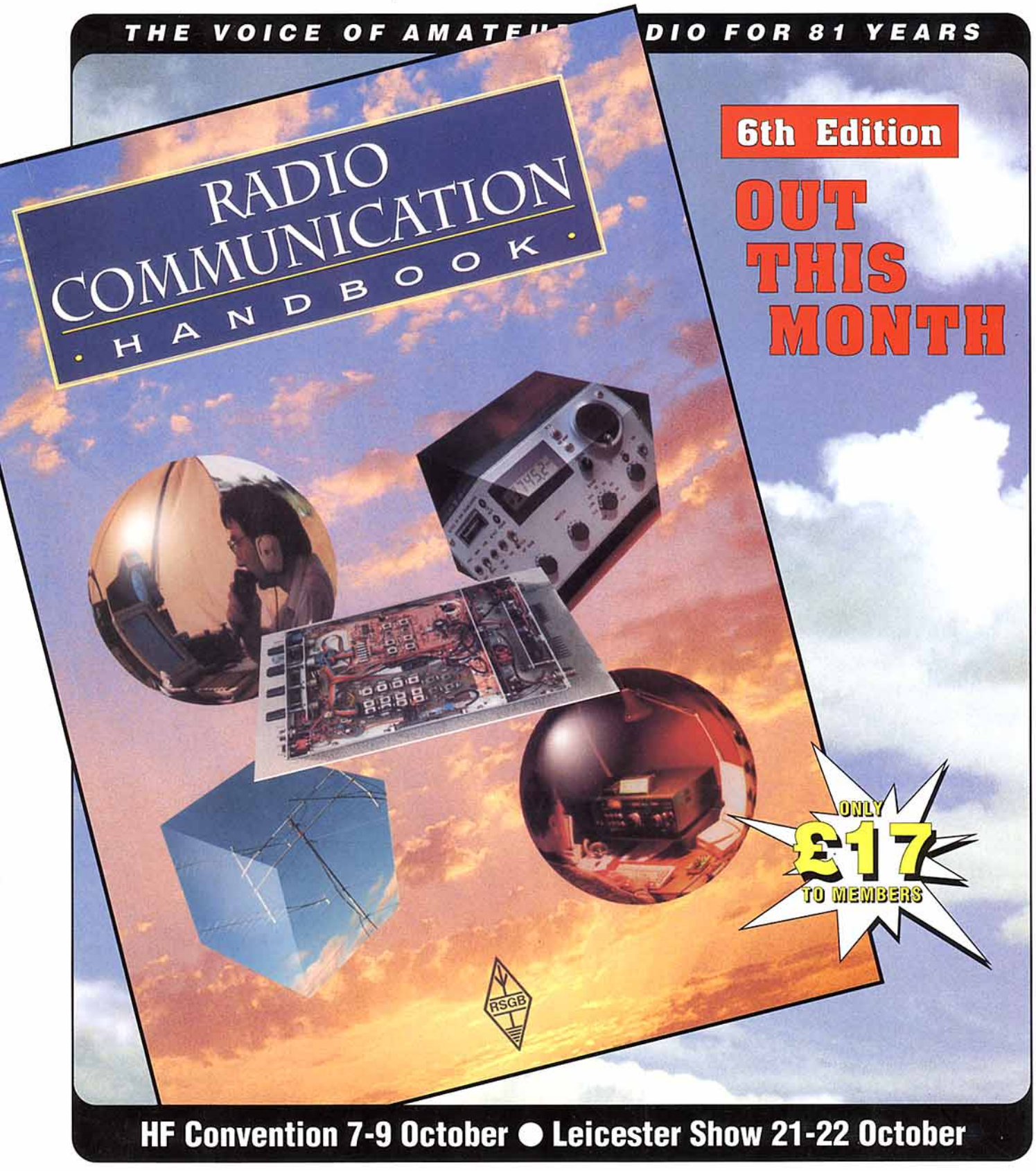
Radio Communication

The Journal of the Radio Society of Great Britain

October 1994

Volume 70 No 10

THE VOICE OF AMATEUR RADIO FOR 81 YEARS



HF Convention 7-9 October ● Leicester Show 21-22 October

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Radio Communication is published by the Radio Society of Great Britain as its official journal on the first day of the relevant month and is sent free and post paid to all members of the Society.

Closing date for contributions, unless otherwise notified, is five weeks prior to publication date.

Filmset by JJ Typographics Ltd, Southend, Essex.

Printed by Southernprint (Web Offset) Ltd, Poole, Dorset.

RSGB membership at 31 August 1994: 30,480

ISSN No: 0033-7803

Radio Communication

COVER PICTURE:
Yes, it's out this month,the long-awaited sixth edition of the Radio Communication Handbook.See page 95.

NEWS AND REPORTS

TECHNICAL FEATURES

REGULARS

REVIEWS

LEICESTER SHOW GUIDE

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS
Founded in 1913 incorporated 1926. Limited by guarantee
Member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the Membership Services Department from which full details of Society services may also be obtained.

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Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
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Corporate (Concessionary): £27.00 over 65 or full time student under 25. (Applications should provide proof of age at last renewal date and/or include evidence of student status.)
Affiliated club or society/registered group (UK): £16.00 (including *Radio Commmunication*). (Subscriptions include VAT where applicable.)

Special arrangements exist for blind and disabled persons. Details are available from RSGB HQ.

Membership application forms are available from RSGB HQ

RSGB Main Switchboard:
01707-659015

The RadCom Leader

Harmonics

FOR THE OLDER generation of radio amateur, the term 'harmonics' can freeze the blood. Harmonics were the bane of the amateur's life in trying to get them low enough in amplitude to not affect Band 1 TV; the amateur in the fringe area of Crystal Palace who could operate 21MHz SSB in the evening was something of a wizard!

In this respect, UK amateurs don't realise how fortunate they are in not having VHF TV to worry about these days. Nevertheless, the 50MHz band does have its second harmonic falling in the FM broadcast band and, especially with the recent relaxations in power on 50MHz, it behoves operators on this band to take steps to minimise harmonic radiation. Private Mobile Radio equipment with harmonics in Band 2 are allowed no more than 4 nanowatts of harmonic power – that's –84dBW, or –110dBc on a 400 watt PA! So a filter of some kind is really essential on a 50MHz PA if you aren't going to get the dreaded knock at the door. It is possible to achieve such levels – it was done in the 'good old days' – and to ensure the future of the 50MHz band, it needs to be done again. To start making sure *YOUR* transmission is clean, see page 56 this month.

Peter Chadwick, G3RZP
Chairman Licensing Advisory Committee

NOTICE BOARD

Twelve Hour Opening

WE ARE PLEASED TO ANNOUNCE a new membership service. The Society has now introduced a direct telephone line to enable you to place orders by credit card quickly with RSGB Sales. This new line has extended our sales opening hours from 8am to 8pm, Mondays to Fridays, and from 8am to 12 noon on Saturdays. The line is for book sales *only* but it is hoped to introduce further help lines in the near future. The new Credit Card Sales number is:

0956 70 73 73

Calls are charged at 'D' rate

NEWS & REPORTS

● STOLEN FROM Manchester, Alinco DJ-1SE S/N 0006860. This is the property of holidaymaker OK2VZE who had paid more than a month's wages for it two weeks previously. Any information please to Newton St Police Station, Manchester, quoting crime reference 0277985T/94.

● ACCORDING TO the newsletter of the Echelford ARS, the first G – ZL QSO took place 70 years ago this month, on 18 October 1924 between ZL4AA and G2SZ on 95 metres.

25 Sept Events Not Cancelled

DESPITE REPORTS to the contrary, the following events are very much alive and still scheduled for Sunday 25 September: The Three Counties Radio Rally, the North Wakefield Rally, the Harlow Rally and the SDX Cluster Support Group Junk Sale. Full details of these events can be found in September's *RadCom*.

Only one event is cancelled, the Peterborough Radio and Electronics Rally.

RLO Oxford

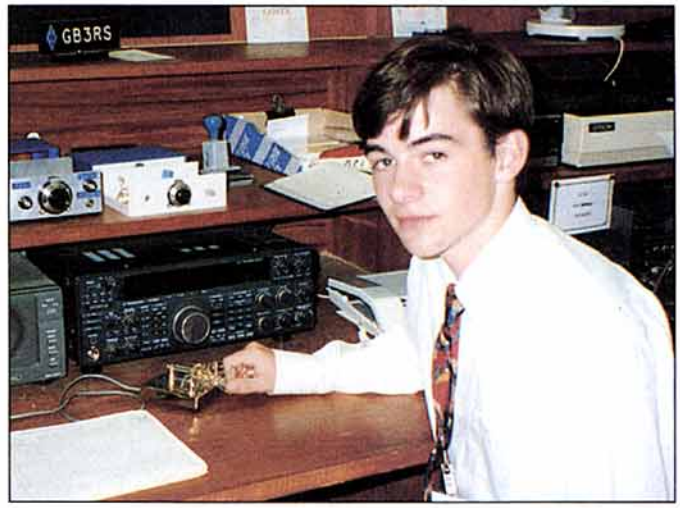
THERE IS a vacancy for an RSGB Liaison Officer in the Oxfordshire area. Any volunteer should contact the Zone D Council Member, Julian Gannaway, G3YGF, QTHR.

Robert financed his RAE by writing Novice RAE questions for City and Guilds.

Young Amateur of 1994

READERS OF *RADCOM*, and indeed several other radio publications, may well have heard of the 1994 Young Amateur of the Year Robert Aley, G7SRR. His activities as 2E1AXZ have been covered in *Novice News* (including more this month) and he's had a letter published in *The Last Word*. Seventeen-year-old Robert was chosen for the prestigious award by a panel comprising representatives from the RSGB and the Radiocommunications Agency.

Like last year's winner, Tim Munn, G7OTO/2E1AMX, Robert has put a huge amount back into amateur radio, despite having been licensed only two years. He has been an RSGB Novice Instructor since September '93 and, as a result of a talk he gave to the Kings Lynn Amateur Radio Club, he has recruited several more Instructors.



Young Amateur of the Year Robert Aley, G7SRR, visits the GB3HQ shack.

In July this year, he received his Full Licence having gained a Credit in Paper Two of the RAE, and he has already booked a date for his 12WPM Morse test. Interestingly, his examination fee was earned by writing questions for the Novice RAE, 30 of which were accepted by the City and Guilds.

Other activities have included running a special event station, designing his own QSL cards and helping the Amiga Amateur Radio User Group.

An active packet radio operator, Robert has written software for a Personal Mailbox System which, once fully tested, will be available freely to all.

The majority of YAOTY entrants over the years have been keen constructors and Robert is no exception. He has built: VHF/UHF aerials, an 80m SSB transceiver, a dummy load and power meter,

CONTINUED ON PAGE SIX

Runner-up Stephen Conner, GM0TET.

CONTINUED FROM PAGE FIVE

a field strength meter and a hands-free mobile microphone.

Runner up

THIS YEAR'S runner-up is Stephen Conner (16), GM0TET. He gained his Novice licence, 2M1ARO, in July 1992, converting a PMR set to get on 70cm. He passed the 12WPM Morse test in October of that year and, after fixing the club's faulty KW2000, was on the air with 2M0ADS. By December he had gained a double-distinction in the RAE and became GM0TET.

Stephen's activities have included operating the club station for most of a 6m contest, helping to teach a Novice course, helping with special event stations and repairing converted PMR radios for other club members.

On the construction side, Stephen has built and fixed his own packet radio modem, assembled a PC kit and designed and built an antenna tuner and two regulated PSUs.

Prizes

PRIZES DONATED by the RSGB, the RA and Industry (see April *RadCom*) will be presented to Robert and Stephen at a ceremony held at the RSGB HF Convention on 9 October.

RAE Courses

DETAILS OF many RAE and Morse courses were published in the July, August and September editions. In addition, Novice course information is available from RSGB HQ. The following late information has also been notified to us:

An **RAE** course is to be held at Southway Community College, Rockfield Avenue, Southway, **Plymouth**, on Thursday evenings commencing 29 September. For details contact the tutor Peter Thornhill, G6ZKQ, on 01364 43433.

Novice Instructors Needed

THE SOCIETY IS looking for more Novice Instructors to cover Wick and the East Highland area of Scotland. Anyone interested should call the Amateur Radio Department at RSGB HQ and ask for the booklet *Novice Licence Training Scheme*.

Hoddesdon Raise £500 for Animals

HODDESDON RADIO Club has raised money for a number of charities. This year, they were asked to participate in Fun Days organised as part of the 70th anniversary celebration of Wood Green Animal Shelters in Godmanchester, Cambridgeshire. Herts RLO John Rudd, G7OCI, and Mike Simkins, G7OBS, set up the station on 26 August with the help of Waters and Stanton Electronics who loaned an MFJ HF Magnetic Loop Antenna.

Members of the public were invited to take part in a 'Guess the Distance' competition to estimate the longest HF QSO made (under the poor conditions prevailing in August, the furthest contact was with Toronto). Conditions and activity on VHF were good, however, yielding contacts with north-west Scotland and Guernsey.

The GB1WAS/GB2WAS aerial farm. On the left is a wind generator used to power the Shelter, with surplus electricity being sold to the national grid.

Thousands of visitors had a chance to sample amateur radio, and the station received local newspaper coverage. Many local amateurs also came along, and the station was 'inspected' by the Director of the RIS.

The total amount raised for the Shelters is expected to top £500. Well done, Hoddesdon.

VHF Contests Committee

THE VHFCC Chairman Bryn Llewellyn, G4DEZ, is working for a while in Hong Kong. In his absense, the Vice-Chairman David Johnson, G4DHF, is responsible for all VHF Contest matters.

Write to him QTHR or phone on 01778 425367, 12.00 – 12.45pm and 5 – 7pm.

Photographs

The VHF Contests Committee is looking for new photographs and exhibition material of a wide range of contest installations, particularly modest set-ups including those used in the Backpackers contests.

Microwave Round Table

MARTLESHAM RADIO Society will be hosting another Microwave Round Table event at BT Laboratories, Ipswich, Suffolk, on Sunday 13 November. The event, which opens at 10am, includes round table sessions as well as test equipment and bring and buy facilities.

The provisional lecture programme includes talks on 10GHz rainscatter, and 24GHz and 47GHz activity. ON6UG will give an update on the 10GHz Phase 3D transponder.

For security reasons, all access is by advance booking only – please give the names of all persons attending in a group if you request multiple tickets. For tickets, send an SASE to Roy Smith, G0RRC, Lykkebo, The Street, Burstall, Ipswich, Suffolk IP8 3DN.

PHOTOGRAPH: SUSAN BATH

Top Band mobile operators pictured at Woburn: (l to r) Standing - G4NZE, G0NJS, G0MVE, G4ENB, G0OJB, G3NDS, G3OLB, G3NMZ, G4TRT, G3TZP, G3TAR, G3RCQ, G3JFH, G3GMN. Kneeling - Ben (G0MVE's jnr op), G3VMD, G4FPH, G4CBQ and G3XTZ.

University of Birmingham

EXISTING OR would-be amateurs attending the University of Birmingham are invited to visit the UOB Amateur Radio Society, either at the Freshers Fair on Sunday 2 October or any lunchtime during term. A good range of equipment is available for use. For more details contact: The Chairperson, Radio Society, The Guild of Students, Birmingham University, Edgbaston, Birmingham B15 2TU.

West Midlands RLO

TONY FAULKENER, G0SKG, RSGB Liaison Officer for the West Midlands, has a new telephone number: 01384 820616. RLOs hold a wide range of information and they are available to help any RSGB member in their county who is seeking advice.

● ALL FORMATS Computer Fairs are at Stoneleigh, Surbiton, Belfast, Washington, Glasgow, Haydock Park and Birmingham in October. Details 0608 662212.

Fund Raisers Ahoy!

OVER THE weekend 16/17 June, many clubs and individuals used GB calls from lifeboat stations. The aim was to raise money for the ongoing 25th anniversary appeal by the Worked All Britain group which aims to raise £10,000 to provide a Class D lifeboat for the Royal National Lifeboat Institution (RNLI).

GB2LHQ

One of these stations was run by Poole Radio Society which rose to the challenge when approached by the WAB Awards Manager. They could hardly refuse as Poole was the HQ of the RNLI.

Poole Radio Society Chairman David Mason, G3ZPR, said that every member of the society contributed towards the successful running of GB2LHQ. He commented: "It was a wonderful way to involve all club members, and to give those who do not operate very often, a chance to get on the air. It also gave many members their first experience of being on the end of a pile-up".

The station was also an introduction to HF for Natalie Doherty, 2E1CSF, operating under supervision. "Anyone who doubted the effectiveness of Novice licence training would have quickly changed their minds having watched and heard her operating", observed Phil Mayer, G0KKL, RSGB Senior Novice Instructor for Dorset.

GB0SHL

Another of the stations was run by Paul Crespel, GJ0NSG, a crew member of the St Helier Lifeboat. He worked from 7am to 5pm on the 17th, giving 260 people the opportunity to receive a QSL card depicting the Tyne Class lifeboat *Alexander Coutanche*.

Geoff Brown, GJ4ICD, visited the station and presented Coxswain Bob Vezier with an AVO 8 multimeter and a cheque.

Lifeboat Award

THE WAB Lifeboat Award is one of a number of projects undertaken to aid the fund-raising. To qualify, stations should have worked ten (five on VHF) of the special event stations active during July. Applicants should list the log data for the stations heard or worked, and send it, with a *minimum* donation of £3 towards the WAB Anniversary Appeal, to: The WAB Awards Manager, Keith Draycott, G3UQT, 28 Ladywood Road, Kirk Hallam, Ilkeston, Derbyshire DE7 4NE.

PHOTOGRAPH: G0JOD

Alan Butcher, G3FSN (foreground), and John Maunder, G0PKU, manning GB4ATC on behalf of the Air Training Corps at the 1994 Royal Tournament.

At St Helier Lifeboat Station: (l to r) Crew Member Paul Crespel, GJ0NSG; Geoff Brown, GJ4ICD; and Coxswain Bob Vezier.

JOTA '94

AS IN PREVIOUS years, the RSGB will be producing an information pack for UK groups participating in Jamboree on the Air which takes place this year on 15/16 October.

The pack will include a list of known participating stations and details of the countries which permit third-party Greetings Messages during the event. To ensure your group is on the list please send your GB call application to arrive at HQ **no later than 30 September**. Groups using a GX or similar club callsign should notify HQ as well.

If you would like to receive an information pack, please send an SASE (A4 size with 38p in stamps) *as soon as possible* to Fiorina Sinapi at RSGB HQ.

Jupiter Noise

BBC TELEVISION'S *The Sky at Night* reported in August that amateur observations of the radio noise from Jupiter have shown a correlation between noise at 20.4MHz and the impact of fragments of comet Shoemaker-Levy-9.

Dave Sumner, G3PVH, presented a paper on his own observations of Jupiter noise at the 1994 AMSAT-UK Colloquium. There is much additional data from amateurs which has yet to be fully analyzed. Watch this space!

● THE LATEST Callsigns issued by SSL at 10 August were in the G0VF, G7TQ, 20AI and 21DJ series.

VLF Link for Cave Station

MEMBERS OF The Central Lancs Amateur Radio Club used a VLF radio to connect themselves with GB4CRO 1000ft above them in what is claimed to be a World first.

Last year, GB4CRO was operated underground using 300ft of coax to the antenna on the surface. This year, with special permission from the RA, the group linked up an 87kHz Molephone (loaned by the Cave Rescue Organisation) to their HF station operated by less adventurous members above ground. The link used an interface built at Lancaster University where the Molephone was developed.

Not content with being heard on just two frequencies, the club managed to get BBC Radio Lancashire to broadcast live a contact between the cavers and the CLARC chairman.

Though not licensed to UK amateurs, there is increasing interest in operation at VLF which tends to go through the earth, rather than reflect off it. Australian and New Zealand amateurs have an allocation at about 180kHz and have made contacts up to a few hundred miles.

PHOTOGRAPH: G3YCC

Joan Heathershaw, G4CHH (RSGB President 1985 and 87), made a presentation to Percy, G4DC, on behalf of the Hornsea Amateur Radio Society. The occasion was a farewell evening organised by the North Ferriby ARS for Percy who has moved from East Yorkshire to Stonehouse, Gloucestershire, having been a member of both societies for a number of years. G4DC, a former member of the RSGB Council, was made an Honorary Member of the NFUARS. He hopes to be active from his new QTH in the near future.

HF Awards

CORRESPONDENCE IS still going to former RSGB HF Awards Managers. The current post holder is Fred Handscombe, G4BWP, QTHR.

Write for Beginners

D-i-Y RADIO, the RSGB's magazine for beginners of all ages, is seeking simple construction projects, particularly for data communications or for bands above 30MHz. Typical subjects might be: Practical applications of digital principles; Simple amateur band receivers; Simple 50MHz receiver; Simple 50MHz phone transmitter; Test equipment; PMR conversions; Getting started on microwaves; Slow-scan using software and Packet the easy way. All articles must have a strong practical element.

If you think you can contribute, send an outline of your article to the Editor Marcia Brimson, 2E1DAY, at RSGB Headquarters. To get an idea of the style needed, phone for a sample copy of *D-i-Y Radio*.

Double Paddle

GORDON, G4ZPY, and Brenda of ZPY Paddle Keys International were married on 26 July. The ceremony took place at sunset on the sea-shore of the Hawiian island of Oahu Eawaii. Doubtless, the thousands of amateurs who have met Gordon and Brenda at rallies will wish them well for the future.

To celebrate the event, three gold-plated micro-miniature pump keys have been manufactured: the first two will be worn as jewellery by the couple, but the third is offered to the first person to phone ZPY Keys and pay the £85 cost. The key will be accompanied by a certificate confirming it is one of only three made – a real collector's item.

Phoneday

LAST MONTH we brought you the news that telephone area code numbers will change from 16 April 1995. In fact, *both* the old and new numbers will work *now*. Thus you can call us on 0707 659015 *or* 01707 659015. If you have our number in a memory on your phone, fax or modem, change it *now*; don't wait for the old code to be discontinued next year.

Note, though, that the extra digit is added to area codes only, not to linkline, premium rate or mobile numbers.

Where possible, we will be using the new codes in *RadCom*, so don't panic if your club's contact number seems to have a spurious '1' in it – it really will work.

BARAC on the Ben

Members of the Bishop Auckland Radio Amateur Club rest at their base camp.

FOLLOWING THE success of last year's expedition to Sca Fell (*News & Reports*, November 93) the Bishop Auckland Radio Amateur Club thought they would try something bigger – Ben Nevis, the highest mountain in Britain.

Despite being mid-June, the weather was cold and wet, with gales and snow forecast for the summit. Though the climb was not particularly taxing, torrential rain made the task harder. The group members were thankful they had decided to leave the HF gear and generator at the Youth Hostel with the base station. Making the climb even more difficult were swollen waterfalls, sometimes knee-deep, which became torrents during the ascent.

By the time the party came within 200ft of the summit, the terrain had become featureless, icy, snow and they decided to turn back for reasons of safety with their object of setting up a station on the mountain defeated. To make things even worse radiant sunshine greeted them the following morning. Defeated, but not downcast, BARAC promised the smug-looking mountain: "We'll be back".

The venture was far from being an overall failure, though. It proved to be an excellent way of cementing relationships in the club, and nearly £1000 was raised for the children's ward at Bishop Auckland Hospital.

Portishead Memories

PORTISHEAD RADIO, BT's long-range maritime and aeronautical radio station (callsign GKA) is celebrating its 75th anniversary next year. Customer Services Radio Officer Larry Bennett, G4HLN, has been tasked with compiling a booklet of reminiscences and stories about Portishead.

Despite the advent of satellites, GKA is still in business, though the use of CW has been discontinued. Originally in Devizes, Wiltshire (and called GKT), the station moved in 1924 to its present receiving location at Highbridge, Somerset. The transmitters are operated remotely. Its aeronautical and 'Gateway' services provide a link from locations where normal telephone and telex lines are non-existent, and in times of war and famine Portishead can provide an essential life-saving link.

Anyone who has any stories or anecdotes involving Portishead since 1920 is asked to contact Larry at: BT Portishead Radio, Worston Road, Highbridge, Somerset TA9 3JY. Tel: 01278 772253; Fax 01278 772222; Telex 46441 BTGKA G.

Amateur Radio in the Media

DURING AUGUST, BBC Television repeated the children's programme *Why Don't You . . . ?*, in which Emma Constantine, 2E1BVJ, describes her enjoyment of amateur radio, both at home and at the school radio club.

Adverse publicity was provided by a story in a number of national newspapers and on BBC television concerning deliberate interference to an air traffic control station. The blame was attributed to an unspecified radio amateur. The RSGB responded rapidly by circulating a press release, expressing concern at the implied slur on all radio amateurs, and pointing out how amateur radio differed from the hobby of listening to aircraft. The BBC read out a correction the following day.

Meet the SUNPAC SysOps

SUNPAC, (the Southern Users Network Packet group) who promote packet radio activity in Hampshire, Dorset, Wiltshire, West Sussex and the Channel Islands, have a 'Meet the SysOps Morning' on Saturday, 15 October, 9am to 1pm. The venue is South Midlands Communications, Chandlers Ford, near Southampton, and admission is free.

Twenty-minute mini-lectures include: Optimising your packet station; TNC parameters – why change them?; Getting the most out of your local BBS; The hows and whys of DX Clusters; and What does a node do?

There will be demonstration stations and a chance to check your rig's deviation (bring along your radio *and* your TNC. Further details are available from Phil Bridges at Siskin Electronics on 01703 207155.

Emergency Call

ON WEDNESDAY 29 June Nigel Harrison, GM6XAC, was mobile on the A68, near Oxton in the Borders when he witnessed a tanker overturning and spilling some of its load of Formaldehyde. He used 2m SSB to call Mike Clarke, GM6OFO, in Perth and asked him to call the Police. The Perth Police contacted the Borders emergency services who were later reported by GM6XAC/M as having arrived on the scene. Congratulations to both of these stations on their quick thinking and prompt action.

Illegal Prefixes

STATIONS USING prefixes not allocated by the ITU should be regarded as pirates and it is therefore illegal to work them. IARU Region 1 has advised that the 1B prefix recently used from the 'Turkish Republic of Northern Cyprus' is not ITU allocated.

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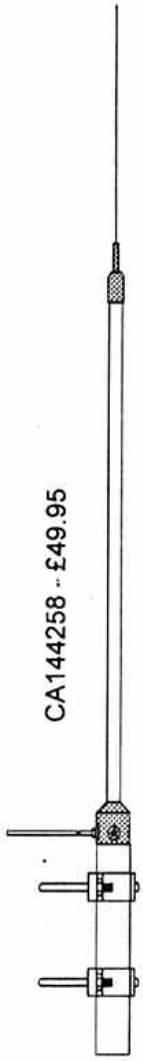

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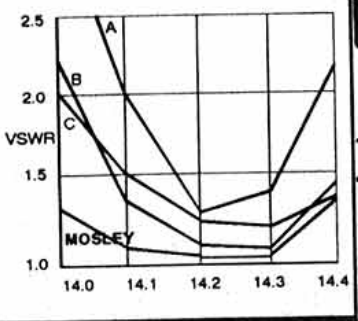

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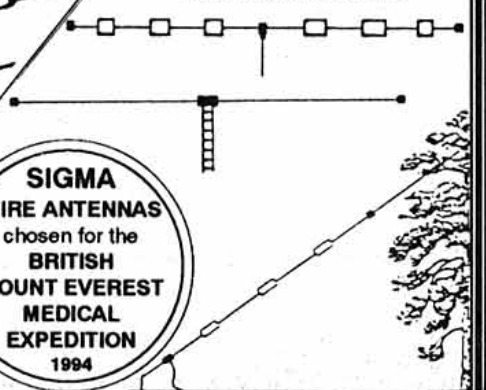

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THIS MONTH'S LEADING FEATURE

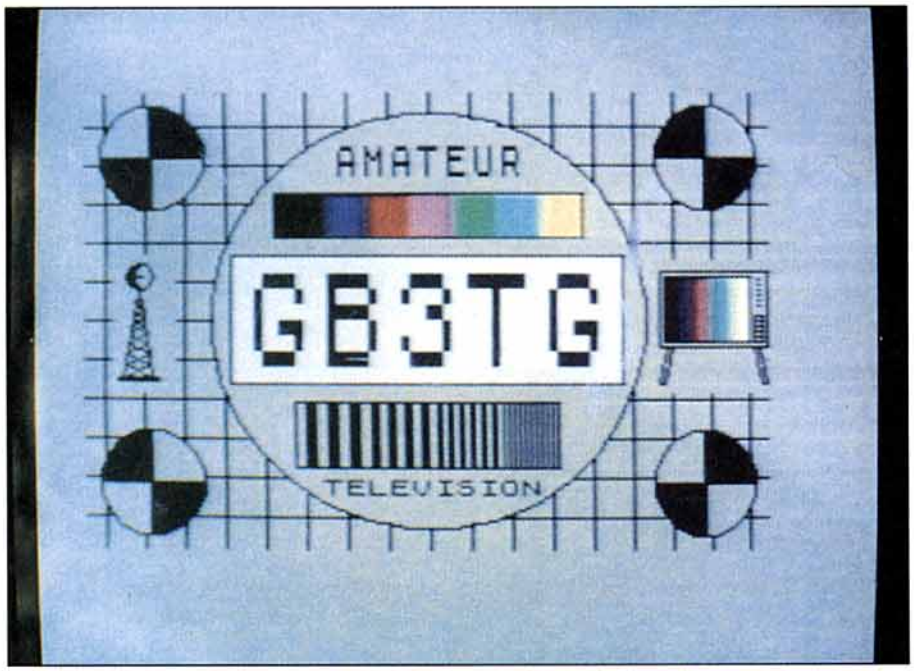
Getting Started on Microwave ATV

The first of a two part article by Dave McQue, G4NJU

MY REAL INTEREST in Amateur TV was aroused after a demonstration at my local club by G4MDU some eight years ago. I did have an early encounter with television way back in 1948 when I built a TV set using a 6 inch VCR517 radar tube and various bits from other wartime surplus radar sets. I later made a loft slot-antenna out of chicken netting to receive the BBC from Alexandra Palace.

At the time of the club demonstration GB3TV, the Dunstable Downs ARC's ATV repeater, had been in action for a year or so. However, now there are many amateur TV repeaters on the 23 and 3cm bands – most of which radiate pictures continuously in 'Beacon mode' when not repeating.

There is still ATV activity on the 70cm band using AM double sideband but this is naturally restricted to simplex operation with monochrome pictures using the ATV talkback frequency, 144.75MHz, for sound.



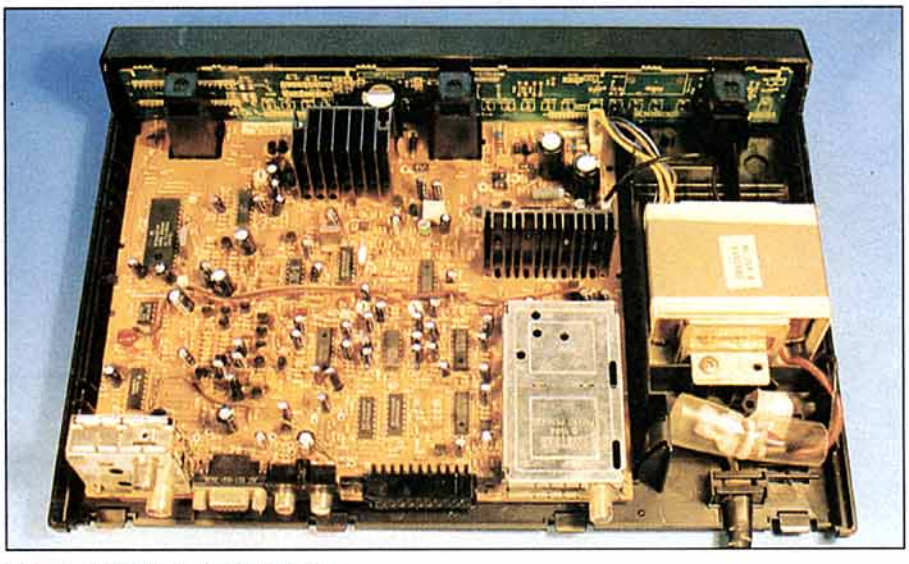
Television test card transmitted from GB3TV.

THE 23CM BAND

ON 23CM GB3TV TRANSMITS on 1318MHz whilst receiving on 1249MHz. Other repeaters have to have displacements of one or two megahertz to avoid clashes with the CAA's local radar, which is the Primary user. As with satellites FM rather than AM is used. The 18MHz channel bandwidth permits the transmission of a standard PAL colour picture with intercarrier sound on a 6MHz subcarrier.

The deviation, however, is restricted to a maximum of 3.5MHz, somewhat less than that of the satellites, although the same pre-emphasis standard (CCIR Recommendation 405-1) is used. While the video transmission is one way only, use of the 144.75MHz talkback frequency permits full duplex audio.

Video sources for transmission include the family camcorder and various personal computers such as the Spectrum and BBC B. Only a few years ago colour video cameras were quite expensive but 'Camcorders without the recorder' complete with an auto-zoom lens, could be bought for £50 or £60 at various rallies this year. CCD ones are best. Before buying check that all the necessary leads are included as otherwise they may cost more than the camera! The supply voltage may not be a nominal 12V so a simple adapter based on an IC regulator, and incorporating the 'Idiot' safety diode, will be needed.



Example of an SATV tuneable receiver.

USING A 'SURPLUS' SATELLITE TUNER FOR 23CM

TO MAKE A START you will need a receiver. When I first started in TV most receivers used on these bands were home-built. The technique was to down-convert to a frequency in the UHF TV band in order to use a standard UHF broadcast band tuner, followed by a home-built unit comprising an IF amplifier, FM discriminator and video amplifier. A board for this system is still available from the BATC.

Nowadays it is all so much easier. All you need is a surplus 'Satellite' TV tuner (SATV) or indoor unit. The availability of these cheap indoor SATV tuners has proved a boon to ATV. There are some manually tuned versions to be found on the surplus market that go for £50 or less as ex rental returns. These units tune between 950 and 1650MHz and

Commercial in-line coax amplifier for 23cm.

are used as a tuneable IF to the LNB (Low Noise Block) which is located at the focus of the satellite TV antenna dish.

The RF stages and tuning of the TV tuner can be used with very little modification but they are not very sensitive. The reason for this is that the noise figure for the receiver as a whole is determined at the LNB. The RF amplifiers, mixer and post mixing amplifiers have an effective gain of 50dB so the gain requirements at the indoor unit are not very high.

This lack of sensitivity of our receiver system means that a preamplifier will be required for all but very local transmissions. I use a low-noise preamplifier at the antenna and a commercial Satellite in-line amplifier both fed with power via a 75Ω coax.

The LA-20 in-line amplifiers, obtainable from most satellite installers, are quite cheap and may be all you need for the local repeater. These amplifiers receive the DC voltage to operate them via the coax cable. An antenna that presents a DC short on the coax (such as an antenna element using a folded dipole or a balun) will require a DC isolating capacitor at the antenna.

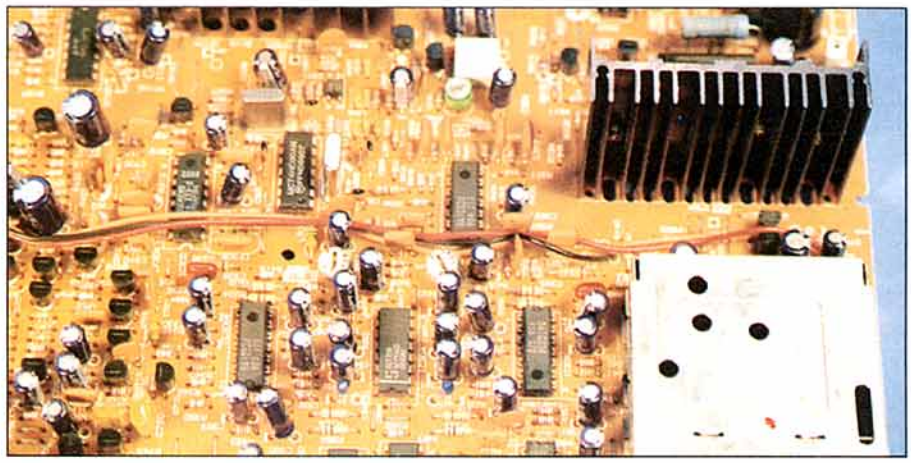
MODIFYING THE AMSTRAD SRX TUNER

AMATEUR TELEVISION uses a lower deviation so the video output of our unmodified SATV receiver will be inadequate. You can sometimes get away with just turning up the internal video gain preset. If this is insufficient a video amplifier can be added.

The early Amstrad tuners such as the SRX 100 or SRX 200 are easy to modify. These tuners have provision for only 16 channels and need an external decoder for encrypted STV so many have now been replaced and can be had for £20 or so at rallies. These provide a direct digital indication of the 23cm reception frequency by pressing the RECALL button or when using the TUNING buttons to set the channel frequency. Unfortunately none of the six sound channels is for 6MHz so it is necessary to replace X302 with an HC18 Xtal of 16.700MHz, available from Quartzlab.

The filter for the sound channels is centred at about 7MHz and it can be moved to 6MHZ by increasing C301 and C304 to 22pF and C303 to 390pF for a small improvement in sound channel sensitivity.

To increase the video gain with these units all that is needed is to replace R702 with a 10k resistor, R704 with a 1k2 resistor, R706 with a link and VR701 with a 1k preset **(Fig 1)**. To access the circuit board, remove the three screws underneath the front of the case. Slide off the top, then unclip the front panel. Unplug the power connector and the black ground wire. There is one screw in the centre of the board to remove before it can be unclipped.



General view of the Amstrad SATV tuner board.

THE ANTENNA

YOU WILL NEED an antenna for your modified SATV receiver. I have used a variety of antennas for 23cm including helicals, corner reflectors, yagis, quadloops and currently six-element broadside arrays. As I am not line-of-sight to Dunstable the path loss is about 150dB. Despite this, P4 to 5 signals are obtained with the little 10dB broadside array secured under the eaves.

You will also have to use a very low-loss coax. The SATV receiver uses an F coax connector so there is no problem connecting the SATV receiver to the antenna using this low loss cable (F connectors are made especially for this low loss coax, which has a foil screen, unlike the fish net outer of the typical UHF cable).

A corner reflector design is reproduced in **Fig 2** from the RSGB *Radio Communication Handbook*. This antenna gives a gain of about 13dB and uses a simple dipole radiator at the focus of the reflector. The advantage of this dipole feed is that its impedance is 75Ω, which gives a good match to CATV coax. Additionally the dipole does not present a DC short on the coax.

I use two antennas; one for receive on 1318MHz and the other for transmitting 15 watts on 1249MHz.

A three-pole filter, tuned to 1318MHz, is used before the receive preamp so that I can see the images I am transmitting (look-through).

Those with line of sight paths get away with less than 1 watt! A point of interest is that due to ground and other reflections it is useful to vary the height of the antenna over a small range to obtain optimum results.

For DXing a super masthead preamp can be had from Camtech Electronics but the price will make the rest of the system look cheap!

USING THE TUNER

WHEN YOU HAVE completed the modifications and reassembled the unit do not replace the lid yet. Set VR701 to the halfway point. Connect the unit to a TV via the RF output, switch on the TEST SIGNAL and tune it in on the TV, switch off the test signal. Connect your antenna, select channel 1, use the UP-DOWN buttons to tune to about 1318MHz.

Provided the antenna is aimed at the local

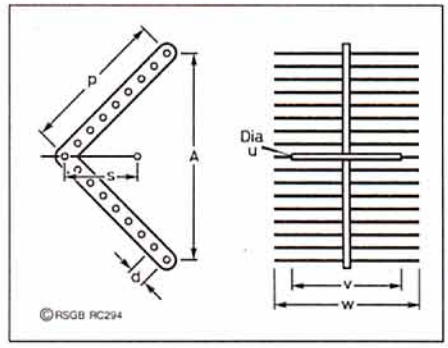


Fig 2: Corner reflector antenna for 23 cm.

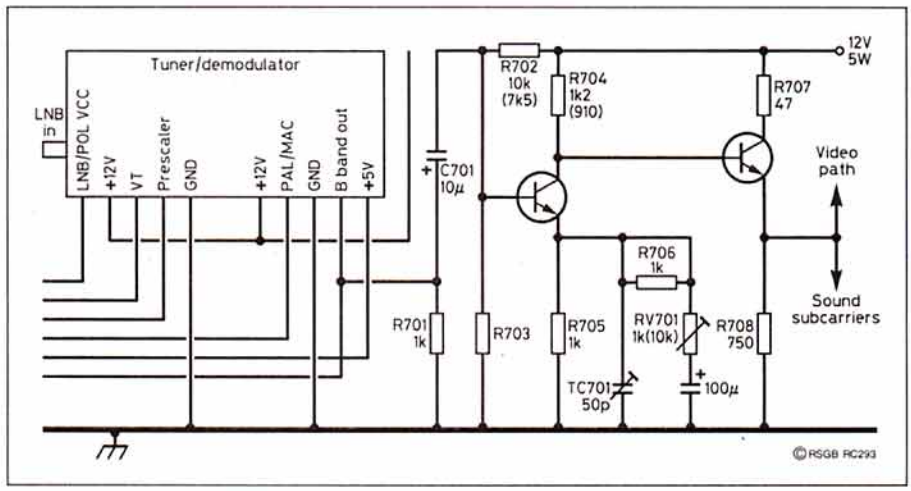


Fig 1: Part of the Amstrad SRX tuner circuit showing changed component values.

Television picture received from G8XTW.

repeater an image should appear, and the AFC will pull the receiver on to the repeater frequency. Try adjusting steps up and down for the best reception then press the preset twice to store the frequency. If you have an oscilloscope connect it to pin 19 of the SCART socket and adjust VR701 for a 2V peak to peak signal on no load, this will then give the standard 1V pp when fed into a 75Ω load. Otherwise adjust for best picture quality if using the UHF RF connection to a TV's antenna socket. If you have fitted the 16.7MHz xtal, 6MHz sound will be on audio channel 5. Select this by pressing the AUDIO button then store it by pressing preset twice.

TRANSMITTERS

VARIOUS KITS are available for constructing 23cm ATV transmitters and some suppliers are listed below. The cheapest is the old faithful 'Worthing' kit at £80 available from G8XEU, QTHR. This will give 1.5W but is not for Novice constructors. Tim Forrester, G4WIM, can supply a board for his latest offering, a synthesised 23cm ATV Tx. The board is £15 and the rest of the components can be purchased from Mainline Electronics. This uses mostly surface mount components so a small soldering iron and a steady hand are required. The latest BATC Tx kit is also obtainable from Mainline.

Other suppliers include:

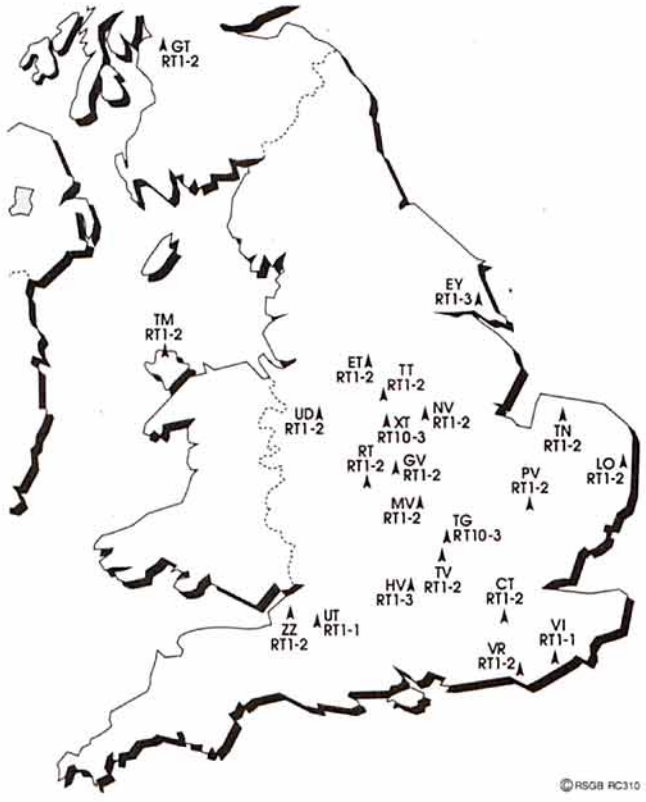
- The British Amateur Television Club. Please contact Dave Lawton, G0ANO. 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD.
- Severnside TV Group, 15 Witney Close, Saltford, Bristol BS18 3DX.
- Antennas & Filters – Worthing & District Video Repeater Group.
- Transmitters, software for Spectrum and BBC B, plus various video kits – R Stevens, G8XEU, 21 St James Avenue, Lancing, West Sussex BN15 0NN.

FURTHER READING

An Introduction to Amateur TV, price £4.25.

NEXT MONTH

IN PART TWO, Dave McQue, G4NJU, shows how easy it is to run amateur television on the 10GHz band.



Television Repeaters

Callsign	Channel	CTCSS	Location	Keeper
GB3UT	RT1-1	J	Bath	G8DKC
GB3ET	RT1-2	D	Huddersfield	G8HUA
GB3GV	RT1-2	C	Markfield, Leics.	G8OBP
GB3LO	RT1-2	F	Lowestoft	G4TAD
GB3MV	RT1-2	B	Northampton	G4WIM
GB3NV	RT1-2	B	Nottingham	G7EJG
GB3PV	RT1-2	C	Cambridge	G4NBS
GB3RT	RT1-2	A	Coventry	G6IQM
GB3TM	RT1-2	H	Amlwch	GW8PBX
GB3TN	RT1-2	F	Fakenham	G4WVU
GB3TT	RT1-2	B	Chesterfield	G1IOR
GB3TV	RT1-2	C	Dunstable	G4ENB
GB3UD	RT1-2	G	Stoke on Trent	G0KBI
GB3VR	RT1-2	E	Brighton	G8KOE
GB3WV	RT1-2	B	Weymouth	G4NTS
GB3ZZ	RT1-2	J	Bristol	G8VPG
GB3EY	RT1-3	B	Hull	G8EQZ
GB3HV	RT1-3	D	High Wycombe	G8LES
GB3TG	RT10-3	C	Bletchley	G4NJU
GB3XT	RT10-3	G	Burton on Trent	G8OZP

ATV Channels

Channel	Input (MHz)	Output (MHz)	Use
RT1-1	1.2765	1.3115	AM TV
RT1-2	1.2490	1.3160	FM TV
RT1-3	1.2480	1.3080	FM TV
RT10-1	10.200	10.040	FM TV
RT10-2	10.225	10.065	FM TV
RT10-3	10.278	10.150	FM TV

Appendix 1: The television repeater network in the UK.

