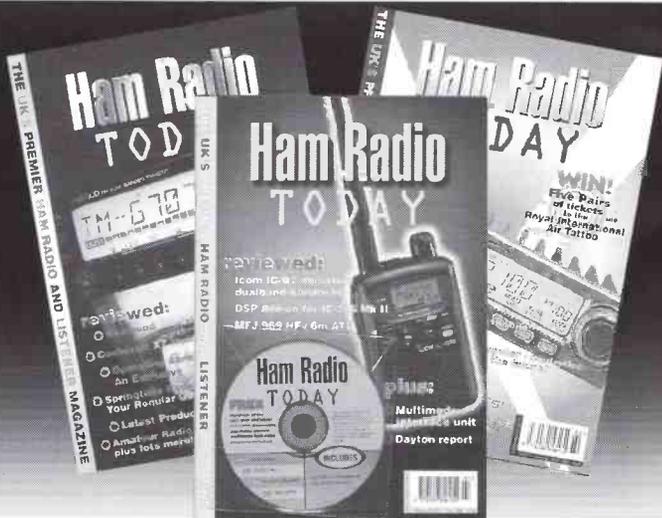
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All hobbies have their own jargon, and Amateur Radio is no exception. This new feature is designed to help beginners understand some of the terms and unusual 'Amateur Radio-ese' used in *Ham Radio Today*. We hope you find it useful.

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

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 (in most cases 50Ω).

Page 16 - All in a Day's Work. A G5RV antenna is a wire antenna designed by Louis Varney, G5RV. It is 102ft 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 lengthier decline. 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. Radial 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 Help Files

Ham Radio Today's guide for beginners to Amateur Radio

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 'leeway').

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 *impedance* as 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 51ft 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 - HF Happenings. **Solar flux** is a measure of the activity of the sun: the higher the figure, the greater the solar activity. A figure of around 65 is very low, over 200 is very high. The figure varies from day to day, but at present solar flux is averaging around 100. Solar activity rises and falls over an approximately 11-year

Radio contacts. DXpeditions often go to places from where there is otherwise very little or no activity, which is why the location is considered to be 'rare' in the first place.

Page 38 - 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 callsign (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 longer distance 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 (28MHz), and the 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 (the **downlink**). Whilst a terrestrial *repeater* will generally only retransmit a single frequency signal, satellite transponders usually translate a band of frequencies.

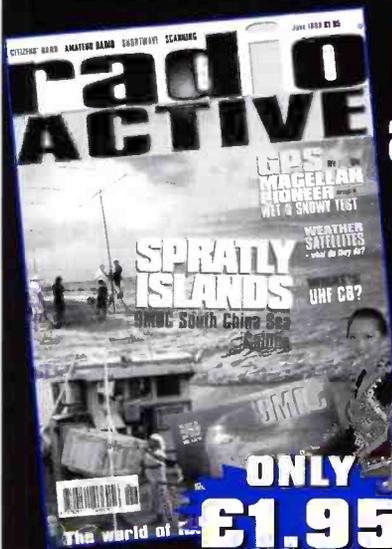
Telemetry is the name given to data signals which are transmitted from a satellite in order to report on its operating characteristics (battery voltages etc); or signals sent from earth to the satellite for control purposes.

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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To include your club in this section, please make sure you send us your events details in time: deadline for November issue is 10 September, for December: 9 October; January 1999: 10 November. We only list active clubs, ie those who send us their diary of planned talks / events. Send your club event details to: The Editor, Ham Radio Today (Club News), RSGB Publications, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE; fax: 01707 645105.

Aberdeen ARS

Meets Fris. 7 Aug junk sale. 14 Aug magazine binding, Findlay Baxter, GM3VEY. Details from Robert Duncan: 01224 896142.

Appledore & DARC

7.30pm 3rd Mon of month at the Appledore Football Club room. 17 Aug astronomy. 21 Sep beekeeping. Brian Jewell, 01237 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, G8BQH. 16 Sep discussion evening. Secretary Gerry, G7VJV: 01296 432234.

Barking Radio & Electronics Society

7.00pm Thus at Westbury Centre, Ripple Road, Barking, Essex. RAE

Rally review. 23 Sep 'foxhunt', Fred, G7LPP. 30 Sep club forum. Jean Fletcher, G0AWX: 01275 834282 (24hr answerphone).