Where in the World will you find Better?

HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

I WAS VERY interested to receive a letter from Richard Ferris, GI0OUM, in which he pointed out that for the next two years or so the bands above 14MHz will be pretty poor and that many people will give them a quick scanning, hear nothing, and presume them to be dead. He proposes that we should decide on specific 'calling frequencies' which might encourage people to try to make QSOs. There is an FM calling frequency on 29.600MHz and Richard suggests 21.250 and 28.500MHz as being suitable as SSB calling frequencies on 21 and 28MHz – how about trying this out?

Something else to try out now, and for the next couple of years, is 28MHz. How about joining the new table or working for the Society's own 28MHz Counties Award. Another way to produce activity on this band is to use it for local contacts – but *not* when it is open for DX!

HF AND IOTA CONVENTION

READERS WILL have seen the full-page advertisements in *RadCom* for the HF and IOTA Convention from 7 to 9 October at Windsor. There may still be some residential accommodation available even at this late stage because of the inevitable cancellations, so do contact Neville Cheadle, G3NUG, tel: 0442 62929 if you would like to stay at the Beaumont. On the other hand day visitors are of course more than welcome; just turn up and pay at the door. Both days have very full programmes starting at 0930 each day. Raffle tickets for the TS50S donated by Trio-Kenwood UK Ltd are on sale *only* at the convention.

If you are a day visitor but plan to attend IOTA's 30th Birthday Party on the Friday evening (7 October) and/or the DX Dinner on the Saturday evening (8 October) do contact Neville *as advance bookings are essential.* I am assured that both these events will be superb occasions – see you there!

IOTA – 30 YEARS ON

THIS IS THE name of the IOTA 30th Anniversary booklet which consists of 60 pages packed with stories about IOTA island operations, articles about the programme, complete IOTA Certificate listings, current most wanted islands list from the IOTA records database, and other interesting features including much material never previously published. It is hoped that this will be available at the RSGB HF/IOTA Convention. Orders can also be sent to Roger Balister, G3KMA, La Quinta, Mimbridge, Chobham, Woking, Surrey GU24 8AR and the price is £6, US$ 10.00, or 15 IRCs. Please make all cheques payable to 'R Balister' – and please also note that *no foreign cheques can be accepted.*

DX NEWS

IN A *DXCC NEWS Release* dated 20 July ARRL announced that documentation has been received (and approved) from the following stations (the dates are those from which the operations count): 8Q7AD (26.9.93), 9A/SP2EXN (30.3.94), 9G1PW (17.2.94), 9N1HP (30.11.93), 9N1UZ (17.12.93), 9Q5EXV (20.4.94), 9Q5TR (4.3.91), 9X5DX (5.12.93), 9Y4/I5JHW (29.12.93), A35RK (4.5.94), ET3VZ (11.494), J79W (3.5.94), J87BZ (23.2.94), S21ZX (18.11.93), T30NA (17.9.93), T5/OZ1FJB (28.4.93), T5/PA3CWM (28.12.93), T5/PA3DFT (28.12.93), T9/PA3DZN (18.1.94), T9/SP2EXN (30.3.94), 5B4/DL8KWS (29.9.93), 5N0/DL9GMM (1.2.94), 5R8DY (9.11.93), 5X1XT (1.1.94), 6Y5/DL2OBO (1.4.93), V5SI (1.3.94), V59PI (1.3.94), VK9NJ (23.11.93), VP5/JM1GYQ (1.1.93), ZS0X (31.1.94), CO2/N6CL (1.6.94), CO2/KX0O (1.6.94), CO2/K7JA (1.6.94), CO2/WA7WMB (1.6.94), FO0RYD (18.4.94), HR3PWF (13.1.94), HR3/KD5M (13.5.94), P40XJ (16.6.94), 3A/IK4CIE (29.12.91), 3A/IK4IDW (24.4.93), 3D2CK (8.9.93), 3DA0SD (24.3.94), 4K1/XE1L (24.2.94), R1A/K7FL (18.6.93), R3/G3MHV (15.5.94), R3/KA6ZYF (15.5.94), R3D/K7FL (18.6.93), R9/G3MHV (25.5.94), R9/KA6ZYF (25.5.94), R0/G3MHV (7.6.94), R0/KA6ZYF (7.6.94), T30P (15.2.93), UE9WTL (31.5.94), UE9WML (31.5.94), V63KW (3.3.94), VP2V/KR4DL (16.6.94), ZF2GT (4.5.94), ZF2MC (23.1.94), ZK1OFM (3.5.94), and ZK1QMU (3.5.94). On 2 August ARRL announced that the number of unprocessed DXCC applications at the end of July was 364 (38,641 QSLs). The DXCC desk had received 489 applications for new awards and endorsements (43,715 QSLs) during July and at the end of the month applications received about two weeks earlier were being sent out. The DXAC is currently considering whether the Turkish Republic of Northern Cyprus should be added to the DXCC Countries List, whether there should be a minimum size for a DXCC country, and whether amateurs other than the station licence owner should be allowed to use the same callsign for DXCC credits.

I understand that there have been protests from the Portuguese DX Group concerning the proposed changes to the Portuguese prefix system as given in last month's column. These have resulted in delay in implementation pending talks. The loss of calls like CQ7N, CT2A, CT3M, and CR3M would be unfortunate. The special call HB4JAM will be on the air until the end of October in connection with the Swiss National Camp for Scouts and Guides near Lucerne. The *URE EA DX Boletins* says that OM9SMP is the callsign of a station in **Slovakia** marking the anniversary of the country's independence. According to the *RSGB DX News Sheet* Cedric, CT3FT (GI3IVJ), is back in the UK for a few months – after making some 55,000 QSOs! The Ostend Radio Club will be using the callsign OS0OST between 1 September and the end of 1994 and all QSOs will be QSL'd automatically via the Bureau and listener reports will also be welcome.

RSGB DX News Sheet quotes information on **Tajikstan** prefixes which had been provided by UJ8JMM via *QRZDX*. The prefixes are as follows: EY1-EY3 = reserved for Tajikstan Amateur Radio League, EY4 = Region of Gornyj (ex UJ-R), EY5 = Region of Kulab City (ex UJ-K), EY6 = Region of Kurgan-Tyube City (ex UJ-X), EY7 = Region of Khujant

BAND REPORTS

Many thanks to those who contributed this month – including G2HKU, G3GVV, G3YOL, GW4KGR, G4OBK, G0MHC, and the UK DX Packet Cluster via G4PDQ. Loggings cover the period between mid-July and mid-August approximately. Apologies for the absence of these reports last month. Callsigns printed in italics are of stations using CW:

7MHz
0100 CE0ZAL, *EX0M, PY2PTG, V3ARF, VU2XTO, ZA1J,* ZF2NE.
0400 *FR5DX, V44KAI/PJ7, VP2EP, Z21HS, DL9GMM/5N0.*
0500 *AA2LA, CM3II, HC4L, OX3/WJ2O, VP5NC, ZL3QK, ZL4AU.*
0600 *FG5ED, TI2KW, VK9NS, VP2VI, YW0RCV, ZW0MI.*
1900 *A71AN, JH5FXP, S21ZG, TT8/F5LGF, ZS6QU,* 9N1KY.
2100 A22EX, *BV4LQ,* HL5JQ, *JT1BR, JT7FAA, 3B8FQ.*

10MHz
0400 *KG4N/C6A, FP/KA1NCH, V31RD, VP2EP, 3B8CF.*
0600 *K6CH, KL7XD, TA4/DK2OC, VK3MR.*

14MHz
0700 AL7NQ, *FO5BI,* KH6EDR, KL7TL, NH6SJ, T31BB, ZK3UC, *3D2YH.*
0800 KH6FKG, V73/W8IDJ, 0S1A, 3D2DR, 5Z4FM.
1000 FM5EJ, *FS/DL8WAA,* JA, ZK3UC.
1200 CY9CWI, YWORCV, VS6WV.
1300 *JW0GB,* XX9AS, YI1EYT.
1500 AP2JZB, ET3BT, FR5ZU/T, HS0ZAZ, KH0/W0WWB, *VQ9TP, YI1OM, 9M2ZA,* 9V1ZB.
1600 *BY1QH, FH8CB,* HL2IOU, JT1CC, TJ1AG, VR2KF, 3XY0A, 9N1KY.
1700 B0OM, BV7GA, HS0/G4WAV, VE8RCS, 0S1A.
1800 S21A, ZD7WRG, 9G1NS, 9U5/F5OWB.
2000 FS5PL, KL7RA, KP2/AA1BU, *YW0RCV,* 5X1F.
2100 C53HG, HZ1TA, KH0/W0WWR, NH2G.
2200 D2EGH, HC8KU, S92SS, YI1MV, *5T5JC.*

18MHz
0800 *BY1QH, VU2OXX, 5W1GC,* 9U/F5FHI.
1400 *TA4/DK2OC, V29SW, VP8GAV, VQ9TP, 5W1GC,* 9V1ZG. **1500** ET3AA, *HS1ZG, HZ1AB, KL7HF,* OX3/G3ZAY, *TN0CW,* 7Q7JK, 9G1UW.
1600 C91AI, J28GR, *TA7/KU0J, V5/DL3HRA, VQ9TP,* ZD9BV, G3MRC/9Q5.
1800 *CY9CWI,* D2TT, KH6CD, TR8CA, TZ6VV, *V47KEP,* Z21PS, 7Q7XT.

21MHz
0800 FH5CB, *VQ9LW, 9U/F5FHI.*
1000 BY5VZ, V85PB, 5U7Y, 9G1MR, *9V1ARU.*
1500 *A71AN, ET3YU, S79KMB.*
1700 D2SA, HL3ERJ, *HZ1HZ,* PY0FF, ZD7WRG, 5H3JD, 5R8KH.
2100 *YW0RCV.*

28MHz
1500 LU2NI, *7Q7RM.*
1900 PZ1EL.
2100 YW0RCV.

28MHZ COUNTRIES TABLE

G0AEV	23
G4OBK	15
G0MCT	7

City (ex UJ-S), EY8 = Capital Region (Dushanbe City) (ex UJ-J), EY9 = Region of Dushanbe City (ex UJ-J and UJ-X), and EY0 = reserved for TARL. Club stations have suffixes beginning with Z (EY-Z). The number of active amateurs in each area at present is EY1-EY3 = 1, EY4 = 1, EY5 = 0, EY6 = 2, EY7 = 27, EY8 = 28, and EY9 = 4. Peter Bacon, V85PB, was due to close down from **Brunei** and return to the UK. In two years on the air he worked 263 countries and achieved 5BDXCC.

RSGB DX News Sheet reports the latest position on the proposed visit to **Bhutan** by Jim Smith, VK9NS. In mid-August Jim had just spoken to the Minister and had been told that they hoped to have him there soon and that the final formality would be completed shortly. Jim says that he will be in Bhutan within about 48 hours of the invitation being received!

A group of Russian amateurs, led by EX0A, who planned to operate from **Iran** last October have reapplied for permission.

If you come across 8J3KYO this is the callsign of a special station being used until 31 December 1994 to mark the 1200th anniversary of the city of Kyoto.

F6GQK is in **French Polynesia** for a prolonged spell as FO5OU. He is on Tahiti (OC-046) and seems to operate mostly on CW on 7, 14, and 21MHz. A reminder that the special callsign VI4WWA will be on the air until the end of the month to celebrate the 'Festival of the Whales'. Look around 3.794, 7.100, 14.235, 21.250, or 28.495MHz.

W9ARV is reported to have petitioned the DXAC to consider separate country status for the **Balleny Islands**. He is claiming that they are eligible under Point 2(a) of the DXCC criteria and that they are more than 225 miles from New Zealand.

Carol, H44BC, is a missionary in the **Solomon Is** and will be there for an extended period. She would appreciate gifts of library books for young children (see *QTH Corner*).

VK4EET will be one of the communications officers with an Australian National Antarctic Research Expedition from **Davis Base** as VK0DX between mid-October and March 1995. He hopes to be stationed on **Macquarie Is** in the future.

F6BLQ, formerly TU5DX, is in **Nigeria** and has the callsign 5N0GC. According to *RSGB DX News Sheet* TN0CW made almost 6,000 contacts on nine bands. It took him two years to obtain his licence and he may return later this year. VE3MJQ is expected to be in **Rwanda** for a six month stay beginning in mid-August and will try to operate – 9X5HG is reported to have lost all his equipment when he left Kigali at short notice. He is now back in Germany and has no plans to return! PA3DZN is also in Rwanda with the UNHCR and has applied for a licence. He also says that he has been discussing amateur radio with the new government which seems to know nothing about the service. GM0FQV/9G1 has been on 14MHz and is expected to have a proper 9G1 callsign but it is not known how long he will be in **Ghana**.

DXPRESS says that Larry, F5IXR, was expected to be on the air from **Tchad** for four months starting in mid-August. He may appear as TT8/F5IXR or TT8XR.

More information about **Seborga**. I1RBJ says that he has discussed with the ITU the possibility of a unique prefix for the area but it is unlikely that '0S' will be issued. The Italian Ministry of Communications has therefore been asked to issue a special Italian prefix for use in the area. For the time being Paul intends to use IS1A/0S1A and his father IS1B/0S1B. CW operations by 3A2LF will most likely appear as IK/3A2LF/0S0C. Paul has discussed the position with ARRL and if granted DXCC status the operations using the 0S calls would be accepted. However, all QSLs will bear the official (and more correct) callsigns. OK8AOA/0S0E was also expected to be active.

Amateurs in **Brazil** were allowed to use 10.138–10.150MHz with effect from 4 August – previously they were restricted to the spot frequency of 10.110MHz. RS 50930 has kindly sent a note which was enclosed with his CY9CWI card. It said that due to a bureaucratic blunder Canada Post returned to sender a number of QSLs which had been sent to the correct VE2CWI address at PO Box 884, Pointe-Claire/Dorval, Quebec. If this happened to you – please re-submit!

Three members of the Western New York DX Association were scheduled to be on the air from **Antigua** between 26 September and 7 October on 3.5 to 28MHz CW and SSB. They will use their home calls W2KKZ, WF2S, and KN2M /V2.

DXPEDITIONS

IN LATE October/November (from 23 October to 7 November 1994) members of the Whitton Amateur Radio Group will be mounting an expedition to **The Gambia** (C56). They will be taking part in the *CQ* DX WW Contest on 29 and 30 October and have been allocated the special callsign C56DX for the duration of the contest. For the remainder of the time they will use C56/G0MRF. The expedition will concentrate on the most needed frequencies and modes. The station QTH is only a few metres from the sea and this should make sure that they have a good signal on all bands 1.8 to 28MHz. Antennas will include a full size λ/4 vertical for 3.5MHz and a five/eighths vertical for 10MHz. Satellite equipment will also be available – and it is hoped that the first contacts on mode S from this location will be made.

CONTESTS

ON CONTEST 1994

0700 – 1100 2 October (SSB)

0700 – 1100 9 October (CW)

3.5MHz only. Contact ON and DA stations (Belgian Forces in Germany) only. Exchange RS/T plus serial number starting at 001. ON and DA stations will also give their club code e.g. "59004 MCL". Each QSO counts three points and each club worked counts as a multiplier. Send logs not later than three weeks after the contest to: Welters Leon, ON5WL, Borgstraat 80, B-2580 Beerzel, Belgium.

VK/ZL/OCEANIA CONTEST

1000 1 October – 1000 2 October (SSB)

1000 8 October – 1000 9 October (CW)

Since writing last month's column I have received the 1994 rules. Please note that QSOs on 1.8MHz count 20 points, on 3.5MHz ten, on 7MHz five, on 14MHz one, on 21MHz two, and on 28MHz three respectively. Logs must be mailed by air-mail to ZL1AAS no later than 15 November 1994 (SSB) or 22 November 1994 (CW). Please indicate 'SSB' or 'CW' on the outside of the envelope.

I can now supply copies of the rules (SASE please).

In the **1993 VK-ZL-Oceania DX Contest** top European station in the SSB section was **G3NAS** with 2,156 points and in the CW section **G3GLL** was top UK score with 1,680. Other UK scores were G5MY with 248 and G3DYY with 220.

CQ WW DX CONTEST

0000 29 October – 2400 30 October (SSB)

All bands 1.8–28MHz (excluding WARC). Categories are single operator single or multiband, multi-operator single or multi-transmitter and QRP (up to 5W *output*). Exchange RST and *CQ* zone (UK is in zone 14).

QSOs with own continent count one point, with others three. Own country may only be contacted for multiplier credit. The multipliers are the total of DXCC and WAE countries and zones worked on each band and added together. Use separate logs for each band and if you make more than 200 QSOs on any band you must submit a 'dupe' sheet.

continued on page 20 ▶

1994 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4OBK	126	186	121	433
EA5GQI	–	133	77	210
G0MHC	48	72	39	159 (CW)
EA5DQE	–	92	49	141
GJ4GG	36	54	37	127
G3ING	62	46	15	123
G2AFV	50	51	9	110
G3KKJ	17	53	39	109
G4CMZ	43	32	3	78
G0TMZ	25	32	11	68
G3IAR	33	16	2	51
G4FVK	18	20	11	49

QTH CORNER

K1RX/BV	Mark S.Pride, 205 Amesbury Rd, East Kingston, NH 03827-5723, USA.
C56DX and C56/G0MRF	to G0MRF, 31 Benson Cl, Hounslow, Middlesex, TW3 3QX, or via bureau.
H44BC	Carol Bradfield, WPAS, PO Box 411, Honiara, Solomon Is.
OK8AOA/0S0E	via DC3MF, Kafkastr 64/8, D-81737 Munich, Germany.
S61 calls	to the corresponding 9V1 calls.
V31RD	via G4SMC, K R Diamond, School Cl, Chandlers Ford I Es, Eastleigh, Hants SO5 3BY.
VK0DX	Eddie DeYoung, 131 Plantain Rd, Shailer Park, QLD 4128, Australia.
YI1OM	via F8RZ, Le Bourg de St Hilaire, F-16300 Barbezieux St Hilaire, France.
ZK3UC	S B Rynn, PO Box 615, Apia, Western Samoa.
3A2LF/0S0C	F6FNU, Antoine Baldeck, BP 14, F-91291 Arpajon Cedex, France.
3A2LZ/0S0D	Daniel Plett, BP 349, MC-98007 Monaco.
9X5HG	DK2SC, Gustav Heinemann-Ufer 112, D-50968 Koln, Germany.
9X/F5PGP	F5PYI, Laurent Borde, l'Orme, F-42520 Maclas, France.
0S1A	I1RBJ, Paul Bavassano, Via Monti 7, I-10126 Torino, Italy.

RSGB 1994 International HF & IOTA Convention

...and IOTA's 30th Birthday Party!

Beaumont Conference Centre
Old Windsor, Berkshire, UK

(Located close to the M25 and Heathrow Airport)

7, 8 & 9 OCTOBER 1994

PROGRAMME

Friday 7 October

EVENING

IOTA's 30th Birthday Party

Saturday 8 October

DAY

Transceivers – G3SJX

IOTA Director's Address – G3KMA

First 100 countries – G0HSD

ZD9SXW DXpedition – G3SXW

IOTA Policy Q&A – G3KMA

Phased Arrays for 80 and 40m – G3PJT

VK9MM DXpedition – G3WGV

Practical LF Antennas – W1XP

Holiday Operations from Islands – K5MK

3Y0PI DXpedition – ON6TT

Computers in the Shack – G3XTT

Antenna Circus – G3WLM

EVENING

DX Dinner

Sunday 9 October

DAY

Contest College – G3SJJ

RSGB and Other Awards – G4BWP

Computers in the Shack – G3XTT

LF Propagation – G4DBN

3Y0PI DXpedition – ON6TT

Cluster Workshop – G4PDQ

Antenna Planning Clinic – GW4ZXG

International Goodwill through Amateur Radio – K7JA

Please note - Full details of the residential packages have already been published in *RadCom*. Day visitors are very welcome, just turn up on either the Saturday or Sunday or both. But if day visitors want to attend the Friday evening IOTA Birthday Party and/or the Saturday evening DX Dinner do book in advance. Plans for both events are well under way and both evenings should be very enjoyable.

A Reminder - Saturday is important: In past years many have only attended the Sunday as this has traditionally been recognised as *the* 'HF Day'. This year is different as all three streams start at 0930 on the Saturday morning and two are solely devoted to HF topics. Very few of the Saturday lectures are repeated on Sunday. To make the best of this Convention do try to come for the full two days.

VISITORS FROM OUTSIDE THE UK

The following visitors are attending from outside the UK:

4X6ZK, 4Z4DX, CT1DIZ, CT1EEB, DF5UG, DJ2YA, DK1RV, DK2OC, DK6AO, DL1AMQ, DL1SCQ, DL1VDL, DL2GAC, DL2SCQ, DL6ATM, DL7CW, DL8AAM, EA5KB, EA5RC, EI2CA, EI2GX, EI5DI, EI5EP, EI5HD, EI6EF, EI6EW, EI7CC, EI8CE, F6AJA, F6ALX, HA1AG, HB9BVV, HB9DX, HB9KT, HB9RG, I1JQJ, I1RBJ, I2MQP, JA1IST, JI6KVR, K5MK, K7JA, LA5QK, LA6MP, N3ERM, NN2C, OE3WWB, ON4AAC, ON5KL, ON5NT, ON6HE, ON6TT, OZ5MJ, OZ7SM, PA3DZN, PA3FQA, RZ1OA, SM6CAS, SM7PKK, SP6TPM, UT8LL, UY5XE, W1DOH, W3KH, W4BAA, WT2O.

SPECIAL INTEREST GROUPS & DISPLAYS AND CLINICS

There will be a number of additional activities running between the lectures including:

G-QRP-Club
160m DXers
FOC
Aerial Planning Panel
Propagation Studies Group
Venus Shareware
Shacklog Users
SuperDuper Users
Turbolog Users
HF Contests Committee

Henri Meunier F6ALX (Island maps)

OTHER ACTIVITIES

In addition to the above there will be an excellent Ladies' Programme, CDXC and ISWL meeting rooms, GB301OTA station, RSGB book stand, Morse tests (bring two passport photos), raffle for a TS-50S transceiver and other goodies and a DX Quiz.

US LICENCE TEST SESSIONS

These will be held on Saturday 8 October at the Beaumont if there is sufficient demand. If you want to obtain a US licence or to upgrade contact Yves Remedios, AC4WT/G3UDT, London ARRL-VE Team, 44 Kingsway, Wembley HA9 7QR. Tel: 081-902-5995 after 7.30pm.

WIN A KENWOOD TS-50S HF TRANSCEIVER

The convention is sponsored by:

MARTIN LYNCH G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

KENWOOD

ENQUIRIES TO:

Neville Cheadle, G3NUG,
'Further Felden', Longcroft Lane,
Felden, Hemel Hempstead,
Herts HP3 0BN, UK.
Telephone/fax +44 442 62929.

Radio Society of Great Britain
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

HF NEWS

continued from page 18

Logs must show date, UTC, station worked, numbers sent and received, and points claimed. Clearly mark each new multiplier and check carefully for duplicate QSOs – if you have too many you may be disqualified. QRP entrants must mark this fact on their cover sheet and indicate the actual power used. All entries for the SSB Section must be postmarked no later than 1 December 1994. Send entries to *CQ Magazine*, 76 North Broadway, Hicksville, NY 11801, USA.

Sample contest stationery is available from that address in exchange for a SAE and a few IRCs. Unfortunately I do not have any of these available but I *hope* to be able to supply copies of the rules as published in *CQ Magazine* in due course – SASE please.

XVII CONCURSO IBEROAMERICANO

2000 8 October – 2000 9 October

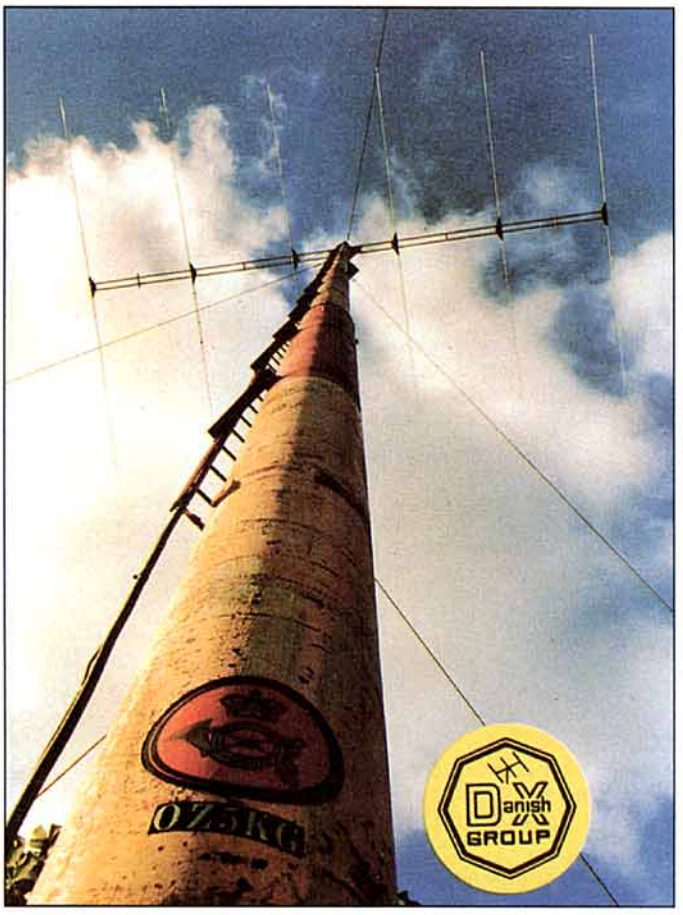
1.8 to 28MHz – no WARC, phone only observing IARU recommended frequency segments. Single and multioperator Latin American and non-Latin American. QRP (less than 5W output), and listener sections. Exchange RS and serial number (from 001). Three points for QSOs with Latin America, one with other areas. Multipliers are Latin American countries (for this purpose they include CE, CO, CP, CT, CX, C3, C9, DU, EA, HC, HI, HK, HT, KP4, LU, OA, PY, TG, TI, XE, XX9, YN, YS, YV, ZP, 3C, and their DXCC dependencies.) Send logs before 30 November to: Concurso Iberoamericano, c/o Concepcion Arenal 5, 08027 Barcelona, Spain.

I can supply copies of the rules (SASE please).

THANKS

TO THOSE who contributed this month and also to the authors of the *Long Island DX Bulletin* (VP2ML), the *RSGB DX News Sheet* (G4DYO), *DXPRESS* (PA3FQA), the *Lynx DX Bulletin* (EA2KL), and the *EA DX Boletin* (EA1QF). Apologies to those who sent in reports last month for the 'Band Reports' section. Unfortunately I ran out of time and was unable to produce it!

Please send everything for the **December** issue to reach me no later than **20 October**.



Six element 20m beam on 90ft steel tube tower at OZ5KG (the author of the RX84 Receiver project).

VHF/UHF NEWS

NORMAN FITCH G3FPK
40 Eskdale Gardens, Purley, Surrey CR8 1EZ

AUGUST DID not appear to produce anything spectacular. E-layer propagation occurred on 50MHz from time to time. Opinions on the Perseids meteor stream varied from poor to good, but it seems to have been a pretty average shower this year.

REPEATERS

UHF REPEATER GB3SG (GNS) on RB15 has closed down until a new site is approved. Keeper Roy Sellek, GW0JZR, has the latest details and is QTHR. On VHF, GB3BF came on stream on 14 August from Manton Lane, Bedford on R2. Its keeper is Mr D F Ash, G1BWW (QTHR), whose packet address is G1BWW@GB7ZPU.

The latest batch of repeater applications submitted to the Radiocommunications Agency (RA) includes three new packet ones; GB7KL, Kings Lynn (NOR); GB7PL, Plymouth (DVN) and GB7ME, Danbury (ESX). On 24cm, GB3VX, Heathfield (SXE), is a new TV relay. The *minimum* time for clearance for UHF repeaters by the RA is six months.

A list of French repeaters, compiled by the CNRB and F6GKD, has been circulating on the packet network and found its way into print in the August issue of *Megahertz Magazine*. On 144MHz, relays are listed on the usual R0-R7 channels, but they also have 'X' channels on R0, 2, 3 and 7. Repeaters on R8B, R9B, 10, 11 and 12 are shown, but it doesn't explain what these non-IARU frequencies are.

61 UHF repeaters are listed on the continental RU channels 1 – 15, 17, 19 – 21, 23 and 24, again with unexplained suffices 'R' and 'B'. Several are still in the planning stage. No details of any access tones or whether they use CTCSS tones are mentioned.

PUBLICATIONS

THE AUGUST issue of the BATC's excellent *CQ-TV* magazine includes a report on the BATC 94 Rally held at the Sports Connexion in Coventry on 1 May. The estimated attendance was 1100. There are always plenty of articles on using commercial satellite TV components for ATV. This edition carries a well-illustrated contribution by Adrian Hunt, G0OJY, on modifying the Philips/Ferguson BSB Satellite Receiver for ATV.

Norman Ash, G7ASH, has written a comprehensive series 'Using Television', part 5 of which is published in this issue. There is the usual Satellite TV News column by Paul Holland, G3TZO, contest news and several technical articles. A timely piece by Clive Reynolds, G8EQZ, deals with illegal, unattended operation and radar interference on 24cm. He lists information about Air Traffic Control (ATC) radars in the 1.3GHz band. *CQ-TV* is edited by Mike Wooding, G6IQM, who is QTHR.

The July issue of *The VHF-UHF DXer* includes Sam Jewell's, G4DDK, regular 'Tech Slot' with more information about the Hewlett-Packard HP8620-series sweepers. These crop up at rallies at prices well below what the 'professional' dealers ask. 'Games with a K2RIW PA' by Steve Thompson, G8GSQ, chronicles his experiences in setting up this much-copied amplifier. The rest of the issue consists of band reports. Contact editor/publisher Dave Hardy, G8ROU, for subscription details; he is QTHR.

Six News is the journal of the UK Six Metre Group (UKSMG) and the July edition includes a study of E-Layer and Sporadic-E (Es) propagation on 50MHz by Ken Osborne, G4IGO. Chairman Geoff Brown, GJ4ICD, wrote a user review of the Kenwood TS-60S 50MHz transceiver. As usual, the 'Snippets' and 'DX News Far and Near' features are very informative. Contact Chris Gare, G3WOS, for UKSMG membership details; he is QTHR.

The Summer 94 issue of *FM News*, published by the Central Scotland FM Group, includes a detailed membership list, repeater status reports, 'Tech Talk' by Simon Lewis, GM4PLM, and a 'Computer Surgery' column by Jim Bavin, GM0GMI. *FM News* is edited by Dennis Cram, GM3NIG, and the CSFMG secretary is Alasdair Fraser, GM3AXX, both QTHR.

CONTESTS

A REMINDER that the final legs of the 144MHz CW Cumulatives are on 29 September and 14 and 31 October, 2030-2300 *local time*.

LOCATOR SQUARES TABLE
STARTING DATE: 1-1-1979

Callsign	50MHz	70MHz	144MHz	430MHz	1.3GHz	Total
G4YTL	–	43	290	38	–	371
G3NKS	2	43	2	2	–	49
G1SWH	285	37	199	64	9	594
GW4LXO	475	34	261	109	48	927
G4TIF	339	28	209	112	–	688
G4MUT	200	26	159	97	34	516
G8TOK	167	25	131	50	9	382
G3FIJ	57	24	83	27	3	194
G4OUT	–	22	103	–	–	125
G8LHT	225	20	210	95	20	570
G3IMV	460	15	521	125	52	1173
G0EVT	251	12	261	65	1	590
G6ODT	–	3	62	66	–	131
GJ4ICD	628	1	264	121	70	1084
G0HIK	1	1	57	13	–	72
G6HKM	481	–	248	118	62	909
G4IGO	565	–	250	–	–	815
G4RGK	183	–	328	203	67	781
G0CUZ	199	–	394	80	–	673
G4DEZ	235	–	255	74	63	627
G0JHC	520	–	48	–	–	568
GW6VZW	399	–	143	6	–	548
G0FIG	200	–	211	69	23	503
G0GMB	106	–	225	108	–	439
G4SWX	–	–	404	–	–	404
G0HVQ	328	–	71	–	–	399
G1UGH	239	–	124	–	–	363
GW8JLY	–	–	284	36	–	320
G8XTJ	183	–	128	–	–	311
G6RAF	–	–	160	114	–	274
G3FPK	–	–	246	–	–	246
GW4FRX	–	–	236	–	–	236
G0ISW	147	–	64	20	–	231
G1AWF	59	–	167	3	–	229
G7LIJ	24	–	171	–	–	195
GW0PZT	–	–	188	–	–	188
GI1CET	97	–	67	6	–	170
G7CLY	98	–	60	2	–	160
GJ7LJJ	93	–	52	–	–	145
GM0GLV	91	–	–	–	–	91
G4OBK	83	–	1	–	–	84
GU4HUY	–	–	84	–	–	84
G3UOL	11	–	59	–	–	70

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Band of the Month is 70MHz. Next deadline is 27 October.

The 70MHz Trophy Contest is on 25 September, 0900 – 1400UTC, and uses county/country multipliers – see page 82 in the July *RadCom* for rules. The big events are the 432MHz-24GHz RSGB and IARU contests on 1/2 October, 1400 – 1400UTC – June *RadCom* p83.

The 1.3/2.3GHz Cumulatives start on 4 October with the second leg on the 19th, 2030 – 2300 *local time* – July *RadCom* p82. The first two legs of the 432MHz Cumulatives are on 12 and 27 October, presumably 2030 – 2300. For TV addicts, the BATC lists the Autumn Vision 94 Contest, 12/13 November, 1800 – 1200UTC; it is an all-band fast and slow scan affair.

PROPAGATION

BEACONS ARE an essential part of propagation studies. Some just give their callsigns while others repeat more details, such as locator, altitude, beam heading (QTE) and power; Irish beacons EI2WRB (IO62IG) on 144.920MHz and 432.870MHz are typical of this latter type. Another class of beacon could be described as programmable in that messages are broadcast. One of these is DK0WCY, now operating in the 80m band in addition to 10.144MHz.

DK0WCY is on 3.553MHz and since the end of April it has been transmitting daily propagation forecasts between 0600 and 0700 and again at 1430-1600. A typical message is: "Info 10 May 0501 UTC – for 09 May R16 Flux 77 Boulder A 26 – forecast sunact quiet – magfield active condx expected – AR". Its computer controlled Tx runs 25W to a dipole antenna and the experimental licence runs till the end of this year. Reception reports should be sent to Emil Johannsen, Hamm 4, D-24392 Scheggarot, Germany. Thanks to the July issue of *Region 1 News* (IARU) for this information.

In the July Report of the *Six and Ten Reporting Club*, editor Ray Cracknell, G2AHU (HWR), states that, in contrast to June, in July there were no days without visible sunspots, so the monthly mean was higher at 35. Geomagnetically, it was a relatively quiet month with only six days – 1, 2, 14-16 and 27 – when disturbances could be detected.

G2AHU comments: "The quest for reliable indicators of good conditions for Sporadic-E on 50MHz becomes increasingly difficult .... In the past we have pointed out that a degree of magnetic disturbance (eg a K-index of 4) seems to enhance Es at VHF by causing electron gradients upon which VHF propagation largely depends, while recognizing that a storm (K = 6-9) will disrupt the layer. The good conditions on 1 – 4, 14 – 19 and 28 – 29 seem to confirm this theory."

A Hydrogen Alpha (Hα) synoptic chart for Carrington Rotation 1883 is reproduced on the back cover. This Mercator projection map of the Sun shows all the regions of coronal holes, plage corridors, filaments, etc, covering the period 24 May to 25 June. The report is printed and circulated by Ian Brotherton, G2BDV (DOR), and the annual subscription from June 1994 is £7.00. Contact G2BDV (QTHR) for details. His telephone number is 01202 886887 and G2BDV@GB7BNM.#45.GBR.EU is the packet route.

MOONBOUNCE

THE ONLY reader to mention EME this month was John Hunter, G3IMV (IO91), who just confirmed poor activity and conditions during the summer. These should improve in October. The 1/2 weekend is listed in *DUBUS 4/1993* as a day AM sked one. The Moon's average declination will be +8°, Sun offset –40°, 144/432MHz sky temperatures 210/15°C and the signal degradation –0.8dB.

The first leg of the ARRL EME Contest is on the 29/30 October weekend when the corresponding figures will be +5 degrees, –60°, 220/16°C and –0.7dB. Members of the Toronto VHF Society plan to operate VE3ONT again from Algonquin Park (FN05XW) using the 46m dish. The proposed schedule is: 29 Oct 0645 – 1815UTC, TX 432.050MHz, listening 432.050 – 432.060MHz. 30 Oct 0754 – 1844, TX 1296.050MHz, listening 1296.050 – 1296.060MHz. Further VE3ONT details in the 50MHz section. If conditions are good, they will start each session on SSB. Anyone working them first on SSB is asked *not* to call later on CW and vice versa. They will use circular polarization on all bands so calling stations can use linear polarization. Use RHCP on transmit on 70cm if you have it; on 23cm they will have switchable sense. All contacts will be random with no scheduling or sequencing. Low power and 'OSCAR' type stations are encouraged to attempt QSOs but don't call on their Tx QRG.

A reminder that I have Doug McArthur's latest version of his EME Planner and EMETRAK software which he has asked me to distribute. These ready-to-run programs just fit onto a 1.44Mb IBM format 3.5in disk. If you want a copy, send me a formatted disk with return envelope and postage. Please make sure your disk doesn't have any bad sectors – run CHKDSK before mailing – and let me have your latitude and longitude in deg/min/secs.

CONVENTION

MANY READERS also operate regularly on the HF bands – I had already worked over 300 DXCC countries on HF long before I got hooked on VHF. On 7 – 9 October the RSGB is running the International HF and IOTA Convention in Old Windsor, Berkshire. Included are activities for the ladies. For details, see page 16 in the August *RadCom*.

METEOR SCATTER

PERSEIDS REPORT

Colin Morris, G0CUZ (WMD), concludes that this year's Perseids shower was a little above average peaking 0900 – 1200 on 12 August. Reflections were quite good 2300 – 0300 on the night of the 12/13th but by the evening of the 13th, reflections had disappeared. However, he noticed a small peak 0830-0930 on the 14th. Only four of his 12 skeds on 144MHz were completed, most of the non-completions being with stations over 2000km range. Best DX was JX7DFA (IQ50OV) at 2071km for a new square and country; in the 35min QSO, 12s bursts were received.

Alec Trusler, G0FIG (SXW), reckons the peak was 0800-1000 on the 12th. In the run-up from the 5th, he completed on 144MHz with HG7B/0 (KN17 and later KN18), S50C (JN76), HA3UU (JN96), OK2SBL (JN99), 9A4EW (JN95), and YZ7UN (KN05). In the 11 – 14 August period he completed with 9A1CDD (JN85), IK1LGV/P (JN43), OY/G4WKN (IP61), LA2PHA (JO38), SM6CMU (JO57), SK4EA (JO79), S57C, IV3HWT (JN65), LZ2UU (KN12) his best-ever MS contact at 2009km, SP9PRO/7 (KO10), I8MPO, GM4VVX/P (IO78) and DL2DXA (JO61).

G3IMV wrote: "I didn't rate the 94 Perseids very highly, I've certainly heard better." Nevertheless, John ended up with four new squares on 144MHz from CW skeds; LA/DL9GJW (JP31), OH7MA (KP52), LA0BY/P (JP89)

and I8/IK0BZY (JM79), his last Italian square. He didn't quite complete with JX7DFA in spite of getting a 12s burst. Derek Hilleard, G4CQM (DVN), noted no real signs of a build-up but recorded a sudden peak on the 12th, 1043-1133.

Mike Tubby, G8TIC, Peter Bowyer, G4MJS, and John Clark, G6YIN, are members of the Black Sheep Contest Group. They put on a DXpedition to Dodd Fell (IO84VG) in the Yorkshire Dales in the 10 – 14 August period. Reflections were weaker and shorter than last year with only four bursts lasting over a minute. On 50MHz G6YIN/P used a TS690, 70W PA and 4-ele Yagi and completed with HB0/HB9QQ on CW and SP9PRO/7 on SSB.

On 144MHz G8TIC/P used an FT-225RD, 400W solid-state PA and two Vagrada 9-ele Yagis, completing SSB QSOs with 23 different stations. A further 18 attempts were not completed. They took two PCs, one running OH5IY's high-speed CW keyer software, the other using MS Windows Sound Recorder, with a sound card, to capture incoming CW and slow it down for playback. About 20 high-quality .WAV sound files were stored on disk, many with full QSOs in single bursts. Mike concludes: "Sound cards in PCs make a good alternative to tape recorders for high-speed CW and are also of value on SSB QSOs."

On 144MHz on 13 August, Ela Martyr, G6HKM (ESX), heard OY/G4WKN calling CQ, with breaks, and managed to complete with Richard in one burst. Edward Allely's, GW0PZT (GDD), report is devoted to SSB MS on 144MHz. He started on 6 August but didn't notice any enhancement till the 11th when he completed on random with 9A1CDD at 1147. This year he made skeds on the 20m VHF net and subsequently completed with HA4XH (JN96), S51AT (JN75), SP6GZZ (JO81), SP3MFI (JO91), DL3BWW (JO72), HA5CW/0 (KN07). Other successes were OY/G4PIQ, DD0VF (JO61), IW1AZJ (JN53) and F/G0RDI.

Stefan Heck, LA0BY/P, E-mailed a long report on his exhausting 144MHz operation from JP89KB 9 – 12 August and from JP98AW 13 – 14 August. He only managed 20 hours sleep in six days! He used a 3CX800 PA and two 17-ele F9FT Yagis. From JP89, British completions were with G6RAF (IO92) and G4SWX (JO02) on SSB and G3IMV on CW. From JP98 he worked GM4YXI (IO87) and GM4CXM (IO75) on CW. LA5TFA/P completed a few Scandinavian MS contacts on 50MHz from the same locations.

THE ORIONIDS

The only significant October shower is the Orionids. According to the IMO's *1994 Meteor Shower Calendar* it should peak on the 21st at Solar Longitude (LS) 208.4°. Times when reflection efficiencies exceed 50% are: NE/SW 2330 – 0500; E/W 0130 - 0730; NW/SE 0400 – 0930 and N/S 0600 – 1030 and 2300 – 0330. The radiant is above a mid-UK horizon from about 2100 – 1200, all times UTC.

TRANSATLANTIC TESTS

IN THE OCTOBER 1993 *VHF/UHF News* I reported G4CQM's 144MHz transatlantic tests programme with several Canadian partners. This year Es was noted on this path on 14 days. On 15 June Derek copied the FM station CBC in Sydney, Nova Scotia on 95.9MHz, 2314 – 2319. VE1KG says it is a 500W ERP local repeater! At the time, high pressure stretched across the Atlantic with no obstructing frontal systems. Overall, the event lasted 2140 – 0038.

On 22 June signals were first heard at 2111 and peaked rapidly. CBC Sydney was copied for ten minutes from 2148 and the event ended at 2230. These were the only dates when Band 2 signals were heard. Continuous CQ calls on 144.200MHz, plus telephone alerts, produced no signals in either direction. Derek now runs 400W from a pair of 4CX350A valves and thanks VE1HD and VE1KG for their part in the tests.

50MHZ

THE TORONTO VHF Society has added 50MHz to its list of bands to be activated by VE3ONT in the ARRL EME Contest. They will be transmitting on 50.100MHz and listening 50.100 – 50.105MHz on 30 October. They will see the Moon 0754 – 1844UTC and reckon stations with a 10dBd antenna system and 1kW should be able to work them. With horizon gain, UK stations with 400W and 6-ele Yagis should certainly try.

Ted Collins, G4UPS (DVN) operated as GW4UPS (IO71IV) between 27 July and 10 August and his daily reports show Es propagation on 27 and 31 July and 6/7 August. Perseids reflections began to build up from the 5th as confirmed by his morning skeds with SM7AED. Later from home (IO80JC) he made QSOs with OY/G4DHF (IP61), HB0/HB9QQ (JN47), SV1DH and various Balkan stations on 13 August. E-layer QSOs were made into central Europe and the Baltic region on the 17th and 18th and to Iberia and central Europe on the 19th.

G6HKM worked ES5WE/0 (KO07) for a new square on 29 July, also R2/DK4VW (KO04). OY/G0WKN, OY/G4DHF, OZ2LD (JO54) and LZ1ZX (KN32 and new) were contacted on 12 and 13 August. Best DX for G8TOK (LDN) was LZ1UK (KN32) on 13 August. Later that day, Derek found lots of SPs in JO91/92, KO01, 10 and 11.

Following recent political agreements between Israel and Jordan, the embargo on Jordanian stations working Israeli amateurs has been lifted. This was confirmed by Mohammad Balbisi, JY4MB, during a telephone conversation with GJ4ICD on 18 August. Geoff says his proposed trip to D4 next year "....is now on 100%" possibly in the first half of June.

Paul Baker, GW6VZW (GWT) has notched up 60 countries this year, in case anyone thinks the band has been in poor shape as we drop into the trough of the sunspot cycle. All-time new countries recently worked are 5T5, JY, ER, UU8, SV9 and 9K2.

70MHZ

DAVID COURT, OZ3SDL, told GJ4ICD that he made no 4m QSOs during his July stay in Cyprus. Derek Thom, G3NKS (GLR), has been active from his present Cheltenham QTH since 1987 but finds activity disappointingly low. In the late 1980s and early 1990s, several groups used to operate /P in the Perseids, but this enthusiasm seems to have waned. He would like to see an increase in such operation. Nick Gregory, G0HIK (CBA), is modifying a PMR set for 4m, so listen out for him.

144MHZ UP

TROPO SIGNALS from OY/G4WKN peaked to RST529 when G0CUZ worked Richard on 14 August at 1800. G0FIG reports tropo QSOs with EB1BDM (IN73) on 26 July and F5JRX (JN25) and F6CBH/P (JN24) on 3 August. The 20/21 August period brought contacts with I2FHW (JN44), F6BEG/P (JN25), HB9STX (JN35), F8CS (JN27) and F6CVY (JN26).

Andy Wyspianski, G1AWF (LDN), has missed all this year's Es openings. At 1200 on 13 August he heard a 9A1 calling CQ but he was gone before completion – there was good Es propagation on 50MHz to that region at the time. G3IMV completed on CW MS with ES5WE/0 on 31 July for another new square. At long last he has got EA9 confirmed after working EA9AI on 21 May.

There have been no useful auroras as far as British Isles stations are concerned and tropo lifts have been few and far between. The only higher band input was by G0FIG who worked F1TBP/P (IN88) and F5MZN/P (JN19) on 23cm on 21 August.

FINALE

LET'S HOPE that we soon get a period of sustained tropo to enjoy, now that the Es season is over. But if all else fails, there is always MS and EME to consider. The deadline for **December** copy is **27 October** and for **January 24 November**. My tel/fax machine number is 0181 763 9457, the BT Gold mailbox is 87:CQQ083, the Internet route is 70630.603@compuserve.com and my CompuServe ID is 70630,603.

RADIO

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IARU

JOHN ALLAWAY, G3FKM
and
TIM HUGHES, G3GVV

ONE OF THE most important tasks of the IARU as we have said before is to spread the awareness of amateur radio as widely as possible, and to demonstrate to administrations that having radio amateurs in their midst is a good thing and that they are a valuable asset. Unfortunately all too many, in less enlightened areas, see our activities as a possible threat to their security. This – unfortunately – is particularly likely to be the case in the less developed countries including some parts of Africa – and African countries hold 55 votes at the ITU. A very powerful bloc indeed.

AMATEUR RADIO IN AFRICA

THE REGION 1 'Support To Amateur Radio Services' (STARS) Working Group is now becoming very active in this vital area and there is now quite a lot of activity. Some examples: There is now a radio society being formed in Burkina Faso and at a preliminary meeting no fewer than 26 interested people attended. A project there is being elaborated in cooperation with REF-Union. In Cameroun there is as yet no society but Mr Simplice Zanga Yene, TJ1ZY, is trying to form one, and called a meeting of the 40 licence holders – three of them nationals of Cameroun who do not have their own stations. In Mali there is also some movement towards forming a society. In Ethiopia there is now great progress with the Ethiopian Amateur Radio Society with their club station ET3AA coming on the air on 4 July 1994. ET3AZ and ET3BT are the first Ethiopians to be licensed for more than 20 years. Tanzania hopes to form the 'Tanzanian Amateur Radio Association' soon with the guidance of Mr Steve Mmari, 5H3EM, and others, and last but by no means least we have heard that the administration in Congo is now showing a healthy interest in amateur radio.

The South African Radio League has now secured the franchise to set and administer the Amateur Radio Examination with effect from November 1994 and the HAREC (Harmonised Amateur Radio Examination Certificate) syllabus has been accepted and will be used as a basis. SARL intends to offer the examination in Lesotho, Botswana, Swaziland, Namibia, Zambia, and other African states where English is the official language. This will greatly reduce the cost to candidates who would otherwise have not been able to afford the very high cost of the UK examination – they will now pay the equivalent of £8.

The first IARU Region 1 Seminar is to take place in Abidjan in Ivory Coast this month. Its aim will be to train 'ambassadors' for the amateur radio services and half of it will be conducted in French, the other half in English. W1RU, 6W1KI, and ON6WQ will be primarily involved.

NEW PUBLICATION

THE INTERNATIONAL Telecommunication Union has given permission for a joint trilingual publication to be prepared which is to be given to the participants at WRC 95 as well as an 'IARU Fascicle' that will include all ITU documents related to the amateur services. At WARC 92 there was a similar booklet made available to delegates and it proved to be very popular.

LEADERSHIP COURSE

A LEADERSHIP COURSE was presented by ARRL in association with HAMRADIO 94 which took place in Friedrichshafen in late June. The International Secretariat was also invited to present a tutorial on developments in amateur radio to the ITU-R technical staff in Geneva. This took place on 28 June and was attended by 20 engineers from the ITU.

MEETINGS

THE AGENDA FOR the meeting of the Administrative Council due to take place in early September included a discussion of IARU representation at WRC 95, and participation in TELECOM-95.

Plans are already under way to make the IARU exhibit even more interesting than usual. It usually attracts attention from the Secretary-General and Deputy Secretary-General of the ITU and many influential members of administrations, including ministers.

Other items to be discussed on the wide ranging list included the findings of various *ad hoc* committees set up by W1RU which include a CW Committee (whose findings draw on the investigations undertaken by our own Society recently), a VGE Committee (which has been following the meetings of the Voluntary Group of Experts who have been attempting to simplify the Radio Regulations), a Satellite Committee, an IARU Evolution Committee, and lastly a committee which has been studying the 7MHz situation.

Frank Butler, W4RH, recently attended a meeting of ITU Radiocommunication Study Group 8/3 in Toronto on behalf of the IARU. Amongst other delegates attending was Peter Chadwick, G3RZP, who was professionally involved. There will be an ITU Plenipotentiary Conference taking place in Kyoto at the time this is being read. This is the highest authority in the ITU and IARU is not permitted to attend. However, Masayoshi Fujioka, JM1UXU, (IARU Region 3 secretary) and Paul Rinaldo, W4RI, will be there as part of the delegations of Japan and the USA respectively.

Voting is now taking place on the admission of the Belarus Federation of Radioamateurs and Radiosportsmen (BFRR) and the Latvian Radio Amateur League (LRAL). Voting will conclude on 12 January 1995. Details of voting on the proposals to re-elect Dick Baldwin, W1RU, to the presidency of IARU, and Michael Owen, VK3KI, to the Vice-Presidency have now been published and a total of 84 societies voted. All voted "Yes" for both candidates except the Botswana Amateur Radio Society which abstained in the ballot for the President.

K Rosier, G3DJK, who was one of those representing the RSGB at the 1952 Region 1 Convention in Denmark, sent us this impressive picture.

ARDF

THE SEVENTH World ARDF Championships took place in Sweden last month. Societies taking part included a team from RSGB and ARDF activities in the past have resulted in the introduction of amateur radio in China. Several teams from the PDR Korea have now participated and there is hope that some progress might result towards the introduction of amateur radio in that country.

WHY?

HAVE YOU wondered why the frequencies allocated to the amateur services differ from Region to Region? The answer is that the world is divided up by the ITU into three parts and that the ITU allocations to the various services (including the amateur services) vary quite considerably between these Regions because of local circumstances. Thus the 3.5MHz band in Region 2 is 200kHz wider than ours!

SWL NEWS

BOB TREACHER BRS 32525
93 Elibank Road, Eltham, London SE9 1QJ

THIS MONTH traditionally sees the start of better band conditions as we head towards the winter. This will be particularly noticeable at LF, but as conditions were so poor, the improvement this year may seem more noticeable. Robert Small, BRS8841, summed up mid-August conditions very succinctly when he said ". . . . considering it is mid-summer, and at the bottom of the sunspot cycle, conditions on 14MHz were not too bad, but DX on most of the other bands was hard to find. 18MHz was not as good as might have been expected, and 21MHz was closed much of the time. QRN made copy very hard on the LF bands."

HF CONVENTION

AS *RADCOM* arrives late September, there is time to mention once again the HF Convention which takes place at the Beaumont Conference Centre, Old Windsor, Berkshire on 7, 8 and 9 October. The main lecture streams are on the Saturday and Sunday. In addition GB301OTA will be active, there is a DX Quiz and an RSGB book stand – it is clearly an event not to be missed and one which will provide sufficient interest to any active SWL.

SWL CHALLENGE

AFTER THE SUCCESS in 1993 at receiving over 40 logs for the SWL equivalent of the *CQ* Worldwide SSB Contest, I hope for an even greater number of logs for this year's Challenge which takes place on 29 and 30 October. Jean-Jacques Yerganian, ONL383, and I have publicised the event widely, and I expect to receive logs from over 20 countries this year. However, the most pleasing aspect of 1994's entry would be to receive a sizeable number of UK logs. Listener participation in GB contests seems to be on the increase, so it will be a real pleasure to get, say, 20 logs from the UK to swell the number of entries still further. Hopefully the results table will be bursting with British BRS and RS callsigns. Please send in a log to show that you listened to the bands during the Challenge weekend. Would you also send a photograph and your QSL Card with your log, so that they can be featured in the results booklet which is to be produced and sent around the World to publicise the contest.

Although conditions are poor at present, the bands always seem to come alive during the *CQ* WW SSB Contest. The contest is probably the best chance in the year to hear a few new countries on all bands, so take the opportunity with both hands and send in your log for the contest. If you want to enter a 'single band' log, please do so. Another fallacy is that logs have to be packed with hundreds of callsigns – last year, one entry was received with only 30 stations logged. That particular listener did not win, but he took part. Take a look at the HF bands during the *CQ* Worldwide contest weekend of 29/30 October and send me an entry – be one of those who help to make the event an even bigger success than last year.

RULES

The idea of the Challenge is to log as many countries as possible in the 48 hours from 0000 on 29 October to 2359 on 30 October. The Challenge takes place at the same time as the SSB leg of the CQ worldwide contest.

1. There are no time restrictions. An SWL may listen at any time during the 48 hours.
2. Only one station from each DXCC country can be logged on each of the main amateur bands (No WARC bands).
3. Scoring: Countries in SWL's own continent score 1 point on each band. Countries outside SWL's own continent score 5 points on each band. Final score is total points on all bands multiplied by total DXCC countries on all bands.
4. Entries *must* show:
   (a) Date
   (b) Time (UTC)
   (c) Callsign of station heard (the callsign of the station being worked is *not* required)
   (d) RS of station heard at SWL's QTH (the minimum report will be 4x4).
5. A multiplier check sheet must be included with entries
6. Computer generated logs will be accepted
7. Logs should be sent to Bob Treacher BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ.
8. Logs must be postmarked no later than 28 November.
9. Certificate will be awarded provided 20 logs are received.
10. Please include 2 IRCs or $ bill to receive a copy of the results.

VHF MS

ONLY TWO REPORTS of this rather specialised form of DXing during the August Perseids Meteor Shower – from David Whitaker, BRS25429, and myself.

David monitored both 50 and 144MHz with reasonable results – best DX was OY/G4PIQ on 50MHz. Other DX on that band included PA3FYM, SM7AED and OZ2LD. 144MHz accounted for 9A1KDE, 9A1CCY, PA3FJY, HG1YA, F2PY and SM3BEI. Down south, only 144MHz was monitored. The best reflections seemed to be after midnight on 12 August when good bursts were heard from many Europeans, including I8MPI, IK1MTZ, IW5BVP, IK5EHR, YU1VG, I2FAK, HA3UU and 9A1KDE. However, the best DX was from 0850 to 1045 the same day, when very good reflections were heard from Sweden. The stations logged were SM7FWZ, SM3BEI, SM4HFI, SM3BJ, SM0EJY, SK6HD and SM5MIX. Having listened to a good many Perseids, I didn't think this year's was particularly spectacular. I shall be interested to read G3FPK's account in *VHF News* to get a second view.

Eddy Scherer, BRS93500, at his shack in Braintree, Essex with his listening station which includes two Realistic DX-302 receivers and a PRO2005 scanner.

HF NEWS

READERS WILL recall mention of Fred, G0EHQ/M, and his cement mixer in a recent issue. Well, it seems that Eddy Scherer, BRS93500, has also heard him and received a QSL card showing G0EHQ and his cement lorry. Fred was HF while driving and Eddy passed on the information that he monitors 28.420, 21.420 and 14.320kHz. Eddy had also heard JR9LKE who sent him a QSL which features a photograph of the entire family – Dad, mum and two sons – licensed as JR9LKB, JR9LKC, JR9LKD and JR9LKE. Another to respond quickly with a QSL was OX3JF, who sent Eddy a Fire Department badge from Thule Air Force Base. If any other listener has an interesting story about a QSL they have received, perhaps they would let me know.

It was nice to hear again from Graeme Caselton, RS44984/G6CSY. He is listening again after an extended spell of VHF/UHF activity as GJ6CSY from Jersey. His receive set-up is a Trio TS130V and a 5-band trapped vertical, and his activity is logged directly onto a laptop PC. Stations heard in August included DL3LAB/TF, KH6WU, CE6TC, TA1/K4UEE and HL3IWD – all on 14MHz.

Finally, a few snippets from Robert Small's (BRS8841) log. The highlights of his month were BO0M (Ma-Tsu Is), ZK3UC (Tokelaus Is), CY9CWI and 9U/F5FHI. On 10MHz, he heard V47KEP, TK/F6AUS, 5N0PR and JW4LN. 18MHz provided new countries in the shape of P43A, G3MRC/9Q5, 9J2SZ, FT5ZF, 9U/F5FHI and CX4DI. Robert has been converted to IOTA and listened to a large number of stations operating from rare islands. WB1CBY/VO2 operating from Big Island was one callsign that caught both my eye and my imagination!

FINALE

UNTIL NEXT MONTH, when the copy deadline for the **December** issue is **19 October**.

THE RSGB QSL Sub-Manager for the G3LAA–NZZ callsign series is now Mr D Keely, GW0OGI, whose address is: Pensarn Cottage, Bryn Du, Ty Croes, Anglesey LL63 5SH. He has taken over from Mr A Giles, G4OJH.

Alex Devereaux, G0TTZ, tells me that he is still getting envelopes with as much as £1 in postage on them for the return of cards. That really is a little silly. It means that he has to stockpile vast quantities of cards until the relevant weight is reached. It would help him and the other sub-managers enormously if the guidelines were observed.

First or second class postage to cover an 8 inches by 6 inches (or 140mm by 80mm) envelope full of cards is all that is necessary. Those wishing to receive their cards before the weight is reached can make arrangements to do so – see February 1991 *RadCom* pages 6 & 7.

I have received a letter from a member indicating that he sent a consignment of outgoing cards to his sub-manager and was surprised to get them back in some of his pre paid envelopes!

I have said before but it's worth repeating, *never, ever* send outgoing cards to a sub-manager. He has more than enough to do sorting incoming cards. All cards that are outgoing should be sent to the central bureau at Potters Bar.

Remember not to send SAEs to the central Bureau. They should go to your sub-manager. It is worthwhile mentioning the fact that a large number of cards go uncollected. This is time consuming and unfair to the sub-manager who volunteers his time to provide a service which is recognised by many as the finest QSL service in the world.

John Tye, G4BYV, who is a keen home brewer, sent me a photograph of the Scott Taggard receiver he made about two years ago. His grand-daughter is pictured here with the equipment made by John – down to the wooden cabinets! John says the 'battery' works off the mains and gives the HT and 2V for the valves. The Ever Ready motif came off a valve box.

He also sent me a bit of radio maths which was prompted by the Air Signallers prayer I mentioned recently. He says G3 + XYL + TVI + HP = QRT.

The unique QSL card used by Ken Frankcom, G3OCA.

One of the new WACRAL awards which will be available soon.

John Tye's, G4BYV, unusual home-brewed Scott Taggard receiver.

AWARDS

THE WORLD ASSOCIATION of Christian Radio Amateurs (WACRAL) is to launch a new series of awards at their conference in October. A total of ten different awards will be announced, available at a very modest cost to all licensed amateurs and short wave listeners. There is even one for logging 'Heavenly Pilots' (WACRAL members who are ordained)!

Further details are available from the Association's Award Manager Steve Nicholls, G0JFM, 20 Belmont Road, Brixham, Devon TQ5 9JH. Please remember to enclose a SASE. A draft of the type of certificate to be used is shown here.

QSL CARDS

E A PERKINS, G3MA, sent me an example of the QSL card used by the special event station GB300GR set up to mark the demise of one of the most famous regiments in the British Army – the Gloucestershire Regiment or the 'Glorious Glosters' whose 300 year record of service was terminated by the recent defence cuts.

Stephen Cole, G3YOL, tells me that it is becoming increasingly difficult to obtain envelopes with gummed flaps for QSL use. Readers will know that we do not recommend the use of self seal envelopes because they cause problems for the Sub Managers. Stephen tells me that he eventually found some called 'Club Group Product' in a former Smiths shop. However, if the problem is going to become widespread we will have to re-examine the recommendation.

Deryck Buckley, G3VLX, wants to know why there are inaccuracies in the *International Call Book*. Deryck says that he moved house in 1985 but the change in address was not reflected until 1990 and I must confess that my own details were not shown until I wrote to the publishers with the information. To be fair, they were included in the next edition. In addition, I occasionally receive letters from punters asking why their details are not shown so I direct them to the publishers. My understanding is that it is produced by a private company but I have no idea why the updating seems to be so haphazard.

Deryck also relates a strange story about some cards he received for distribution to G3RCI. The cards were for a special prefix – EJ9 – and were routed via the G call. Deryck has no envelopes for G3RCI, can find no trace of the call in call books going back to 1986 and the call is not on the Headquarters' database. Deryck returned the cards to the LZ1 saying he could not forward them and duly received them back asking for them to be sent on to G3RCI! Can anyone help?

This attractive QSL card is used by the Torfaen Scouts ARC.

The 'Glorious Glosters' special 300th Anniversary QSL card.

Ken Frankcom, G3OCA, had the QSL card shown on the left designed specially and says that there isn't one similar in the 50,000 cards in his collection. He has been a keen DXer since being licensed in 1960 and has 314 countries confirmed. A bit of a traveller, Ken has just returned from Venezuela and is off to Costa Rica at the end of the year.

Richard Chatwin, GW0VAW, sent me the beautifully printed card for the Torfaen (Rockbreaker) District of Gwent Scouts ARC. Richard says the club needs all the publicity it can get and I am delighted to assist. Formed in November 1993 it is possibly the only Scouts ARC in Wales which is affiliated to the RSGB. Since starting, one 14-year-old Scout has obtained a Full Class B Licence and one 13-year-old achieved Novice Class B standard. Richard says they would appreciate some help with their work on club nights (second and fourth Wednesdays in the month) and would give a warm welcome to any volunteers. They use an FT980 and hope to have a 45' tower on site before long.

NOVICE NEWS

MRS ESDE TYLER, G0AEC
43 Nest Est, Mytholmroyd, Hebden Bridge, W Yorks, HX7 5BH

I PROMISED to give the callsigns of the next batch of instructors who had achieved outstanding success in Novice training. A special certificate from the Training and Education Committee was sent to each instructor for their effort in successfully coaching twenty (and more) Novices through the course and exam. These are: G0LGE, G0PLJ, G1NCG, G3SDY, G3UNM, (assisted by G3HZL) G4TLS, G6GTM, G7CND, G7DEM, G7DHM, G8VPS, and 2E1AHB. I find the last one especially pleasing – someone who is very quickly giving something back to the hobby.

Unfortunately, space has beaten me and I can't give names – but your collective 312 Novices can bear witness to your sterling efforts. On behalf of them and all amateurs, may I add my thanks and congratulations, and hope that the certificate is displayed in a place of honour on your shack wall.

To other Instructors, keep up the good work – if your successes are approaching the twenty mark, your callsign should appear on the next list.

NOVICE COURSES

NEW NOVICE courses are planned in the following areas – if you know anyone who would like to enrol, please pass on this information.

York Radio Club has a waiting list at present, but would be pleased to add new names and include you at the earliest opportunity. The overall cost, including the exam fee and components is £18 – with students providing their own essential books.

They also operate their own exam centre but external students may use it if their Instructor books it. In this case the cost incurred is exam fee plus postage. Barry, G4KCT, sent this snippet adding that the club works /P on sunny evenings and also enters 70cm and 23cm contests on SSB. With 2E callsigns in great demand by continental stations, they are very successful. If you are interested please write to Barry Firth, 8 Lyndale Ave, Osbaldwick, York YO1 3QB.

Mid Glamorgan Amateur Radio Group started a Novice course in September, and will follow with other courses. Morse tuition is also available for anyone requiring it. The Group meets at the Sports and Social Club at Aberkenfig, near Bridgend on Thursday evenings. Roger, G3XJC, sent this information and added that if any schools in the area are interested in having amateur radio demonstrated to their pupils, they will try to arrange it or they will lend their video tape on the subject.

This is of interest primarily to potential Novices, but Roger adds that other amateurs would be welcome – possibly to help in the training – and maybe form a club after classes with the emphasis on the practical side of the hobby.

Anyone interested – whether for tuition, helping or swelling the numbers of the club – should contact Roger on 0656 733729, or Tom on 0656 736954.

GB4NWC

FOR THE second time, this special event callsign was heard from the Neale-Wade Community College PTA Summer Fayre. The photograph shows the team of operators. Look again at the youngster standing second from the right – he sent in the following information.

At the event last year Robert Aley, 2E1AXZ, was very busy – and was busier this year. The event was held on the same day as the VHF National Field Day and the two metre band was crowded, but contacts made were: G, EI, PA, ON, and FT and G and 2E stations on 70cm. On 40 metres they 'collected' GM, G, GU, DJ, DK, F, LA, PA, PI and SM callsigns.

Besides operating, Robert was station manager which involved all the things that need to be done to make a station run smoothly – which it did. Robert has asked me to give public thanks to the amateurs who helped in all sorts of ways and these included two Novices. Robert is also a Novice Instructor; under the supervision of John, G0FLP, he coached Shaun – now 2E1DBV.

He has now passed the next hurdle and holds the callsign G7SRR, and hopes to go on to train more Novices. He comments that it is very useful to have followed the Novice course from the other side of the desk before teaching it.

(L to R) Andy, G6OHM; Shaun, 2E1DBV; Dave, 2E1CYK; Robert, now G7SRR and Bill, G0BXJ.

Robert has been nominated for the 'Young Amateur of the Year' title and he has already shown that he is more than willing to put something back into the hobby. Well done, Robert – we need youngsters like you.

KIDLINK

IT SEEMS amazing that it is a year since I last gave advance notice of this event. Last year conditions were poor and a full week was not very successful so, this year, it will be limited to three days – 3, 4 and 5 October.

As there are interested schools from Alaska to Australia there is a reasonable chance of youngsters meeting some of them. For distant working, it is suggested that a 'calling' time and frequency can be monitored and if a contact is made, a move up or down will leave the frequency clear for another contact. The suggested time is 1400UTC on each day around 14.275MHz.

For British and European contacts, suggested fixed 'meeting' frequencies should ensure that schools are not scattered up and down the bands calling in vain for other schools – who are doing the same thing. The suggested frequencies for this are 3.78 and 7.078MHz depending on which band is favourable at the time.

Many schools have an active radio club and use packet radio and satellites for contacts as a matter of course, and there should be even more opportunities for long-distance contacts for these schools.

May '92 Novice News explained what Kidlink is all about, but in case you do not have it handy here is a condensed version: Youngsters will make four statements answering the following questions –

1. Who am I?
2. What do I want to be when I grow up?
3. How do I want the world to be better when I grow up?
4. What can I do to make this happen?

Apart from making youngsters give some thought to these questions and how they will answer them, there is a strong possibility that these small beginnings could lead to a curiosity to know more about the person contacted. I still receive letters from children I spoke to on Kidlink in previous years.

If you want to know more, contact Peter Daley, G0GTE (QTHR) or ring him on 0438 724991. Once again, I hope to be there to speak to some of the youngsters.

GROUP GESTURE

HAVING GAINED the licence to transmit, the Novice then faces the expense of getting on the air. For the younger Novice, it may not be easy to raise the necessary cash without help. Denby Dale and District Amateur Radio Society has come up with a scheme to help these youngsters which other clubs may also like to consider:

Four Guides have passed their exam thanks to Paul, G0LVV, and are now being trained in CW by his wife Jean, G0LPV. They are aiming at the 12WPM test bypassing the Novice test as many Novices are doing. This of course takes time and, meanwhile, the Guides are keen to join in the fun with their class B licences.

Club members came to the rescue and started fund-raising. Four pocket-phones were acquired, fitted with new crystals, calibrated and converted to become 70cm handheld transceivers.

A special evening has been arranged at their HQ, when the Guides will be signed on as members of the society and the equipment will be handed over – on loan – to them. As they purchase their own equipment, the transceivers will be returned for the use of another group.

HF F-LAYER PROPAGATION PREDICTIONS FOR OCTOBER 1994

The time is represented vertically at two-hour intervals UTC for each band, ie 00=0000, 02=0200, etc. The probability of signals being heard is given on a 0 (indicated by a dot) to 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally F-layer openings at 50MHz and 1.8MHz are indicated by a plus (+) sign in the 28 and 3.5MHz columns, with these latter bands having a probability of 9.

Time / / UTC	28MHz 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 124680246802
** EUROPE								
MOSCOW	.....11.....	....1222....	....46652...	...178875l..	...5887885..	211665567863	875433235798	++3.....24++
MALTA	.....1.....	....23221...	....56554l...	...1787773..	...5877898l.	442765567984	997532235899	+++2....25++
GIBRALTAR	....	.....11.....	....24323l..	....476564..	....8877882.	13.576667882	896753335798	+++52...24++
ICELAND	....	....	.....1221...	.....35431..	....2788751.	676677861	662454445787	+++52...24++
** ASIA								
OSAKA	....	....	....32.....	....541.....	...27642l1..	...2433345l.	....21.13662	.........34.
HONGKONG	....111.....	....232.....	...1565.....	...27772.....	...2665433..	333357411	1.....13684	352
BANGKOK	....221.....	....343.....	...26661.....	...36774.....	...2465531..	1....132356511	2.....13686	.........3+4
SINGAPORE	....2211....	...14433.....	...26766l...	...3677751..	...2365675l.	1....132358621	1.....13686	.........3+3
NEW DELHI	....222.....	...14432.....	...36665.....	...4677611..	...3355641l.	311.122356641	62.....13688	3.....3++
TEHERAN	....2222....	...14444l...	...46667l...	...6667761..	...1544567l.	6342112358761	862....13689	+3.....3++
COLOMBO	....2222....	...14444l...	...36667l...	...4567761..	...2245676l.	11...123587l6	51.....13689	2.....3++
BAHRAIN	....3222....	...25444l...	...46677l...	...6667761..	1.143356752l	7431..235887	861....13688	+3.....3++
CYPRUS	....43331...	...16655l...	...48878l2..	...7888885..	212766678842	876533346898	9852111247l9	++2.....4++
ADEN	....43341...	...25556l...	...46678l1..	...5556884..	2.132236783l	8331..135887	861.....2688	+3.....3++
** OCEANIA								
SUVA/S	....	....	.....21.....	.....244.....	....355512..	...2433345l.	...321.123..	....
SUVA/L	....	....	....2.....1.	...2421..13.	.1.56431.441	..26432215l.	...31...23..	....
WELLINGTON/S	....	....	....1231....	....3453.....	....16655l2..	...443335l1.	...221.133..	....
WELLINGTON/L	....	....	.....1.....	.....1.....	.1133....241	.1254...1531	...21...13..	....
SYDNEY/S	....11.....	....331.....	...16533.....	...377552...	...5765652..	...2433357l.	....1..1363.	.........3..
SYDNEY/L	....	....	....1.....	....3.....1.	....62....51	..114311.352	...12...152.	.........2..
PERTH	....221.....	...1543.....	...47762.....	...577742...	...3565564l.	2...232357l3	13673	.........35.
HONOLULU	....	....	....	.........1..	.....1.341.	...3221531.	..2421.121..	...2........
** AFRICA								
SEYCHELLES	....23342...	...245564...	...456787l..	...455788l..	2112246783l	742...135887	84.....2689	+.....35+
MAURITIUS	....44342...	...265564...	...466787l..	...555788l..	2113225678l2	742...235888	83.....2689	5.....3++
NAIROBI	....44453...	...166676l..	...46668l3..	...555588l1..	2214222678l2	8741...35897	872.....2688	+4.....3++
HARARE	....35565...	...156687l..	...36678l5..	...555589l1..	12.522257962	7742...25898	873.....2688	+4.....35+
CAPETOWN	....12576l..	....34688l..	...256789l..	...455678l2..	12.533347972	7743l...14898	8841....2589	+5.....25+
LAGOS	....45567l..	....67788l..	...l776788l..	...375568l3..	14.642236982	79551...3798	8982....1588	5+5.....25+
ASCENSION Is	....34336l..	....56558l..	....7766882.	....8655685.	141163224783	79753...1488	88851....279	+++2.....4+
DAKAR	....25546l..	....47667l..	....7777882.	....8755785.	132274224782	688641..1588	88851....269	5++2.....4+
LAS PALMAS	....14323l..	....36546l..	....6887871.	....8888894.	131287667882	687764334798	9996311124l89	+++3.....25+
** S. AMERICA								
Sth SHETLAND	.....1232..	.....1345l..	....1466772.	....3677774.	132265554562	577643221234	56652.....12	2332.....
FALKLAND Is	....2345l..	....4567l..	....1777772.	....3776675.	132166531462	588643211135	78852.....13	4++2.....
R DE JANEIRO	....42234..	....6435l..	....8656l2.	....2865575.	132156322472	688543...147	89852.....26	+++2.....3
BUENOS AIRES	....2434l..	....5656l..	....7767l2.	....2776665.	.221565333l2	688543l..136	89852.....4	5++2.....
LIMA	.....3122..	.....534l..	.....7565l2.	.....7554l..	.1...2532232	476223l...14	69852.....2	4++2.....
BOGOTA	.....2122..	.....433l..	.....7555l2.	.....1755l4.	.1..1453224l	465133l...14	79742.....2	4+52.....
** N. AMERICA								
BARBADOS	.....3122..	....2534l..	....5755l2.	....6755l5.	.1..1652236l	56523l2...36	887521....15	++52.....2
JAMAICA	.....1111..	.....323l..	.....6555l2.	.....765l3.	2542242	453.2321..14	787421.....2	4+52.....
BERMUDA	.....1111..	.....323l..	....1655l2.	.....2765l4.	5543462	453.13211136	888421....15	+++2.....2
NEW YORK	.....1.....	.....122l..	.....4544l1.	.....6666l3.	2554551	442..3221235	787311....14	5++2.....
MEXICO	.....1.....	.....221..	.....543l1.	.....1654l2.	463221	342.3123...2	387321.....	.++2.....
MONTREAL	.....1221..	.....354l1.	.....5665l2.	2555551	441..3332245	787221....14	5++2.....
DENVER	.....1.....	.....132..	.....354l1.	.....554l3.	231...232222	376211.....1	.4+2.....
LOS ANGELES	.....32.....	.....153l1.	.....364l2.	22..1..33111	256221..l...	.3+2.....
VANCOUVER	.....1.....	.....23.....	.....155l2.	12.....24322	255311.12..1	.2+2.....
FAIRBANKS	.....1.....	.....134l1.	11.122225531	223421.12211	..22.....

The provisional mean sunspot number for August 1994 issued by the Sunspot Data Centre, Brussels was 22.8. The maximum daily sunspot number was 44 on 14 August and the minimum was 10 on 2, 22 August. The predicted smoothed sunspot numbers for October, November and December, are respectively: (classical method) 23, 22, 21 (±5); (SIDC adjusted values) 19, 17, 15 (±4).

Contest Exchange

ANDY COOK, G4PIQ
Fishers Farm, Colchester Road,
Tendring, Essex, CO16 9AA.
G4PIQ @ GB7MXM.#36.GBR.EU

THE VHFCC is going to undertake a complete review of VHF contesting and associated rules over the next year. The present rules were generated years ago, and evolved from a process of continual tweaking which led to the current unwieldy set. Because of timescales for publication and the size of the task, the rules for 1995 will be very much along the present lines, however we desperately need your feedback to set the rules for the following year.

Comments on all aspects of contesting are welcome - for example, what would you like to see us do to the rules; what is it that puts you off entering some contests; what can we do to encourage more people into contesting etc. Acting VHFCC Chairman David Johnson, G4DHF, 59 West Street, Bourne, Lincs, is coordinating this activity, and you can mail him your comments. Alternatively, if you want to send it by packet, then send it to me and I will pass what I receive onto David.

This activity is bound to take some time to complete, but we hope that the outcome will be worthwhile, with a simpler, more consistent set of rules, which will provide hassle-free contesting. Please do take the time to make your feelings known.

COMPUTER AIDED CONTESTING

LAST MONTH I spoke in general terms about the benefits of computer logging. The picture shows a screen dump of a typical contest logging program (CT by K1EA) showing how it may look in the middle of *CQ*WW - particularly topical since the SSB leg takes place at the end of this month. In the bottom left-hand corner is the QSO entry field - where most of the work takes place with the QSOs being entered here and editing of any previous contacts carried out. If you are in the multi-single category in *CQ*WW you are allowed another station whose sole purpose is to work new multipliers on the bands where your main station is not. In the top right is the rate window giving you some idea of how well you are performing at that moment and, finally, in the bottom right corner is the summary of how you stand in the contest at that moment, showing number of QSOs, Zones, Countries and Duplicates on each band, and the current total score.

The number of countries worked in the summary window gives an idea of the chance to work DX; it is one of the best opportunities for clubs to put on a contest station and astonish themselves at what can be worked.

There is a very large variety of software packages available for contest logging, and unfortunately I am only going to be able to concentrate on the major ones here. Some cover both HF and VHF contesting, but equally, there are many which confine themselves to one part of the spectrum or the other. I'll cover the different systems using this convenient divide starting with those available to HF contesters. There are three main packages for IBM-PC compatibles in use in the UK for HF logging - Super Duper by EI5DI, CT by K1EA, and LOG by G3WGV.

You can check the September 1993 issue of *RadCom* for more details on Super Duper in a review. Its great virtue is ease of use and I can well believe that complete beginners to computer logging are very comfortable with the software within minutes. If you are used to the key-strokes within CT or LOG you will find SD very different, but a couple of hours of practice has the differences under control. There is full window editing, so it is just a matter of moving the cursor keys up and down to change the details of a previous QSO, and SD is somewhat unusual in that it won't let you do anything inconsistent. It supports all the usual features which help search and pounce operation such as 'check partial' (eg enter IQ and it will list all the calls worked containing IQ) and the ability to search either by suffix or prefix. Also the normal counties, countries, zones, states etc worked lists are nicely implemented, making it easy to keep and handle your multiplier situation. The standard CW keying functions are all there too. The software certainly appears to be able to support the vast majority of RSGB and international contests and requires very little computer power since it is claimed that it will even run on an XT. There is a separate program SDV for VHF contests.

LOG

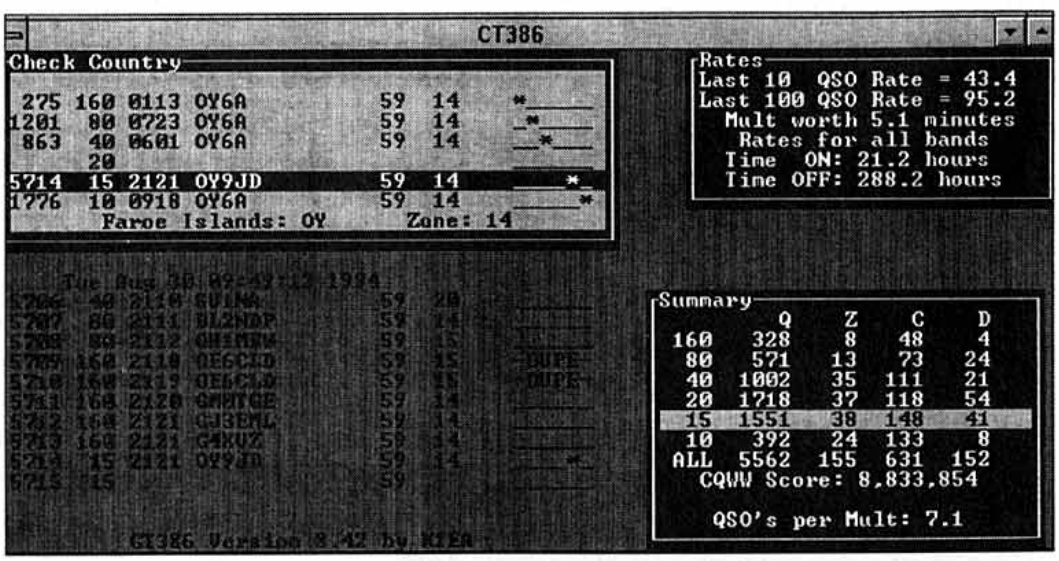
LOG by G3WGV has a user interface which bears more resemblance to the 'standard' of CT, making it easier for those accustomed to CT and its clones, but not necessarily simpler for beginners. One big difference between CT and LOG is the lack of a full window editor in LOG. Most of the functions are very similar to Super Duper although implemented differently. However, LOG supports some nice extra features for multi-operator contests enabling you to look at the statistics of the operating; the ability to display bearings is useful, and it has a nice front-end for the filing system. LOG is also able to support pretty much all the RSGB events (including VHF contests), and some major international ones, and will run on a simple computer platform.

Neither SD nor LOG support Packet Cluster access, however I have managed to circumvent this by running the applications in a DOS window in Microsoft Windows and having a separate terminal emulator window open for packet access. I would not like to guarantee that this will work on all machines and indeed EI5DI specifically states in his manual that this may well not work. The other downside of doing this is that you require at least a 386 machine, and I have found that, to get adequate speed in LOG, a 25MHz 486 seemed to be about the minimum requirement when running inside Windows.

CT

CT by K1EA was the first piece of contest logging software to make it really big and has now developed into a very sophisticated tool. The basic functions of CT are fairly easy to use since it is based around a full window editor, but it has now acquired so many features that some of the less often used commands are a nightmare to remember. All the functions of SD and LOG are supported in CT, along with of extra ones, including integrated Packet Cluster access and control of the radio. However, CT really comes into its own in multi-station contests, even if just a run station and a multiplier station.

It has built-in networking facilities enabling up to 16 computers to be linked together through their serial ports, thus allowing all the stations to see what has been worked on other bands. If you have a multiplier station it can always have an up-to-date list of countries still needed, and I can vouch for this being very simple. However, CT is very much optimised for the US market and, whilst it supports the major international events such as *CQ*WW etc, it does not lend itself well to many of our RSGB contests with their many and various exchanges!



A screen dump from the CT logging program by K1EA.

Novice Note Book

IAN KEYSER, G3ROO
Rosemount, Church Whitfield, Dover,
Kent CT16 3HZ

I HAVE ALWAYS MAINTAINED that the clothes peg is a very useful item in the workshop and John, G0FZW, has come up with another idea for it.

John writes: "some system of supporting a printed circuit board whilst components are placed and soldered into position is definitely required".

The gadget he suggested is very simple to make and very cheap so it may be of interest to our younger members. This required very few components and, in fact, most of the bits can be found easily at home **(Fig 1)**.

CONSTRUCTION

CUT OFF THE HEADS of the nails with a hacksaw and file the cut ends to remove the burr. Then carefully drill a hole in each of the pegs so that the nails push tightly into them. They can of course be glued in, but careful selection of the drill makes a 'push fit' satisfactory.

Drill a matrix of holes, just larger than the nail diameter in the board, these should be about 10 mm deep.

Cut a piece of stiff card (empty cereal packet) the size of the PCB.

TO USE THE VICE

IN USE, ALL THAT IS NEEDED is to clip a peg to each corner of the PCB and insert the nails into appropriate holes in the drilled board. Components are then easily inserted into position. After a few are in place, say all the resistors, unclip the board, cover with the piece of card that you have already cut to size, invert the whole thing and reclip onto the pegs. The card now holds the components and they can be soldered in place and the surplus wire cut off. Both hands are free all the time. Easy!

AN 'EYE-BALL' QSO

I AM HOPING that I will be able to get to the HF convention on Saturday 8 October. There are two talks that I am interested in, Tranceivers by G3SJX and Antenna Circus by G3WLM. If all goes to plan I will be in the bar at 1200 wearing a navy blue baseball hat and assisted by a four foot (sorry we're metric now .... 1.2metre) thumb stick. If you see me, stop me!

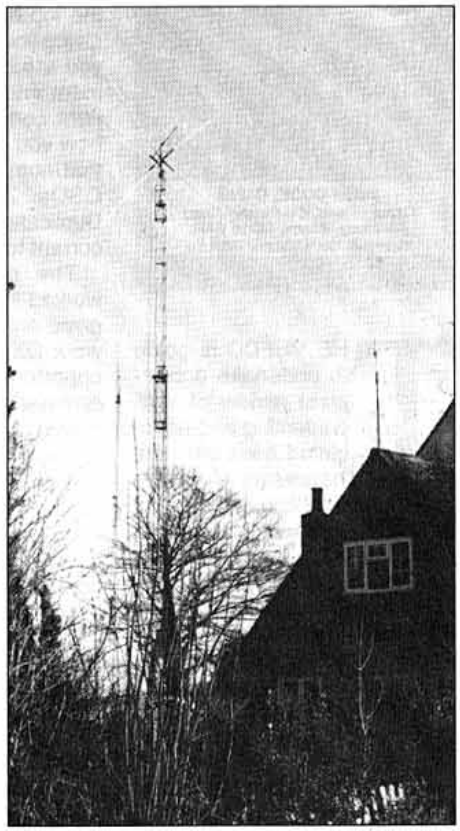
ANOTHER AERIAL INSULATOR!

ALAN, G3XOI, POINTS out that plastic garden chain, four to six links, makes an excellent aerial insulator. A refinement is to tie a short length of plastic cord to the second from the wire and let it hang down about six inches. Any rain running down the catenary will drip off and not form a water conductor to the mast.

If you have an idea for a simple fix to a ham radio problem, why not share it with us?

COMPONENTS

4 wire nails (50-70mm long)
4 wooden spring type clothes pegs
1 piece of wood (approx 15mm thick x 150mm square)



Just to show what my aerial system looks like!

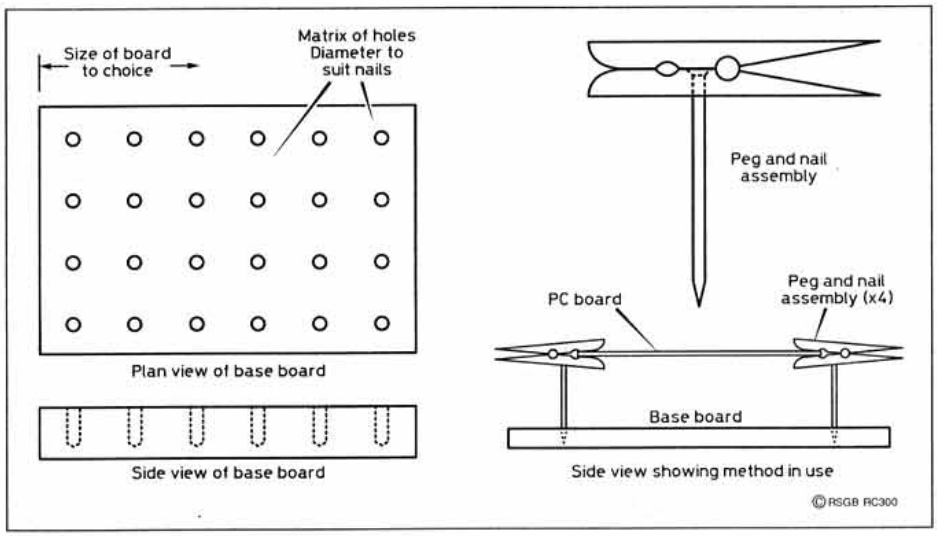


Fig 1: How to construct this handy little peg-vice designed by G0FZW.

RADCOM TECHNICAL FEATURE

Frequency Display for the Phasing Transceiver

by John Hey, G3TDZ

NO CLAIMS FOR originality are made for this frequency display as it has appeared in the amateur press for many years. The circuit has however been adapted for use in the G3TDZ phasing transceiver [1] by adding a mixer which is fed from either of two crystal oscillators.

Before synthesizers, it was common in amateur transceivers for the dial scale to read in reverse on some bands. The three lower bands, 160m, 80m and 40m are reversed in this design, see **Fig 1**. In order to display the frequency correctly, the VFO is mixed with the output from a 7MHz crystal oscillator on the low bands, and from a 6MHz crystal on the higher bands. By using one of the unused pins on the DIN41617 converter connector, strapping it to one of the earths, some simple logic causes the appropriate crystal to be brought into use.

Four 4026 C-MOS decade counter, seven-segment display driver ICs count and display the hundreds, tens and units in kHz, clocked at a rate of 100Hz. Once a count is made, its sum is latched into the display drivers and a refresh pulse causes a new count to be initiated, thus the display is refreshed at a 100Hz rate. The clock is derived from a 3.2768MHz low cost crystal, a 4060 crystal oscillator divider bringing it down to 400Hz when a further 4013 divides twice more to produce 100Hz.

> This project has been designed for use with the G3TDZ Phasing Transceiver featured in *RadCom*, July and August, 1993. Copies of the original articles are available from the RSGB at a cost of £5. Please supply an A4 SASE.

It is much simpler to use two crystal oscillators than to switch crystals. A 4011U two input NAND acts as oscillators and switching logic; a single connection returning to the 41617 converter housing socket.

A 4070 OR gate accepts the oscillator selection and sends the signal to the data input of a 4013 D-type flip-flop. A simple transistor stage amplifies the VFO signal; a BC548 or similar is suggested. This feeds a section of the OR gate IC which is biased 'on' by the 1M resistor; its output now at logic level drives the clock input of the 4013 mixer. The RFC consists of three turns of any suitable enamel wire on a single FX1115 ferrite bead.