Bromley & DARS

7.30 for 8.00pm on 3rd Tue of month, at Victory Social Club, Kechill Gardens, Hayes, Kent. 18 Aug barbecue. 15 Sep construction competition. Alan Messenger, G0TLK: 0181 777 0420; e-mail: alangm@clara.net

Bromsgrove ARS

8.00pm on 2nd & 4th Tue of month at Lickey End Social Club, Alcester Rd, Burscot, Bromsgrove. 11 Aug barbecue. 25 Aug mobile DF. 8 Sep discussion, awards. A Malcolm, G8DEC: 01527 875573.

Bromsgrove & DARC

7.30pm Weds & Fris at Avoncraft Arts Centre, Bromsgrove. Weds

'foxhunt'. Details: 01223 872258. Web site: <http://peach.cam-orl.co.uk/cdarweb/>

Cardiff RSGB Group

2nd Mon of month. 10 Aug aerial debate. 14 Sep 'Hamcom', Bill Turner, GW6MNC. David Thomas, GW3RWX: 01222 620939.

Chelmsford ARS

1st Tue of month. 1 Sep amateur satellites, Pat Gowen, G3IOR. Charles Shelton, G0GJS: 01245 256654.

Cheltenham ARA

7.45 for 8.00pm on 1st Fri of month at Prestbury Library, The Burgage, Prestbury, Cheltenham. 7 Aug Rob Mannion, G3XFD, Editor *Practical Wireless*. 4 Sep Spratly Islands DXpedition, John Linford, G3WGV. Details from the Secretary, Mrs Patricia Thom,

City of London ARS

RAE and Morse courses commence in Sep in Elephant & Castle area. For details contact Tony Hern, G1UFX, 0171 928 3481, e-mail: g1ufx@mccmail.com; or packet: G7UZU @ GB7HSN

Cockenzie & Port Seton ARC

has 'normal club nights' on first Fri of month at the Thorntree Inn, High Street, Cockenzie, from 1900 'till late'. 14 Aug annual junk night at community centre, South Seton Park, Port Seton, East Lothian. Bob Glasgow: 01875 811723.

Cornish RAC

7.30pm on 1st Thu of month at Perranwell Village Hall, near Truro. 6 Aug practical antenna design. 3 Sep DXing - where do I start?, Robin, G0MYR. Robin Worsley, G0MYR: 01209 820118.

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course commences Mon 14 Sep - enrol on 3 or 10 Sep. Course details from Bill Chewter, 0181 478 4785. Sec Harry Coots, G7WJE: 01708 746731.

Braintree & DARS

8.00pm 1st & 3rd Mons. No details of August or September meetings received. Details from Keith, 2E0ARS, 01376 347736.

Bristol (RSGB) 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, G3TKF: 01225 420442; e-mail: robin@g3tkf.demon.co.uk

Bristol (South) ARC

7.30pm Weds at Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol. 12 Aug HF workshop, Doug, G3KUL. 19 Aug BC repeater group, GW8ERA. 26 Aug 160m evening. 2 Sep Bristol Rally preparation, Muriel, G4YZR. 9 Sep 10m activity. 16 Sep Bristol

are construction & operating nights, Fris club meetings. RAE / NRAE / Morse courses start in Sept. John Burford, G4OAZ, 01527 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: bbrc@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@g8eap.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, G4IHO: 01298 25506; G4IHO @ GB7DAD

Cambridge & DARC

7 Aug SHF, Dave, G6KWA. 21 Aug project evening. 28 Aug 2m

G1NKS: 01242 241099 (9.00am 9.00pm); e-mail: g1nks@g3nks.demon.co.uk

Chesham & DARS

8.15pm Wed at The White Hill Centre, Chesham. 12 Aug members' memoirs. 19 Aug forum night. 26 Aug computer logging, M1BWT & M1BFL. P Blakeney, G8BLB: 01494 784811.

Cheshunt & DARC

8.00pm Weds at the Church Room, Church Lane, Wormley, Herts. 12 Aug portable on Baas Hill Common. 19 Aug members' forum. 26 Aug open. 2 Sep night on air. 9 Sep 9MOC Spratly DXpedition, Steve Telenius-Lowe, G4JVG. 16 Sep members' forum. 23 Sep open. 30 Sep natter night. Details John Crabbe, G3WFM, 47 Torrington Dr, Potters Bar EN6 5HU or at GB7HSN.