Although the first 4026 counter will drive a 100Hz LED display, it is suggested this be left alone as a counter, and only the kHz displayed. As the count is refreshed at the same rate, the 100Hz count can flicker more than is

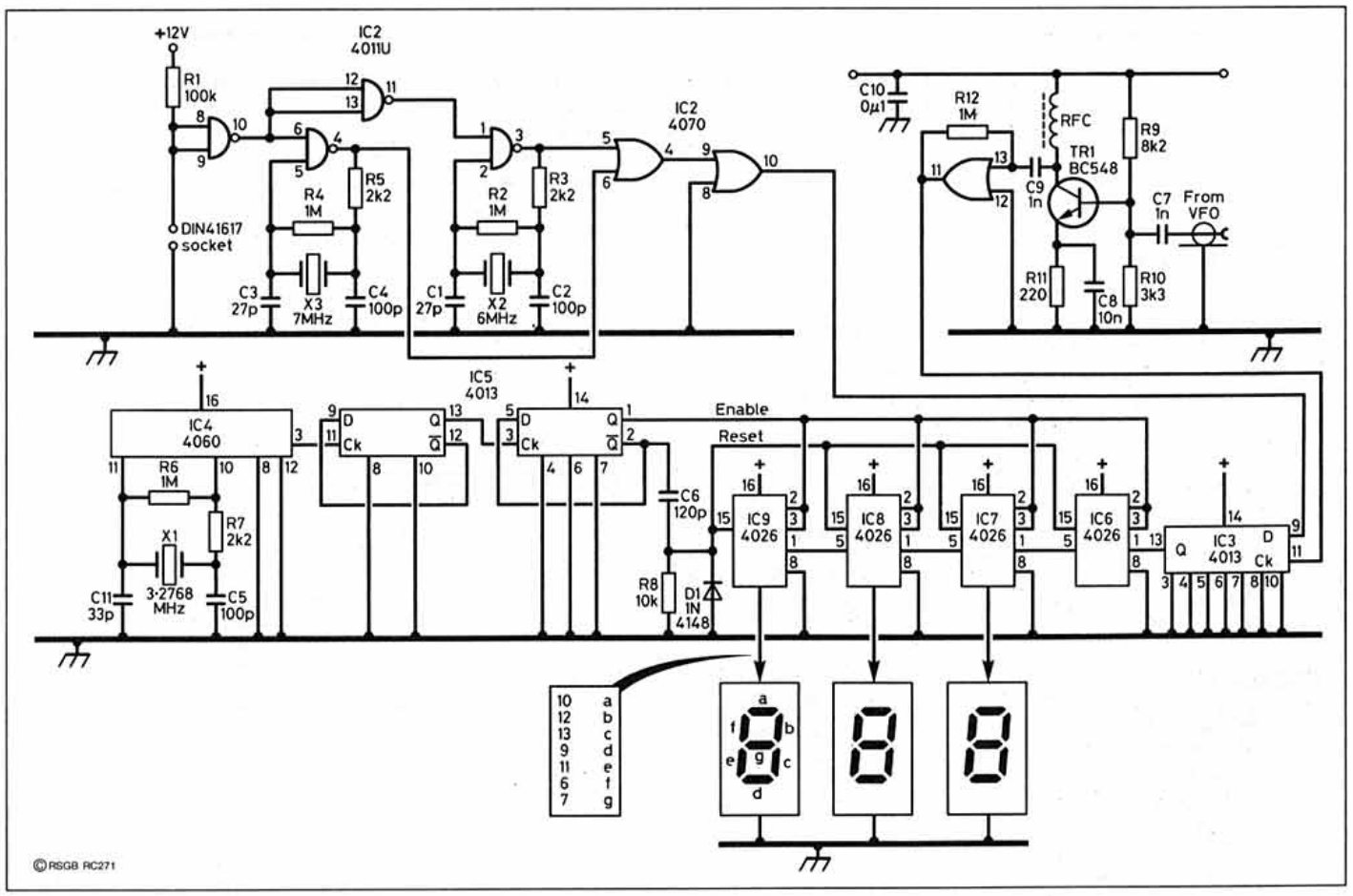


Fig 1: Digital display, circuit diagram.

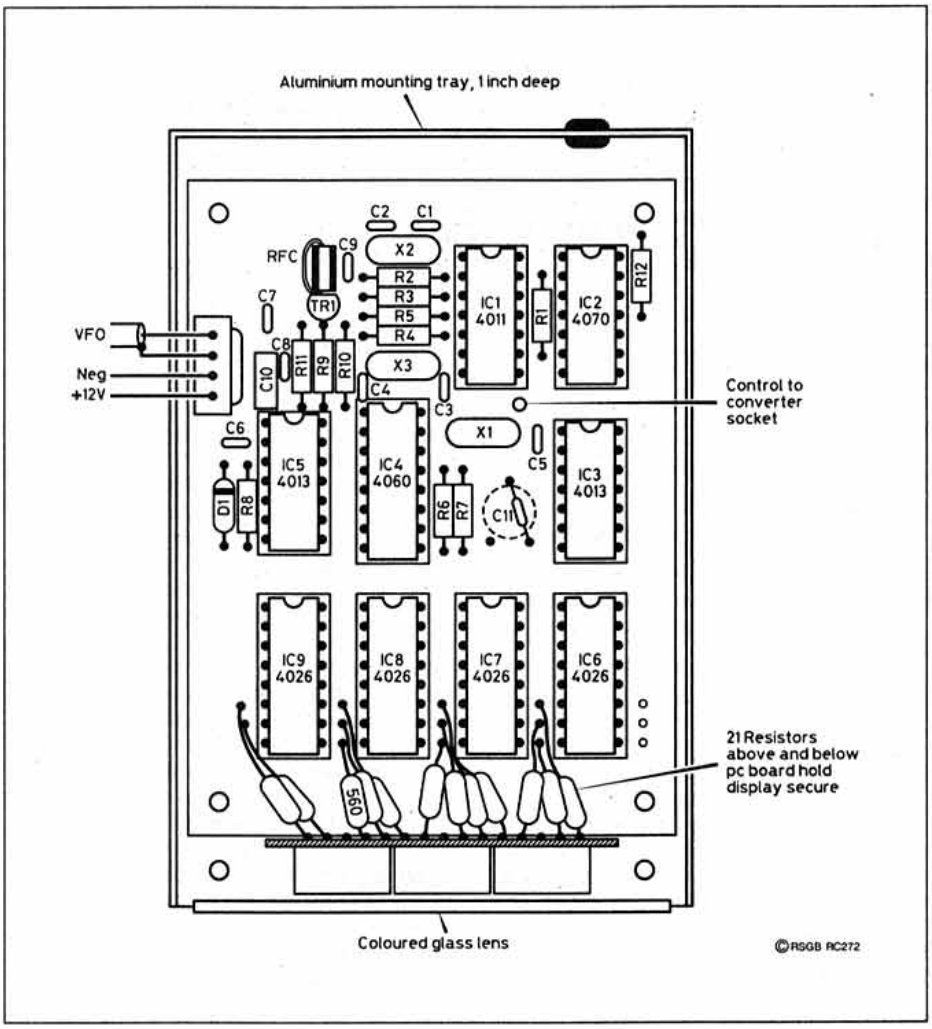


Fig 2: Digital display, component layout.

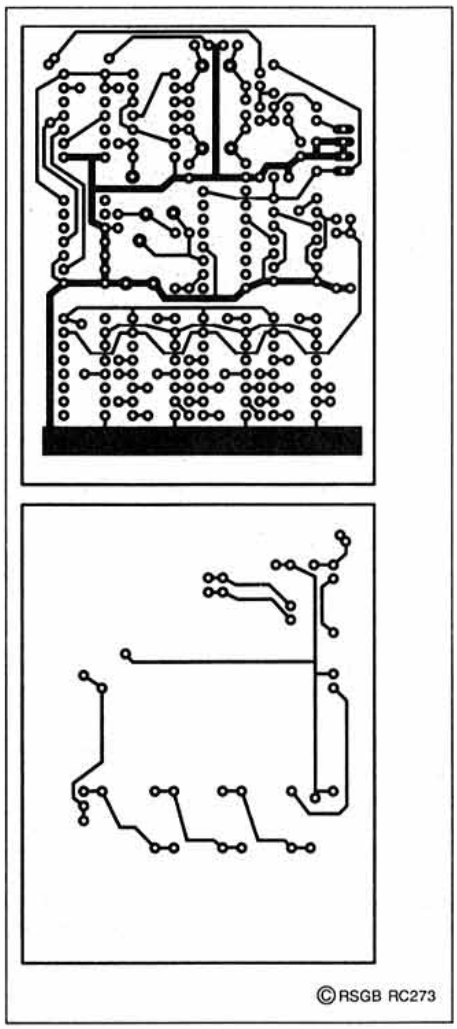


Fig 3: Digital Display, PCB artwork (reduced to 70%).

desirable. Note, the MHz are not displayed. If you are on say 40 metres, then you know that a 'seven' is taken for granted, therefore if the display shows 057, then the working frequency is 7.057MHz, and the same applies to all the bands.

CONSTRUCTION

THE DOUBLE SIDED PC board, see **Fig 2**, carries all the electronics except the seven segment LEDs. These should be mounted on a small strip of board at right-angles to the main board. This is held in place by the feed resistors from the drivers. A 560Ω resistor should be soldered to each drive, so with twenty one resistors and a common earth, the display is held very firmly.

It is suggested when fitting to the transceiver, to avoid hum loops which cause VFO modulation, the display board is given its own 12V regulator and a 1000µF capacitor, and fed directly from the main reservoir electrolytic. The circuit has been well tried by White Rose Amateur Radio Society members and the display makes the transceiver look quite professional.

A good way of mounting the display is to construct an aluminium three-sided tray, about 1" deep, mounted on metal spacers above the tuning gang and drive mechanism. The PCB and its seven-segment LEDs are fitted into this on small spacers.

Three seven-segment units can be made to just peep nicely through the original dial window. Glue a piece of red or green acetate sheet inside the window.

It will have been noticed that space for a trimmer was made on the board next to IC4. This may be replaced by a fixed 33pF capacitor, C11.

REFERENCE

[1] 'Multi-band' Phasing Transceiver by John R Hey, G3TDZ, *RadCom*, July and August 1993.

PRINTED CIRCUIT BOARDS

PCBs can be obtained from:

Badger Boards,
80 Clarence Road,
Erdington,
Birmingham B23 6AR

Telephone: 021384 2473

Price on application.

COMPONENTS LIST

Resistors

R1	100k
R2, R4, R6, R12	1M
R3, R5, R7	2k2
R8	10k
R9	8k2
R10	3k3
R11	220
LED feed resistors:	21 at 560Ω

Capacitors

C1, C3	27pF
C2, C4, C5	100pF
C6	120pF
C7, C9	1nF
C8	10nF ceramic disc
C10	0.1µF polyester
C11	33pF

Inductors

RFC	3 turns on FX1115 bead

Semiconductors

IC1	4011UB
IC2	4070
IC3, IC5	4013
IC4	4060
IC6, IC7, IC8, IC9	4026
D1	1N4148
TR1	BC548 or similar

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X2	6.0MHz computer crystal
X3	7.0MHz has to be ordered

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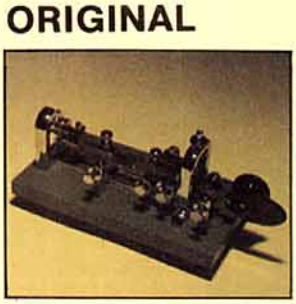
ORIGINAL



The **Vibroplex "Original"** design, with little modification, is made today using the same tools and dies as the early models. Modern day operators can put their fist to the same equipment as the Western Union and railroad operators of old. The feeling of quality and pride from owning a piece of history can't be achieved with any other later day piece of equipment. Still popular today, the distinctive sound of the "Bug" can still be heard; – the signature of a true C.W. expert.

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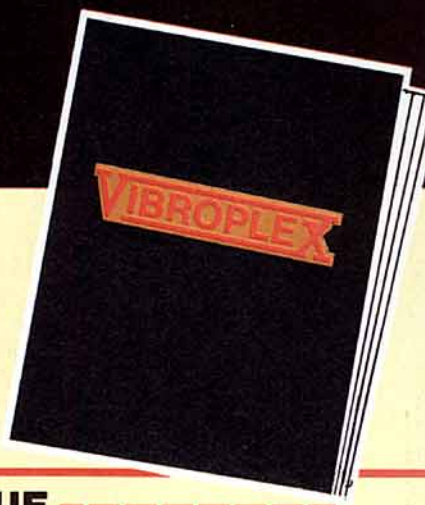

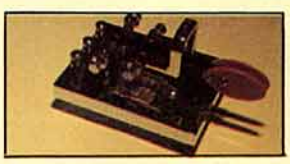

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A BEAM IN THE LOFT

WHAT DO YOU RECOMMEND for a beginner's indoor 2-element beam for 50MHz, preferably something that could be fixed in the loft?

IN A NORMAL LOFT you can hardly fit in a 2-element Yagi for 50MHz. The element length is about 3m and the boom length might be about 1.2m, so you'd be lucky to be able to mount the beam anywhere without serious detuning by nearby objects. It is also very important to keep loft-mounted antennas as high as possible, not only to radiate a better signal but also to avoid coupling with the mains wiring (bedroom lights) and the telephone wires. To give you all the bad news at the outset, you can't expect wonderful performance from indoor antennas because they are always relatively low down and screened by the roof. But don't give up – with a little luck and a lot of patience, people have worked the world with simple antennas in the loft. Here are a few ideas, particularly for VHF, taking maximum advantage of the fact that you don't need to bother about the wind and weather.

Why bother with a fixed beam if you could rotate it? Signals can arrive from many directions, and there's no point in having to dismantle your beam in order to aim it where you want. A good first move would be to fix yourself up with a rotating mast in the loft. The mast can be nothing more than a straight length of wood located at the centre of the loft-space. The foot of the mast can be supported on a small board between the ceiling rafters and pivoted on a dowel (**Fig 1**). The top can be steadied by a loose conduit clamp screwed to the ridge-board. To work on the antennas, move the bottom of the mast away to one side and let the top slip out of its bearing. Take extra care when working inside the loft – make sure you have enough light, and lay down some boarding over the whole of area where you will work. Many DIY stores sell chipboard in long, narrow sizes especially for this purpose. You don't need a motorized rotator for the mast; there's nothing wrong with scooting up the loft-ladder and doing it by hand. If you can reach from the hatchway, well and good. If not, rig up something at the bottom of the mast with cross-pieces and lengths of string. You now have a good basis for an indoor VHF antenna farm.

The simplest rotatable antenna suitable for loft mounting is a quad loop (**Fig 2**). Although it is bidirectional, the diamond configuration fits nicely into a loft and a loop has the major advantage of being compact and relatively immune to detuning by nearby objects. All you need is a wooden crosspiece attached to your mast and you can rig up a wire loop on drawing-pins, without any special insulators. Use a small terminal block to connect the coax. Since the feedpoint impedance of the loop will be about 125Ω you will need a transformer to match 50Ω feedline. This can take the form of an electrical quarter-wavelength of 75Ω cable such as 980mm of URM70 or RG59. The theoretical VSWR on your 50Ω feedline would be about 1.1, though you may have to adjust the length of the loop for the lowest VSWR in your particular loft environment.

With any indoor antenna you need to take strong precautions against RF on the feedline. Wind the 75Ω cable into a ten-turn choke, about 100mm diameter, as close as possible to the antenna feedpoint. You may also need to use ferrite rings and/or linear-resonator traps further down the feedline. Try to use low-loss cable such as UR67 for the main feedline. You've already sacrificed a lot by mounting the antennas indoors and relatively low down, and if you make yet more compromises you cannot expect any success at all.

To graduate to a 2-element beam, one option would be to add a quad reflector, again retaining the diamond configuration. Since this involves considerable extra carpentry and the whole antenna must be further down the mast in order to rotate freely, possibly a better shape for a very compact rotatable beam would be the VK2ABQ. This is a quad loop turned on its side and divided by insulators into a driven element and a reflector (**Fig 3**). You will need two spreaders at right-angles, and you may actually be able to get a VK2ABQ higher up in the roof-space than you could manage with the diamond quad. Two lightweight insulators are required, which can be plastic coat buttons, and you will need to support the feedline to prevent it from dragging down on the driven element. The feedpoint impedance of a VK2ABQ is around 50Ω at resonance so you can connect the coax cable directly to the wire element. If the VSWR is too high for your taste, you may have to alter the lengths of the elements slightly. The drawing pin supports can be repositioned if necessary. Use a feedline choke if there is an indication of antenna currents on the transmission line.

This has assumed horizontal polarization. If you're thinking of something vertically polarized, eg for packet, you could try either of the above antennas turned on its side – but forget about rotation. You will need to take the cable horizontally away from the antenna as far as possible before running it down the rafters, and you may also need additional cable chokes to avoid inducing currents on the feeder. Please note that the dimensions given above are all carefully computer-optimized but I haven't been able to try them out – our loft is already too full! To make the antennas work in your situation, you may have to experiment with the wire lengths and perhaps also the matching methods. The delight of loft antennas is that they're so easy to play around with, in all weathers. Just mind where you're putting your feet!

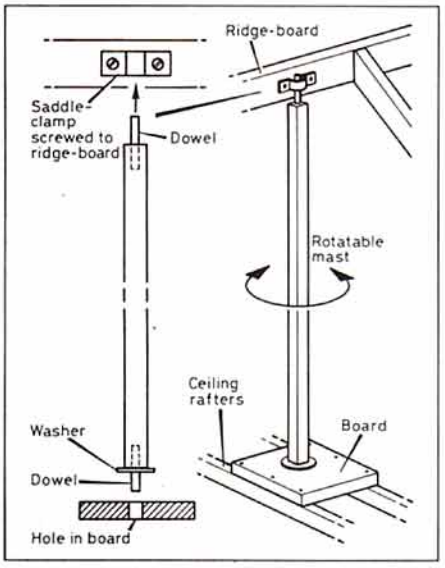


Fig 1: Ideas for a rotatable mast inside the loft.

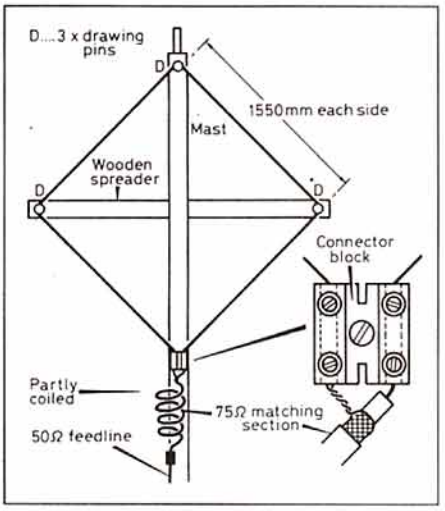


Fig 2: A simple bidirectional quad loop for 50MHz (not to scale). The impedance matching section is 980mm of URM70 or RG59 coax (75Ω). Coil some of the matching section into a choke just below the feedpoint and run the feedline straight downwards as far as possible.

WHICH LOW-LOSS COAX?

I HAVE BEEN RECOMMENDED two types of low-loss coax for 70cm. One is 'H100' and the other is RG213. My local dealer has the RG213 and assures me there is very little, if anything, to choose between them. What is the difference between the two types? Is it worth paying the extra for the H100, and where could I get it?

YOUR DEALER IS BEING 'economical with the truth'. For 10W into a 10m length of cable at 432MHz, RG213 will lose 3W while a lower-loss semi-airspaced cable such as H100 or W103 will lose only 1.5–2W. In terms of transmitted signal strength, the difference is 0.6 – 0.8dB; this doesn't matter if signals are already several dB above the background noise, but it might make all the difference between success and failure with a weak DX station.

The lower loss of H100 cable came from a combination of design features: a large solid-copper inner conductor, the relative absence of lossy dielectric material between the inner and outer conductors (unlike RG213 which uses solid polyethylene). H100 also has an RF-tight outer conductor consisting of solid copper foil covered by a light woven braid. Being originally manufactured for use in un-

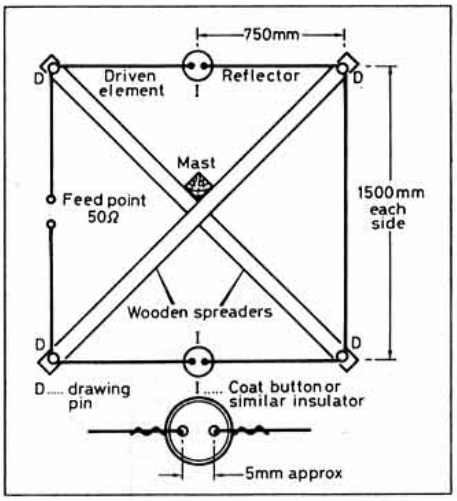


Fig 3: VK2ABQ 2-element beam for 50MHz (top view, not to scale). See text for matching suggestions.

derground cable TV systems, H100 had a thick heavy black polyethylene sheath. Unfortunately this proved its downfall for amateur applications: it was very difficult to fit connectors securely to this slippery sheathing material, which also had a smaller outside diameter than the RG213 cable for which ordinary connectors are designed. Thus water tended to leak in, and would run unobstructed down the inside of the cable and into the shack, promoting the scurrilous rumour that the 'H' in 'H100' meant 'hosepipe'. Also, the inner conductor was not restrained inside the cable and tended to shift, both sideways and lengthways. At the shack end of a long vertical run of cable this could result in the inner pin being pushed out of the plug, while the corresponding pin up at the mast-head became totally disconnected — and I still have a burnt-out connector to prove that! In its heyday, many VHF/UHF DXers came to love H100 for its low loss and low cost, but cursed almost everything else about it.

The good news is that H100 is no longer available in the UK, having been replaced by the much better designed Westflex 103 from the same dealer, W H Westlake (0409-253758, or see *RadCom* adverts). W103 has slightly lower loss even than H100, and is much better designed mechanically. The outer sheath is PVC, and has the same diameter as RG213 (10.3mm – hence the name '103') so N-plugs fit easily and remain watertight, and the inner conductor stays in place. When fitting a standard plug the only special thing you need to do is to file down the diameter of the inner conductor a little, though Westlake can supply a special N-connector if that seems too demanding. Even for high-power VHF/UHF stations which use semi-rigid coax for the main feeder run, I can recommend W103 as a flexible link around the rotator. However, you still need to take care to avoid all the bending force concentrating in one place, because that will tear apart the coil shielding, leaving only the thin braid.

Loss, dB/100m

	144MHz	432MHz
RG213	8.4	15.5
H100	5.5	9.8
W103	4.5	7.5

AUTOTRANSFORMER OR NOT?

AT A RALLY OR a junk sale, how do I tell an autotransformer from one that provides safety isolation from the mains?

LOOK AT THE MAINS TERMINALS. There will always be one set marked something like 0-110-115-120-200-220-230-240, but any transformer that does not have another winding with a completely separate set of terminals marked in a similar way is not 'double-wound' and will not provide safety isolation. Of course, the only way to make absolutely certain is to test the windings with an ohmmeter. If you're going to rallies or junk sales with major purchases in mind, slip a small multimeter in your pocket (a quick-change screwdriver set can be handy too). Nobody selling surplus transformers should object to your asking to test them with an ohmmeter. If they do object, don't buy from them – some rally traders need to be taught a few hard lessons about customer relations, don't they?

LOOSE ENDS

HOW DO I CUT and finish the ends of synthetic-fibre rope?

THE PROFESSIONAL METHOD is to use an electrically-heated knife, to melt the fibres together and stop them fraying. Alternatives for amateurs include the barrel of a soldering iron, or a carefully-applied flame from a cigarette lighter. Although this doesn't always prevent loose strands from escaping, nowadays you don't need to back-splice the loose ends or 'whip' them with twine. A short length of heat-shrink tubing does the job perfectly.

By the way, don't take the photographs of knots in the June column too literally – leave a much longer free end than shown, in case the knot slips a little. When tying-off to a guy stake, always bring the free end back to the stake and secure it with a couple more half-hitches. Remember that knots can reduce the effective strength of a rope by 40-60%, and rate your guys accordingly. I'll have more to say about that in a future column.

VARYING VSWR READINGS

MY VSWR SEEMS TO IMPROVE at low power levels. How can this be?

VSWR IS TOTALLY INDEPENDENT of the RF power involved (at least up to the power levels where your feedline arcs over!). Trust this as a fact, and look for explanations elsewhere. The explanation is actually quite simple, and lies in the detectors used in all VSWR meters to measure the 'forward' and 'reflected' signals.

These are simply diode rectifiers (**Fig 4**), and any normal diode shows a threshold RF voltage below which no detected DC flows. It isn't a sharp threshold; rather the rectified current begins to flow a little with any applied

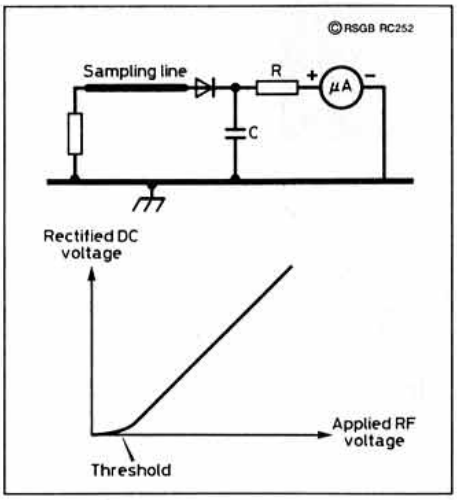


Fig 4: Typical diode detector in a VSWR meter or wattmeter. At low signal levels, particularly when reading reflected power, the diode's threshold voltage makes the meter read low

RF voltage and the threshold region is where it increases towards the direct proportionality that you see at higher RF voltages. The threshold voltage is typically about 0.6V for ordinary silicon signal diodes (1N914 etc.) and rather lower (0.4V) for Schottky-barrier diodes (HP5082-2800, BAT85 etc.). So-called 'zero-bias' Schottky diodes are available but are too expensive for ordinary amateur VSWR meters.

The RF voltage sampled by the VSWR meter and detected by the 'forward' sensor diode can be as much as 10V, which is well above the threshold; but in a well-matched system the 'reflected' signal could be only a fraction of a volt, so the threshold effect in the diode is very noticeable. Hence the 'reflected' reading may be substantially low and the meter underestimates the VSWR. If you increase the overall RF power level, the 'reflected' signal increases beyond the threshold region so you see a truer VSWR reading.

Unfortunately this goes against all the good advice about only using low power for antenna tests. There's no way around this unless you use a VSWR meter that is specially designed for low-power work, an impedance bridge in conjunction with a low-level detector, or a noise bridge in conjunction with the receiver.

TIP – The Electromail catalogue – all three volumes totalling well over 2000 pages – is on offer for £2.95 (inclusive) until 31 October. This is the same as the professional RS Components catalogue except for the cover pages. Whether or not you choose to buy anything, the catalogue itself represents magnificent value as a data book covering almost everything electronic and a great deal more besides. Order from Electromail, PO Box 33, Corby NN17 9EL (0536 204555).

IF YOU HAVE NEW QUESTIONS, or any comments to add to this month's column, I'd be very pleased to hear from you by mail or by packet (see head of column). But please remember that I can **only** answer questions through this column, so they need to be on topics of **general** interest.

RSGB Morse Practice – GB2CW

Slow Morse is broadcast on behalf of the RSGB by Morse practice volunteers in many parts of the UK using the call sign GB2CW. The intention is to assist those preparing for the amateur radio Morse tests.

Receiving practice alone is not sufficient to enable candidates to pass the 5WPM or 12WPM test, so many volunteers use their own callsigns after the transmissions on 2 metres to give Class B licensees sending practice. New volunteers are required in many parts of the UK.

For more information on the RSGB Morse Practice Service, please contact the Coordinator: David M Pratt G4DMP, 11 Moorleigh Close, Kippax, Leeds LS25 7PB.

HF Transmissions

DAY	TIME	FREQ	OP	LOCATION
Mon	2030	1.976	G3ASR	Harrow
Wed	1930	3.550	G4XQI	Stockport
	2000	28.350	GM4HYF	Rutherglen
	2015	3.600	G4LEQ	Birmingham
Thu	1930	1.976	G3ASR	Harrow
Fri	1830	3.550	GW0TAF	Neath
Sat	0915	3.602	G4LEQ	Birmingham
	1930	3.550	G4XQI	Stockport
Sun	0915	1.975	G3LEQ	Knutsford
	0915	3.600	G3LEQ	Knutsford
	1930	3.550	G4XQI	Stockport
	2015	3.600	G0BAA	Wilmslow

VHF Transmissions

DAY	TIME	FREQ	OP	LOCATION
SCOTLAND				
Mon	2000	145.250	GM4HYF	Rutherglen
Tue	2000	145.250	GM0GYN	Cambuslang
	2030	145.250	GM0LZE	Stornoway
Wed	2000	145.250	GM0MDX	Hamilton
Thu	2000	145.250	GM0UET *	East Kilbride
			GM0UOU *	Paisley
Fri	2000	145.250	GM0NPS	Coatbridge
			* Alternately	
NORTH EAST ENGLAND				
Mon	2000	145.250	G4RXR	Peterlee
Tue	2000	145.250	G4RXR	Peterlee
Thu	2000	145.250	G4RXR	Peterlee
Sat	2000	145.250	G4RXR	Peterlee
NORTH WEST ENGLAND				
Mon	1900	145.250	G4OTN	Preston
	1930	145.275	G0IIM	Sale
	2100	145.250	G3AVJ	Huyton
Tue	1930	145.275	G4GBK	Atherton
Wed	1900	145.250	G4OTN	Preston
	1930	145.275	G4XQI	Stockport
	2100	145.250	G3AVJ	Huyton
Thu	1930	145.275	G4GBK	Atherton
	2100	145.250	G3AVJ	Huyton
Fri	1930	145.275	G4IAV	Atherton
	2000	145.250	G3RR	Barnoldswick
	2100	145.250	G3AVJ	Huyton
Sat	1930	145.275	G0IIM	Sale
Sun	0915	51.250	G3LEQ	Knutsford
	0915	145.250	G3LEQ	Knutsford
	0915	434.250	G3LEQ	Knutsford
	1200	145.575	G0RDH	Morecambe
	1930	145.275	G4XQI	Stockport
	2015	51.250	G0BAA	Wilmslow
	2015	145.250	G0BAA	Wilmslow
	2015	434.250	G0BAA	Wilmslow

VHF Transmissions (continued)

DAY	TIME	FREQ/MODE	OP	LOCATION
WEST MIDLANDS				
Tue	1930	144.160	G4TDO	Wolverhampton
	2100	144.250	G3HZL	Upper Tean
Wed	2015	51.250	G4LEQ	Birminham
	2015	145.250	G4LEQ	Birmingham
	2015	434.250	G4LEQ	Birmingham
Thu	1930	145.250	G0KCM	Penkridge
Sat	0915	51.250	G4LEQ	Birmingham
	0915	145.250	G4LEQ	Birmingham
	0915	434.250	G4LEQ	Birmingham
	1000	145.250	G3HVI	Meir Heath
	1930	144.160	G4TDO	Wolverhampton
Sun	1200	145.250	G3HVI	Meir Heath
	1930	144.160	G3LDW	Halesowen
EAST MIDLANDS				
Mon	2000	145.250	G4NZU	Nottingham
Tue	1900	145.250	G0FOG	Nottingham
Fri	1900	145.250	G4NZU	Nottingham
SOUTH MIDLANDS				
Tue	2030	144.250	G4PDP	Chawston
Wed	1900	145.250	G3BLS	Oxford
Thu	2000	145.250	G4DLB	Banbury
Sun	1100	145.250	G3BLS	Oxford
SOUTH WEST ENGLAND				
Mon	2000	145.250	G0JVA	Taunton
Tue	1930	145.250	G3ZYY	Saltash
Wed	2000	145.250	G0JVA	Taunton
Thu	1930	145.250	G3ZYY	Saltash
	2000	145.250	G0JVA	Taunton
SOUTH EAST ENGLAND				
Mon	1900	145.250	G0IZU	West Ewell
	2000	145.250	G4INM	Chelmsford
Tue	1900	145.250	G0NFJ	Abridge
	2000	145.250	G4INM	Chelmsford
Wed	1900	145.250	G0JUD	Aldershot
	2000	145.250	G0EYE	Eastbourne
	2000	145.250	G4INM	Chelmsford
	2015	51.250	G3VJF	Herne Bay
	2015	145.250	G3VJF	Herne Bay
	2015	434.250	G3VJF	Herne Bay
Thu	1900	145.250	G0JUD	Aldershot
	2000	145.250	G4INM	Chelmsford
Fri	1900	145.250	G0NFJ	Abridge
	2000	145.250	G4INM	Chelmsford
	2100	145.250	G3CAR	Amersham
Sat	1900	145.250	G0JUD	Aldershot
Sun	1900	145.250	G0NFJ	Abridge
	2030	144.250	G3ORP	Maidstone

Modes of Emission

A1A/J3E: 144.160, 144.250 MHz and all HF transmissions
F2A/F3E: 51.250, 145.250, 145.275, 145.575 & 434.250 MHz

RADCOM TECHNICAL FEATURE

The G3BIK Electronic Keyer

E Chicken MBE G3BIK

MANY OF THE ORIGINAL Mark 1 keyers, as published in *Radio Communication*, August 1993, have been constructed and are giving lots of pleasure in use. In general, there has been no problem with the operator-lead effect inherent in electronic-keyers of simplistic design and as discussed in the article.

However, the author was asked to advise on one finished keyer which showed occasional reluctance to key a single dot or the first dot of a character. It did in fact produce the dots every time, but the key-make pressure had to be a little more pronounced than normal.

This unusual effect was traced to one individual IC of a particular type, which though perfectly functional when tried in other applications, did exhibit a transit-time just slightly longer than usual. The effect of this was to make the first dot seem reluctant to appear, ie an exaggerated operator-lead effect.

Two improved versions of the popular el-bug published in *RadCom* August '93

MARK 2 KEYER

THE MARK 2 KEYER circuit allows the original circuit stripboard to be very simply modified, so as to prevent completely even the possibility of such an effect occurring.

The simple modification entails replacing flip-flop IC4a 4013B by a 4001B IC which is a quadruple 2-input NOR-gate, then making a few easy-to-do wiring changes to the original stripboard. Only two of the four NOR-gates are used.

Fig 1 shows the circuit stripboard after modification to Mark 2, together with fully detailed step-by-step wiring guidance on how to modify the original board indicated in the caption. The modification entails about half an hour's work.

Fig2 shows the circuit diagram of the Mark 2 Keyer.

The Mk 2 circuit uses a different method for automatic completion of dots, spaces and dashes than did the original Mark 1 circuit, which used the flip-flop action of IC4a as a temporary store for the dots and dashes until completed.

In the revised circuit of Mark 2, IC4a is removed, and the Set ports at pins 6 and 8 of the flip-flops IC2a and IC2b are controlled by the newly introduced NOR-gates IC3a and IC3b in such a way as to ensure that the dots from IC2a and the double-dot periods from IC2b are self-completing.

They are then routed to IC1c as in the original Mark 1 circuit, to be passed onwards as dots or combined therein to form dashes. Operator-lead possibility in the Mark 2 circuit is therefore negligible.

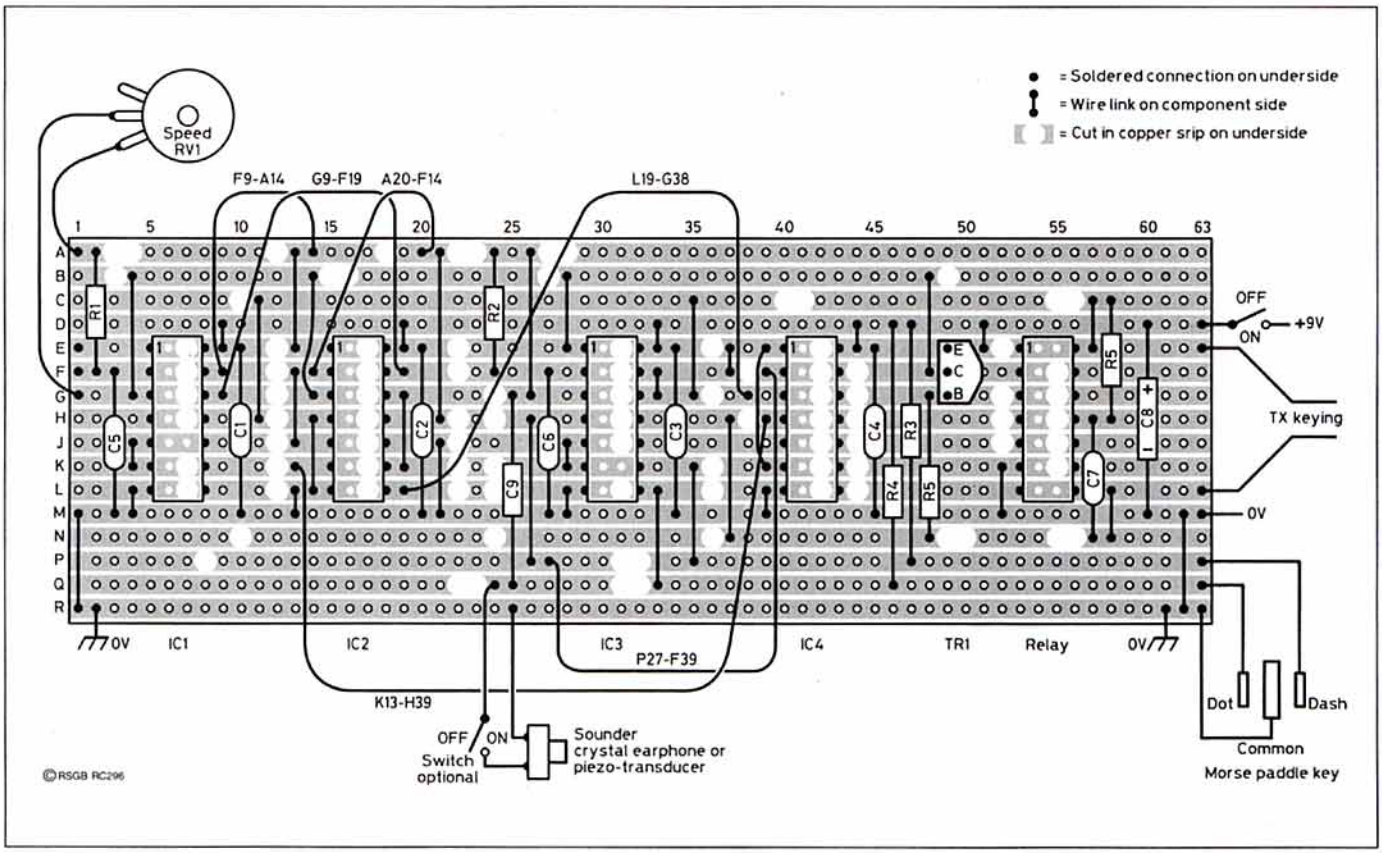


Fig 1: Modifications to the Mark 1. Replace IC4, 40138 by 40018. Cut tracks; F12, L17, R18, G36. Remove links; H2-Q2, G9-K9, L9-P9, K11-N11, L14-M14, L13-K13, G23-N23, J19-L19, K21-Q21, K38-L38, C35-G33, H39-K39, H14-K14. Add Links; L13-M13, M14-L14, G18-K19, M21-J21, F33-G33, G35-C35, E39-K39. Add Loops; F9-A14, G9-F19, A20-F14, L19-G38, K13-H39, P27-F39.

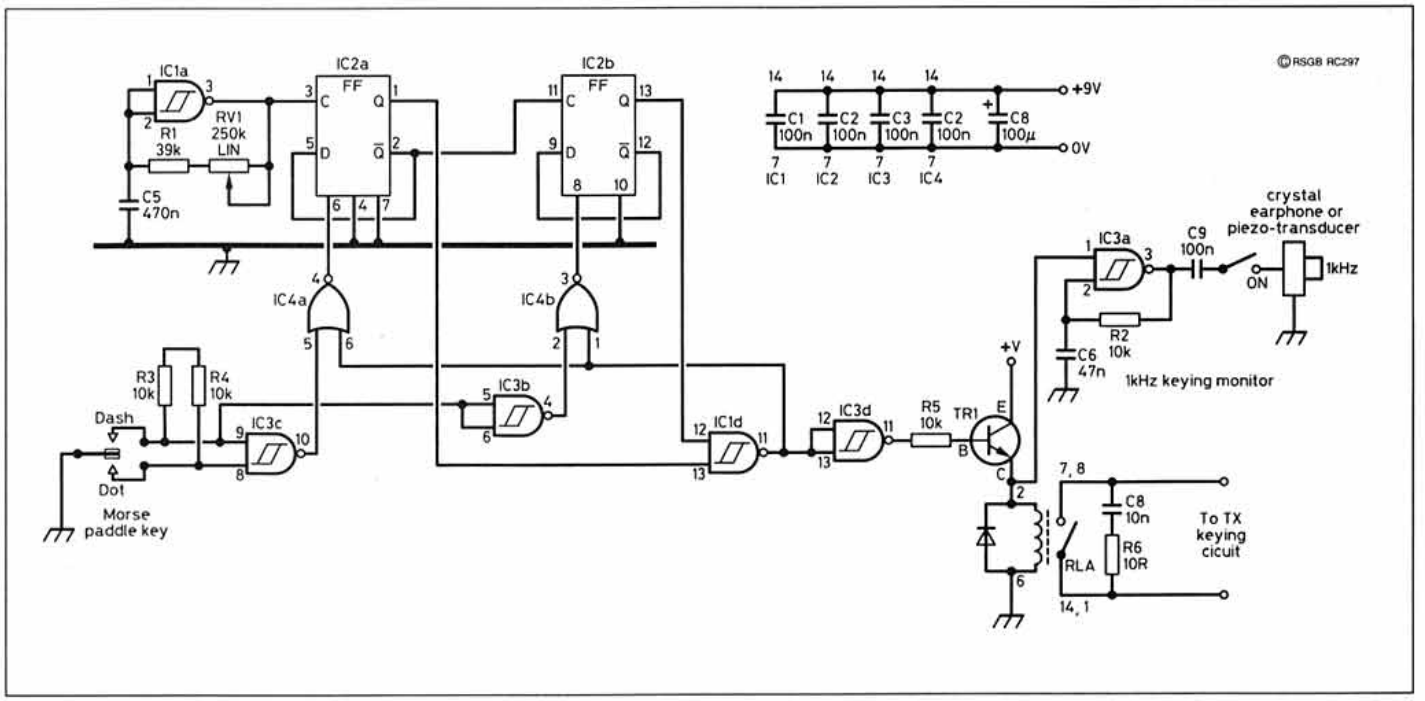


Fig 2: Keyer Mk2, circuit diagram.

MARK 3 KEYER

BUT INTERESTINGLY, the Mark 2 circuit lends itself readily to even further simplification in reducing the IC count from four to three by using the two spare nor-gates of the new IC4 as replacements for the original IC3a and IC3d, and by replacing the PNP transistor for an NPN type.

This better and simpler Mark 3 as illustrated in **Fig 3** embodies the improvement of Mark 2. It further offers a solid-state sounder alternative to the keying-monitor now formed by the dual NOR-gate IC3c and IC3d 1kHz tone-oscillator plus piezo-transducer. But the cost saving in components is only a few pence.

The Mark 3 circuit-board shown in **Fig 4** although again slightly extravagant in stripboard for clarity of drawing, can easily be cut through at hole-column 29 to allow stacking of the two halves to fit into a smaller and cheaper box.

See components list for dimensions. Flexible 50mm wire-links would then be needed at rows A,D,L,M,P,Q,R to electrically join the two sections of stripboard.

COMPONENTS LIST FOR MARK 3 KEYER

RESISTORS

Carbon film or metal film 0.25/0.33W

R7	100R
R2,3,4	10k
R5	47k
R1,6	100k
RV1	Potentiometer, 470k linear law, carbon, miniature rotary

CAPACITORS

C5	10n	Ceramic, disc or resin-dipped, 63V DC
C2,3,4,6,8	100n	Ceramic, disc or resin-dipped, 63V DC
C1	1µ	Polyester layer 100VDC
C7	100µ	Electrolytic, axial lead, 35V DC

SEMICONDUCTORS

IC1	4093BP	dual input Schhmitt NAND gate
IC2	4013B	dual D-type flip-flop
IC3	4001B	quad 2-input NOR gate
TR1	BC108	NPN

ADDITIONAL ITEMS

Specific order-code numbers refer to Maplin or RS catalogue

- 1 Piezo transducer 27mm/1.8kHz YU87U (or alternative Sounder)
- 1 Piezo sounder PCB-mounting JH24B
- 1 Relay, DIL, Form A/FX88V, 1pole, normally open
- 2 Toggle switch, SPST, ultra-miniature, panel mounting
- 4 DIL socket, 14 pin, low-profile
- 1 Copper stripboard, 0.1 inch pitch, 16 strips x 63 holes JP50E
- 1 Battery PP3 9V
- 1 Battery clip, dual miniature for PP3
- 1 Box, plastic, low-cost 114x76x38mm, LH14Q or aluminium
- 1 Box, aluminium, type AB7 133x70x38mm, LF08J
- 1 Pointer knob RW75S
- 1 Terminal post, small, black, FD69A
- 1 Terminal post, small, white, FD73Q

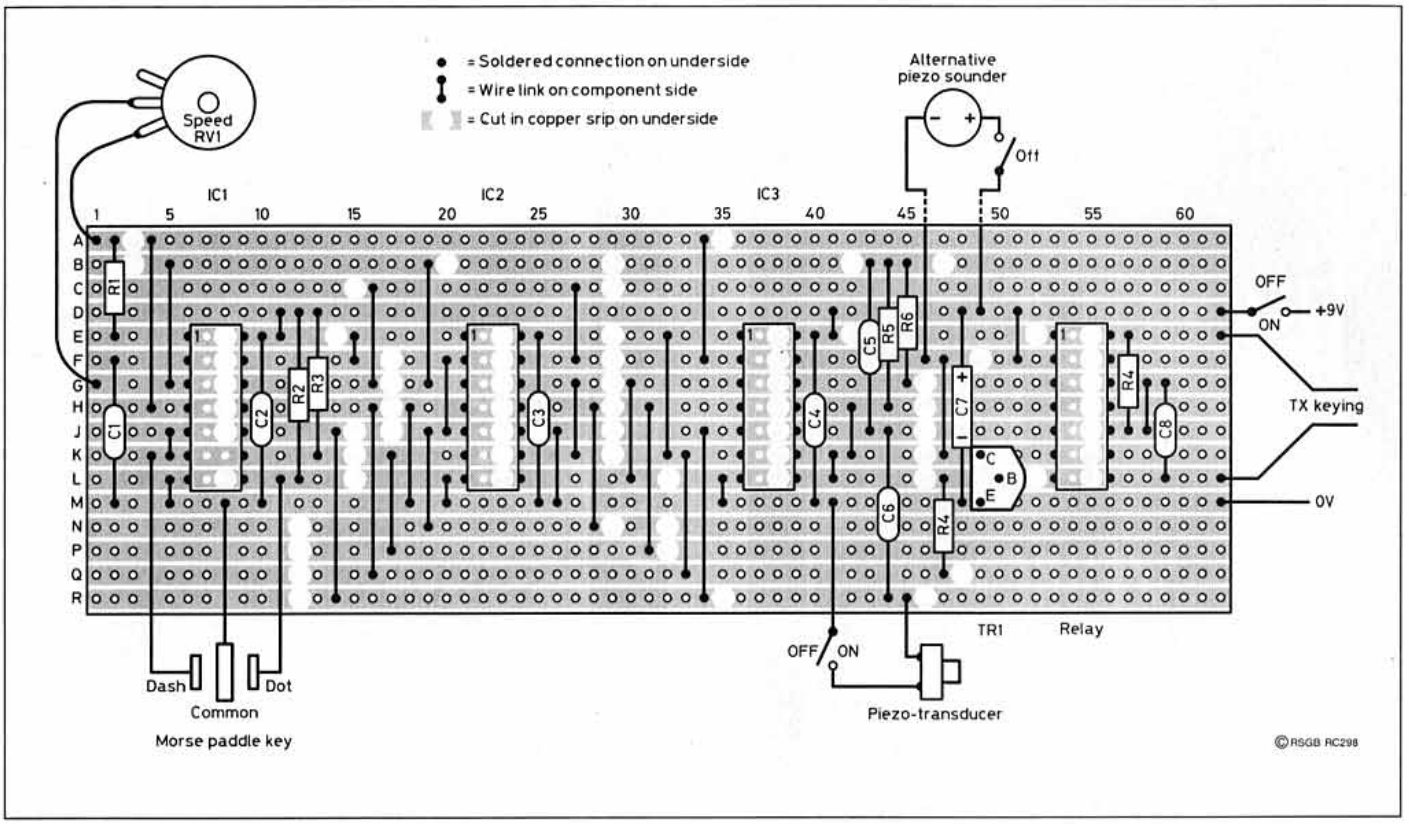


Fig 3: Keyer Mk3, circuit diagram.