Chester & DARS

8.00pm 1st, 3rd & 4th Tues (but no meetings in Aug). 8 Sep Titanic, G Robins. 15 Sep surplus equipment sale. 22 Sep video night. 29 Sep in memory. Nils Foster, G0ONQ, 01244 347930.

Coulsdon ATS

7.45pm on 2nd Mon of month at St Swithun's Church Hall, Grovelands Road, Purley. 10 Aug barbecue at G4RWW & G6LX. 14 Sep JL Baird 30-line TV, Jon Weller, G0GNA. Alan Bartle, G6HC: 0181 684 0610.

Coventry ARS

8.00pm Fris 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 portable 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

Denby Dale (Pie Hall) ARS

8.00pm Weds at the Pie Hall, Denby Dale. 2 Sep talk on portable operation, Gerald, G3SDY. Tony, G4LLZ, 01484 664360.

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 556878.

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: 01304 821007.

Dragon ARC

7.30pm 1st & 3rd Mons of month at Ebenezer Hall, Foel Graig Lane, Higher Village, Llanfairpwll. 17 Aug QE2, Phillip Marriott. 7 Sep visit police HQ. Tony Rees, GW0FMQ: 01248 600963.

Dunstable Downs Radio Club

8.00pm Fris at Chews House, 77 High Street South, Dunstable, Beds. 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 Moose International Centre, Blackboy Road, Exeter. 3rd Mon is committee / open meeting. 10 Aug visit to Stockland Hill transmitter. 14 Sep lifeboat visit. Theo, G3EQM: 01392 875498.

Felixstowe & DARS

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

Gloucester AR&ES

Mons. 24 Aug RF bridges workshop. Details: 01452 618930 office hours.

Goole R&ES

7.30pm Fris at West Park Pavilion, Goole. 7 Aug on air. 14 Aug history of GRES. 21 Aug contest debrief. 4 Sep on air. 11 Sep junk sale. 18 Sep AGM. G6YYN: 01757 638539.

Guildford & DRS

14 Aug SOS satellites, D Carter. 28 Aug car boot sale. T W Dabbs, G7JYQ, 0181 399 5125.

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 Swain, G0FYX: 01705 472846.

Hornsea ARC

19 Aug museum pieces, G4IGY. 26 Aug Howes kits, G0DEB. 2 Sep field day preparation. 9 Sep 2m 'foxhunt'. 16 Sep committee meeting. 23 Sep 'activity'. 30 Sep ATV, G3RMX. No details of venue given. Contact secretary J R Thompson, G0TPS, 01964 562258 for details.

Horsham ARC

8.00pm on 1st Thu of month at Guide Hall, Denne Road, Horsham, West Sussex. 6 Aug debate, control access to HF. 3 Sep maritime mobile operation, G4FRN. David Miller, G4JHI: 01403 252101, or e-mail: g4jhi@dmliller2.force9.co.uk; Internet: http://www2.prestel.co.uk/jelley/harc

Ipswich Radio Club

Meets Weds: 5, 19, 26 Aug Otley operational evening. Iain, G0OZS, 01206 396419.

Lincoln Short Wave Club

7.45pm Weds at Railway Sports & Social Club, Ropewalk, Lincoln. 19 Aug video 'Getting Started in Amateur Satellites'. John, G1TSL, 01522 793751.

Liverpool & DARS

8.30pm Tues at Churchill Club, Church Road, Wavertree, Liverpool. 11 Aug night on air. 18 Aug stub matching, G8DEY. 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, G4WWX: 0151 722 1178.

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 microprocessors, Barry, G0LCU. 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 218259.

Loughton & DARS

11 Sep testing PCBs, John,

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(venue TBA). Paul McVay, G7TSJ: 01582 861936.

Eastbourne area (new club)

8.00pm 2nd Mon at Red Lion Public House, Wish Street, Willingdon, Eastbourne. 10 Aug inaugural meeting. Stuart Constable, M1BWU, 01435 863020.

East Cleveland ARC

7.00pm Fris at Jubilee Hall, Gurney St, New Marske. Novice class starts Sep. No club meetings in Aug. 4 Sep NRAE enrolment. 11 Sep classic receivers on air. 18 Sep components' symbols. 25 Sep soldering. Alistair, G4OLK, 01642 475671.

Echelford ARS

2nd & 4th Thu meets in Ashford, Surrey. 13 Aug Lithuania, Steve Wilkins, G0NIF. 27 Aug charging batteries, Ed Gowler. Details: 01784 456513.