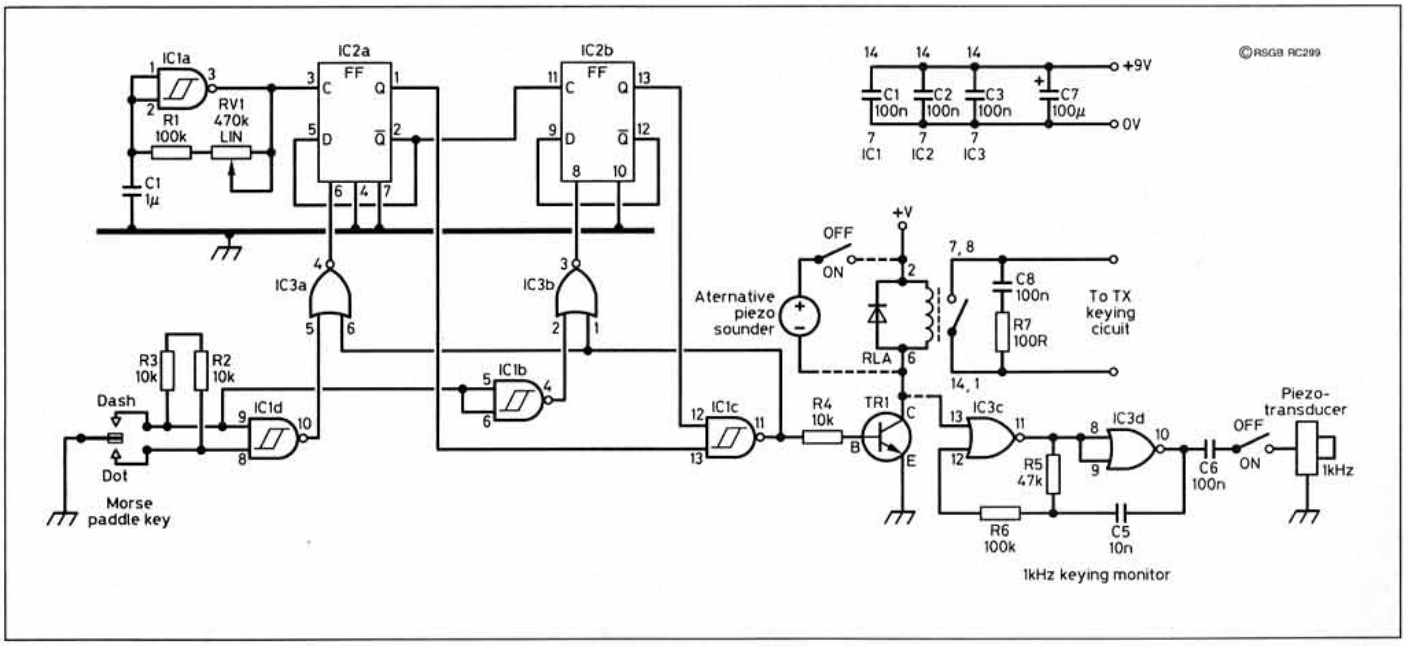


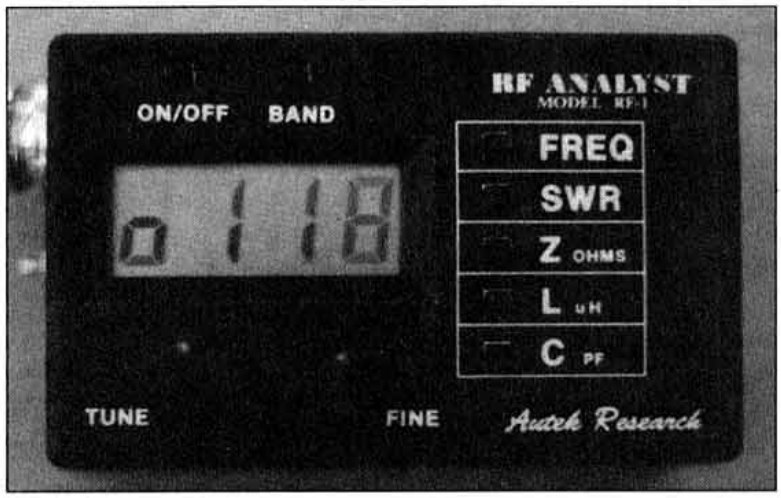
Fig 4: Keyer Mk3, Stripboard layout, component side.

RADCOM USER REVIEW

The Autek RF-1 RF Analyst Reviewed

by John Bazley, G3HCT

IT MUST BE AT LEAST twenty years ago that Autek introduced their QF1 audio filter which was considered the 'Rolls Royce' of filters available at that time. Little happened until they recently introduced their 'RF ANALYST – Model RF1' which is, to quote from their sales leaflet: 'A Revolutionary Microprocessor Based RF Instrument'. Nothing revolutionary about the measurements that it can make *but*, for the price, it most certainly is revolutionary. The Instruction Leaflet is comprehensive but there are areas where I think more detail is required to understand fully what can be achieved.



INSTALLATION

INSTALLING THE SMALL 9V battery was harder than anticipated! Once you understand how the slide to the battery compartment works you know where to apply the pressure to open it easily! A simple diagram would help considerably.

The unit is voltage regulated and accuracy does not degrade until the battery voltage falls below 6.5V. Between 35 and 60mA is drawn depending on the frequency being used – the higher frequencies requiring the higher current. There is a built-in time-out if the unit has not been used for 20 minutes; the instructions explain how to disable this feature but not how to reinstate it! In fact powering off/on does it.

Tapping the ON/OFF switch produces briefly the version number of your unit (mine was PC2.2). The RF1 immediately goes into the 'Frequency' mode and the LCD shows the frequency of the oscillator. This can be varied by coarse and fine tuning controls, with the 'Band' button cycling the oscillator through the five bands. **Table 1** shows the frequency range available at the extremes of the band selected.

Below 10MHz it was very easy to set the frequency to an accuracy of 1kHz. Above 10MHz it became a little 'touchier' but the 10kHz resolution was easily achieved and the oscillator was stable. The accuracy was checked against the digital readout on the station transceiver and was found to be excellent from 1.5 through to 30MHz.

Band	Coarse Range	Fine Tuning Range
1	1.162 to 2.505	15 to 120kHz
2	2.166 to 4.720	22 to 150kHz
3	3.963 to 9.085	35 to 190kHz
4	8.154 to 19.34	60 to 220kHz
5	15.21 to 38.00	90 to 330kHz

(The Fine Tuning Range corresponds to the lower and higher frequencies respectively, eg a range of 35kHz at 3.963MHz and 190kHz at 9.085MHz)

Table 1: Limits of tuning on the five frequency ranges.

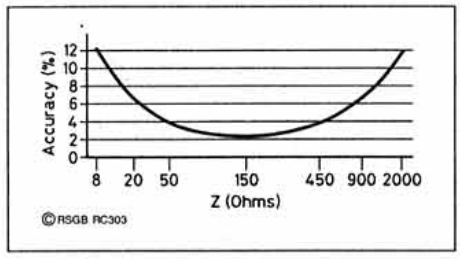


Fig 1: Typical impedance accuracy.

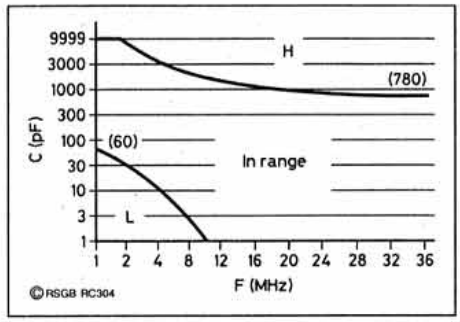


Fig 2: Capacitance measurement range.

THE FACILITIES

SWR

On tapping the SWR button, the display panel shows a small square box in the upper left hand corner to indicate that you are in the SWR mode. For a ratio above 15:1 an 'H' is indicated on the right hand side. SWR is measured relative to 50Ω and stated as being generally accurate to 10% below 3:1 and 15% up to 9:1. Between 9:1 and 15:1 the accuracy is usually below 20%. Measurements tend to be more accurate for impedances greater than 10Ω.

RF IMPEDANCE

This is a combination of reactance, either positive or negative, with the resistive part of the complex impedance. Again an 'H' appears if the impedance is too high. A curve is supplied giving the percentage accuracy to be expected over the range of the instrument (**Fig 1**). The greatest accuracy is stated as being at 150Ω.

CAPACITANCE

Tapping the C button brings up a small 'C' in the left hand corner indicating that you are in the Capacitance mode. If the capacity being measured is out of range (for the oscillator frequency) either an 'L' or 'H' will appear on the right-hand side of the display area. Detailed attention is drawn to the effect of long leads when measuring capacitors. For the range see **Fig 2**.

INDUCTANCE

Tapping the L button you see a small 'L' in the left-hand side with again 'L' or 'H' being displayed on the right when out of range. The range is indicated in **Fig 3**.

ALTERNATING DISPLAYS

Pressing, for example, the SWR and Frequency buttons simultaneously the display will cycle between these two modes. Moving from 'L' to 'C' and 'Z' enables one to obtain additional data. For example if you are measuring a capacitor at a specified frequency you can tap the L button to get an indication of the inductance required to resonate that capacitor at the frequency at which the instrument is set. If you then tap the 'Z' button the instrument displays the reactance at that frequency.

Another neat variation on this is that if you are measuring a short vertical, tapping the L button will give you an indication of the inductance required to resonate it!

MEASURING VELOCITY FACTOR

The frequency of a length of coax, either shorted or open circuit, is determined at minimum impedance, clearly illustrated in **Fig 4**. At the first null the frequency is noted and the velocity factor calculated from:

(i) VF = First null frequency (MHz) x Cable length (ft) / 492

MEASURING TRANSMISSION LINES

Having calculated the velocity factor from formula (i) the physical length of λ/4 or λ/2 lines can be computed, measured, cut to length, and checked.

To test this, a random length of coax was selected and the RF1 used in the 'Z' mode to find the frequency at which it was a half-wave long. The RF1 gave the frequency as 8.630MHz. The GR Bridge (see Note) gave a frequency of 8.700MHz, an accuracy of 0.99%. Similar results were obtained at 26.1MHz. Very impressive.

The instructions state that you can either make the measurements with the line open or closed. I found that a more accurate result was obtained by shorting the far end of the cable under test.

MEASURING CABLE LOSS

Carrying out the same procedure stated above for calculating the velocity factor the loss at the null frequency is given by:

(ii) Loss (Db) = 8.69 x Minimum 'Z' / Cable Impedance

therefore for 50Ω cable = 0.17 x Min 'Z'

DETERMINING CABLE IMPEDANCE

If you think the cable is 50Ω, connect a non-inductive 50Ω resistor at the end of the cable. Slowly sweep the frequency in the 'Z' mode. If the cable is 50Ω the 'Z' will change very little. If the cable is, for example, 75Ω the 'Z' would swing cyclically with frequency. The object is to find a resistor at the end of the cable that gives a 'flat' 'Z' with frequency change. This will also work with 300 to 600Ω lines.

TUNING YOUR ASTU

The RF1 can be used to tune your Antenna System Tuning Unit without using a transmitter, as shown in **Fig 5**. Set the RF1 to the frequency required and adjust the tuning unit for a 'Z' of 50Ω. Then switch over to the transmitter.

MEASURING A COIL'S Q

The method is shown in **Fig 6**. At the frequency of interest (the capacitor must resonate the coil at that frequency) measure the minimum 'Z' – this tuning will be *very* sharp. Make a note of this reading. Now disconnect the capacitor and measure the 'Z' of the coil alone. The 'Q' of the coil will be given by:

(iii) Q = Coil 'Z'/Minimum 'Z' in tuned circuit.

SIGNAL GENERATOR

The accuracy is stated as being +/-1kHz below 10MHz and +/-10kHz above 10MHz.

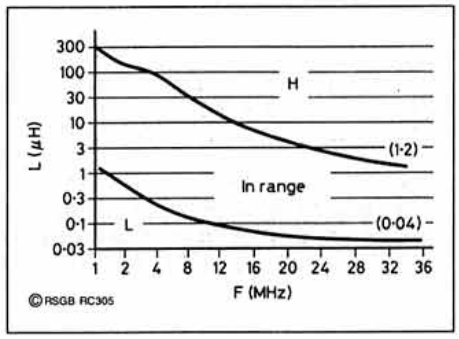


Fig 3: Inductance measurement range.

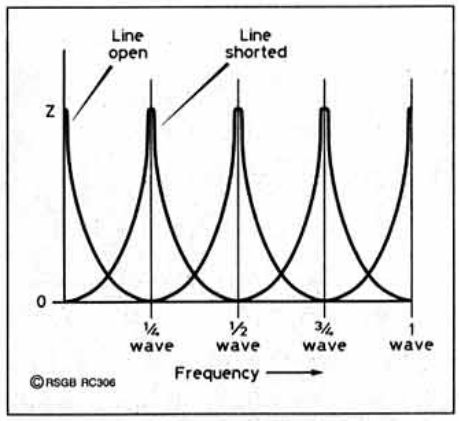


Fig 4: Transmisson line impedance vs frequency.

The output is 2V p-p (open circuit) with an output impedance of 150Ω. The manufacturer recommends a matching pad to yield an output of 400mv p-p with output impedance of 50Ω.

IMPEDANCE

In the 'What is impedance?' section of the instructions, I consider that more space should have been devoted to detailed examples of using the instrument to measure antennas and giving 'worked' examples of the measurements taken. The Instruction Leaflet refers to two formulas:

(iv) $Z = \sqrt{R^2 + X^2}$

(v) $X = \pm\sqrt{Z^2 - R^2}$

To quote fully:

"However by using the above equation, X can often be accurately determined. Some examples:

"A) We measure Z for a dipole or vertical. At resonance X disappears, leaving only R (Radiation Resistance). Now for a small change in frequency (3%) away from reso-

Freq	'Z'	Loss computed from formula (ii)
4.634MHz	4	0.68dB
6.170MHz	5	0.85dB
9.273MHz	7	1.19dB

Table 2a: Coax loss measurements using the RF1.

Frequency	Loss
5.700MHz	0.88dB
6.200MHz	0.91dB

Table 2b: Coax loss as computed on the GR bridge.

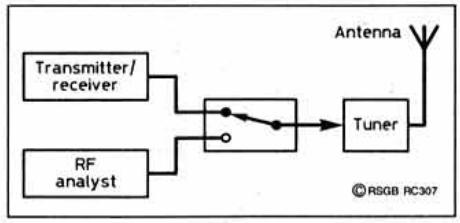


Fig 5: Tuning an antenna tuner without transmitting.

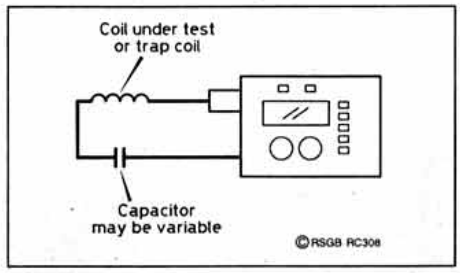


Fig 6: Measuring coil Q at the frequency of a trap or tuned circuit.

nance R hardly changes at all. Virtually all the impedance change is caused by X changing. So we can put the measured value of Z and R in the equation (v) and solve for X.

"We also know that a dipole of λ/4 vertical has capacitive reactance below resonant frequency and inductive reactance above so we know the sign of Z as well.

IN PRACTICE

HAVING EXPLAINED what is claimed for the RF1, how well did it work in practice?"

CABLE LOSS

To assess the accuracy in measuring cable losses I decided to check the loss on my 50Ω coax line feeding the LF antennas. The cable run is 216ft of RG213U.

The far end of the 50Ω coax line was terminated with a ferrite sleeve balun and shorted. The RF1 was tuned to obtain at least two frequencies which indicated a low 'Z' reading at the feed point. These are shown in **Table 2a**.

With the same cable termination the losses were calculated using the GR Bridge and the computer program from W2DU book 'Reflections'. The results are in **Table 2b**.

Ideally we need to bring the results to a common frequency to enable the measurements to be compared, not only between each test instrument but also against the data provided by the cable manufacturer.

There are two major contributors to the loss over the frequency range of interest: Conductor loss and dielectric loss. The total loss is the sum of these for a specified frequency.

Using the formula in the Appendix with the test and manufacturer's data we have the following results, all converted to a frequency of 7MHz:-

From the manufacturer's data the loss of 216ft of coax is 0.98dB. From the RF1 data the loss is 0.94dB, and from the GR Bridge data it is 0.95dB. The cable obviously does not require changing!

The accuracy of the RF1 is *very* impressive and it is a *lot* easier to measure the cable loss with the RF1 than with the GR Bridge.

The Leicester Show Guide 1994

Leicester Amateur Radio and Electronics Exhibition

Granby Halls, Aylestone Road, Leicester

Friday 21 October – 10am to 6pm (disabled 9.30am)
Saturday 22 October – 10am to 5pm (disabled 9.30am)

Admission price £1.50, concessions £1 (discounts for block bookings)

The Leicester Amateur Radio Show Committee organises the annual exhibition at the Granby Halls, Leicester with a view to furthering the interest and aims of amateur radio. We encourage all the local clubs to enlist their members as stewards, car park attendants, ticket collectors, etc to assist in the smooth running of the exhibition; in return any profits realised are distributed to these local clubs. All national amateur radio organisations are represented at the Leicester exhibition with the RSGB taking pride of place in the number one stand in the Exhibition Hall. The committee is: John, G4MTP, Chairman; Frank, G4PDZ, Organiser/Secretary; Geoff, G4AFJ, Treasurer; Tony, G1YEZ, Floor Manager; Tony, G4NWS, Personnel Manager.

- **Extensive Trade Exhibition**
- **RSGB Book and Information Stand**
- **Bring and Buy Stand** *(run by the Leicester Radio Society)*
- **RAOTA AGM** *Conference Room, Saturday*
- **Talk-in by GB2GH on S22 and SU22**

Special Hotel Arrangements

Block booking terms have been negotiated with the following hotels for the duration of the show.

GRAND HOTEL: £25 per person per night. Tel: 0533 555599.

ALEXANDRA HOTEL: £28 (single), £40 (double/twin room). Tel: 0533 703056 (G6HSF Andy).

POST HOUSE: £21.50 per person per night. Tel: 0533 630500

PARK INTERNATIONAL: £27.50 (single room), £16.75 (double/twin room). Tel: 0533 620471.

HOLIDAY INN: £28 per person (twin room), £42 (single room). Tel: 0533 531161

To qualify for these concessionary prices it is essential to quote 'The Amateur Radio Exhibition At Granby Halls'.

The Leicester Show Product News

We asked exhibitors to let us know what new products would be displayed at the Leicester Show. Here are the items they told us about:

The information below is compiled from information sent in by the manufacturers and distributors concerned. Details are published in good faith but the RSGB cannot be held responsible for false or exaggerated claims made in the source material.

Eastern Communications
Stand S22

THE NEW **AUTEK RF1 RF Analyser** will be on show for the first time at Leicester. See October *RadCom* page 45 for a review of this model.

This unit is designed to help check and adjust antennas, feed lines and RF networks. The RF1 measures SWR, Z, inductance in mH and capacitance in pF. All this is achieved using a microprocessor, analog/digital converters and a low-distortion, levelled, sine-wave generator with a 4-digit frequency readout.

The frequency of the signal source of the RF analyst is continuously adjustable from 1.2 - 35MHz in five bands. The unit fits into a shirt pocket and runs off a 9V battery.

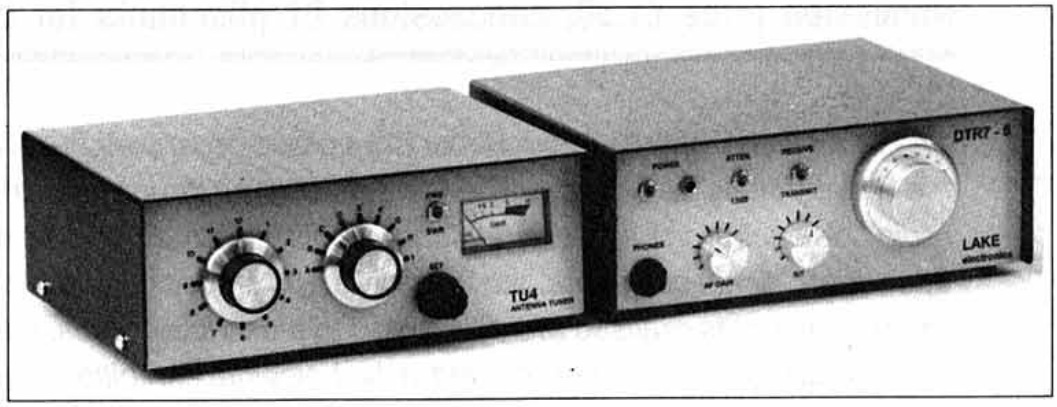
Also on show for the first time will be additions to the range of **Sigma wire antennas** - one of the newest models is currently being used on a Mount Everest expedition.

Delta Enginnering has produced a new range of **switches** for use by radio amateurs and, of course, the ever-popular **Eastcomm World Clock** will be on show.

With all these goodies available perhaps you can convince someone that an early Christmas or Birthday present would be welcome!

Lake Electronics
Stand 6A

THERE IS nothing more annoying than buying a kit and then finding that all the bits are not included. It is usually the beginner who, for reasons of economy, or early enthusiasm chooses to build his first rig, and this could ruin the newcomer's enjoyment of what could lead to a life-time's enjoyment of home construction. Not so with the new **QRP kits** from Lake Electronics. They boast that their kits include *all* the bits, including hardware. They will be displaying all their current kits at the show, but in particular the new **TU4 Antenna Tuner** and the **DTR7-5 CW Transceiver** (power output up to 5W). Both of these kits are priced at under £100, which makes them very good value for the radio amateur on a tight budget.



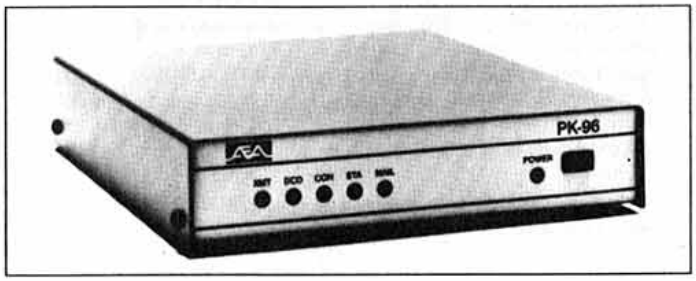
ICS Electronics Ltd Stand tbc

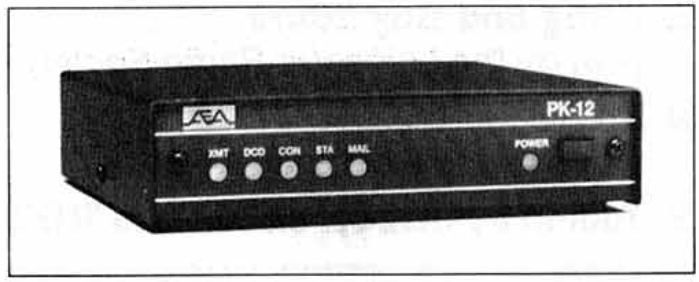
AMONG THE products that ICS will be displaying at the Leicester Show for the first time will be their brand new **PK12 Packet Radio Controller**.

This is an extremely compact (147 x 134 x 34mm) high performance, 1200 baud VHF packet controller, offering an ideal unit for the newcomer into data communications. The PK12 includes Gateway firmware, offering MYGATE callsign connection as opposed to the usual MYALIAS or MYCALL. Maildrop allows you to automatically receive and reverse forward messages and control third-party traffic. When the unit is turned off the back up lithium battery holds the Maildrop contents. Special commands included in the PK12 are KISS, PERSISTENCE and SLOTTIME, plus the extremely useful EXPERT command, which will allows the beginner to over-ride some of the more complicated commands.

The **ICS-WeatherSat** will be released to the amateur market at Leicester. This is a low cost NOAA type Polar orbiting satellite receive system for the PC.

The latest **ICS-WeatherPlot** upgrade for the ICS-FAX III, and the 'high speed' **PK 96 Packet Radio Controller** will also be on show.





YAESU UK
Stand 52

THE **FT-900** HF all-mode transceiver featured in September *RadCom*, p67, will take pride of place on the Yaesu UK stand at the show. The rig is compact (238 x 93 x 253mm without knobs), and features include 100W out on all HF bands; general coverage reception 100kHz – 30MHz; bargraph meter with peak-hold facility; reversible sideband on CW; adjustable BFO offset, plus a built in antenna tuner.

Yaesu will also be displaying the **FT-2500M**, their new 144MHz 50W FM mobile transceiver. The unit has been built to UK Military specification for shock and vibration – so should be able to cope with the stresses of motoring in the UK! The design has been kept simple, with large controls and a LCD display providing large, easy to read, characters. The rig has a 'less used' covered panel, which controls the repeater shift, call channel and output controls. Ask at the stand for further details on these show-stoppers.

Kenwood UK
Stand 35

KENWOOD WILL be introducing the new **TH-79E dual-band hand-held** transceiver. This slimline model offers a host of features including:

Built-in guide functions accessed through the new dot matrix LCD display. Simultaneous receive and dual frequency receive with automatic band change. CTCSS encoder as standard, with optional decoder. DTMF, DTSS and PAGE functions. 80 channel alpha-numeric memory. MOS FET power module for longer battery life.

Waters and Stanton
Stand 15

FROM THEIR Alinco range, the **MO-6** 6 metre 10W FM mobile transceiver will be launched in the UK at the Show. This is Alinco's first venture into the 6 metre market.

Also the **DJ-580E** dual-band hand-held has been reduced in price following improved production techniques, and now represents excellent value. It comes with 'auto-repeat' mode.

There are several new products from the MFJ range of equipment:

The **MFJ-1276** data controller will be introduced, which covers both HF and VHF packet operation plus the latest Pactor mode.

The **MFJ-9420** 12W SSB transceiver will be displayed for the first time, and is claimed to be one of the most efficient designs with low current drain and a realistic output. It is fully VFO controlled, has an analogue meter and comes complete with a microphone.

The **MFJ-432** voice keyer offers 20s of recording which can be divided into four banks; recordings last for up to ten years and the unit is powered by one PP3 battery.

The new **MFJ DSP filter** will also be on show, and is the first fully tunable Digital Signal Processing filter to be launched. It also has programmable memories.

Siskin Electronics Ltd Stand 7

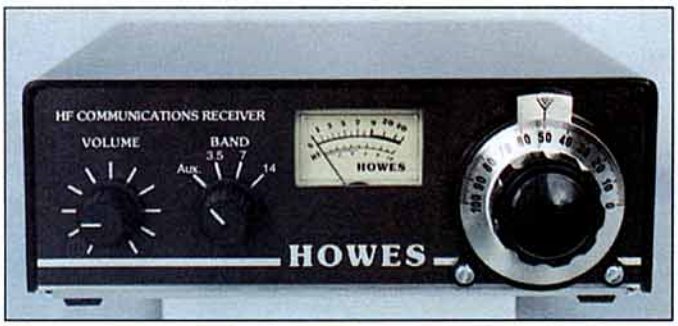
SISKIN ELECTRONICS will be launching their new **'Multi-CAT'** transceiver controller at the Show. Siskin have come up with a complete package that will cater for 'CAT-ready' Icom, Yaesu and Kenwood receivers and transceivers.

This is Siskin's first venture into designing and manufacturing their own product in-house, and the initial feedback has been very encouraging.

The Multi-Cat is supplied complete with ready-made cables for both the radio and computer, easy-to-use software backed by Siskin's well known support policy, and an economical price. The Multi-Cat has already attracted a large number of advance orders.

Siskin will also be displaying a wide range of both 1200 and 9600 baud packet radio TNCs and the latest **Buckmaster HamCall** worldwide callbook log.

C M Howes Stand 9A

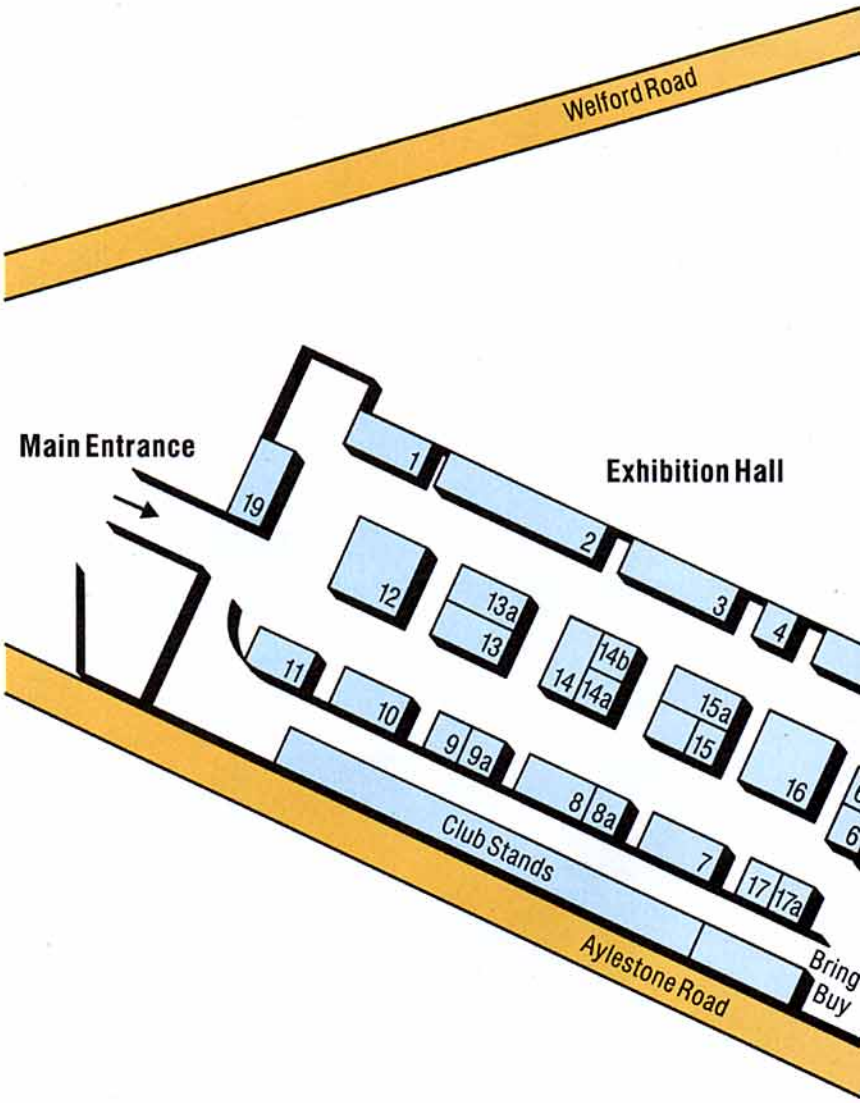


C M HOWES Communications is launching the new **DXR20 receiver kit** at the Leicester Show. This is a direct conversion receiver covering the 20, 40 and 80 metre amateur bands as standard, with the provision for plug-in 'band modules' to add any additional short wave band you choose. Modules can be selected from the standard range, or designed to meet individual requirements. The receiver is designed for SSB, CW and related modes and features a double-balanced mixer, active audio filtering and eight pole RF bandpass filters with separate FET VFO for each band. There are two versions of the kit available, one covering the electronics and the other including the **HA20R** 'hardware pack'.

This is ideal for the amateur looking for an economic and simple receiver kit for the short wave bands. Call in at the C M Howes stand at the Show and check out this super little kit.

The Leicester Show

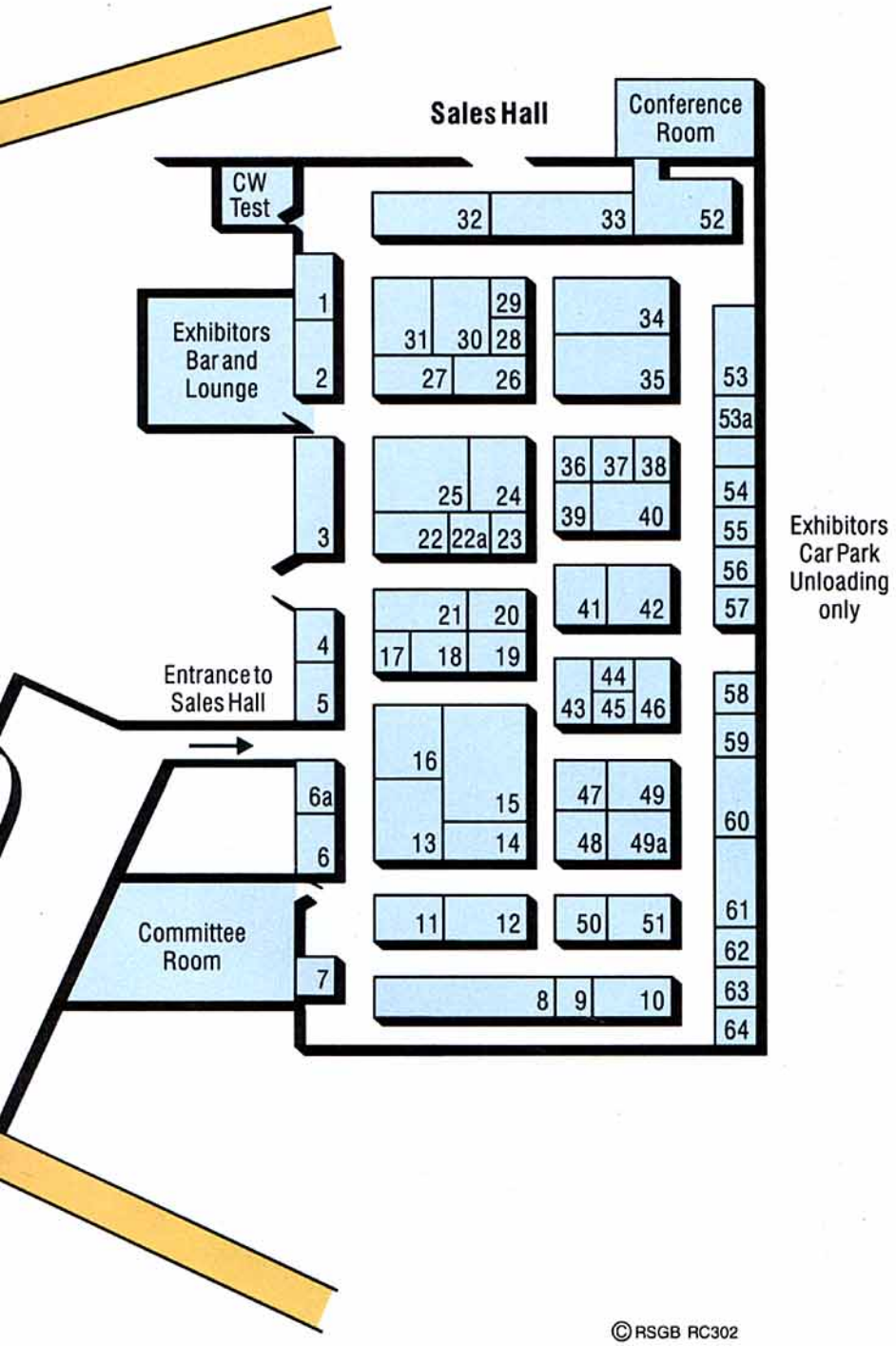
The 24th Exhibition takes place at Granby Halls, Aylestone Road, Leicester, on Friday 21 and Saturday 22 October. Talk in will be on SU22 and S22 using the show callsign GB2GH. Entrance for disabled visitors at 9.30am.



Exhibition Hall

EXHIBITOR	STAND
RSGB	1
Icom (UK)	2
Practical Wireless	3
Wilson Valves	4
Peter Rodmell Comms	5
2J Sound	6
R & D Electronics	6a
Siskin Electronics	7
Electrocomp	8
Poole Logic	8a
Jandek	9
Howes Comms	9a
Alan Hooker	10
Videoquip	11
Lowe Electronics	12
Rich Electronics	13
T W Wraith t/a Mailtech	13a
Haydon Comms	14
R A Kent	14a
Field Electrics	14b
HRS	15
Tennamast	15a
Commtek Electronics	15b
Dataphone	16
Venus Electronics	17
Microgenesis	17a

FLOOR PLAN AND EXHIBITORS



SALES HALL

TABLES

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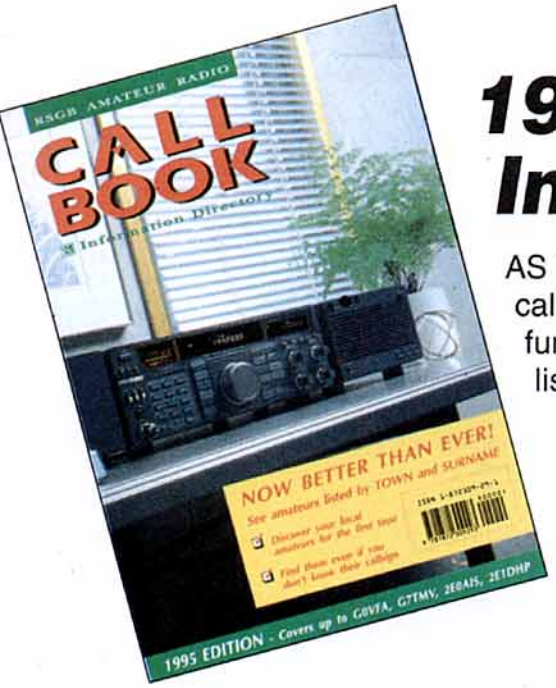

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AS WELL AS LISTING over 61,000 UK and Republic of Ireland callsigns, and over 100 pages of information, we have improved still further on this already popular directory with the inclusion of two new listings: You can now search by post town/county *AND* by surname.

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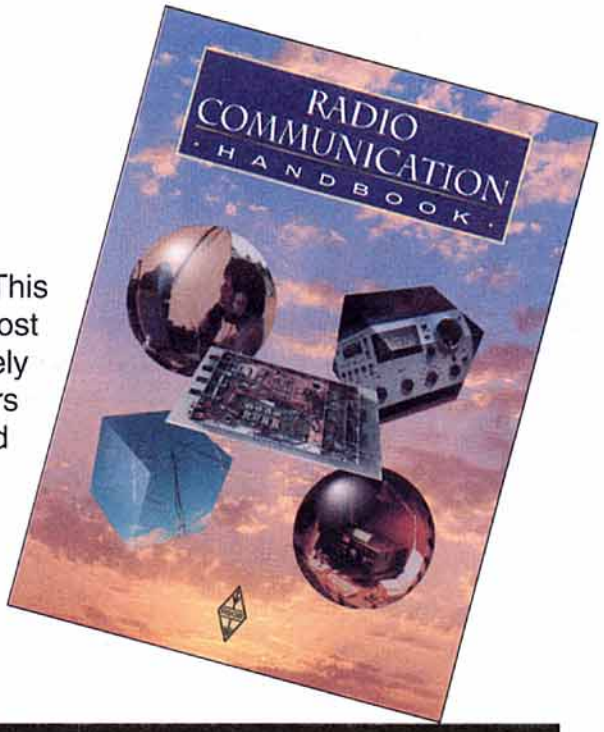
Radio Communication Handbook



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The Leicester Show

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The most comprehensive guide to space radio communications. 242 pages.

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Normally: £10.63

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This formula is also useful for calculating the loss that will exist on a *matched line* for intermediate frequencies, from data published by the cable manufacturer. These are usually quoted for 1MHz, 10MHz and 100MHz. Using the formula we can easily calculate the loss for, say, 7.000MHz, 28.500MHz or 432MHz. It must be remembered that this will be the loss in a matched line to which must be added any additional loss through a high SWR, though it is perhaps re-stating that even with an SWR of 2:1 on a *low loss* cable the additional loss through the SWR is marginal.

RF IMPEDANCE

The test set-up shown in **Fig 7** was used for 3.5 and 7MHz.

The 50Ω load was connected to the 'TX' connection of the matching unit and a short length of coax connected to the 'Antenna' connector. The GR Bridge was set to the Complex Impedance shown in **Table 3** and the matching unit adjusted for a null at this setting. The RF1 was then connected in place of the GR Bridge to make the measurements.

Results obtained by using formula (v) are listed in Table 3. Section A lists the measurement frequency, the 'Z' and the GR Bridge measurement at that frequency. Section 'B' lists the frequency shown by the RF1 giving the lowest 'Z' reading, and the complex impedance measured by the GR Bridge at that frequency.

When the test arrangement was used on the other higher HF bands the RF1 would locate the lowest 'Z' that it 'saw' (which was verified by the GR Bridge) but this could be some way away from the frequency of interest. The conclusion from this is that the RF1 cannot measure small reactances *accurately*. It can *detect* them *together with* the 'sign' (either positive or negative reactance), but not actually measure them. The resistive part was sufficiently accurate for most amateur purposes.

In view of the above difficulties I decided to use actual antennas operating on 14, 18, 21 and 28MHz and varied the test procedure by first determining with the RF1 the lowest SWR. At that frequency I measured the complex impedance with the GR Bridge. This is tabulated in section 'A' of **Table 4**. With the same antenna connected the RF1 was then placed in the 'Z' mode and tuned for the lowest 'Z'. At this frequency the GR Bridge measured the complex impedance tabulated in section 'B'.

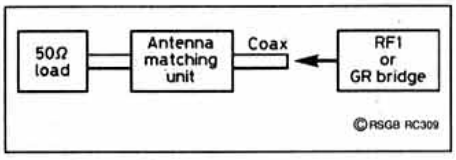

Fig 7: Measuring Impedance.

FEATURES OF THE AUTEK RF1

- A stable oscillator covering 1.2 to 35MHz in five overlapping bands with fine tuning capable of being set to 10kHz at 28MHz with the digital counter.
- SWR measured relative to 50Ω
- RF Impedance measured in Ω (0 to 2000Ω)
- Capacitance measured in pF (0 to 9999)
- Inductance measured in uH (04 to 300)
- Battery powered (life approximately 12 hours) with 'Auto Off'
- All measurements displayed digitally by an LCD

CONCLUSIONS

THIS UNIT REALLY is a useful piece of equipment to have available in the shack, particularly if you are interested in constructing your own antennas and matching networks. If you are a constructor and do not have access to a bridge for measuring capacitors and inductances then this unit represents excellent value.

For the price of the RF1, one cannot expect the accuracy of a laboratory standard bridge for the measurement of complex impedances. However, it will accurately indicate resonance and the sign of the reactance present. If your interest is setting up close-spaced phased arrays, then you do need more accurate data than is possible with the RF1.

Having said that, it does offer:

- The means to check the loss in transmission lines easily and *accurately*,
- The means to cut λ/2 and λ/4 wave lines to an accuracy of 1.0%,
- The means to cut an antenna accurately to resonance or to find its resonant frequency,
- The means to measure inductance and capacitance *at frequencies* of interest and to acceptable levels of accuracy,
- For SWLs – to have a calibrated signal source. The accuracy is really excellent,
- The means to tune an ASTU without the Tx on,
- To find resonances in TV cables and installations within the frequency range of the RF1 (useful from a TVI point of view).

AVAILABILITY

UNTIL RECENTLY, the RF1 was available only from the US manufacturers.

However, it is now available in Europe from Eastern Communications, Cavendish House, Happisburgh, Norfolk NR12 0RU. Tel: 01692 650077, fax: 01692 650925.

The price is £139.95 inc P&P within Europe.

NOTE

WHERE COMPARATIVE measurements were taken a GR1606A RF Bridge was used.

A Freq	'Z'	GR Bridge	B Lowest 'Z'	Freq RF1	Calc Impedance
3.500	28	30 + j0	28	3.498	28 + j0
3.500	55	50 + j0	55	3.502	55 + j0
3.500	99	90 + j0	99	3.502	99 + j0
3.500	66	50 + j28.57	58	3.484	58 + j31
3.500	62	50 – j28.7	51	3.520	51 – j35
7.025	58	50.5 +j7.62	50	6.692	50 + j29
7.025	59	49.6 +j8.40	48	6.659	48 + j34

Table 3: Comparative RF impedance measurements with the RF1 and the GR Bridge.

A Freq	Lowest SWR	GR Bridge	B Lowest 'Z'	Freq	GR Bridge
14050	1.3 :1	57.6 – j4.8	14	13120	10.5 + j0
18110	1.2 :1	44.1 – j1.34	42	18620	36.8 +j2.4
21200	1.2: 1	44.6 – j5.2	46	21300	44.8 +j4.2
28630	1.2 :1	40.0 + j67	23	27620	16.5 –j1.0

Table 4: Antenna measurements using the RF1 and the GR Bridge.

APPENDIX 1

1 The loss of round copper wire due to skin effect for any given cable can be stated as:
Loss (S) = M x √F
where M is a constant for any given cable and F is the frequency in MHz.

2 Dielectric loss varies with frequency:
Loss (D) = N x F
where N is a constant for any given cable and F is the frequency in MHz.

3 Total loss = Loss (S) + Loss (D)

4 Using published data we can obtain a figure for M and N and calculate cable loss for other frequencies and lengths using the formula:

$$M = \frac{(Loss1 \times F2) - (Loss2 \times F1)}{(F2 \times \sqrt{F1}) - (F1 \times \sqrt{F2})}$$

$$N = Loss\ 1 - (M \times \sqrt{F1}) / F1$$

Where Loss1 and Loss2 are stated for frequencies F1 and F2 respectively for a specified length of cable.

Example

RG213 Published data for 10 metres of cable:
Loss1 = 0.18dB at 10MHz, and Loss2 = 0.62dB at 100MHz
M = 0.0546; N = 0.0007
Loss at 7MHz = 0.149dB per 10 metres
For 216ft the loss is 0.98dB.

RADCOM TECHNICAL FEATURE

2nd Harmonic Filter for 50MHz

Reducing Interference to the FM Broadcast Band

WITH THE REMOVAL OF the power restrictions on 50MHz it is important that you should be aware of possible problems with the second harmonic, particularly if you do run the full legal power limit. This second harmonic must be suppressed to a low level because it falls into the VHF FM broadcast band. The simplest solution is to fit a quarter-wave (λ/4) stub filter.

HOW DOES IT WORK?

THE FOLLOWING IS A description of such a filter. It comprises an electrical λ/4 of transmission line at the operating frequency. One end is connected in parallel with the antenna feeder at the transmitter or transceiver, and the other end is shorted.

At the operating frequency it presents a very high impedance and, because it is in parallel with the main antenna feeder, the fundamental frequency power to the antenna is unaffected, ie the insertion loss is very low. However, it presents a short-circuit to all even harmonics of the transmitter output. In practice a λ/4 stub provides a second harmonic attenuation of at least 30dB - it also provides a static discharge path.

CONSTRUCTION

AS ALREADY STATED the filter is constructed from an electrical λ/4 of transmission line or coax. A full wavelength at 50MHz is 6 metres so a λ/4 is 1.5 metres. However, the velocity factor of the coax also determines what physical length is actually required. If the velocity factor is 0.66 then the length will be 1.5 x .66 = 0.99 metres.

On the other hand if you use semi-air-spaced cable then the velocity factor may be 0.8. The physical length of the stub will now be 1.5 x .8 = 1.2 metres.

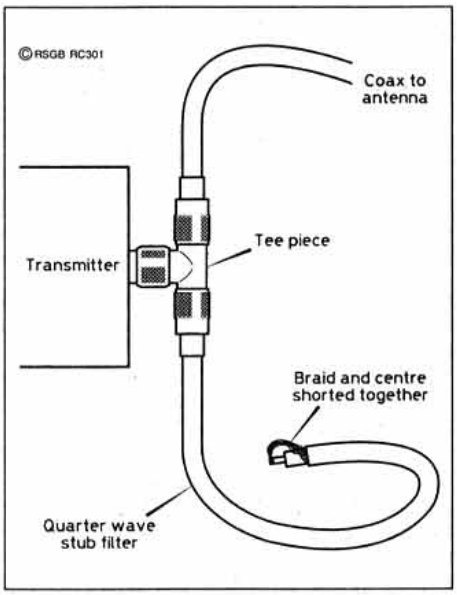

Fig 1: How to connect a quarter-wave stub to the antenna feeder.

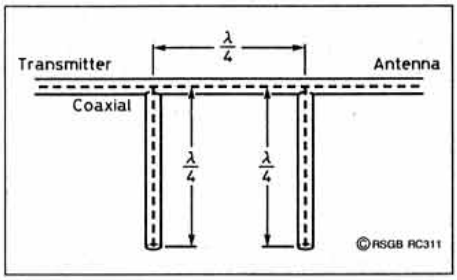

Fig 2: Use of two quarter wave stubs to obtain a greater rejection of the second harmonic.

Assuming a section of cable with a velocity factor of 0.6, cut a length of coaxial cable one metre long. Connect an appropriate coaxial T-connector (BNC, N, UHF), whatever matches the connectors you're already using to the transceiver. Connect the antenna to one side of the T-piece as shown in **Fig 1**. Fit a plug on one end of the length of coax stub (the most difficult part of the operation) and ensure that the other end of the cable is cut so that the inner and braid aren't shorting together. Don't plug the length of cable on to the 'leg' of the T just yet.

SETTING UP

FIND A STRONG LOCAL 50MHz signal. If you have a suitable signal generator or a 50MHz beacon nearby then setting up the filter is fairly simple.

Make a note of the S-meter reading. Then plug in the length of cable to the vacant socket on the T-connector. At the opposite end of the coax from the T-piece, use a pin and push it through the outer insulation and braiding until the tip is in contact with the inner conductor. Note the reading on the S-meter, remove the pin and make the short-circuit 5mm further from the end of the coax stub. You should find that the signal becomes stronger with each move. When the incoming signal reaches a maximum you know that the cable's electrical length is exactly a quarter wave.

All you need to do then is to cut the cable at the point of maximum signal strength. Remove the outer sleeving and inner insulation for about 1/16in, fold them together and join with solder. To prove it's working, check that the S-meter reading is unaffected after the outer and inner are joined and doesn't change when the stub is plugged into the T-connector.

A second stub can be added, λ/4 along the transmission line, as shown in **Fig 2**. This will increase the total harmonic rejection to a value greater than 60dB. Stub filters will be described in detail next month.

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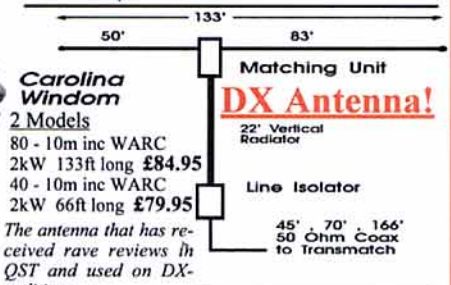

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Technical Topics

RF HAZARDS STILL CONTROVERSIAL

THE QUESTION OF WHETHER relatively low-level non-ionized electromagnetic radiation – below the accepted standards at which known thermal effects occur – at frequencies from 50Hz to microwaves are potentially hazardous remains controversial, with something of a split between the biologists and the physicists.

TT last covered the general question of possible health hazards arising from the operation of transmitters in some detail in January 1990 pp 36-37 ('Health Hazards: tougher guidelines') with a follow-up 'Handhelds and your eyes' in June 1992, p40. The possibility that athermal effects of radiation could conceivably represent a leukaemia risk was first raised seriously by Dr Samuel Milham in *The Lancet* (April 6, 1985). Dr Milham's statistical study was noted in *TT* August 1985 and appears in *Technical Topics Scrapbook* , 1985-89, p46 with related material on pages 46, 66, 141, 234-235, 252, 258.

One might have thought that by now, the issue would have been settled one way or another. This is far from the case. As amateur transmitters we might wish that the public would give us the benefit of the doubt until the matter was settled beyond all doubt. But as Camelia Gabriel (King's College London/Microwave Consultants Ltd) puts it in 'The Radiation Risks – Are They Real?' (*The Radioscientist*, June 1994, pp70-71): "With an increasing public awareness of environmental issues comes a perception that exposure to EM fields may be detrimental to health. The public has the right to question the issue and to expect the scientists to consider matters, perform the necessary research and provide as many answers as possible."

She continues: "The main issue is that of biological effects resulting from the interaction of EM fields with living organisms including people. The extensive body of literature . . . . enables the following statements to be made for exposure to EM fields in the range 10MHz to 10GHz:

(a) When a person is exposed to EM radiation the incident external fields induce internal fields within the body. The internal fields interact with the body tissues at various levels of organisation and result in induced currents and energy absorption.

(b) The degree of energy coupling depends mainly on the field parameters and on the shape and size of the exposed person.

(c) Generally, when the rate of energy absorption during exposure exceeds the rate of energy dissipation, the body temperature rises. Most of the biological effects of EM fields are an indirect consequence of this thermal stimulation, and are therefore known as thermal effects.

(d) There is a strong correlation between the intensity of the internal fields and the severity of the biological effect. Internal fields are quantified in terms of the rate of energy they deliver per unit body mass, this quantity is known as the specific absorption rate (SAR) and is expressed in watts per kilogram (W/kg).

(e) There is a threshold whole body SAR above which there is an increasing likelihood of adverse health effects.

(f) The concept of whole body SAR is not sufficient to guard against adverse biological effect in exposure situations where acute localised heating is likely to occur. The partial body exposure to the non-uniform fields from hand-held transceivers results in complex field distribution within the body. The shape and layered structure of the tissues of the head make it particularly prone to non-uniform field distributions. In terms of SAR, the field patterns are further accentuated by difference in the electrical properties of the tissues.

(h) To safeguard against localised overheating, restrictions on SAR averaged over small masses of tissue must be postulated.

Fig 1 shows the reference levels at frequencies above 100kHz as advised by the UK National Radiological Protection Board published in 1989 in *NRPB-GS11* 'Guidance as to restrictions on exposures to time varying electromagnetic fields and the 1988 recommendations of the International Non-Ionizing Radiation Committee'.

Camelia Gabriel points out that the exposure standards developed by national and international bodies are almost exclusively based on threshold wholebody SAR and localised heating. They are formulated to guard against thermal effects and she concludes that on present knowledge, the concepts of threshold whole body SAR and SAR averaged over a small mass of tissue are adequate to protect users of hand-held transceivers.

She questions, however, the situation with low-level exposures which result in SAR below the level of thermal significance and which are implicitly assumed safe: "The debate over the potential health hazard of exposure to low levels of microwaves was recently reopened over allegations in the press of a relationship between the use of portable communication equipment and the development of brain cancer." She considers this view is not supported by the scientific evidence, but concludes that "it is generally agreed that there is a need for further research to improve and consolidate our understanding of athermal responses and their biological significance."

She accepts however that under certain conditions, exposures from hand-held transceivers with output powers of 7-watts (usually considered the safe upper limit) may give rise to exposure conditions that contravene the protection philosophy and that there is an obligation on manufacturers to ensure that, when used as intended, they do not give rise to exposure conditions that contravene the protection philosophy. A warning that the 7W exclusion clause of the ANSI standard needs to be revised downwards was given in a paper by Niels Kuser and Qurino Balzano which was referred to in *TT*, June 1992, page 40 in a *TT* item 'Handhelds and your eyes'.

Perhaps more than Europeans, the American public takes the unproven risks of electromagnetic radiation seriously – even, for example, questioning the effects of electric blankets in appearing to change the body's rate of production of such cancer-inhibiting hormones as melatonin. The ARRL advises the policy, originated by Professor Granger Morgan, of 'prudent avoidance', avoiding unnecessary exposure to EMFs as a common-sense response to potential – but not yet proven – health hazards. Not abandonment of electric appliances but minimizing exposure to EMFs when it's practical to do so.

Wayne Overbeck, N6NB in 'Electromagnetic Fields and Your Health' (*QST*, April 1994, pp56-59) considers the whole question of electromagnetic fields generated by power lines, TV sets, amateur radio gear etc. He emphasises that scientists from the FCC and Environmental Protection Agency conducted a field survey of EMFs at typical American amateur radio stations in 1990: They con-

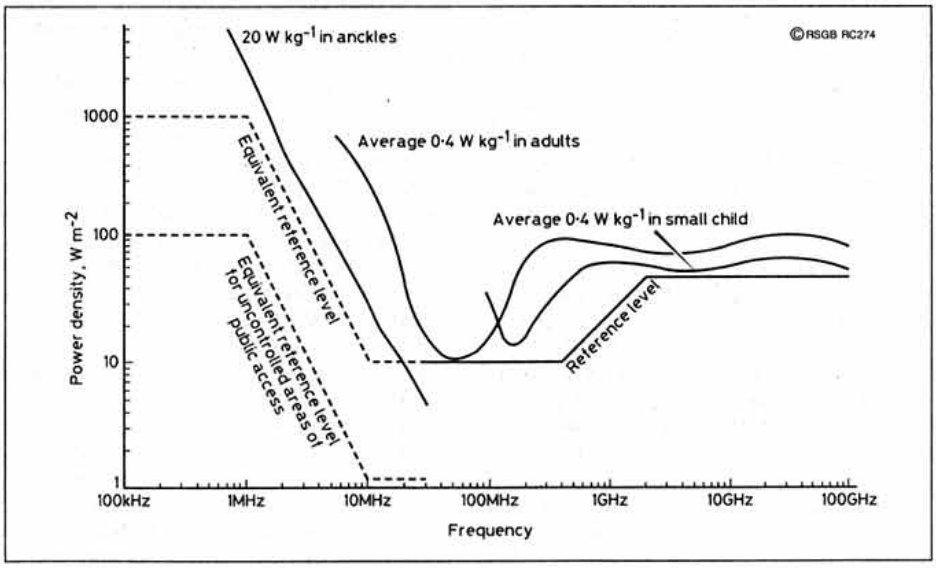

Fig 1: Advised reference levels above 100kHz and curves relating specific energy absorption rates in the body to incident power density (NRPB publication *GS-11*, May 1989).

cluded that most amateur operations do not produce EMFs strong enough to pose any health hazard.

However, based on guidelines developed by the Bio-Effects Committee of the ARRL, he puts forward a number of practical suggestions – some of which are considerably more rigorous than the official recommendations and not all of which I, in common with many amateurs, could claim to adhere to. (I must confess my antenna is less than 35ft high, partly in the roof space and end-fed in the shack with an RF power of the order of 100 watts, all transgressions of the ARRL code).

The following is a shortened and edited version of N6NB's suggestions:

- Transmitting antennas should be mounted well away from living areas. For power of 100W or more, if possible antennas should be at least 35 feet above populated areas. Transmission lines, open-wire or coax with SWR should preferably be routed away from areas where people spend much time.
- With ground-mounted or mobile antennas, be careful not to transmit when anyone is near the antenna. A rule of thumb is to avoid transmitting when anyone is within three feet of a car-mounted 144MHz whip used with a typical 25W transceiver, or five or six feet with a 100W amplifier. With a beam antenna and 100W or more, don't transmit when anyone is within 35ft of the front of the antenna.
- Exercise particular care with indoor antennas, including attic antennas. In some situations these can generate substantial RF fields. Try to locate them as far from people as possible and use low power (10W output or less) and keep transmissions short when someone might be near the antenna.
- Never use a power amplifier that has its metal cover removed.
- UHF and microwave antennas and waveguides may produce hazardous levels of RF energy and must be installed carefully so that no person is in the line of fire. Never look into an activated waveguide or stand in front of a high-gain VHF-UHF antenna when the transmitter is on.
- When using hand-held transceivers use the lowest power possible and keep the antenna as far from your head as possible .... there is growing evidence that even 1W or 2W hand-held radios may produce significant EMFs within the user's head, with possible health effects that are not yet fully understood. Where possible use hand-helds in the 'low-power' position with only a fraction of a watt of output power.
- Be aware that low-frequency fields exist in your home. If possible avoid being within 24 inches of any electric motor or power transformer while it is turned on. Hair dryers, AC-operated hand drills and other appliances that are held close to the user's body often expose them to stronger EMFs than those produced by amateur-radio equipment. It is a good idea to stay about 24-in away from the fans and power transformers found in high-power amplifiers and 12V power supplies, for example.

The specific problem of possible RF interference to the safe operation of implemented cardiac pacemakers was discussed in *TT*, February 1989 (see the *TT Scrapbook 1985-89*, p287). This showed that while the immunity of such devices had been greatly increased since they were first introduced in the late 1950s, there remained considerable difference in immunity between various models and between pulsed and continuous wave RF. I then concluded "It seems reasonable to suggest that persons depending on implanted cardiac pacemakers should avoid areas subject to strong electromagnetic fields, either as operators or as visitors, or as members of the family, unless they are certain that their particular device is guaranteed not to be affected up to the range of levels involved.

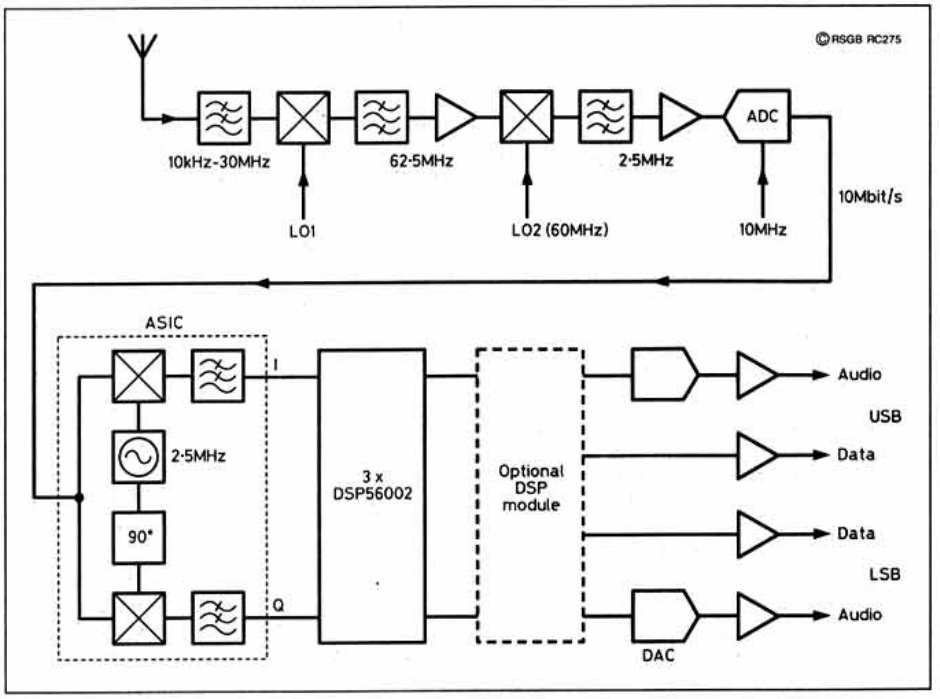

Fig 2: Simplified block diagram of the Marconi H2550 'digital' MF/HF communications receiver.

A full-length article 'Pacemakers, Interference and Amateur Radio' by Fred Weber, MD, AA2KI (*QST*, July 1994, pp34-36) shows that while amateurs who have pacemakers can expect to safely use their stations, "these wonderful devices were [initially] not free of risk and reports of unwanted interactions between pacemakers and electrical devices began to appear."

AA2KI in discussing current risks to pacemaker users, singles out a number of sources of high EMFs, not usually met in practice; these include spot-weld machines, arc welding machines, submerged arc welders, neon sign test rooms; electrical sub-stations etc. Hostile environments may also be encountered in radiation therapy for breast cancer and within magnetic-resonance imaging (MRI) scanners.

He points out that when estimating potential dangers to pacemaker users, take steps not to generalize about particular models, configurations, lead systems etc: "Each patient is unique, and all variables must be carefully evaluated. Safe operation of a particular unit in a particular environment does not guarantee safe operation of that device in another."

For amateurs with pacemakers, he provides a number of tips for safe operation. He stresses that as long as accepted safety practices are maintained there is no increased danger. He does however note one final precaution involving antennas: "Most hams use external antennas that limit their exposure to RF energy. Everyone is encouraged to do this – especially hams with pacemakers. The increasing use of indoor loops and attic wires, however, brings RF closer to the shack, sometimes even bathing it in RF. As a precaution, hams with pacemakers should avoid these types of antennas."

HF PROGRESS AT THE CONFERENCES

WITH THE RSGB 1994 International HF & IOTA Convention looming up (October 7-9, see *RadCom*, August p16) it seems apposite to consider some of the developments reported at recent professional conferences, in particular the IEE's 6th International Conference on 'HF Radio Systems & Techniques'. At one time it looked as though the coming of satellite communications, and long-distance satellite broadcasting, professional VHF meteor scatter etc might leave the HF spectrum virtually as a happy hunting ground for amateur radio.

Unfortunately, the already outdated idea that HF is no longer of importance to professional communications appears to have influenced the Director and management of the Science Museum in their highly regrettable decision to close down GB2SM, a decision that they will surely come to regret unless they can be persuaded at the last minute to reverse it. The full history of HF cannot yet be written. It is far from a dead technology!

It is clear from the IEE conference book of papers (*IEE Conference Publication No 392)* that despite all the problems of reliable HF systems, there remains a vast number of military and other systems still interested in HF with its unique potential for low-cost, long-distance communications in peace or war. Furthermore, quite a lot of the professional R&D is being carried out by those who, in their spare time, operate on the amateur bands. Dr Brian Austin, G0GSZ, who was on the IEE

organizing committee (together with Les Barclay, G3HTF and Mike Underhill, G3LHZ) tells me that of the 211 delegates from 19 countries, 46 admitted to holding amateur calls: 16 of the 96 UK delegates, 13 of the large Swedish contingent of 29, five of the 21 from the USA.

J M Goodman (SRI International) in 'The last quarter-century of ionospheric study and prospects for the future' pointed out that "there are well-founded military imperatives which necessitate the continued use of HF (and other ionospherically-dependent) systems despite capacity restrictions. Moreover, within the military sector it is recognised that it is not prudent to put all one's eggs into a single basket .... effective management of a variety of communications media is needed .... It is well known that the HF spectral domain is limited and the number of users is vast, leading to a problem of spectral congestion .... There will be an obvious benefit if HF systems can be modernized to support data rates consistent with a seamless connection with ATM/SONET backbone. Primary use would be the support of long-haul connections of remote sites with base stations, corporate networks, and military headquarters. In addition, viable HF communication capability at high data rates could greatly leverage the well known advantages possessed by HF skywave at times of national emergency, including disaster relief following earthquakes, floods and hurricanes."

Reported hardware developments include a paper by R J Eassom (GEC-Marconi) describing the Marconi H2550 MF/HF analog/digital receiver covering 10kHz to 30MHz, together with an associated transmitter drive (H1550). Both of these new equipments have now reached the stage of being delivered to customers. It is pointed out that "the replacement of conventional analogue HF communications receivers by digitally-implemented equipments is becoming increasingly common. These offer the advantages of improved performance, increased flexibility and lower cost."

It is emphasised that naval communications presents one of the worst environments for HF radio equipment since high power local transmitters can result in unwanted signals as high as +20dBm at the receiver antenna input, with frequency offsets as low as 5%. At the same time, the wanted signals may be as low as 1uVemf ie –113dBm. This results in a requirement for a receiver combining low noise figure, high signal level handling and excellent linearity – requirements equally desirable for amateur operation.

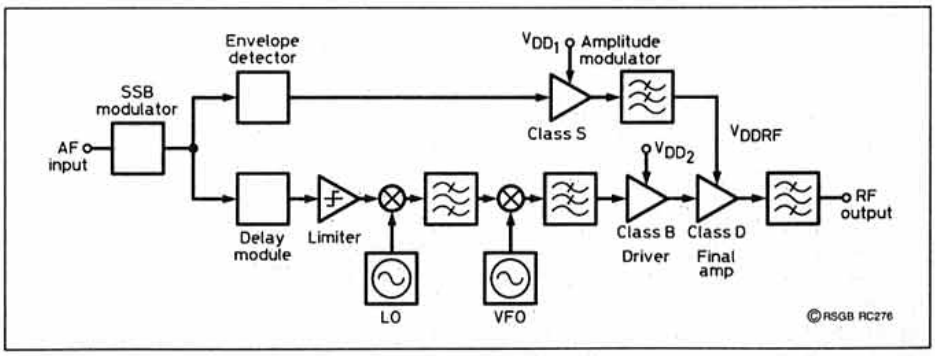

Fig 3: Simplified block diagram of high-efficiency SSB HF/VHF transmitter based upon Kahn-type envelope elimination and restoration with an average efficiency of about three-times that of a transmitter with a conventional Class B power amplifier. (Raab & Rupp, *IEE Conference Publication No 392*).

The H2550 (outlined in **Fig 2**) employs what is described as a novel bandpass sigma-delta analog-to-digital converter (ADC) on the second IF signal at 2.5MHz, with application-specific (ASIC) custom ICs in conjunction with digital signal processing (DSP). As with all 'digital communications receivers' so far described, the RF front-end uses analogue circuitry including 'a new mixer developed for high linearity coupled with minimum loss and low local oscillator (LO) drive level. A patent has been filed for this design as it achieves better than a +40dBm 3rd order intercept point for a +5dBm LO drive from the synthesizer. The same circuit is used for both mixers: RF to 1st IF (62.5MHz) and 1st IF to 2nd IF (2.5MHz). However, the mixers radiate high levels of LO harmonics, so screening, especially between the two mixers, was extremely important in the mechanical design." Unfortunately no further details of this mixer are given in the paper.

"The traditional crystal filter at the first IF, which can limit overall linearity, was replaced by a two-cavity helical resonator. Similarly, an LC design was used for the second IF filter rather than crystal type, although provision was made to fit a crystal filter as an option . . . . For naval applications, the receiver selectivity and reciprocal mixing performance is enhanced by a pre-selector filter. Organised as four couple-pair octave filters tuned by an arrangement of binary weighted capacitors, this provides 20dB rejection at 5% frequency offsets and 30dB at 10%."

F H Raab and D J Rupp (Green Mountain Radio Research Company, USA) describe a 'High-efficiency single-sideband HF/VHF transmitter based upon envelope elimination and restoration (EER)'. This multi-mode transmitter is based upon the EER technique (exploited also in polar-loop and cartesian-loop systems, see *TT*, June 1994, pp53-54) originally described by L R Kahn in *Proc IRE*, 1952, Vol 40, pp803-806, with sub-systems using a Class D RF power amplifier, a Class-S high-level amplitude modulator, an SSB modulator, a delay-compensated circuit and frequency translators:

"The experimental transmitter (**Fig 3**) is a prototype for both communication and jamming applications. It can produce a wide variety of signals, including SSB, AM and FM. Its efficiency is about 60% for all signal ampli-

CARE NEEDED WITH MOVS?

THE USE OF METAL-OXIDE varistors (MOVs) to remove spikes from mains supplies has been widely advocated and widely adopted for the protection of solid-state equipment including home computers and the like. In the UK, the usual specification for MOVs in this application is to use 275V AC working (350V DC) types with energy absorption ratings of from about 8 to 60 joules. I have always assumed that a clamping-value of 275V AC would safely handle mains-supply variations and MOV tolerances, while effectively removing the high-voltage transients that can damage solid-state equipment.

This would seem, however, to be disputed by Jim Sandoz, N2MPT in a long letter in the Technical Correspondence feature of *QST*, July 1994, pp82-83. In this he criticises the use of 130V AC MOVs with the American 120V mains, and argues that it is important to specify an MOV voltage rating of – at minimum – 1.5 times the nominal mains voltage. For 120V mains supplies this would mean 180V AC MOVs; for 240V mains 360V AC MOVs. N2MPT suggests that MOV tolerances can typically range from 5 to 20%: "The MOV clamping voltage is a function of many variables, including operating temperature, age, and transient event history. With this in mind, it's prudent to specify an MOV with a voltage rating of at least one and a half times the AC mains voltage."

N2MPT writes: "Should the MOV turn on and stay on, there are a number of possible results. The least-hazardous outcome is that the fuse in the equipment opens due to the high current flow. Unfortunately, a large number of MOV applications depend on a circuit breaker or fuse located at the building's distribution panel. Taking into account the impedance of the mains circuit and the on impedance of the MOV, the current flow may not trip the overcurrent protection device and may attempt to continuously dissipate anywhere from 20 to 200 watts. As MOVs are designed for very short transients, anything but the lower end of this range is far above its thermal rating .... the overheated MOV package will either burst into flame and/or expel hot material, possibly igniting nearby components or materials. Unfortunately, this failure mode is fairly common."

He also draws attention to a different hazardous situation which occurs when MOVs are improperly applied in telecommunications applications, for example being connected directly across phone lines to remove transients. He warns against "do-it-yourself protection using MOVs is not a good idea unless all the risks are understood." I am not too sure how seriously we should take N2MPT's warning (although he seems to know what he is talking about) and wonder if any reader has experienced difficulties with 275V MOVs?

tudes, which makes its average efficiency for voice signals about three times that of a transmitter with a conventional class-B PA. For voice-bandwidth signals, the IMD products are 43dB or more below the peak carrier output (–43dBc)."

"A compact portable HF terminal" proposed by M Darnell et al (HW Communications Ltd) utilises a 100W amateur transceiver as the basis of a modern 'suitcase radio'. Their terminal provides a fully automatic HF radio system intended for digital transmission using MFSK (multiple frequency shift keying), based on the Piccolo concept, implemented via real-time DSP. Real-time channel evaluation (RTCE) provides automatic adaptive operation at data rates matched to channel conditions.

The authors point out that amateur radio enthusiasts make extensive use of the HF medium with modern amateur-grade transceivers. Although these are much lower in cost than professional/military systems, they are reliable and have good performance specification in some respects; but, in other respects, eg frequency stability, their performance is marginal for digital traffic.

The major elements of the proposed terminal (**Fig 4**) are: (a) amateur-grade transceiver with maximum of 100W RF output; (b) sloping-V or other simply deployable antenna for both transmission and reception; (c) 486-based laptop PC for overall system control and protocol generation; (d) a PC DSP expansion card to perform real-time signal generation and processing functions (–32C processor); and (e) flexible power supply facilities.

The MFSK modem would provide tone frequencies independently variable to an accuracy of 1Hz with tone positions adjusted to avoid sources of narrowband co-channel interference, with the number of tones adapted in response to path or equipment state would be from 2 to 32 tones. Error control based on Reed-Solomon codes. The system currently operates in low-speed data transmission modes but could be extended to transmit analogue speech, medium-rate data and digitised image information.

At the 11th National Radio Science Colloquium (University of Liverpool) July 1994, V Petrovic and M A Billsberry showed that the polar-loop technique can be applied to conventional radio transmitters without altering the transmitter other than by adding extra, external circuitry. While I have not seen their paper, the abstract (provided by Dr Brian Austin, G0GSF) states: "The polar-loop and cartesian-loop techniques are the most effective means currently available for improving the linearity of radio transmitters used in narrow-band modulation systems .... This [Polar-Loop] technique was implemented using a 20W amplifier operating at 220MHz. A reduction in third-order intermodulation products from –27dB to –53dB, on a two-tone test, was achieved. Further improvements are possible with more detailed circuit design."

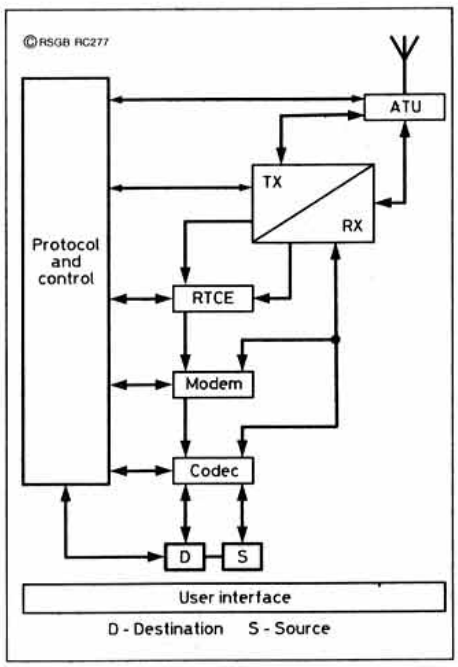

Fig 4: Professional low-cost 'suitcase' portable HF terminal using a 100-watt amateur transceiver and adaptive Piccolo-type MFSK digital transmission with real-time-channel-evaluation to control bit-rate (M Darnell, B Honary, R Enright & I Martin, *IEE Conference Publication No 392*).

MULTI-WIRE DIPOLE AND MONOPOLE ANTENNAS

AN INTERESTING LETTER from Dr David Pearson, GM3TLA, draws attention to various forms of multi-wire folded dipoles that are often overlooked, including the possibilities they present for dipoles with short-spans and their use as two- or multi-band antennas. This has arisen from his use as a receiving antenna of the four-wire, three-eights wave, folded dipole which was described originally by Dr John D Kraus, W8JK, in the late 1930s and which is briefly described in several editions of *Amateur Radio Techniques* (ART7, pp 296-7) and *TT, July 1987 (see also Technical Topics Scrapbook, 1985-89*, pp179-180).

GM3TLA notes that his antenna, with a three-eighths-wave span on 21MHz uses 20 metres of wire and also resonates on 7MHz, although the radiation resistance is probably too low to make this a really efficient 7MHz transmitting antenna – but it might be worth trying. Several other, too-often forgotten, types of folded dipoles and folded monopoles were described by W8JK. **Fig 5** shows some of these folded antennas and the approximate resistive feed impedance with wires of equal diameter when erected about a half-wave above ground.

It should not be forgotten, however, that a folded element used in a beam array will have a reduced input resistance which can, for example, provide a good match to 50 or 75Ω coax feeder. Similarly a wide variety of input resistances can be obtained by using wires of unequal diameter, a technique originally described by W Van Roberts, W3CHO in *RCA Review*, June 1947 and in the UK in an article by H A M Clark, G6OT (*RSGB Bulletin*, October 1947 with an abac for finding the input resistance for unequal wire/rod diameters etc). As for a single-wire half-wave dipole the height of a folded antenna above ground has an important effect on its terminal resistance and reactance, as does also mutual coupling to nearby objects or array elements.

While the three-eights-wave folded dipole means that a 14MHz antenna can be erected with the span normally required for 21MHz, GM3TLA raises the question that this type of

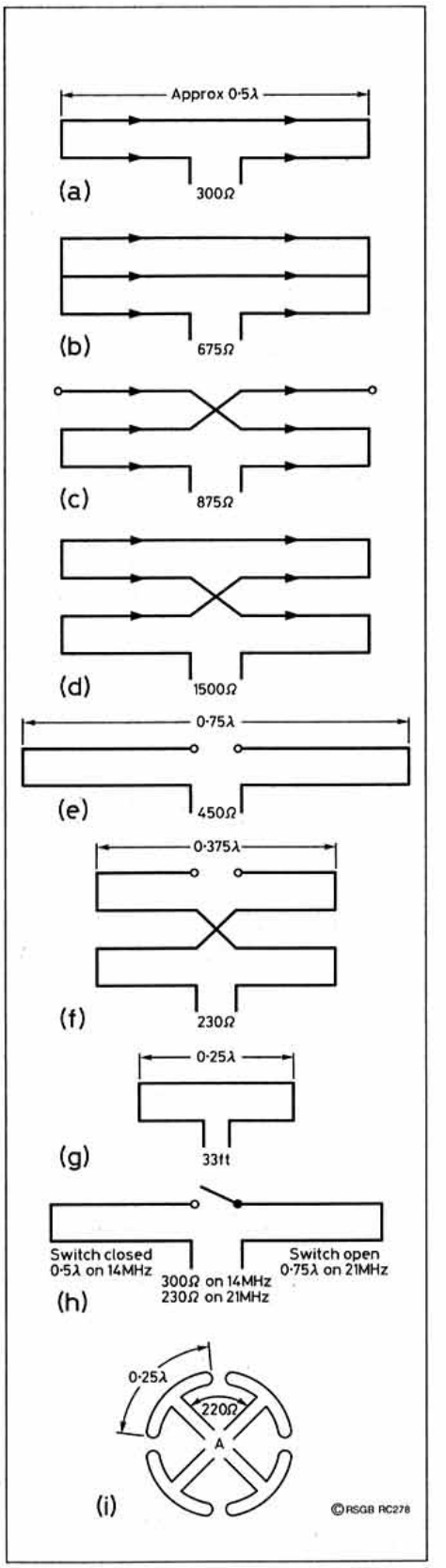

Fig 5: Various forms of folded dipole antennas. (a) and (b) physical span 0.49-wave. (c) 0.46 wave. (d) 0.47-wave. (e) 0.71-wave; (f) 0.38-wave. (g) basic quarter-wave, folded dipole, voltage-fed. (h) Practical two-band 14 and 21MHz antenna with switch closed on 14MHz. (i) The original Empire State Building TV-sound VHF ring antenna using four quarter-wave dipoles to form circular omni-directional ring. The mutual coupling reduces the feed impedance of each segment to about 220Ω, with four twin feeders parallelled at A and coupled to 55Ω coax cable via a balun. The folded parts are of equal length mounted one above the other but shown in two-dimension form in the diagram.

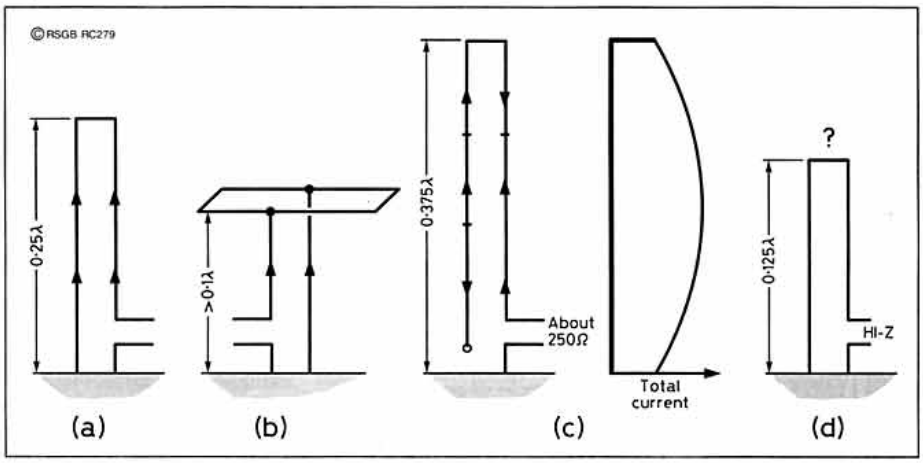

Fig 6: Various forms of the folded monopole antenna. (a) λ/4 folded vertical of conventional form. The feed impedance can be adjusted to required value by using wires/rods of different diameter. (b) Folded-Tee antenna developed by G3LNP (*TT*, August 1992). (c) Three-eights-wave vertical folded antenna working against earth with feed impedance about 250Ω. Current distribution is similar to that of a vertical top-loaded single-conductor antenna with maximum radiation a λ/4 above earth. (d) Possible form of a λ/8 wave monopole which might be worth trying but will have a low radiation resistance that will reduce efficiency.

multiple folding might possibly provide a way of building a dipole with one half wavelength of wire with an overall span of only one-eighth wave which could be erected in a highly restricted space. I suspect that such an antenna would require critical adjustment of the element to resonance. W8JK in his *Electronics* article (reproduced in the *Electronics Manual for Radio Engineers*) points out that the length of an antenna becomes more critical as the number of wires is increased beyond two, reducing rather than as might be expected increasing the effective bandwidth.

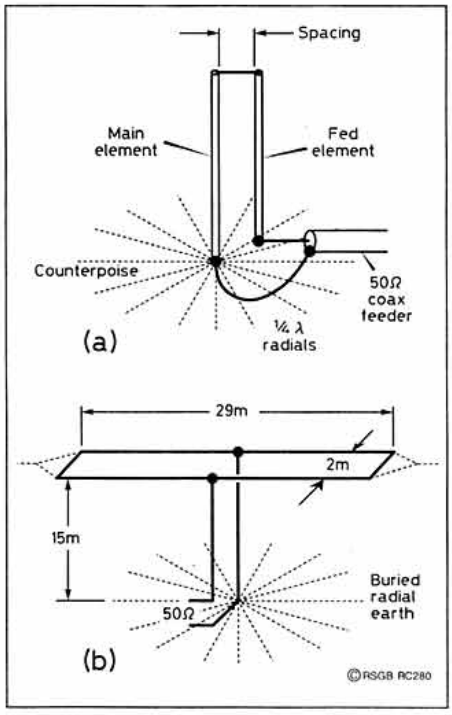

Fig 7: (a) Form of folded monopole investigated in detail by K8CFU in the mid 1980s. Provisional dimensions for 14.2MHz antenna are listed in Table 1. (b) Dimensions of a 1.85MHz folded-T antenna as described by G3LNP in 1992. Dimensions can be scaled for higher-frequency bands.

The original dipoles investigated by W8JK were for the pre-war 14MHz band (14.0 to 14.4MHz) and were constructed with No 12 (B&S gauge) with the overall spacing (d) of the order of 0.015 wavelength or less. Thus his two-wire 14MHz dipole was 34ft long and had a wire spacing of one foot.

In his article, W8JK referred to the work of N E Lindenblad for the original television (sound) transmitting antenna on the Empire State Building (*RCA Review*, April 1939). W8JK stressed that "The transmission line terminals of all the types described [in Electronics] are located at a current loop point. Lindenblad has recently described a folded antenna, which might be called a two-wire quarter-wave doublet, in which the terminals are located at a current node."

As I had never previously followed up this reference to a quarter-wave folded doublet, it seemed worth seeking out, in the IEE Library, the April 1939 issue of *RCA Review*. I found that the first VHF TV-sound antenna (modern TV antennas are broad-band and carry both vision and sound, usually on UHF for four channels) on the Empire State Building consisted of a loop antenna made up from four folded dipoles bent into circular segments.

To quote Lindenblad: "Among the dimensions of folded radiators which, at a given frequency, result in resistive input impedance, only the two smallest dimensions are of any interest in this case. At the larger of these dimensions the distance between the folding points of the radiator is approximately a half wave: **Fig 5(a)**. The folding points coincide with maximum potential and the currents in the parallel conductors flow in the same direction.

"The distance between the folding points at the smaller dimension is only about a quarter of a wave: **Fig 5(g)**. The input terminals are at maximum potential and the currents in the parallel conductors flow in opposite directions. A ring antenna of this later type need only be about half the size of that required by the first type, reduces the possibility of undesirable mutual effects between the sound and the vision antennas and reduces the mechanical problems. For these reasons, the small-type folded dipole was chosen."

For a λ/4 folded dipole the terminal resistance would be very high, implying a voltage-fed system – possibly from a resonant open-wire feeder (preferably about one-quarter or three-quarters wave long to provide a current fed system from a balanced ATU output). In the case of the four λ/4 radiators in the RCA ring antenna, by properly spacing adjacent folding points, it was found possible to influence the characteristics of the radiator so that the input impedance of each radiator in the combination was reduced to 220Ω, permitting parallel connection of the four short open-wire balanced 220Ω lines via a balance converter [1:1 balun] to a 55Ω coaxial line without impedance transformation: **Fig 5(i)**.

For amateur operation with a quarter-wave dipole, it would presumably be possible to use 300Ω line as a resonant line on the fundamental frequency but as a flat line on the harmonic frequency at which it would be a conventional half-wave dipole.

There might also be a possibility of an effective one-eighth-wave high folded monopole. Dr Kraus pointed out the advantages of a three-eighths wave vertical antenna working against ground including the lower ground loss due to the higher feed resistance: **Fig 6(c)**. Whether a one-eighth wave vertical monopole without top loading **(Fig 6(d)**, would be effective is questionable but might form an interesting experimental project. The radiation resistance would be low. **Fig 7** shows two practical implementations of folded monopoles.

Base impedance	Height	Main el dia	Fed el di	Spacing
50Ω	15.1ft	0.25in	1.75in	3.0in
			2.75in	4.0in
			4.0in	6.0in
75Ω	15.1ft	0.25in	1.25in	14.25in
			1.75in	16.25in
			2.75in	22.5in

Table 1.

HERE AND THERE

JOHN GARDNER, GW4KVJ, was reminded of finding many old zinc-air primary cells in black moulded cases on the railway embankment he rents from British Rail . Cell No 518A, CAD on star (trade mark), described as an inert caustic soda cell with capacity of 850 to 1000 Ah. EMF 1.4V, discharge rates: continuous normal 100mA; continuous maximum 400mA; intermittent maximum 800mA. An 'important' note added "when in service the cell must be well ventilated". The makers, Le Carbone (GB) Ltd of Portslade, Sussex. GW4KVJ also recalls that in his youth he worked for an electrical contractor who had the task of maintaining the bell circuits of the composer Ralph Vaughan Williams. It was his job to check the bells, cleaning out the Leclanche cells, fitting new zinc rods and renewing the solution, mixing sal-ammoniac crystals with water to form ammonium chloride. ***G3VA***

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IC-820H

This one's so new that we still get asked what is it? It's the latest Dual Band Multimode Base Station from Icom. 35/45 watts on two & seventy, it's the neatest package around for the VHF operator. Once again, the men at Icom have priced this very sensibly.

IC-736

It's funny that only a year ago you were all asking me when a manufacturer was going to bring out an HF rig with six, that offered 100 watts across the whole range. Icom's ears must of been wagging, presto! the new IC-736. It didn't stop there however. Whilst they were busy giving you a world first, somehow they've squeezed in a mains PSU and an auto tuner in the smallest space possible! Don't forget what Peter Hart said about it's brother, the IC-737 (without 6m), "amongst the best receive performance of any rig I've tested".

IC-737A

If you're not enthused about the NEW IC736, or simply don't want 6M or possibly a power supply, then take a special look at the IC737. It's been a favourite of mine since it's introduction last year. Voted one of Peter Hart's favourite rigs, his comment "amongst the best receivers I've ever tested" is absolutely true. They're in stock at a special price to suit you.

FT-736R

Still the only Base Station that can take all four VHF/UHF bands at once, the FT736 for 6/2/70 & 23CM is out on it's own. No other offers you a built in PSU. No other offers satellite operation at the press of a button and is so convenient for packet operation. It's SSB facility allows true DX when the local FM chat becomes a bore. A Turbo front end, courtesy of messers muTek has been available for almost two years enhancing the receiver performance even more on 2 & 70.

FT-990

More and more customers are realising the high quality offered by Yaesu and the "Nineties" series of H.F. communications transceivers. The FT990 is probably the most "commercial grade" transceiver available to the Amateur. For example, no other has plug in boards interfacing to a mother board, giving you low servicing times in the unlikely event of a break down. No other has digital filters fitted as standard, giving you razor sharp selectivity. No other has a front panel layout that allows the operator to take full advantage of all the features available - without referring to the handbook every time. The list goes on. Visitors to the store always comment on how solid the FT990 feels to the hand. The performance has been underlined by Peter Hart and Rob Manion. Test drive one today!

FT-840

With the FT747 now finished, the FT840 takes over. The reports from the "big boys" on H.F. constantly remind me how good the FT840 is. (see our newsletter, FT840 - First Impressions by Henry Lewis G3GIQJ. I'm so confident that you'll agree, the FT840 really has performance to match the big rigs, I'm offering a TEN DAY money back guarantee.

FT-900

On July the fifteenth, 1994, Yaesu Musen Co. of Japan unveiled their exciting (and world first), FT-900. For those of you who "preferred" to use the features of the FT-890 for mobile use, but found it a little too large, Yaesu engineers have "split" part of the front panel, enabling full feature HF mobile, with base station facilities from your car, in the new FT-900. For mobile operation, the new lightweight detachable sub-panel permits separating the transceiver and mounting the main unit in a remote location. This makes the FT-900 convenient for mobile and maritime amateur operation, or wherever space is at a premium. With similar features to the FT-890, the new FT-900 incorporates an option ATU-2 Auto Antenna Tuner and many more newly introduced features, not yet seen on such a small and compact package.
Operating frequency and other important settings are displayed on a high-contrast back-lit LCD. The new three-mode bargraph meter display features delayed "peak hold" circuitry for the tuning bargraph segments that simplifies tuning stations with rapidly varying signal strength.

FT-747GX - ONLY 5 LEFT

Now in it's final stages of production, the FT747GX allowed thousands of operators to get on the H.F. bands for the cost of a dual bander mobile rig! It's simple in operation and Yaesu's brief was to give the user 100 watts on all Amateur Bands, include a General Coverage Receiver and the option of all modes. The biggest crunch was the price. I've managed to secure the very last production from Yaesu Japan and I'm offering them to you at cost. Last chance - there are no more!