Edgware & DRS

8.00pm 2nd & 4th Thus at Watling Community Centre, 145 Orange Hill Rd, Burnt Oak, Edgware. 13 Aug no meeting. 27 Aug SSB field day briefing. Julian, G4ZOD: 0181 958 6178.

Halifax & DARS

7.30pm on 3rd Tue of month at Tap & Spile Pub, Wards End, Halifax, for committee & Morse tuition. 18 Aug junk sale. 21 Sep AGM. D Moss, G0DLM: 01422 202306.

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 @ GB7CYM.

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 812350.

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

Keighley ARS

8.00pm Thus at Ingrow Cricket Club, Hainworth Rd, Ingrow, Keighley. 1st Thu is on air night, except where shown. 13 Aug video. 20 Aug air traffic control. 27 Aug RTTY on air night. 10 Sep visit to brewery. 17 Sep inter-club quiz. 24 Sep QRP, Rev George Dobbs. Ann, M0BLZ: 01274 499733.

Leicester Radio Society

Mons. 17 Aug junk sale. 24 Aug history of radar, Bob James. 31 Aug Bank holiday. 7 Sep Rob Mannion, editor Practical Wireless. 14 Sep pre-Leicester Show meet. 21 Sep quarterly progress, Leicester Show discussion. 'On air' nights are held on Mons not shown above. John Alexander, G7GCK: 0116 231 3194.

Leiston ARC

7.30pm Leiston Town Athletic Association, Victory Rd, Leiston. 1 Sep computers in Amateur Radio, Andrew Nunn, G8AXO, Richard Tyler, G0CFB. John Rabson, G3PAI: 01394 460298; fax: 01394 420795; e-mail: word.factory@zetnet.co.uk

G8DZH. 25 Sep HF night on air. 9 Oct quiz at Silverthorn club (TBC). Marc Litchman, G0TOC, 0181 281 0886 (evenings); g0toc@ndirect.co.uk

Louth & DARC

8.00pm 1st Wed of month at Woodman PH, Eastgate, Louth, Lincs. 2 Sep meteor scatter, Derek Brown, G8ECI. Roger Wilson, G4IPE: 01507 602220; e-mail: g4irc@lincom.demon.co.uk

Maidstone ARC

holds Morse tuition Tues and Fris and Novice classes Weds, plus: 9, 15 Sep: dummy Morse tests. 19 Sep RSGB Morse test. Mike Grainger, G0VQB: 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: DHobro@aol.com

Mansfield ARS

7.30 for 8.00pm 2nd & 4th Mons

of month at Debdale Sports & Recreation Club, Debdale Ln, Mansfield Woodhouse. Sat / Sun 8 / 9 Aug special event station GB4ASH at Ashfield Show, Sutton Lawns, Sutton-in-Ashfield, Notts. 10 Aug shack construction. 24 Aug 'foxhunt' & BBQ. 14 Sep talk by Paul Clarke, G7WKH. 28 Sep shack construction. Angela, G1DZH, 01623 429218.

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 Fris. 7 Aug on air. 14 Aug quiz. 21 Aug VHF on air. 28 Aug Working with VHF, Derek, G3GRO. 4 Sep Resistors, Tony, G3NPF. 11 Sep junk sale. 18 Sep PW, Rob Mannion, G3XFD. Philip Baldwin, G3LCE, 01273 557878.

preparation. 20 Aug Harewood special event planning. 3 Sep surprise speaker. 10 Sep rally planning. 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 Bouisand underwater centre. 1 Sep Devon air ambulance. Den Perryman, G7NMA: 01752 346158 (before 9.00pm).

Poldhu ARC

7.30pm 2nd Tue of month. 11 Aug operating practices & procedures, David, G3PLE. 8 Sep barbecue & antenna kite flying. David Barlow, G3PLE: 01326 240738.

Reading & DARC

8.00pm 2nd & 4th Thus at the Pavilion, Woodford Park, Woodley, Reading. 13 Aug frequency synthesisers, Ian Poole. Chris Nunn, G0MZN: 0118 987 4870.

Salisbury ARC

2nd & 4th Tues. 11 Aug BBQ. 25

Centre, South Normanton, Derbyshire. Novice course starts 7 Sep. 10 Aug antenna maintenance. 17 Aug locator squares, Russell Bradley, G0OKD. 27 Aug talk by Rob Mannion in the New Village Hall, rear of the Council Offices. 31 Aug no meeting. 7 Sep junk sale. 14 Sep night on air. 21 Sep natter night. 28 Sep night on air. Russell Bradley, G0OKD, 01773 863892.

South Notts ARC

7.00pm Weds at Fairham Community College, Farnborough Rd, Clifton, Nottingham. 5 Aug foxhunt. 12, 19, 26 Aug, 2 Sep - no meetings. 9 Sep antenna work. Vice Chairman tel: 01509 672846.

Stevenage & DARS

7.15pm Tues at the Day Centre, Chells Way, Stevenage. No meetings in August. 1 Sep welcome back. 8 Sep QRP, Bob G4ARL. 15 Sep vintage radio (bring an old radio). 22 Sep HF operating 40m. 29 Sep video. Peter Bell, 2E1CRK: 01462 674505.

Stourbridge & DARS

8.00pm on 1st & 3rd Mon of month (except Bank Holidays & no meetings in Aug), at the Radio

becue. 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 / Frome road. 19 Aug open meeting. 2 Sep talk by G0DAB. Ian Carter, G0GRI: 01225 864698 (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 & DRS

8.00pm Tues at Community Centre, Prospect Road, Ossett, West Yorks. 11 Aug talk by Ian, M0BFO. 18 Aug talk by John, G0MVA. 25 Aug on air. 1 Sep contest preparation. 8 Sep contest debrief. 15 Sep what to do for the Millennium. 22 Sep APRS demo, Dave, G0DJA. 29 Sep on air. Ian Roberts, M0BFO, 01924 216502.

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Moray Firth ARS

RAE and Novice RAE courses available. Geoff Crowley, GM7SJC, 01542 882818.

Newbury & DARS

7.30pm on 4th Wed of month at Memorial Hall, Upper Bucklebury, near Newbury. 15 Aug Skittles vs Basingstoke ARC. 26 Aug no meeting. 23 Sep 9MOC Spratly DXpedition, G3WGV, G3XTT & G0OPB. Ian Trusson, G3RVM, 01635 826019, g3rvm@compuserve.com

Norfolk ARC

7.00 for 8.00pm Weds at Ugly 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, G0TWW, inc free buffet. Hon Sec, Sandra Simpson, 2E1FOF.

North Wakefield RC

8.00pm Thus at East Ardsley Cricket Club, Wakefield. 6 Aug on air, QSL checking. 13 Aug rally

Aug cable TV & fibre optics, Bob, G0WYD. 5 Sep annual club open day. 8 Sep 2m SSB operating. 22 Sep surplus equipment sale. E J Donaghy, G7WAA, 01722 334935.

Saltash & DARC

Normally 1st & 3rd Fris 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 RC

Fris. 7 Aug shack progress. 14 Aug FT-847 reviewed. 21 Aug 50th anniversary. 28 Aug Amateur Radio for disabled, G0BJK. G E Spark, G7FQY: 0161 969 1964.

South Normanton & DARC

7.30pm Mons (exc Bank Holidays) at New Street Community

Shack, Oldswinford Hospital, Heath Lane, Stourbridge. 7 Sep on air. Gordon Bryant, G0TZV: 01384 395206.

Stroud RS

7.30pm alternate Weds at Minchinhampton Youth Club, nr Stroud, Glos. 2 Sep video. Stuart, G0GNM: 01453 752411; e-mail: stuart.g0gnm@gifford.co.uk

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 the air. No contact details provided.

Torbay ARS

7.30pm Fris at ECC Social Club, Highweek, Newton Abbot. Informal meetings most Fris & talk / event once a month. 21 Aug bar-

Weston-Super-Mare RS

7.30 for 8.00pm 1st & 3rd Mon at Woodspring Inn, High St, Worle, Weston-super-Mare. 7 Sep data modes, Dave Dyer, G4CXQ. 21 Sep workshop evening. Graham Winder, G8WAR, tel: 01934 415700.

West Somerset ARC

7.30pm 1st Tue of month in Room GB7, Gibbs Block, West Somerset Community College, Minehead, Somerset. 4 Aug talk on use of Amateur Radio. 1 Sep bring & buy. Alan Elliott, M0AOJ: 01643 707207.

Wimbledon & DARS

2nd & last Fri of month at St Andrews Church Hall, Herbert Rd, Wimbledon SW19. 11 Sep computer forum. J Gale, G4WYJ: 01737 356745.