FT-530

Hands up all those who thought they had bought the right dual band handie, only to find their mates bought the correct one first - the FT530. The new FT530 from Yaesu is in our opinion the easiest to

LEICESTER SHOW STOPPERS!!!

For all customers spending over £100 on the LYNCHY STAND at the Leicester show, your entrance fee will be returned - in cash!! How's that for a fair deal?

REMEMBER REMEMBER the 26th of NOVEMBER

Last year was the opening of the new shop, this year we're celebrating the first anniversary and what a day that will be! More news next month, but make a note in your diary NOW. Nearly a thousand people poured through the door and grabbed tens of thousands of pounds worth equipment at virtually trade prices. Further more, they were fed and watered for free. ARE YOU SURE YOU'RE BUSY THAT DAY? What ever you've got on - cancel it and come to MARTIN LYNCH. Make him sweat and give yourself a big grin - grab a bargain! More details next month.

TS-50S

I've been using one mobile for nearly a year. For all those skeptics, it hasn't gone wrong, even running 100 watts output. I remember other manufactures scoffing at the fact "I wonder how long it takes to burst into flames?" Well let me tell you, they don't. The TS-50S is the most reliable HF transceiver we probably sell. It only begs the question why are the other H.F. transceivers so large?

SUPER SLIM TH-79E

The TH-79E is a new very slim and lightweight DualBander, offering features exclusive to this new design. Despite it's compactness, the radio can operate full duplex and monitor two frequencies at once, within the same band. Monitoring both input and output of repeaters simultaneously are therefore possible.

80 non-volatile memory channels with ID

The TH-79E has 80 multifunction channels - all capable of storing TX/RX frequencies, CTCSS and split channel operation. Each channel can be assigned with letters (upto 7 characters) to identify each one individually. All memories are stored in EPROM, so no more worries about lithium backup!

Multiple scan Modes, DTMF Memory & DTSS & pager functions are all present in this tiny well constructed package.
★ Power on call sign display ★ Selectable dual & single band operation ★ A.B.C. (auto band change) ★ CTCSS operation (with optional TSU8) ★ Tone alert system ★ Auto repeater offset (VHF) ★ 3 position power, High/Low/Economy low ★ Over voltage display and audible warning ★ Auto power off ★ 10 minute time out timer ★

Dot-Matrix LCD & menu/guide system

Making its debut on handheld transceivers, the dot matrix display greatly improves user friendliness since there are no limitations on the variety of messages that it can handle. In addition to frequency data, this can be used to access a menu system with full alphanumeric display of functions and settings. the operator can also scroll through a summary of current operational status. What really sets this system apart is the "on-line" guide - simple operating instructions appear in the display whenever needed.

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YAESU

use, most feature packed, only one to offer CTCSS as standard, super-wide extended coverage Handie available. Like other Yaesu products, once you've read the manual, we doubt you'll need to read it again.

FT-11R/41R
I know you probably think the Japanese have gone bonkers building VHF portables, but you've just got to see what Yaesu have done with these two. No larger than a packet of cigarettes, the NEW FT11/41R handies are full-feature machines with all the "trick" facilities built in. The volume & squelch are controlled by up & down buttons, leaving the top panels with only one knob - the channel change knob. See one today!

KENWOOD

TS850S
The TS850 set the standard for sub £2K radios and judging by how many we get through every month, you obviously appreciate the machine as well! Rather like a popular car, you either know someone with one, had one and wish you never sold it, or haven't yet got round to investing in the best HF base station since Trio launched their TS530 all those years ago. I'm here and I'm ready to take your money!!

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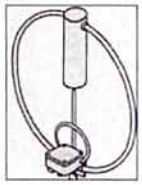

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RADCOM TECHNICAL FEATURE

The Extended Double Zepp Improved

by R A Formato, K1POO

THE EXTENDED DOUBLE ZEPP (XDZ) has been a popular amateur antenna since the early days of shortwave radio. It can be used from HF well into the UHF range, where it is especially attractive because shorter wavelength offsets the XDZ's increased physical length. The XDZ provides exceptional gain for a simple antenna, but its impedance properties can create matching problems [1]. This article describes a simple technique for controlling and improving the XDZ's impedance performance.

XDZ geometry is shown in **Fig 1**. The antenna consists of two collinear, end-fed, electrically long radiating elements ('Zepp' elements). The element spacing at the feed is S, the diameter D, and the overall physical antenna length is L. If the length-to-diameter ratio is large (L/D >> 1), the antenna is 'thin'; otherwise it is 'fat'. The electrical length of the original Zepp element is half-wave, but an XDZ element is somewhat longer, approximately 0.64 wave. When the spacing S is small (S/L << 1), the XDZ is essentially a long centre-fed dipole, and its performance is accurately analysed using a dipole model. It is assumed that S/L << 1.

The reason for the XDZ's popularity is apparent from an examination of **Fig 2**, which plots the directivity of a free-space centre-fed dipole vs end-to-end electrical length.

The widely used thin λ/2 provides 2.15 dBi gain (dB relative to an isotropic radiator) with a well-behaved input impedance of approximately 77+j44Ω. But longer dipoles provide much better performance. As the length increases, the directivity also increases, reaching a maximum of nearly 5.2dBi at a length of 1.27 waves. this electrical length is optimum for the XDZ. More than 3dB gain over a λ/2 dipole is obtained by simply making the antenna longer.

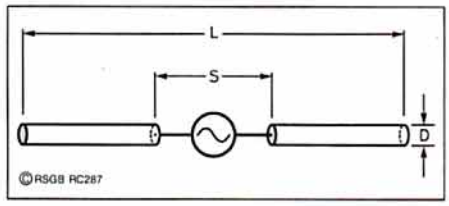


Fig 1: Extended double zepp geometry.

The pattern factor (normalised radiation pattern) for the 1.27-wave XDZ is shown in **Fig 3**. Three lobes appear because the antenna is electrically long. the main lobe, with a maximum gain of 5.2dBi, is oriented broadside to the antenna axis. Its –3dB beamwidth is 31.5°. The XDZ's two sidelobes are almost 10dB down, and, for practical purposes, can be ignored.

Note that Figs 2 and 3 are based on an ideal thin radiator (infinite L/D ratio) having a sinusoidal current distribution. This approximation provides accurate directive gain and the general pattern shape even for 'fat' radiators (small values of L/D). The major pattern effect for a fat element is that the nulls begin to 'wash out'. The sinusoidal current approximation, however, is not accurate for impedance calculations, especially for fat elements.

Considering only the data provided in Figs 2 and 3, the XDZ might seem to be the ideal antenna, one that provides excellent gain in a very simple, easy-to-build structure. Unfortunately however, the XDZ has a serious drawback. Because it is a full-wave antenna, its input impedance is high, possibly thousands of ohms, which can create matching problems.

For this reason an XDZ with a more moderate input impedance would be a better antenna. Fortunately, there is a simple solution to this problem, and it lies in choosing the optimum XDZ L/D ratio.

Figs 4 and **5** plot dipole input resistance and reactance vs electrical length. At its full-wave resonance (X = 0), a thin dipole (L/D = 5000) has a very high resistance (approximately 1,800Ω). In contrast, 'fatter' elements (smaller L/D ratios) exhibit more moderate impedance levels. By properly choosing L/D, the XDZ input impedance can be controlled while still achieving maximum directivity from its increased electrical length. The data in Figs 4 and 5 are based on a non-sinusoidal current distribution for improved accuracy at small L/D values.

The optimum L/D ratio for a 50Ω feed is 30.5, since this value results in a driving point impedance of 50-j123Ω for a 1.27 wave XDZ. These theoretical values provide a starting point for an improved XDZ design. The only matching required is an inductor to tune out the 123Ω capacitive reactance. At most frequencies, the matching inductance is small. At frequencies in the high VHF-UHF ranges, the feed system may well contain enough stray inductance to virtually eliminate the need for adding any.

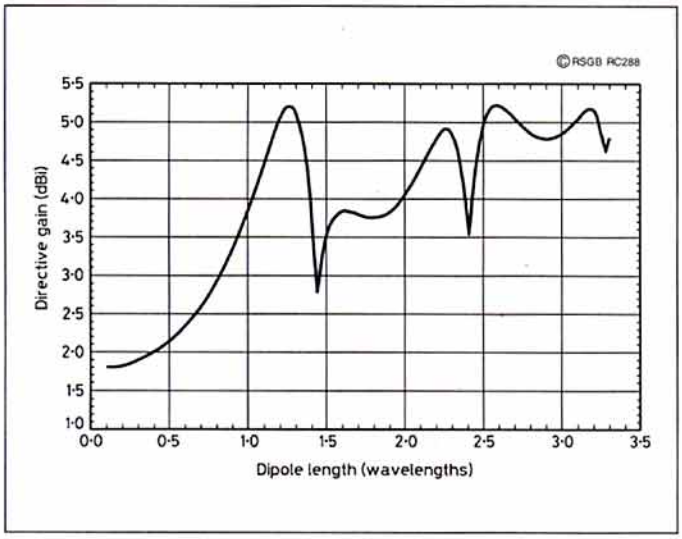


Fig 2: Directivity of free-space centre-fed dipole vs end-to-end electrical length.

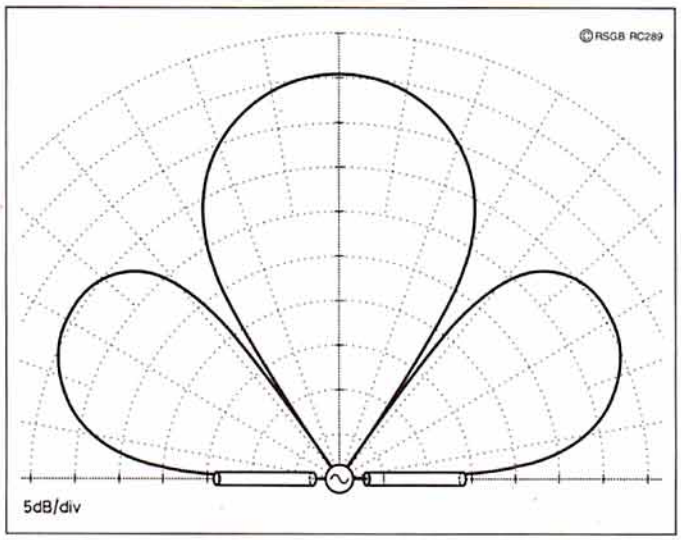


Fig 3: Pattern factor for a 1.27 wavelength double extended zepp.

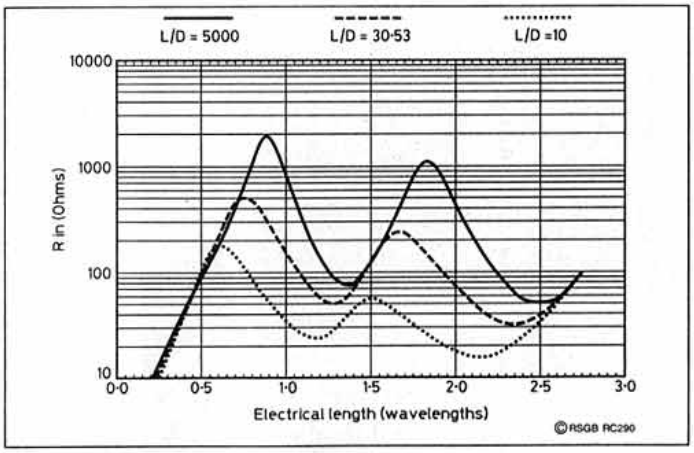


Fig 4: Double extended zepp; resistance vs electrical length.

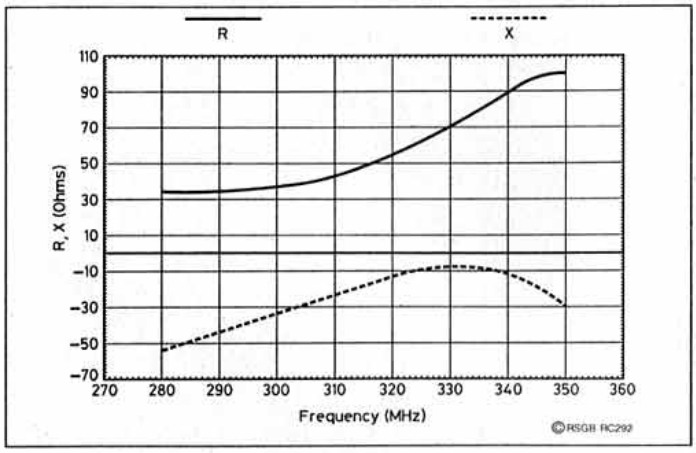


Fig 5: Double extended zepp; reactance vs electrical length.

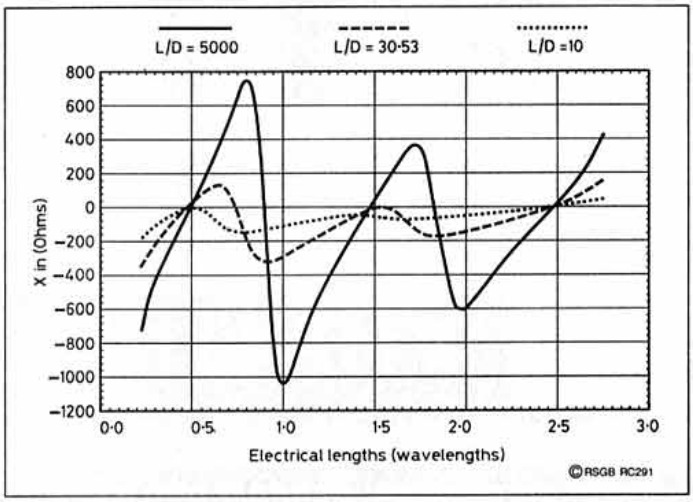


Fig 6: Measured values of Rad X of an XDZ antenna between 280 and 350MHz.

TEST ANTENNA

A SIMPLE 'PLUMBER'S delight' dipole was built and measured as a crude validation of this technique. Even though no effort was made to perform a controlled experiment, the data clearly illustrates the viability of this approach.

The test antenna consisted of two 24 3/4in. x 1 5/8in. OD copper tubes separated 1in. at the feed point. These radiating elements were strapped to a 12in. x 1in. x 3/8in. plexiglass support using four nylon cable ties on each element. A female type N chassis connector was soldered to the elements using straight 14 SWG solid copper wire pigtails (no balun was used, although normally one would be).

The antenna was mounted vertically in a 10in diameter pine tree about 16in from the trunk. The feed point was approximately 8ft above the ground. The RG-8 coax feed cable was tied horizontally along a branch for a distance of about 4ft from the antenna feed, then dropped to the ground.

Measured values of R and X appear in **Fig 6**. The test XDZ was approximately 1.27 waves long at 300MHz, where the input impedance was 36.7-j35Ω. Without matching, the corresponding VSWR is 2.34:1 (0.76dB mismatch loss). By adding inductance to tune out the –35Ω reactance, the VSWR could be reduced to 1.36:1 (0.1dB loss). Without matching, the minimum measured VSWR was 1.3:1 (0.07dB loss) at 322MHz (input impedance 56.3-j12.4Ω). These moderate values of R and X show how effective L/D can be in controlling XDZ input impedance.

The bandwidth of a 'fat' XDZ is also surprisingly good because the input impedance varies gradually with frequency. VSWRs of less than 2.5:1 are achievable over more than 10% of the design frequency, which is enough bandwidth to cover most amateur bands using one antenna without matching. The XDZ's directivity, however, falls off quickly on either side of the frequency at which the antenna is 1.27 waves long. Nevertheless the gain is still better than that of a λ/2 dipole.

DESIGN APPROACH

DESIGNING AN OPTIMUM XDZ thus consists of three steps:

(1) Choosing the electrical length to provide the desired gain.

(2) Choosing L/D ratio to achieve the desired input antenna resistance.

(3) Adding components at the feed to tune out any reactance at the design frequency, [see Note].

The graphs shown will provide a starting point for these design steps, but design details will vary depending on the specific antenna. For example, resistance and reactance introduced at the feed point will modify the XDZ input impedance. Such effects are difficult, if not impossible, to predict in advance because they depend on exactly how the feed is built. As with any antenna design, some 'tuning' will be necessary after the basic system is fabricated.

XDZ implementations using solid copper or aluminium tubing are feasible at VHF/UHF. But at HF the element diameter needed to obtain the desired L/D ratio is too large for tubing. The 'cage' structures described in [1], Chapter 9, can be used instead of a large diameter conductor. As a general rule, the radiating element should consist of at least eight wires parallel to the element axis to adequately simulate a continuous conducting surface.

The technique of varying L/D to control antenna input impedance and impedance bandwidth is not restricted to the XDZ. Similar considerations apply to monopoles on ground planes, active and parasitic arrays of Zepp elements, and, in fact, any wire antenna structure. Input impedance and impedance bandwidth can be considerably modified by changing L/D. Of course, the optimum L/D ratio depends on the specific antenna geometry and the design objective; there is no universally 'best' value.

All this illustrates how useful the L/D ratio can be in designing wire antennas. It is hoped that this information will encourage experimentation with easily constructed antennas, in particular dipoles and monopoles. Simply changing the element diameter often produces a much better antenna!

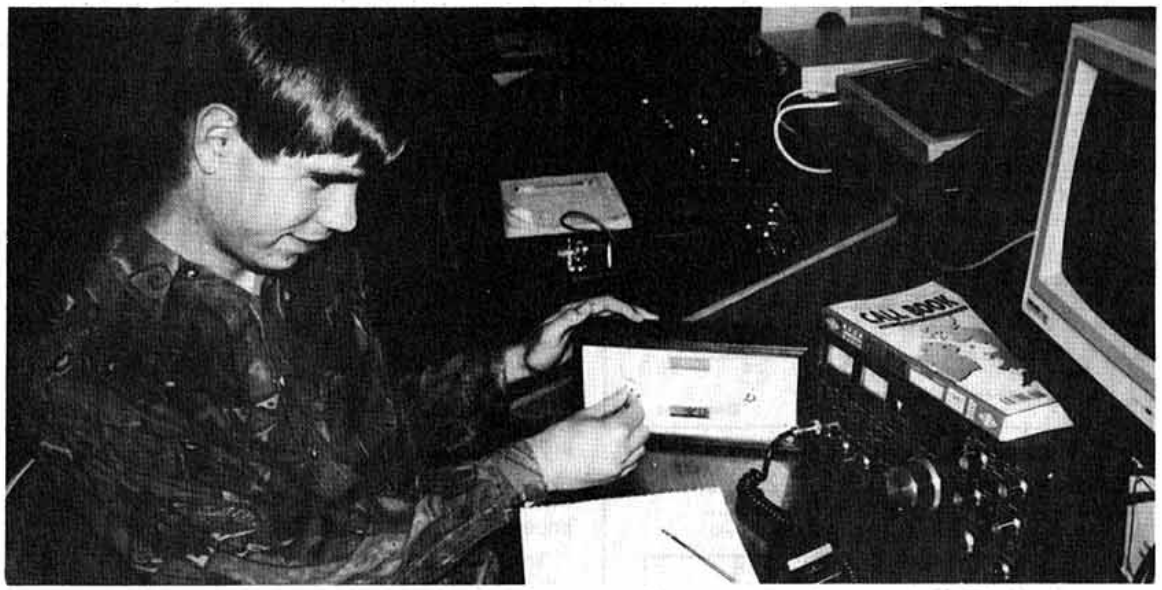
NOTE

INDUCTANCE OR CAPACITANCE should be added symmetrically to the radiating elements. for example, if a total of 1μH is required, then 0.5μH should be added in series with each radiating element to maintain the XDZ's electrical balance as a symmetrical radiating system.

REFERENCE

[1] *The ARRL Antenna Book*. Available from RSGB sales.

CONGRATULATIONS 2E1ARU!



Robert Dilley, 2E1ARU, checks out his R&D Weather Station prize at the consol of HQ's shack.

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IC725/735 Ctrlr EPROM		EPROMICOM	£5.00
Wobbulator	(Nov 92)	WOBB	£4.95
Wobbulator ready built		RBWOBB	POA
Simple Spectrum Analyser	(Nov 89)	1189SSA	£16.00
Oscilloscope Probe Tester	(Nov 91)	OSCPRO	£4.50
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G3TXQ 3-band Transceiver	(Feb/Mar 89)	TXQ7	£23.50
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G3PCJ 160m Transceiver	(Jan/Feb 93)	TOP160	£7.50
Direction Finder	(TT Apr 91)	VHFDF	£3.75
AF Oscillator	(Sep 90)	AFOSC	£4.95
Synthesiser	(Jul/Aug 92)	SYNCPCB	POA

Add £1.50 to all prices for postage and packing

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Telephone: 021 384 2473.

KIT SERVICES FOR *RADCOM* PROJECTS

KITS

JAB's aim is to have kits available off the shelf. Sometimes, especially following publication, demand is unknown so you are advised to check availability or allow 28 days for delivery. Kit contents vary, the contents are given, eg 1+2 means that PCB parts and PCBs are supplied. Price shown is the price you pay except that if the order value is under £15.00, please add £1.00 towards P&P.

Contents Codes:
1 = PCB Mounted Parts Only
2 = PCB Only
3 = Case Mounted Parts
4 = Ready Punched Case
5 = Case Un-Punched

Exclusions Codes:
A = Air Spaced Variable
B = Crystals
C = Display

Notes:
SF = State Frequency or Band
POA = Price on Application

Author	Date	Kit	Contents	Price	Notes
G3TSO	1088	Multiband Tx/Rx		POA	
G4PMK	1189	Spectrum Analyser	1+3	£55.65	
G4WIM	0590	Dual Bander 50+70MHz		POA	
G3BIK	0990	AF Oscillator	1+2+3+5	£25.00	
G3TSO	0691	80m SSB Tx/Rx	1-A	£77.00	
G3BIK	0192	HF Absorb W/meter		POA	
G4SGF	0492	A Novice ATU	1+2+3+5	POA	
G4ENA	0592	QRP+QSK Tx/Rx	1+2+3+4	£52.60	SF
G7IXK	1192	Wobbulator	1+2+3+4	£21.50	
G3ROO	0493	6m Converter	1+2	£11.85	SF
G4ENA	0593	Direction Finding Kits 160m:-			
		DF Receiver	1+2+3	£32.50	
		DF Transmitter	1+2+3	£25.30	
G3TDZ	0793	Phasing Transceiver:-			
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		Exciter	1	£24.10	
		Converter	1-B	£11.40	SF
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RG58CU, 5mm dia, 50 ohm, stranded centre	30p/m
RG174U, 2.3mm, 50 ohm, miniature coax	35p/m
UR95, 2.3mm, 50 ohm, mini nylon coax	30p/m
UR111, 2.3mm, 75 ohm PTFE mini coax	40p/m
UR57, 10.3mm, 75 ohm low loss coax	70p/m
UR70, 6mm dia, 75 ohm transmitting coax	30p/m
Double screened, 75 ohm coax, 8mm dia	40p/m
UHF low loss TV downlead, 75 ohm	25p/m
75 ohm twin balanced feeder, 400 w PEP	25p/m
300 ohm standard ribbon	25p/m
RG62AU, 6mm dia, 95 ohm coax	50p/m
Single core screened cable, 2.3mm dia	12p/m
Two core screened cable, 5mm	30p/m
3 core mains, 5 amp, cable	25p/m
6 core rotator cable, heavy duty	45p/m
8 core rotator cable, heavy duty	65p/m
14 SWG HD copper	25p/m
16 SWG HD copper	20p/m
PVC coated AE wire, light duty	8p/m
Red/black DC power cable, 8 amp	30p/m
Red/black DC power cable, 15 amp	45p/m
PVC coated AE wire, heavy duty	12p/m
NEW UR67 50 ohm HD with robust outer sheath	90p/m
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NEW 300 ohm heavy duty slotted feeder	60p/m
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N plug one end... BNC socket on the other, MIL spec	£3.50 ea
BNC plug one end... N socket on the other, MIL spec	£3.50 ea
PL259 plug one end, Phono socket on the other	80p ea
Phono plug one end, SO239 socket the other	80p ea
BNC plug one end, Phono socket on the other	80p ea
3.5mm plug one end, SO239 socket on the other	80p ea
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All the types below are with pressure sleeve clamp

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N plug... special for Westflex 103	£5.80 ea
N line sockets.. for UR67/RG213	£2.50 ea
N plugs for 5mm cable (UR43/76 RG58 etc)	£2.60 ea
N chassis sockets... 4 hole fix	£2.00 ea
N in line adaptors... 2 x N sockets back to back	£3.00 ea
N in line adaptors... 2 x plugs back to back	£3.60 ea

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BNC plugs for UR43/76/RG58 or any 5mm coax	£1.20 ea
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PL259 plugs... with built in reducer for 5mm coax	60p ea
Angle PL259 plugs... side 5mm coax entry	£1 ea

MICROPHONE PLUGS & SOCKETS

4 pin mic plug... the piece on the end of the mic lead	80p ea
4 pin mic plug... angle type, with side cable entry	£1.30 ea
4 pin mic socket... chassis mt to suit above	80p ea
4 pin mic line males... used to extend mic leads etc	£2.40 ea
6 pin mic plug... with 5 holes on the outside, 1 in the middle	£1.20 ea
6 pin mic socket... chassis mt to suit above	£1.20 ea
6 pin mic line male, used to extend leads etc	£3.00 ea
7 pin mic plug	£1.50 ea
7 pin mic socket... to suit above	£1.50 ea
7 pin mic line male... like to piece on the set but line type	£3.00 ea
8 pin mic plug	£1.50 ea
8 pin mic socket... to suit above chassis mt	£1.50 ea
8 pin mid line male... other way around from the bit on the mic	£3.50 ea

NB The piece which goes on the end of the mic lead we call a plug... it is in fact a line female connector and the male side which is fitted on the rig we term a socket... it is in fact a chassis mt male.

TNC

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PL259

PL259 plugs... high quality, with PTFE insulation & silver plated bodies for UR67/RG213 (not pressure sleeve type)	£1.20 ea

ADAPTORS

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N plug one end to BNC socket the other	£3.50 ea
PL259 plug one end, N socket on the other	£3.50 ea
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BNC socket to BNC socket in line	£1.60 ea

All the above connectors are 50 ohms

BNC SERIES

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BNC plug... 50 ohm high grade MIL spec, silver plated .5mm coax	£1.20 ea
BNC plug... 50 ohm for 10.3mm coax, RG213 etc	£4.00 ea
BNC 50 ohm chassis sockets, round hole	80p ea
BNC 50 ohm chassis sockets, round hole, insulated mount type	60p ea
BNC 50 ohm chassis sockets, square flange type, 4 hole	90 ea
BNC coupler... 2 sockets, back to back in line, 50 ohm	£1.60 ea
BNC coupler... 2 plugs back to back in line, 50 ohms	£2.00 ea
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TNC SERIES

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TNC couplers... 50 ohm, socket to socket back to back, line/chassis	£1.50 ea

N SERIES

N plug... 50 ohm, 10.3mm entry, UR67/RG213/103 etc MIL spec	£2.60 ea
N plug... 50 ohm, 5mm entry, UR43/76 RG58CU, MIL spec	£2.60 ea
N plug... 50 ohm, large 20mm entry, MIL spec, Greenpar	£4.00 ea
N plug... 50 ohm, large 23mm entry, MIL spec, Suhner	£4.00 ea

(Any of the above 3 large plugs could be adapted for Heliax cables)

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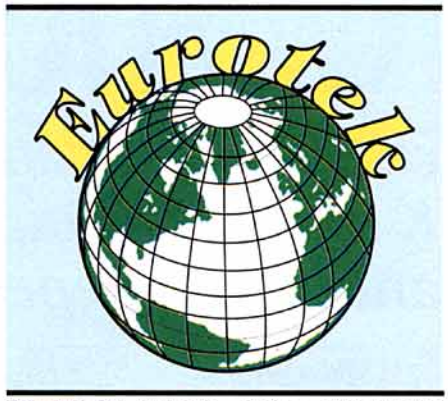

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

A 20W RF amplifier module from a defunct high-band PMR rig cheaply boosts the output from a 2-m hand-held transceiver. **James Pierrat, F6DNZ**, designed a passive **Diode T/R switch, Dominique Petitprez, F1JNL**, built it and **Michel Pauwels, F9ZS** explained it in *Radio-REF* (F) 5/94.

ONCE THE PA MODULE and its low-pass output filter have been electrically separated from the donor rig, possibly rehoused, and furnished with suitable RF and power connectors, a switching system must be added to insert the PA between the transceiver and the antenna when transmitting; the received signal, however, must bypass the PA on its way from the antenna to the transceiver.

This can be done with one or two carrier or PTT operated relays, but coaxial relays are expensive. **Fig 1** shows a carrier-operated system using only inexpensive components.

HOW IT WORKS

ON RECEIVE, THE RF voltages on all diodes are negligible, so none of them conduct. The amplifier is isolated by the high impedance of the diodes and points P and Q, the antenna and the transceiver, are connected via two sections of λ/4 coax cable.

When the amplifier unit receives RF from the transceiver during transmit the peak RF voltage at Q is 17V, assuming a transceiver output of 3W and a 50Ω load. This voltage is much greater than the turn-on voltage of diodes D5/D6, each of which will now conduct over the greater part of the alternate RF half-cycles.

The low impedance path of D5/D6 effectively connects the transceiver output to the amplifier input.

Similarly, the amplifier output is connected, via the low impedance path of diodes D1/D2, to the low-pass filter [1] and hence to the antenna.

The amplifier output must be prevented from feeding back to its input through the receive path P to Q. This is achieved using two quarter-wave sections of coax cable, (Fig 2) for paths PR and QR, and shorting each at the centre-point R through the capacitor C and the diodes D3/D4 when the latter are conducting during transmission.

Thus, the receive path presents a high impedance from either P or Q. The amplifier output can be peaked when earthing D3/D4 through capacitor C rather than directly[2].

3	10	20	30	40	50	watts
2	3	4	5	6	7	pairs

Table 1: Number of parallel 1N4148 diode pairs vs RF watts. Power levels above 20W were not tried.

HOW MANY DIODES?

1N4148 DIODES ARE FAST and cheap but they have limited current carrying capability. Several diode pairs can be connected in parallel, depending on the current requirements. **Table 1** shows how many are required for a given power level. For an RF power of 3W input, two pairs should be used for D5/D6. At 20W output, four pairs would do for D1/D2 and D3/D4. [The resonant current through D3/D4 can only be roughly estimated but the number of diodes required at D1/D2 should suffice for D3/D4 – *G4LQI*]

To ensure that the RF current is equally shared between parallel diodes, they should be matched within, say, 50mV. Diodes from one batch generally come that way but this can be easily checked with the circuit of **Fig 3**; approx. 50mADC is forced through a diode and the voltage across it is measured with a DVM.

ASSEMBLY AND TUNE-UP

IN THE EXPERIMENTAL MODEL a small PCB was used to mount the 20 diodes, 5-50pF trimcapacitor, and to make the coax connections on. The trimcap must be capable of withstanding high RF voltage and current if the amplifier output exceeds a few watts. The two λ/4 lines are made of RG58/U and coiled up with a diameter of 3cm. Surprisingly, the dressing of these coils had a noticeable effect on reception.

Set up a transmit chain (without the switching system) comprising, transceiver, amplifier, LP filter, power meter and dummy load and tune the amplifier for maximum output. Then install the switching system and replace the dummy load with antenna. Tune the trimcap for maximum output. If parasitic resonances are encountered, experimenting with the lengths of the interconnecting cables may be useful.

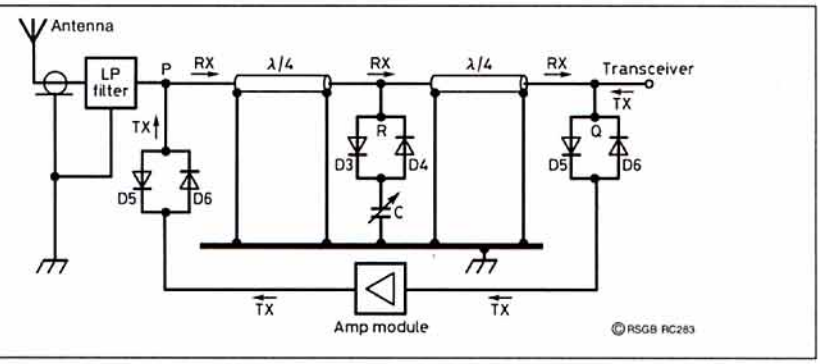

Fig 1: Carrier-operated T/R switching for a 20W amplifier used with a 3W 145MHz transceiver.

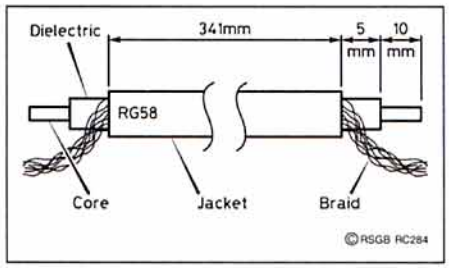

Fig 2: Cutting dimensions for a λ/4 line @ 145MHz.

NOTES

[1] The low-pass filter from the PMR rig cannot be left connected directly to the amplifier; it must be inserted between D1/D2 (Fig 1) and the antenna to ensure that the harmonics generated by these diodes are suppressed *[G4LQI]*.

[2] The dimension 341mm in Fig 2 represents an electrical λ/4 at 145MHz. The actual path from point P or Q (Figs 1 & 4) through the coax and D3/D4 to the trimcap C is several cm longer than λ/4; these extra lengths represent inductances which, when tuned out by the trimcap, effectively place short circuits where they should be, ie λ/4 away from points P and Q *[G4LQI]*.

DTMF DECODER ICS – EUROTEK, JULY 1994

PRONTO ELECTRONICS do not retail the SST-7ST202-IP decoder IC used in the DTFM decoder (Eurotek July 1994). However G4LQI has obtained a small supply of these devices, which will be available until the end of November. The cost of the SST-7ST202-IP decoder IC, inclusive of VAT and postage is £6.50 from G4LQI, QTHR.

Note that G4LQI cannot handle returns or warranty claims.

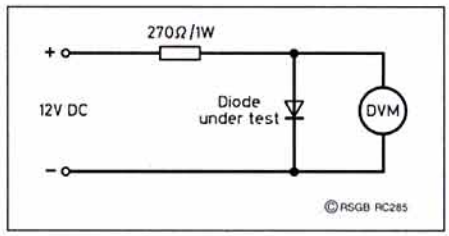

Fig 3: Circuit for selecting diodes with equal turn-on voltages.

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VM-727RS	2M/70CM Mobile Whip	£32.00
HS-727SS	2M/70CM Mini Mobile Whip	£17.00
EX104B	2M/70CM Mini Mobile Whip	£22.50
SMC12SE	12M Mobile Whip	£16.50
SMC15SE	15M Mobile Whip	£16.50
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HS-GP62	2 X ⅝ Base Colinear	£65.00
GP23	3 X ⅝ Base Colinear	£39.00
SQ44	2M SWISS QUAD	£45.00
WX1	2M/70CM Base Colinear	£75.00
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144-20T	2m 10-ele Cross Yagi 12.2 dBd	£99.00
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424B	24-ele 70cms Yagi	£115.00

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B1016G	2m, 10W input, 160W output preamp	299.00	C
B2516G	2m, 25W input, 160W output preamp	269.00	C
B5016G	2m, 50W input, 160W output preamp	269.00	C
D1010N	70cm, 10W input, 100W output	349.00	C
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HL100B/80	80M Linear, 10W in 100W out PEP	210	C
HL66V	6M Linear, 10W in 50-60W out Rx Preamp	169	C
HL166V	6M Linear, 3/10W in Auto select 80/160W out Rx Preamp	299	C
HL37VSX	2M Linear, 0.5-5W in 20-35W out variable gain preamp	109	B
HL62VSX	2M Linear, 5/10/25W in 50W out preamp	235	C
HL36U	70cm Linear, 6/10W in 25/30W GaAs FET Preamp	155	B
HL63U	70cms Linear, 10/25W in 50W out GaAs FET Preamp	259	C
HL180V	2M Linear, 3/10/25W i/p auto select 170W out Rx Preamp	389	C
HL130U	70cms Linear, 3/10/25W i/p auto select 120W out Rx Preamp	485	C

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HX640	6M to HF Specs as above	299	B
HX650	10M to 6M transvertor high performance, MGF1302 Preamp dB/12dB selectable 10/50W selectable output input selectable, 100m V/1V RMS	369	B

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THOSE READERS with E-mailing facilities may like to know about the QRP Mailing Group on Internet. To join the group send a mailing to qrp@think.com with the message 'please subscribe' and wait. My only warning is that this is a very active group and you will receive a lot of mail. I was away for about 10 days and received over 280 items of mail on my return!

The group seems to include almost all of the well known people in QRP operating in the USA and quite a significant number in Europe and the rest of the world. The topics are legion, ranging from simple questions about equipment to internet inspired operating events and the design of home-built equipment. It is a good place to find out about QRP equipment and kits. The members pull no punches in their opinions. It represents a busy, but interesting, source of information on QRP.

Another Internet address of possible interest is the amateur radio homebrew news group. The news group can be found at rec.radio.homebrew. Its content varies a great deal and tends to follow lines of interest set by questions fed into the group. I log on to it from time to time to check the current topics and stay with it as long as the content is of interest.

THE G QRP CLUB IS TWENTY YEARS OLD

TWENTY YEARS AGO, after some conversation with a group of operators on 80 metres, I wrote a letter to the *Short Wave Magazine*, asking anyone interested in low power operation on the amateur bands to write to me with the view of forming a group. 32 people replied and, inspired by their interest, I decided to produce a simple news sheet. On the advice of Gordon, G3DNF, I called it *SPRAT* from 'Small Powered Radio Amateur Transmission'. The first issue was produced using an old Banda spirit duplicator at the local church school. In more recent years many people have requested copies of issue one but as it was printed in pale purple, it is very difficult to photocopy.

The club grew very slowly. It took about three years to gain 100 members and seemed to be regarded as a rather eccentric small group of radio amateurs. Later the G QRP Club, as we decided to call it, took off with all sorts of members. At the first RSGB Convention at the National Exhibition Centre, over 100 people joined on the first day. In the 20 years which has followed, the G QRP Club has enrolled over 8,000 members. There are now members throughout the world including over 400 in the USA.

From the very beginning the club journal *SPRAT* has formed the backbone of the club. Each issue contains over two-thirds practical technical content. Over 20 years the technical content of *SPRAT* has been amazing. Several major technical projects in *RadCom* began as pilot articles in *SPRAT*. Most of this is not due to my efforts as editor. Members of the G QRP Club are very generous with their ideas and the club seems to contain an extraordinary collection of builders and experimenters.

Any reader who would like to know more about the G QRP Club is invited to send me a first class stamp. They will receive a sample copy of *SPRAT* and full details of how to join the club. The current membership fee is £6.00 a year.

KK7B KITS ARE NOW AVAILABLE!

WITHOUT DOUBT, THE best amateur radio technical article I have ever read is 'High-Performance Direct-Conversion Receivers' by Rick Campbell, KK7B, which appeared in the *QST* for August 1992. It is technically innovative, lucid and full of good humour: a classic of amateur radio journalism. I have since met Rick Campbell, and his home-made equipment, twice and was not disappointed. He is a good design engineer and excellent company.

Rick's starting point came of the desire to build: "a 40 metre CW receiver with the clarity and signal to noise ratio of a CD player". The first result was his R1 receiver board, which was followed by his R2 receiver board and then a T2 transmitter board. The receive boards can be used at any frequency from 1 to 500MHz and inspired many constructors to copy his design. Initially Rick offered printed circuit boards for these projects but soon became overwhelmed by the demand.

He has now passed the production of the printed circuit boards and kits of parts for the boards to Bill Kelsey, N8ET. Bill has just about begun to issue his first kits for the R1, R2 and T2 boards with plans to sell a Mini-R2 kit. Details can be obtained from Bill Kelsey, Kanga US, 3521 Spring Lake Drive, Findley, Ohio 45840, USA. Tel: (0101) 419 423 4604. Try this number between 7pm and 11pm Eastern USA Time. An article on how to use the boards is promised for the G QRP Club journal *SPRAT*.

THE G QRP CLUB WINTER SPORTS

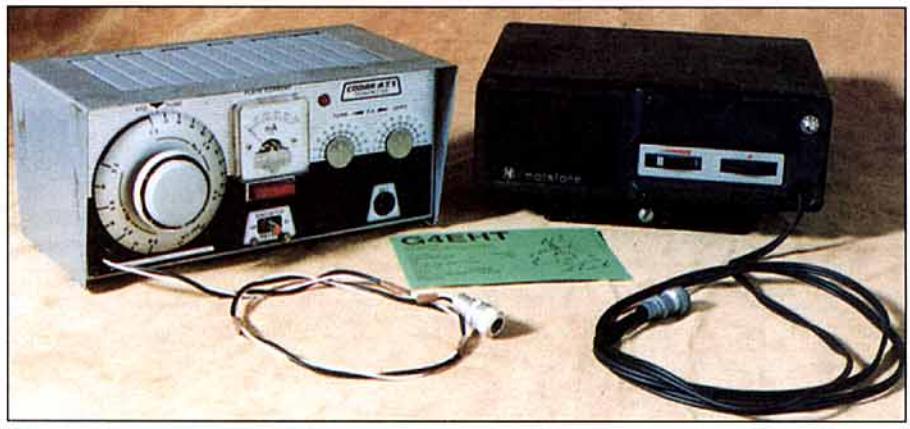
I SIT WRITING THIS in August in a rare hot spell in the North West of England but I am obliged to mention the most popular annual QRP operating event. The G QRP Club Winter Sports is an established event in the calendar of HF band operating. I have even heard experienced QRO operators complain that they were 'seen off' by the large number of QRP stations during the Winter Sports! It is a QSO Party rather than a contest. The idea is to come on to the QRP calling frequencies on any band during the period from Boxing Day to New Years Day (inclusive), using an output power of no more than 5 watts and work as many other QRP stations as possible.

Although it is not a contest there is an award, the G4DQP Trophy, for the station judged to have contributed most to the overall event. Logs and comments may be sent to the G QRP Club Communications Manager, Gerald Stancey, G3MCK, 14 Cherry Orchard, Staines TW18 2DF. The International QRP Frequencies are: 1.843, 3.560, 7.030, 10.106, 14.060, 21.060 and 28.060MHz on CW and 3.690, 7.090, 28.885 on SSB.

WHAT IS UNDER THE BONNET?

IF YOU HAVE EVER READ kit car magazines, you will know the delight some people get from hiding all sorts of exciting engineering under the bonnet of what may seem to be a conventional car. Bill Watson, G4EHT, attempted a similar approach in amateur radio. The photograph seems to show what are two conventional items of equipment: a Pye Motafone and a Codar AT5 Transmitter. But appearances can deceive.

These now operate on 160m SSB. The Pye Motafone has become a top band crystal controlled SSB transceiver. The facia of the Motafone is completely unchanged but it offers full transceive facilities with a couple of watts of SSB. The Codar AT5 is now a top band SSB transmitter. This was a little easier to build as the original VFO dial could be used. The old Power Amplifier Tune and Load controls were no longer required. The more observant may notice two five pence pieces covering up the former control holes! With a little bit of ingenuity, G4EHT has produced two customised 160m SSB units using existing surplus equipment.



Bill Watson's, G4EHT, cleverly disguised home brew 160m SSB rigs.

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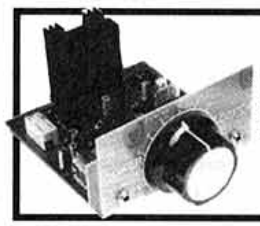

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RAY PEART, G0FHK, of Gloucester had a problem with his neighbour's TV, which was about 60 feet away from his transmitting antenna. Ray's 50 watt FM transmissions on 2m wiped out the picture on this particular TV although the sound was not affected and neither were other TVs nearby. The TV in question was a Ferguson model 51P7 which has remote control and FastText and uses the TX98 chassis. Although most cases of TV breakthrough can be solved by the use of suitable plug-in filters, they did not solve this problem as it was caused by the amateur signal being picked up directly in the circuitry of the TV itself. Fortunately, G0FHK's neighbours were friendly and cooperative.

EMC Committee member Fred Robins, G3GVM, contacted Ferguson who responded positively, arranging for a Technical Liaison Officer to visit the owner of the TV. A screening cover was fitted to the IF and video detector chip which cured the problem. G0FHK now operates knowing that his neighbour can watch television without interference; the neighbour is delighted at Ferguson's response and their degree of commitment to their customer.

The screening can is a standard item fitted to export versions of the TV receiver but not to the home market version. This is because the export standard TV receivers tune VHF TV Bands 1 and 3 in addition to UHF bands 4 and 5. There are many different frequencies present in a TV receiver and harmonics of these can radiate and affect Band 1 performance, particularly on a portable receiver having an in-built antenna, a form of self-generated TVI! The screening reduces these self-generated emissions and in this case improves immunity too.

LOCATING RECEIVED INTERFERENCE – 1.8 TO 7MHZ

EMC COMMITTEE MEMBER Dave Lauder, G0SNO, has been busy with his grid dip oscillator and has made some easily constructed portable DF (direction finding) antennas for locating sources of interference on any band, 1.8 – 144MHz. Those for 14MHz and above will be described in a future *EMC* Column.

For the 1.8MHz band, check whether the interference can also be heard at the high frequency end of the Medium Wave broadcast band. If so, a portable radio may be all you need to find the source. If not, you could use an HF portable receiver or an amateur transceiver which can operate from a 12 volt battery pack. A portable HF receiver generally has a telescopic whip antenna which feeds a high impedance input but a whip antenna is not particularly good for direction finding. For the 1.8MHz and 3.5MHz bands, it is better to use an external ferrite rod which can be made to tune both bands.

FERRITE ROD FOR 1.8 & 3.5MHZ

Fig 1 shows a simple arrangement using a ferrite rod 140 – 200mm long (eg Maplin YG22Y). L1 consists of 22 turns of insulated wire (diameter not critical) wound on a cardboard former in a single layer about 30mm long. VC1 can be a miniature AM tuning capacitor such as Maplin FT78K, with the two sections (142 + 59pF) connected in parallel. L2 is a 2 or 3 turn coupling winding wound over L1 and is connected to VR1 using coaxial cable or a short length (30 – 50cm) of screened audio cable. Starting with L1/L2 about three quarters of the way along the ferrite rod, slide it along the rod until VC1 can tune over a range of about 1.5 – 4.0MHz.