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 VK0IR Heard Island video. 16 Sep D&W. 23 Sep sur-

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

Wirral ARS

8.00pm at Club Room, Ivy Farm, Arrowe Park Road, Birkinhead, opposite Landican Cemetery. Activity nights 1st & 3rd Weds; 'natter nights' Tues from 7.30pm; Morse tuition Thurs. 16 Sep surplus equipment sale. Arthur Aspinall, 0151 678 8956, GONDM @ GB7OAR.#16. GBR.EU

Wolverhampton ARS

8.15pm Tues at Wolverhampton Electricity Sports and Social Club. 11 Aug video, Geoff, G3GZK. 18 Aug natter night. 25 Aug social. 1 Sep committee meeting. 8 Sep FT-101 talk, Mike, G4BTE. 15 Sep social. 22 Sep quiz, G3JKX. 29 Sep computers, Chris, G7JIN. Joy Smith: 01902 751936.

Worthing & DARC

19 Aug BBQ. 26 Aug DF hunt. G4GPX: 01903 753893.

Yarmouth RC

7.30 for 8.00pm Fris exc no meeting 1st Fri of month, at Bradwell

G0DXB, 14 Farquahar Road, Maltby, Rotherham, S.Yorks S66 7PD, tel: 01709 814010 (Tues, Thurs & Fri, 7.00pm to 9.00pm. Sat/Sun before 9.00pm), or via GB7WRG. Internet: http://www.bartg.demon.co.uk

British Amateur Television Club (BATC)

produces a quarterly magazine, *CQ-TV*, and holds its own rally each year. BATC has an Internet site at <http://www.batc.org.uk> For details contact: Dave Lawton, GOANO, 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 prospectus and further details please contact the Secretary, Barry Cooper, G4RKO, 1 Strouds Meadow, Cold Ash, Newbury RG16 9PQ; e-mail: cooperb@g4rko.demon.co.uk

the yearly IRTS Callbook. They also have a video library. For further details of IRTS, contact Joe Ryan, EI7GY; tel: (Eire) 01 2854250 or by e-mail: jryan@iol.ie Book Sales: Dave Moore, EI4BZ, 12 Castle Ave, Carrigtwohill, Co Cork; tel: (Eire) 021 883555.

Radio Amateurs' Emergency Network

can be contacted at Hunters Moon, Newton-le-Willows, Bedale, N Yorks DL8 1SX. 24hr emergency national contact line: tel: 0141 621 2121; Raynet supplies enquiries: tel: 0141 620 1000; Training Team, PO Box 2, Chinnor, Oxon OX9 4SR; Packet BBS: GB7NRC; Telephone BBS: +44 (0) 1296 393737; Internet web site: <http://www.sgi.leeds.ac.uk/raynet/>; HF news net: Sun 0830 local, 3663kHz.

Radio Amateur Invalid and Blind Club (RAIBC)

is a registered charity which raises money for radio / computer equipment, and audio cassette courses for home study, for blind, deaf and disabled amateurs. The club attends rallies throughout the year,

including the booklet *How to Become a Radio Amateur*, and their *Novice Licence Information* sheet and can offer advice on many aspects of licensing. New Kings Beam House, 22 Upper Ground, London SE1 9SA. Amateur Radio line, tel: 0171 211 0160. General enquiries, tel: 0171 211 0211. Answerphone service, tel: 0171 211 0591.

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 QSLing, 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

This Month at the Clubs

ham radio today latest club news

Community Centre, Church Lane, Bradwell. 14 & 21 Aug SSB field day antenna construction. 28 Aug SSB field day preparation. 11 Sep operating & construction. 18 Sep CW fun evening. 25 Sep visit RAF Neatishead (tickets only). Tony Besford, G3NHU, 01493 721173.

Yeovil ARC

7.30pm Thus at the Red Cross Centre, Gove Avenue, Yeovil. 6 Aug DX crystal set, G7LNJ. 13 Aug noise temperature, G8AWB. 20 Aug 'a glance at yesterday's papers', G3CIO. 3 Sep practical fault diagnosis, G3TSK. Mike, G7SDD, tel: 01963 250594.

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, Rev G Dobbs, St Aiden's Vicarage, 498 Manchester Road, Rochdale, Lancs OL11 3HE; tel: 01706 31812 or see their web site at <http://www.btinternet.com/~g4wif/gqrp.htm>

International Short Wave League (ISWL)

who, as well as running an international QSL 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, Immingham DN40 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 Durlay Ave, Pinner, Middx HA5 1JH. Web site address: <http://www.gurney.co.uk/raibc>

Radio Amateur Relief Expeditions (RARE)

is a registered charity made up of radio amateurs and friends who take aid to Eastern Europe and organise summer camps for young people to learn about amateur radio, English language and life in the UK. New members are required to support this work both at home and by taking part in expeditions. Please contact: The Secretary, RARE, 1 Allfield Cottages, Condoval, Shrewsbury SY5 7AP; tel: 01743 873815; fax: 01743 874729; packet: G6FHM@GB7PMB; e-mail: rare@donsun.demon.co.uk

Radiocommunications Agency (RA)

is the licensing authority for all UK radio amateurs. They have a large number of free publications,

short wave listener with any enquiry. Address is: Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE; tel: 01707 659015; Internet site: <http://www.rsgb.org> and e-mail: info@rsgb.org

Subscription Services Ltd (SSL)

handles the issuing of amateur licences 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, or e-mail: admin@ukrs.org; Internet: <http://www.ukrs.org>

for sale

● **HEATHKIT SB-101.** Heathkit SB-610 oscilloscope. Heathkit SB-600 speaker, Heathkit HP-23 power supply, vgc, no mic, pwo, unknown value: open to offers. Buyer collects or pays postage. Complete line up. Tel: 01383 831713 and leave message. May swap: WHY? (Glenrothes, Fife).

● **VERSATOWER BASE** plate P60 £400. FT-5200 £250. TS-930S cascaded 400Hz filters £650. Ameritron AL-811 new, unused £500. FT-1000MP three extra CW filters £1700. Part built amp pair 4-400 160 - 10 offers. Ham 4 rotor £150. Tel: 01691 831111 (Oswestry).

● **FT-980 £500** ono. FT-230R £175 ono. FT-208 £95 ono. VC-300DLP £110 ono. MFJ LPF £15. USA and International Callbook CD-ROM £30. brand new. All boxed, manuals etc, plus P&P. Contact Steve tel: 01482 795646 (Hull).

● **YAESU FT-900AT** as new, one careful lady owner, £650. Sue, tel: 01793 770916 evenings (Swindon).

● **SANGEAN ATS** 803A radio. SW. MW. LW. FM. SSB, with accessories. Boxed, as new. £60. Tel: 0141 632 5408 (Glasgow).

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● **MVT-7000 SCANNER** for sale with manual. case, 200 channels. £100. Contact Darren, tel: 0181 245 4779 (Middx).

● **SICK AMATEUR** selling up equipment. STD C528 dual h/held £200. R11 text rx £250. AOR-8000 receiver £260. Watson Hunter counter £45. Jim M75 pre-amp £50. Opti Techtoyz mini counter £40. All working. Will swap for Opti Explorer. Tel: 01473 785203.

● **ONE HEATHKIT** 2.4kHz filter for SB-200 plus all xtals for HF bands. Filter is 3.395kHz. Bill, GM3ZTA, tel: 01389 891276 (Glasgow).

● **YAESU FT-650** £400. FT-One S-meter not working £350. FT-77 £200. FT-726 2m HF £350. FT-201 old £150. Kenwood TS-530 £300. Call Colin, GOVDL, tel: 01375 384179 (Greys, Essex).

● **YAESU FT-23R** handheld, tone squelch, charger, dry pack, s/mic, new 12V battery £100. Two 2m BNOS linears with pre-amps, 100W out. £98 each. PSU 20A £20. RS SWR / power meter £30. Yaesu mag-mount aerial unused £20. Tel: 0181 397 7823 (Surrey).

● **YAESU FT-102** all filters, AM / FM fitted, with mic, boxed, £300. Martin, tel: 01245 266728 (Chelmsford).

● **TANDY PRO2006** scanner 25 - 1300MHz, pristine condition, one owner from new, no mods, boxed with manual £150. Yaesu G-250 rotator for small beam ants. with cables £40. Tel: 01925 821414 (Warrington).

● **FOR SALE AR88** receiver with speaker, manual £35. KW-1000 amp as new £350. Bob Richardson, G3WRD, Common Crest, Drapery Common, Glemsford, Suffolk CO10 7RW; tel: 01787 280259.

● **YAESU FL-DX400** and FR-500 transmitter and receiver, manuals, gwo. £150. Racal RA-17L £100. Scanner Pro2035 £180. G3ZEH tel: 01502 560869 (Lowestoft).

● **ALINCO DJ-580** with batteries, charger and manual £130. Kenwood TS-850S ex cond £750. Kenwood TS-690S £750. Capco ATU £70. Vectronics ATU £70. Colyn, tel: 01624 801592 (IOM).

● **COMPLETE STATION.** going QRT: Kenwood TR-9130, Icom IC-4GE, Yaesu FRG-7700, Baycom BP2 c/w s/ware, aerials, books, accessories. all for £600 ono, or will split. Buyer collects. Tel: Barry 01797 270651 after 6.00pm or G1VZT @ GB7RMS (Kent).

● **THOUSANDS OF IRCs** for sale, 50p each plus SASE. All proceeds go to the 9MOC DXpedition fund. Please make cheques payable to P A and J R Whitchurch, G3SWH, 21 Dickensons Grove, Congresbury, Bristol BS49 5HQ.

VFO, FTV-700 transceiver with 4m module for 6m HP tcvr or HF + 6m tcvr. G4XPP QTHR, tel: 01388 747018 (Co Durham).

* **JUPIERT ACE**, fourth computer, wanted in nearly any condition. Peter Liebert, DK4BF, Luetzow str 3, D-38102 Braunschweig, Germany, e-mail: p.liebert@t-online.de

* **ALINCO DJ-G1E** 12 volt battery wanted. Would consider one with dead nicads. Dave, tel: 0141 632 5408 (Glasgow).

* **WANTED POWER** supply for Collins TCS-12 tx. 'Homebrew'. WHY? 200V DC @ 1 amp, 400 + @ 1 amp. Peter, G4VUN, tel: 01287 634397 (9am - 4pm) works QTH: will ring you back.

* **WANTED HRO** 500TS speaker cabinet and LF-10 pre-selector and original service manual or circuit for HRO 500 SW rx plus any spares etc. Tel: 0121 602 5439 (West Midlands).

* **ICOM BP4** battery cases empty for KTS for six AA cells, two required. Tel: 0121 742 2920 (Solihull).

help needed

◆ **HAVE M/S**, housebound, would like to ask if anybody has an FT-101ZD for sale and also if there is somebody out there in the Hastings area that could teach me the RAE exam. Thank you. No time wasters please. Tel: 0441 195902.

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September 1998

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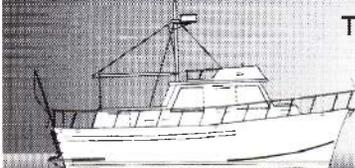
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 - AM: A3E Low-level (early stage)
 - FM: F3E Variable reactance
 - FSK: J1D, J2D, F2D Audio frequency shift keying (external input), F1D Frequency shift keying (V/UHF: external input)
- Options:
 - FC-20 Automatic Antenna Tuning Unit (External)
 - FVS-1A Voice Synthesiser
 - ATAS-100 Active Tuning Antenna System

4 into 1 does go!

Technology moves inexorably onward, evolving, adapting, forever changing. At the same time, today's Radio Amateur puts even more demands upon designers to build quality, sophisticated, but easy to use stations for Voice, Packet, Satellite, CW, VHF, UHF, HF, just to mention a few. Yaesu's designers took on that challenge, and following in the footsteps of the revolutionary FT1000, FT1000MP and FT920 are now proud to offer today's Radio Amateur the station in a box - the all new FT-847!

The Yaesu FT-847 Ultra-Compact Satellite and All Mode Transceiver has jumped the technology with a transceiver ready for the new millennium. With it's high-tech design

and revolutionary features, the FT-847 is truly the one radio that can do it all! Massive band-width coverage from a single unit, the FT-847 has many features to keep it at the top of the evolutionary pile. These include crystal clear 100 watts on HF and 50MHz, a massive 50 watts on 2 meters and 70cms. Yaesu's effective DSP for bandpass, noise reduction and notch filter, and direct input of frequency on the supplied keypad. Silky smooth tuning with 0.1MHz tuning steps, Cross band and full duplex, CTCSS and DCS encode and decode built in. And for Satellite reception, normal and reverse tracking. A matching ATU (Automatic Antenna Tuning Unit) is also available as an option.

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...choice of the World's top DX'ers



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Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

FT-920

The highest performing HF/6 meter rig in its price class with Yaesu's renowned Omni-Glow™ display



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