VR1, which can be between 1kΩ and 5kΩ, linear or log, should be a carbon potentiometer, not wire wound. It allows the signal to be attenuated as you get closer to the source. This is necessary with receivers such as the Sony ICF 7600D portable HF general coverage receiver which do not have an 'S' meter. This receiver has a socket for an external antenna but needs to be placed in a screened box or biscuit tin to reduce direct pick-up in the receiver itself. The screen of the cable from the external ferrite rod should be connected to the screened box.

If an HF transceiver can be operated from a 12 volt battery pack, it could be used for portable or mobile receiving on 160 or 80 metres using an external ferrite rod as shown in Fig 1 but with L2 reduced to 1 turn to match a 50Ω load.

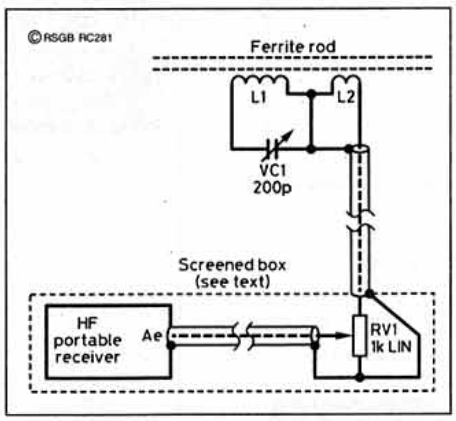

Fig 1: Ferrite rod DF antenna for 1.8 & 3.5MHz bands

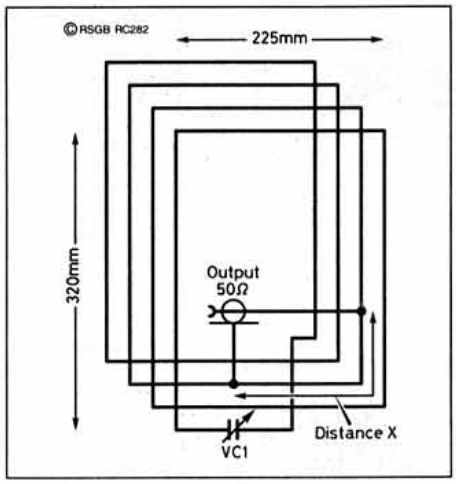

Fig 2: Four turn frame antenna for 7MHz

FRAME ANTENNAS FOR 1.8, 3.5 & 7MHZ

On 1.8MHz, a frame antenna of the size shown in **Fig 2** gives about 15dB more signal into a 50Ω load than the ferrite rod in Fig 1. It is wound with insulated wire about 20 SWG (0.9mm) on a non-conductive former 320mm x 225mm. Lids from cardboard boxes of A4 photocopier paper were used for the prototypes.

Neither side of VC1 is grounded so it must be fitted with an insulated knob or better still a non-conductive extension shaft to avoid detuning due to hand capacitance. The screen of the output coaxial socket is connected to the centre tap of the winding and the coaxial inner is connected to a tap at a distance X from the centre tap. This point has been selected to match a 50Ω load, for matching higher impedances, the distance X can be increased.

The antenna in Fig 2 is a four turn loop for 7MHz which can also tune down to 3.5MHz (with 140pF) but an eight turn loop is recommended for 3.5MHz and 1.8MHz. The number of turns, the approximate capacitance C required to tune and the distance X for the three bands are given in **Table 1**.

It is also possible to cover 14MHz using a two turn loop tuned with 20pF and X = 100 mm but this is rather insensitive. More effective DF antennas for 14MHz and above will be described in a future *EMC* Column.

HF DIRECTION FINDING TIPS

First, it is worth checking whether any other amateurs nearby can hear a similar signal. If they do, it may be the same source which you can hear although there could be more than one source.

A ferrite rod has nulls (minimum response) for signals arriving end-on and a frame antenna or magnetic loop has nulls for signals hitting it broadside-on. In either case, the source could be in one of two directions. To DF a source using such an antenna may take longer than with a proper DF receiver with a sense antenna but it is still possible.

An advantage of a magnetic field antenna such as a ferrite rod over an electric field antenna such as a whip, is that the ferrite rod can detect the magnetic field from interfering signals radiated by underground cables such as telephone cables.

It can be useful if you can get someone to drive you around your local area while you hold a frame antenna or ferrite rod out of the car window and above the car roof level on a pole. Passing the interference source in a car can give a sudden sharp peak which is not so noticeable on foot. On the lower HF bands, interference can travel for hundreds or even thousands of metres along electricity cables or telephone cables, especially overhead cables. You may find peaks due to standing waves but the source could be elsewhere! It is best to search on the highest frequency on which you can hear the interference. If it is audible on 28, 50 or 144MHz, then it may be easier to find on these bands.

FROM AROUND THE WORLD

NICK, SV1EN, sent us information dealing with interference to consumer electronics in the USA, in particular telephone terminals and home entertainment equipment.

Bob Vernall, ZL2CA, writes the EMC Column for *Break-in*, the New Zealand national society's magazine. In his recent letter he says: "Amateur EMC matters in New Zealand have no burning problems at present. Hence how amateurs deal with NZART and in turn the relationship of NZART with our administration (Ministry of Commerce) has yet to deal with a substantive EMC issue. However it is generally appreciated that there are inevitable increases in digital electronics for domestic appliances and that these can pose threats for urban QRM to amateur reception. Also cable television is starting. Thus like most amateur societies there are good reasons for establishing an EMC infra-structure as it is not going to get any easier as time goes on". Perhaps IARU Region 3 might benefit from an EMC Group similar to that in Region 1.

Z21HL has written for advice on curing breakthrough to his neighbour's TV and cassette player. It is good to be able to help members from other continents. Although long distance diagnostics are difficult, it afforded an opportunity to point out that advice on how to solve most EMC problems is contained in the pages of *The Radio Amateur's Guide to EMC* [£6.79 + P&P from RSGB Sales].

Recently I have had a number of requests from Spain for copies of the RA's old 26-page glossy booklet *How to Improve Television and Radio Reception* which was so useful as background reading, and which has now been replaced by the six-page leaflet *Advice on Television and Radio Reception, RA179.* Apparently a Spanish amateur radio magazine carried the information that I had a supply of these booklets and hence the requests. I do have half a box of the old glossy booklets left. If you want a copy, please send an A4 SAE with two First Class stamps to me QTHR.

TOUCH AND GO

FOLLOWING THE REQUEST for information on touch lights in the April column it has become clear that these devices are only just coming onto the market in the UK. However in the USA, they are more plentiful and apparently do, as GW4BYA reported, cause interference on the HF bands as well as being susceptible to picking up nearby radio signals. The touch lamp is controlled by an RF-operated switch which generates a number of harmonics from its oscillator. The oscillator, which runs whether the lamp is on or off, is connected to a touch plate or to the whole lamp body. The circuitry responds when a hand is placed on it but some types can also pick up nearby amateur radio signals making the light flash on and off.

Band	Turns	C(pF)	X(mm)
1.8	8	120	300
3.5	8	27	220
7	4	27	150

Table 1: Frame antenna details.

At the IARU EMC WG Meeting in Friedrichshafen, Lou van de Nadort, PA0LOU, presents Henryk Cichon, SP9ZD, with the IARU Region 1 medal for his excellent work in the EMC field over many years.

We have recently been testing a 15 inch high touch-controlled brass-finish table lamp from the B&Q DIY chain. It uses an oscillator at about 194kHz and boasts: "four level touch control to suit your mood".

Unfortunately, it produces a sawtooth waveform with harmonics in the 1.8, 3.5 and 7MHz bands and could put radio amateurs in a bad mood!

ARE YOUR PLANS BEING INTERFERED WITH?

DURING THE LAST few weeks, I have had an increased number of requests for help from members who are experiencing problems in obtaining planning permission for antennas or masts, not on the grounds of visual amenity but on the grounds of fear of interference.

The *Department of the Environment Planning Policy Guidance Notes on Telecommunications*, PPG8 (revised December 1992) are written for the benefit of local planning authorities. They are clear and easy to read but they do not take into account that some planning officers do not have an understanding of technical issues such as amateur radio transmissions and interference/breakthrough.

It may be useful to quote some extracts from PPG8 which are relevant to this situation. Under the heading 'Facilitating Development' paragraph 34 states: "Applications for planning permission to install the masts often used by amateur radio operators, radio taxi firms and other private and commercial users usually present few potential planning problems in terms of size and visual impact over a wide area. Such masts need to be high enough for technical efficiency and located as far as possible from other antennas in order to minimise the possibility of interference. However, they will not normally be of such a scale as to have serious impact on local amenity . . . ." In spite of this, there is a common misconception that a higher mast increases the possibility of causing interference to neighbours' televisions.

In a separate section which deals with radio interference from any proposed development, paragraph 38 says: "In any development significant and irremediable radio interference with other electrical equipment of any kind can be a material planning consideration. There are essentially two types of interference. The first type is electrical interference caused by a radio transmitter or by unwanted signals emitted by other electrical equipment. The Radiocommunications Agency has statutory powers for dealing with this type of interference under the Wireless Telegraphy Act 1949. Only if there is clear evidence that significant electrical interference will arise or will probably arise and that *no practical remedy is available* [my emphasis – *G4JKS*] will there generally be any justification for taking it into account in determining a planning application". Incidentally, the second type is physical interference such as blocking of TV signals by large buildings (shades of Canary Wharf).

Control of radio interference warrants an annex of its own and starts off by stating that all users of radio equipment are required under WT legislation to avoid causing undue interference. Paragraph 1 in Annex 4 ends: ". . . . In most situations, therefore, questions of potential interference are of no relevance to the determination of planning applications for the masts or antennas needed to operate a transmitter. Other controls will generally be available to deal with radio interference problems".

Paragraph 4 in Annex 4 states: "It is unlikely that refusal of planning permission would be justified on the grounds of radio interference from a transmitter or non-radio equipment alone, except in extreme cases. It may sometimes be appropriate to grant temporary planning permission to allow for a trial period of operation but this course should not be adopted unless there is evidence of significant interference and only as an alternative to refusal . . . . Where applications which are turned down solely or mainly on interference grounds come to appeal, the Secretaries of State will expect planning authorities to produce full details of the evidence of interference or likely interference and evidence that *there are no reasonable remedies that would be satisfactory.*" [My emphasis – *G4JKS.*]

Paragraph 7 in Annex 4 states: "In cases in which interference from a transmitter or from non-radio equipment has occurred, complainants should first approach their service engineer, aerial contractor, equipment supplier or dealer. Experience has shown that in the majority of cases, the affected equipment has insufficient immunity to interference or there is a defect in its installation. Such interference can often be alleviated by means of suitable technical measures to improve the immunity of affected equipment to unwanted signals".

The EMC Committee does not become involved in planning matters unless interference or the possibility of interference is being used as grounds for refusal of planning permission. In such cases, letters of support are provided.

Requests for assistance with planning applications for antennas, masts, etc should be directed to the Chairman of the RSGB Planning Advisory Committee, Geoff Bond G4GJB.

IN THE PINK

THE SOCIETY is selling the new Philips pink ferrite rings which provide better performance across the HF bands. In fact one pink ferrite does the job of two grey ones. The cost is £3.90 per pink ring for members; £4.60 for non-members. Add 60p for UK postage.

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CONTEST CLASSIFIED

All rules should be read in conjunction with the General Rules published in *Contest News* January 1993

HF RESULTS

COMMONWEALTH CONTEST (MAR 1994)

CONDITIONS DID NOT favour our flagship contest this year, and were especially poor on 21 and 28MHz. This is reflected in the scores, which are down considerably on the last few years. Not unexpectedly, those with good antennas did best. The number of single-band entries is slightly up on last year, but multiband entries are down. There were some notable absentees, particularly ZL3GQ, G3MXJ and VE7CC.

Even so, about 640 stations participated, including over 400 Gs. There were more than 500 different calls logged on the main band, 14MHz. Over 300 on 7MHz, 145 on 3.5, 100 on 21, and just over 30 even on 28MHz, which will surprise the many entrants who reported no QSOs at all on 10. The list of Commonwealth call areas that were active was C5, C6, G (incl GD GI GM GW), GB (HQ), V3, V8, VE1,2,3,4,5,6,7,9 VE3 (HQ), VK1,2,3,4,5,6,7,8,9, VK3 (HQ), VO1, VP2, VP5, VQ9, VR2/VS6, VU, Z2, ZB2, ZC4, ZD8, ZF2, ZL1,2,3,4, 3B8, 3D2, 3DA0, 5B4, 5W, 5Z, 6Y, 7P, 7Q, 8P, 8Q, 8R, 9H, 9J and 9V.

The winner of the BERU Rose Bowl in 1994 is Bob Whelan, G3PJT/VP9, no stranger to success in BERU both from home and abroad; he used 250W from a TS930 and TS940, and a range of beams. Tim G4VXE, in his first competitive entry in this contest, operated VE3EJ, a station well known at the top of the list, to take second place. Ex-G3PEK evidently finds Australia suits him, and as VK2BJ moves up a place or two each year: he came third this time and clearly the leaders must watch him! He used only 100W from a TS930S, with a Cushcraft A4S at 45ft, and a pair of two half-wave in phase antennas on 7MHz also used as doublets on 3.5MHz. GW3YDX has not been seen in this contest for a number of years but used his 400W and antenna farm to good effect to become top-scoring UK station. G4BUO was not far behind but was let down on the LF bands.

He had the consolation of working VP9 on all five bands. Also very worthy of note is VK3FC who gained 27th place at the age of 90. He was first licensed in 1928. After his success on 21MHz in 1992 Bob Whelan G3PJT has donated a series of awards in the form of medals. The Commonwealth Medal will be awarded each year to the individual who is considered to have most improved his performance in BERU, and the HF Contests Committee is very pleased to be able to award the first medal to Tom Dowling, VK4OD.

Those precious bonus points are hard to come by when conditions are so poor, and unfortunately there is little prospect of a dramatic improvement in the next couple of years. On the other hand, the re-admission of South Africa to the Commonwealth will bring an interesting new dimension to the 1995 event as well as many more potential bonuses. Perhaps some of those who were only able to be active on a single band this year can rejoin the multi-band entrants and help to support the Society's oldest contest through its sixth sunspot minimum.

Comments received with logs: "Great contest - polite, gentlemanly - a pleasure!" V85KX; "Conditions mainly rotten .... but great fun" VK6AJ; "Definitely the worst conditions I have experienced. Fancy only one G on 20m and no VEs!" VK4OD; "The less said about conditions, the better!" G3NKS; "Antenna a bit of wire about 15 inches above the tiles - no masts are permitted" VK3XB; "Hard work this year. Very poor conditions" G4BUO; "Condx lousy, but good fun as always. Even if you banned the term BERU I'm sure most of us would still use it" ZL1MH; "Nearly got WAC in one go" G3DOT (4W QRP!); "Nice to greet some of the OTs who seem to show only during BERU" VE3ST; "A bit like pulling teeth" G0LII (ex ZD8LII); "At least I got some good DX!" G3ZGC; "Next year I'll try and be in Antigua for the contest" G6QQ. *G2HLU*

1	%	G3PJT/VP9	719	1468	2623	627	150	5587
2	*	VE3EJ	692	1796	2024	544	98	5154
3	*	VK2BJ	707	1538	1990	355	-	4590
4	*	6Y5HN	473	1447	1822	447	130	431 9
5	&	GW3YDX	475	1227	1392	325	40	346 9
6		G4BUO	403	1036	1434	350	75	3298
7	*	VK4XA	480	953	1460	200	123	3216
8	*	ZL1MH	225	1104	1222	283	183	3017
9		G3OZF	255	849	1153	248	75	2580
10		G3TBK	223	685	1291	298	48	2545
11		VE3ST	273	608	998	319	50	2265
12	*	VK5BN	480	702	792	200	-	2174
13	*	9J2BO	75	150	852	800	263	2140
14		VE3VHB	358	402	882	325	150	2117
15	*	VE7UZ	398	535	670	457	-	2060
16		VE3JKZ	200	500	847	275	50	1872
17		VK5GZ	387	495	939	25	-	1846
18		VK4XW	460	603	705	75	-	1843
19		VK4EMM	375	922	513	-	-	1810
20		ZL1HV	280	590	700	100	50	1720
21	*	VK3ZC	515	847	350	-	-	1712
22		G2QT	148	520	932	100	-	1706
23		VK4OD	429	564	564	123	25	1705
24	*	VK6HQ	-	615	1034	50	-	1699
25		VK2DID	313	540	622	-	-	1475
26		G3JYP	95	457	769	147	-	1468
27		VK3FC	387	600	392	-	-	1379
28	*	VU2JOS	-	395	862	50	-	1307
29		G3BPM	150	342	651	50	-	1193
30	*	VE1EP	230	373	545		-	1148
31		G3IGW	25	635	415	50	-	1125
32	=	G2AFV	225	197	650	25	-	1097
32	=	GW3HGJ	150	247	600	75	25	1097
34		G3DEF	50	350	637	50	-	1087
35		VE3NXB	200	348	400	125	-	1073
36		GM3CIX		415	630		-	1045
37		VK5RG	303	513	225		-	1041
38		G5MY	125	267	542	23	-	957
39		VK3XB	248	372	305	25	-	950
40		G3KSH	48	148	567	175	-	938
41		G3NKS	25	380	490	25	-	920
42		G3LHJ	25	225	510	150	-	910
43		G3VDL	100	250	473	50	-	873
44		G3ESF	50	323	440	25	-	838
45		G3VW	25	273	427	100	-	825
46	=	G3MPB	50	360	300	100	-	810
46	=	G3SEP	75	200	485	50	-	810
48		VE1AGB	184	262	285	23	-	754
49	*	VQ9SS	75	150	497	22	-	744
50		VK3DDX	175	197	355	-	-	727
51		G2BLA	48	75	585	-	-	708
52		G3SWH	22	225	385	60	-	707
53		G3JKY	-	200	425	-	-	625
54		VK5HO	227	250	120	25	-	622
55		G2HLU	100	125	370	25	-	620
56		G3KNU	50	50	461	50	-	611
57		G0IDE	125	207	265		-	597
58		GW3JI	75	148	372		-	595
59	*	VE6BF	50	175	275	25	-	525
60		VK2NV	-	205	318		-	523
61		G3ZDD	100	100	280	25	-	505
62		G3LIK	100	198	198		-	496
63		G3NAN	48	23	399	25	-	495
64		G3WRR	50	100	278		-	428
65		G4CZB	50	125	223		-	398
66		GW3SB	-	75	253	25	-	353
67		VK3KS	-	50	98	-	-	148

7MHZ CONTEST (FEBRUARY 1994)

If you wanted to do well in the 7MHz contest this year, it seems that Cornwall was the place to be! Congratulations to Jan Fisher, G0IVZ, for securing first place. Runner-up from a few miles further west is Brian Coyne, G4ODV. Brian's success must be encouragement for those that feel a beam is necessary to achieve a high position in the contest, since he used "only" wire antennas. Plenty of DX was worked by competitors, including AH8F, BY1QH and HS0/G3NOM. One high-placed entrant logged HS0/G3NOM as S50/G3NOM - what a pity!

In the overseas section, congratulations to Bill Maxson, N4AR, for an excellent entry which just saw off Stanley Ingram, EA6ZY. Both commented that they could have done with some more UK stations to work - so please try to make an appearance next year, even if it's just for a few minutes. Steve Ireland, VK6VZ, was the leading entrant from Oceania - having entered the contest before from the UK as G3ZZD. Particular mention must go to YU7SF, who has entered the 7MHz contest for 27 years. Thank you for your support!

The SWL section was very poorly supported, ONL-383 being the leader once again. Well done, Jean-Jacques.

Concurrent contests and new CIS prefixes caused many entrants problems, but it is good to see that everyone enjoyed themselves and we hope you will enter again next year. *G4VXE*

UK SECTION

Pos	Callsign	QSOs	Mults	Score
1	G0IVZ	601	81	467280
2	G4ODV	490	80	383600
3	G3HEJ	494	76	342472
4	G3UFY	433	67	282740
5	G3IGW	358	64	218560
6	G0JNZ	368	61	189286
7	G2QT	318	64	188937
8	G3SJJ	282	72	154296
9	G3VYI	305	54	145962
10	G4ERW	289	60	139417
11	G0LII	281	47	107184
12	G0FDX/P *	250	50	93000
13	G5MY	180	45	80740
14	G4IQM	212	49	68600
15	G3BPM	165	49	61209
16	G3MPB	216	45	56835
17	G4CWH	196	45	56100
18	G2RSA	167	31	33390
19	G3HKO	159	29	28800
20	GW3WWN	151	30	25265
21	G4KDL	137	34	24321
22	G3VNG	100	34	21590
23	G3KDB	80	34	20230
24	G3LIK	111	29	18415
25	G3GMS	110	29	17700
26	GM3CFS	114	29	16740
27	G4WYG	103	28	14391
28	G4CZB	94	27	13390
29	GM0/NX1T	96	21	11298
30	G3GMM	77	25	10875
31	G3ZDD	63	27	10665
32	G3RSD	79	24	10200
33	G3SQX	53	26	9360
34	G3NKS	58	19	6555
35	GW3SB	50	19	4940

OVERSEAS

1	N4AR	69	37	38295
2	EA6ZY	130	51	33150
3	HA8FK	111	46	25530
4	DA1ET	80	45	18000
5	VK6VZ	32	19	16910
6	HA8RC	74	39	14430
7	SP8YAQ	73	38	13870
8	SQ6J	68	40	12008
9	JA6GCE	36	24	11660
10	DL5KUD	63	37	11470
11	OK1ARN	64	37	11376
12	SP2BKF	59	38	11210
13	UR7VA	80	42	10080
14	DL3SEM	59	34	10030
15	K0OD	30	20	9000
16	VK3APN	21	14	8820
17	UT5UGR	55	32	8736
18	YV1OB	29	20	8700
19	SK0PR	50	32	7776
20	OK1DMS	47	32	7520
21	SP5GKN	54	30	7410
22	PA3BEJ	47	30	7050
23	DL3BRA	49	29	7047
24	OK1FPG	48	28	6426
25	LA1IE	43	29	6235
26	OK1RR	41	28	5740
27	RW3AI	41	27	5481
28	RX3DRU	41	26	5330
29	YU7SF	40	24	4680
30	SP6BGZ	34	26	4420
31	SP5GH	36	24	4320
32	OM3EA	34	25	4250
33	DL2BQD/QRP	34	24	4032
34	HB9DX	35	23	4025
35	DF3QN	33	22	3630
36	DL5SVB	31	24	3432
37	JA4XRN	19	12	3420
38	DL2KDW	30	20	3000
39	OH2GB	25	19	2375
40	KA1WIF	15	11	2365
41	UA9YC	14	11	2310
42	EA5BU	42	13	2268
43	HA5CIU	27	14	1722
44	RZ6LJ	21	17	1584
45	WQ5L	12	9	1575
46	DK2EE	18	14	1260
47	PA2CHM	15	14	1022
48	VE3YBH	11	6	960
49	VE3NXB	8	6	690
50	DL8ZWG	10	9	450
51	KA6A	6	5	425
52	EA9AI	4	4	240
53	SP3PL	7	6	210
54	SP4EAK	5	4	100
55	UA9XC	3	2	90
56	JG1EIQ/3	1	1	15
57	SP2BMX	1	1	5

SWL

1	ONL383	27	21	3885
2	OK2-31097	12	15	900

* = Multi-operator

Checklogs YO3LX, DL4LVM, NM1Q, YO3FWC/P, KA1DWX, DK9WA, GW3JI

SINGLE-BAND ENTRIES

7MHZ

1	*	VK2APK	1505
2	*	G4ODV	810
3		VU2XTO	656
4		VK7RO	628
5		G0AEV	475

14MHZ

1	*	V85KX	1585
2		ZB2EO	1570
3	*	GM3WOJ	1053
4		VK4TT	916
5		VK6AJ	877
6		VK2ETM	868
7		VK5AGX	777
8		VU2HJA	768
9		G3CSR	640
10		G0LII	537
11		VK3JI	473
12		G6QQ	466
13		G4MVA	412
14		G3ZGC	300
15		G8QZ	175
16		G4KDL	148
17		G3DOT (QRP)	125

21MHZ

1	*	G3DYY	125

28MHZ

2	*	VE3HX	198

There were no entries in the Receiving Contest. % Beru Rose Bowl; & Col Thomas Rose Bowl; * Certificate winner. Checklogs are gratefully acknowledged from ONL-383 (SWL), G0AEV, G3DYY, G3GMM, G3WP, G4ODV, GB5CC, V85KX, VE3VCA, VK3WIA, ZB2EO

HF RULES

RSGB CLUB CALLS CONTEST 1994

1. Aims - to encourage contacts between Affiliated Societies, to give Club Callsigns an airing and to encourage Class B licensees to operate under appropriate supervision.

2. Eligible Entrants: All licensed Amateurs and SWLs in UK. Multi-operator entries accepted in the Transmitting Contest.

3. Date and Time: 2000UTC to 2300UTC Saturday 12 November 1994.

4. Frequencies/Mode: 1870kHz - 1990kHz, any licensed mode. CW operation to centre about 1955kHz to encourage QSOs with Novices. Entrants may encounter stations working DX (particularly JAs, whose entire frequency allocation lies within this segment), and should take care to avoid causing unnecessary QRM to non-contest users of the band.

5. Exchange: RS(T) + serial number commencing at 001 + (Other Data) [name of Club + 'Club Station'], or [name of Club + 'Member'], or 'No Club', as appropriate.

NB: The name of the club may only be reduced to initials for CW QSOs, otherwise it must be given in full, ie: Addiscombe Club = OK any time, AARC = OK only on CW. A 'Club Station' MUST use a callsign which is specifically issued to a Club or Society which is currently affiliated to RSGB.

6. Scoring: Only ONE contact with any station, regardless of mode. 3 pts per QSO, with these bonuses: 5 pts for the 1st ordinary member from each club; 25 pts for each Club Station; 50 pts for the RSGB HQ Station.

7. Address and Date for Entries: as per General Rules.

8. Awards: The Ariel Trophy to the leading Society/Club station. Certificates to the leading individual club member and the individual non-club-member giving away the most points.

RECEIVING CONTEST: Rules as above except: SWLs log only stations active in the transmitting section.'Log column Other Data' to show name of Club + 'Member', or 'No Club', or name of Club + 'Club Station' as appropriate. Any station may appear only once in the 'station heard' column, regardless of mode.

A certificate will be awarded to the leading entrant. Additional awards may be made, subject to the level of support.

WINTER 1.8MHZ CONTESTS 1994/5

THERE ARE EXPECTED to be other European 1.8MHz contests running at the same time as these events, which should increase activity and interest. This applies particularly to the November contest. The normal contest exchange must be sent in full and any received information should be logged.

1. The General Rules for RSGB HF Contests as published in *RadCom* will apply.

2. When: 2nd 1.8MHz CW Contest 1994 - 2100UTC 19 November to 0100UTC Sunday 20 1994; 1st 1.8MHz CW Contest 1995 - 2100UTC 11 February to 0100UTC 12 February 1994

3. Sections: Single-operator entries only. (a) British Isles. (b) Overseas including EI."

4. Frequency and Mode: 1820 - 1870kHz, CW only.

5. Exchange: RST, Serial Number starting at 001 and County Code. (British Isles stations)

6. Scoring: Overseas stations work only British Isles stations for points. Section (a) Three points per QSO plus a bonus of five points for the first QSO with each

continued on page 82 ▶

AMATEUR RADIO DIRECTION FINDING

SLADE DOUBLE MIDNIGHT EVENT (TOP BAND)

Date: 15 October 1994

Map: 151 (Stratford upon Avon)

Assembly: 1700 for start at 1730

Location: The Greenway Parking area, off roundabout on A4390 Stratford Southern Bypass. NGR 196539

Competitors requiring supper should notify Geoffrey Foster, Tel: 0789 294699, no later than 8 October.

ERIC MOLLART MEMORIAL EVENT (TOP BAND)

Date: 29 October 1994

Map: 165 (Aylesbury & Leighton Buzzard)

Assembly: 1700 for start at 1730

Location: Coombe Hill, 4 miles SSE Aylesbury. NGR 852063

Competitors requiring supper should notify Alan Simmons, Tel: 0844 342388, no later than 15 October.

COVENTRY/NORTHAMPTON TOP BAND QUALIFYING EVENT

TWENTY TEAMS met at Irchester Country Park (NE corner of *OS Landranger* Northampton and Milton Keynes map). The turn-out was excellent.

Most teams went for Station B, G2ASF/P, first which was located close to a footpath near Staverton approx 37km west of the start. The ploy was not to use the usual hiding places, but to hide in a less obvious place. However, this didn't stop some of the slick operators locating the transmitter pretty quickly. There wasn't a great deal of undergrowth to hide in but the cover was in prickly blackthorn bushes.

Station A, G4CFG/P, was hidden in Wicken Wood approx 31km SW of the start. The NE edge of the wood was chosen to hide the transmitter since this gave the optimum aerial run to get a good signal to the start and provided the furthest point from any road. A fair length of aerial wire was strung out giving a few peaks and nulls along its length. Competitors who had made good time on station B soon lost it searching Wicken Wood; as clearance work was being carried out by the Forestry Commission there were plenty of felled trees and branches to hide under.

Incorporated for the first time was the presentation of the Derrick Newman, G4AKL, Memorial Cup, generously donated by Cyril Hayward, G4AHH, in memory of Derrick's many years in top band ARDF. The ARDF committee decided to award the trophy on a different qualifying event each year in recognition of Derrick's support for all the qualifying events. The trophy was presented to Alan Simmons.

Pos	Name	Club	Transmitter A	Transmitter B
1	A Simmons	Mid Thames	3.26	2.35
2	P Cunningham	Colchester	3.40	2.43
3	C Wells	Mid Thames	3.41	2.27
4	B Bristow	Mid Thames	3.49	2.33
5	R Gray	Mid Thames	3.51	2.52
6	C Merry	Dartford Heath	3.52	2.45
7	P Clark	Torbay	3.53	2.24
8	S Stone	Mid Thames	3.54	2.27
9	A Collett	Colchester	3.54.5	2.22
10	G Foster	Mid Thames	3.55	2.32
11	M Hawkins	Colchester	3.55.5	2.29
12	M Standen	Mid Thames	4.01	2.50
13	G Blomeley	South Manchester	4.11	3.10
14	G Nicholls	Banbury	4.11.5	2.52
15	T Gage	Mid Thames	4.12	3.14
16	J Hall	Ripon	4.17	3.12
17	D Holland	South Manchester	4.30	3.10
18	C Metcalfe	South Manchester	3.41	-
19	R Goodearl	Mid Thames	-	4.22

One competitor failed to find either transmitter
Brian Bristow and Bob Gray qualify for the National Final

HF RULES

continued from page 81

British Isles County worked and the first QSO with each Country (outside the British Isles) worked. Section (b) Three points per QSO plus a bonus of five points for the first QSO with each British Isles County worked.

7. Address and closing date for logs: RSGB HF Contests Committee, c/o S V Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England. Send within 15 days from end of contest.

8. Awards: (a) 2nd 1.8MHz CW Contest 1994 - The Victor Desmond Trophy to the leading station in the British Isles. (b) 1st 1.8MHz CW Contest 1995 - The Somerset Trophy to the leading station in the British Isles. (c) Certificates of merit to the second and third placed UK entrants in each event. (d) The Maitland Trophy to the Scottish entrant with the highest aggregate number of points in both events combined. (e) Certificates of Merit to the leading three entrants in the Overseas section in each event.

RECEIVING CONTESTS: The General Rules for RSGB Receiving Contests will apply, as will the special rules for the Transmitting Section except as modified below.

Eligible entrants: (a) British Isles - RSGB members only; (b) Overseas - all SWLs.

Holders of transmitting licences for frequencies ONLY ABOVE 30MHz may enter the receiving section. Holders of UK Class B licences are particularly encouraged to enter.

Logs: Columns to be headed: time UTC; callsign of station heard; report/serial number/County Code sent by that station; callsign of station being worked; bonus; points claimed. NOTE - In the column headed 'station being worked' the same callsign may only appear once in every three contacts unless the station heard is a new bonus.

Awards: Certificates of merit will be awarded to the leading entrants in each section. Additional certificates may be awarded at the discretion of the HF Contests Committee dependant upon the number of entries.

HF CONTESTS CALENDAR

(Overseas events in italics; rules in parentheses)

Sep/Oct	QRS Cumulatives
24/25 Sep	*SAC SSB (Sep 94, p18)*
24/25 Sep	*CQ WW RTTY (Sep 94, p19)*
2 Oct	21/28MHz SSB (Jun 94)
8/9 Oct	*VK-ZL CW (Sep 94, p18)*
16 Oct	21/28MHz CW (Jun 94)
29/30 Oct	*COWW DX SSB (Oct 94, p18)*

VHF RESULTS

23/13CM CUMULATIVES

While entries to many VHF/UHF contests are on the increase, entries to this event - as with many cumulatives - were down to a very disappointing level this year, particularly on 13cm. The contest will run again during 1994 but if entries do not show a significant increase we will have to consider the future of this event carefully. Is there something in the format of the cumulatives which you are unhappy with - please let us know so we can consider what we can do about it.

On 23cm John Quarmby, G3XDY, achieved an excellent performance once again - in spite of having only low power and radar jammer QRM during the first session, and being denied the DX worked by many stations further west in the fourth session. To prove that you don't always need a mega station to compete if you have a reasonable site and a lot of patience Robert Ferguson, GD4GNH, was a close runner-up slot in the single operator section using only 10W. G3XDY commented on his remarkably consistent signal and he was often the only real DX worked. In the multi-operator section, the South Birmingham Radio Society once again took the honours. However, two days after the last event their tower folded over in the high winds and the whole antenna system was destroyed.

On 13cm thanks and congratulations to John Smith, G8ZQB, for being the sole entrant and winning the band once again. Martin Platt, G4XUM, commented that although he had gear for the band, he just didn't make it on - he thought that there were only two stations active so it didn't seem worth it! Well - this is a classic case of inactivity breading inactivity - there were five stations worked including G8ZQB and many more are equipped and would come on if they thought others would appear. Let's see a little more activity for '94. *G4PIQ*

23CM SINGLE OPERATOR FIXED

Pos	Callsign	5-Oct	21-Oct	2-Nov	18-Nov	6-Dec	Norm	QSO	Loc	Pwr	Ant	km
1	G3XDY	80	107	115	213	97	3000	78	02OB	250	8 x 23Y	453
2	GD4GNH	51	79	100	242	0	2608	49	74QD	10	4 x 23Y	627
3	G4XUM	92	77	0	119	34	2211	60	83SB	250	8 x 23Y	272
4	G8ZQB	50	44	78	72	29	1633	32	74QD	10	4 x 23Y	452
5	G8NEY	38	38	68	93	45	1468	50	81VK	250	55Y	342
6	G3MEH	46	48	52	91	47	1437	72	91QS	100	2 x 50QLY	376

23CM ALL OTHERS

Pos	Callsign	5-Oct	21-Oct	2-Nov	18-Nov	6-Dec	Norm	QSO	Loc	Pwr	Ant	km
1	G8OHM	45	107	101	175	26	3000	70	92AJ	150	4 x 23Y	809

13CM SINGLE OPERATOR FIXED

Pos	Callsign	5-Oct	21-Oct	2-Nov	18-Nov	6-Dec	Norm	QSO	Loc	Pwr	Ant	km
1	G8ZQB	7	1	2	1	1	3000	8	92JN	8	1.6m	121

VHF/UHF CONTESTS CALENDAR

25 Sep	70MHz Trophy/SWL (Jul 94)
25 Sep	10GHz Cums (Apr 94)
29 Sep	144MHz CW Cums (Feb 94)
1/2 Oct	RSGB 432MHz-24GHz (Jun 94)
2 Oct	1.3GHz Trophy/SWL (Jun 94)
2 Oct	2.3GHz Trophy/SWL (Jun 94)
1/2 Oct	IARU 432MHz-24GHz (Jun 94)
4/19 Oct	1.3 & 2.3GHz Cum (Jul 94)
9 Oct	24GHz Cums (Apr 94)
12/27 Oct	432MHz Cum (Jul 94)
14/31 Oct	144MHz CW Cums
30 Oct	2nd 23cm & 13cm Fixed/SWL (Sep 94)
30 Oct	10GHz Cums
3/17 Nov	1.3 & 2.3GHz Cum

70MHZ CW (JUN 1994)

ALMOST ALL contestants remarked on the above average conditions between a North/South path with both GB3ANG and GM3WOJ being about the only signals coming out of GM. This general lack of activity was compounded by deep bouts of QSB which made many of the longer haul contacts difficult to complete. While most entrants were wrestling with conditions, GJ4ZUK/P reported: "Sunshine and sunburn with temperatures in excess of 24°C"! Many also commented on the gentlemanly operating procedures, as is usual for this band, which made the contest a joy to compete in. Congratulations to both section winners and runners-up. G3LVP receives a certificate for being the leading otherwise uncertificated station running 25W or less to a single antenna. *G4DHF*

SINGLE OPERATOR FIXED

Pos		Call	Pts	QSO	Loc	Pwr(W)	Ant	Best DX	km
1	*	G3UKV	131	19	IO82RR	80	5Y	GM3WOJ	569
2	*	G0AEV	106	18	IO81WL	10	5Y	G4RQI	255
3	*	G3LVP	95	17	IO81WV	20	2Y	GJ4ZUK/P	290
4	=	G3FIJ	87	12	JO01KV	40	4Y	GJ4ZUK/P	361
4	=	G4OUT	87	15	IO92AT	10	3ele'CV	GJ4ZUK/P	393
6		GW4HBK	83	15	IO81KP	30	3Y	GJ4ZUK/P	273
7	=	G3TCU	80	12	IO91QE	50	6Y	G3APY	280
7	=	G3HYH	80	17	IO92JO	100	5Y	GJ4ZUK/P	376
9		G5UM	55	11	IO92MP	8	3Y	GJ4ZUK/P	350

OPEN SECTION

Pos		Call	Pts	QSO	Loc	Pwr(W)	Ant	Best DX	km
1	*	GJ4ZUK/P	184	15	IN89WG	70	4Y	G3APY	435
2	*	G0PNT/P	101	18	IO91VJ	100	4Y	GJ4ZUK/P	273

Certificate winners *

1.3GHZ / 2.3GHZ FIXED CONTEST 1994

CONDITIONS WERE described as poor, and the situation was certainly not helped by the low level of activity. Roger Piper, G3MEH, summed it up by saying: "Well, I've experienced worse, but not much"! The South Birmingham Radio Society, G8OHM, who are normally stalwarts of the 23cm contests went out portable for a few hours since their normal fixed antenna system had recently been wiped out in some storms - thanks to them for the check log. Congratulations to the winners and runners up on each band. *G4PIQ*

23CM SINGLE OPERATOR SECTION

Pos	Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	G3MEH	79	23	91QS	100	2 x 50QLY	PA0GHB	315
2	G4XUM	74	16	83SB	200	8 x 23Y	G0BPU	271
3	G8NEY	65	11	81VK	250	55Y	G3XDY	245
4	G8FBG	64	20	91SG	10	4 x 55Y	G4LU	247
5	G8ZQB	55	15	92JN	50	27QLY	GD4GNH	286
6	GD4GNH	48	6	74QD	10	4 x 23Y	G8ZQB	287
7	G6SPS	14	8	01IS	20	2 x 23Y	G8FBG	98

13CM SINGLE OPERATOR SECTION

Pos		Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	=	G6SPS	1	1	01IS	0.8	25Y	G0BPU	47
1	=	G6PHJ	1	1	92JN	8	1.8m	G4LRT	12

2ND BACKPACKERS 144MHZ (JUN '94)

THIS WAS the only one of the four events which was not planned to run alongside a major 2m contest. There was certainly a fair amount of activity on the band, rather more than is suggested by the numbers who actually submitted entries. The weather was certainly more clement than the first event, although G0LBO/P on Coniston Old Man summit reported: "inside cloud for all four hours .... sheep tried to demolish the mast!" G0HIK/P won his section despite the fact that he was only able to operate for three hours because his battery let him down. It is clear that a great many operators are operating within the spirit of the contest and climbing / walking to vantage sites where their low power stations are providing some good distance contacts. Those who are less energetic can still, if they wish, operate from inside their car. Congratulations to all section winners and runners-up. *G4DHF*

10W SINGLE OPERATOR

Pos		Call	Pts	QSO	Mult	Loc	Ant	Best DX	Km
1	*	G0RMG/P	53280	129	72	IO82XJ	12 ZL	ON1KHG	510
2	*	G8JAY/P	29792	81	56	IO91AW	17ele	GM4ZMK	471
3		G7LQD/P	27780	77	60	IO93AD	17ele	GM7BXA/P	445
4		G8NWM/P	24115	79	53	IO92TR	9ele	GU/DC9KZ/P	395
5		G0SSO/P	19635	64	55	IO91SE	17ele	G8PNN/P	481
6		GW0WVJ/P	16458	50	39	IO72QT	8ele	?	
7		G8ZRE/P	14130	56	45	IO83PF	HB9CV	EI7GL	412
8		G0GCI/P	10296	46	39	JO01ED	13ele	G8PNN/P	498

10W MULTI-OPERATOR

1	*	G8PNN/P	61824	83	64	IO95CK	4x9ele	G7RAU	528
2	*	GW3TAD/P	47454	88	66	IO81KW	17ele	PE1AHX	574

3W SINGLE OPERATOR

1	*	G0HIK/P	43896	81	62	IO84KF	13ele	EI7GL	439
2	*	G0LBO/P	34278	70	58	IO84KI	9ele	G0FIG	434
3		G0GRI/P	27660	74	60	IO91AI	DDQUAD	G8PNN/P	454
4		G7OZE/P	17800	52	50	IO92BN	12 ZL	PA0GHB	645
5		G4FUH/P	17238	73	34	IO93SN	9ele	EI2GK	373
6		G4IDF/P	12420	53	46	IO82TC	8ele	G8PNN/P	372
7		G0HAX/P	6963	40	33	JO01ED	17ele	G8PNN/P	498
8		G0LJD/P	4680	34	30	JO01FJ	12 ZL	G8PNN/P	473

3W MULTI-OPERATOR

1	*	G0HAC/P	20272	58	56	IO83XH	9ele	EI7GL	457

Check logs received with thanks from G7ANQ/P and G4DHF/P.

Certificate winners *

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Warning: *Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid.*

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VALVES. BRAND NEW at £1 each. EB91, ECC81/82/84, ECC91, ECL80, EF80/85/89, EF91/95, EF183/184, EL32, EL81/85, EZ81, 6BJ6, 6CB6, 6CH6, 6X4, 6X5GT. Also at £3 each: 5R4GY, 5Y3GT, 5Z4, 6BG6G, 6BK4, 6C5, 6DE4, 6DW4, 6F6, 6F13, 6F30, 6G6G, 6H6, 6J7, 6K25, 6P25, 6P28, 6F33, 12BH7, 5763, KT81, DM70. Please add £2 Postage. Cheques to:- K. Bailey, Flat 3, 177 College Road, Moseley, Birmingham, B13 9LJ.

YAESU FRG7 Rx, 0.5-30MHz, exc condx: £75. Commodore 64, plus 1701 Colour Monitor, TIF-1 Interface, TX3 S/ware: £60. Lowe 13.8v 20A Reg PSU: £40. Ring David, G4XNV, QTHR. (Warrington) 0942 722981.

YAESU FT102 HF Tcvr, fitted AM/FM Board, narrow (1.8KHz) SSB Filter, new valves, excell condx: £525 or sensible offer. (Watford) 0923 243650.

386SX16 Laptop Computer, 20Mb HD, 3.5 1.44Mb FD, 2Mb Ram, batteries, charger, carry case, two years old: £450. G4NYO, QTHR. (Travistock) 0822 614682.

ABSOLUTELY IDEAL Shack. Tower, adjoining modernised Stone Croft House, three double bedrooms, mature garden. Tarbert, Argyll: £75,000. GM3LBX, QTHR. (Tarbert) 0880 820842.

AEA MORSE Machine, boxed, manual: £125. ETM-SQ Twin Paddle, boxed: £25. Kent Straight: £26. Cambridge Twin Paddle: £10. All plus postage. Maxon Mobile Tcvr xtalled 433.65MHz, complete, boxed, used packet only. Tonna F9FT 19 ele 435MHz Ant, Offers! Bill, G3WNI, QTHR. (Hemyock, Devon) 0823 680778.

AEL HF CW/SSB Tcvr, 2-16MHz, 4 chan Xtal controlled all solid state 12V DC/240v AC i/p, 100W o/p and inc Bantex glass fibre Mobile whip Aerial: £150. Pneumatic Telescopic Mast, extends to 40ft, suitable VHF field day use, complete with set of terylene guys: £125. MM Transverter, 2m i/p, 6 Metre 20w o/p: £125. MM Transverter, 2m i/p, 70cm 10w o/p with normal and Rev repeater shifts: £100. Telequipment D61A Oscilloscope, little used, in excl condx with handbook: £100. Prefer buyer collect, otherwise carriage at cost and buyers risk. G3WXI. (York area) 0759 388172.

AKD2001 2m Tcvr 5/25w. New, not required: £150 (incl P&P). Altron 3 ele HF Beam, used 6 months: £100 ono. ST5 MC+ RTTY Terminal Unit as new: £50 ono. Creed MOD-7E Printer (FREE) and must be collected. (Maldon) 0621 855648.

ALTAI PSU 13.8V 5/7A, new overload protection and Regulation: £15. (Bristol) 0272 656783.

ALTRON MINI BEAM. New 4 ele Conversion and all Spokes: £120. Rotator Kenpro 600: £120. Yaesu YS60 PWR/SWR Meter, near new: £55. Trio 7300 FM, trans spurious display, hence: £55. Six channel Xtal PMR, some repeaters/simplex fitted, Marconi: £35. (Teignmouth) 0626 773301.

ALUMAST 30ft Triangular Lattice Tower, (3 x 10ft sections), hinged Base: £150. Diawa Rotator, Controller: £75. Moseley TA33 3el HF Beam with Balun 10/15/20m: £60. G4KGK, QTHR. (Southport) 0704 24700.

AMSTRAD 1512 Computer, vgc, Colour Monitor, Hard Drive, Floppy Disc, Keyboard: £130 ono. Buyer collects. (Clapton Common) 081 806 4470.

AMTOR RTTY, CW Complete System, Tx-Rx, comprises Dragon 32, Modem(G4USU), all cables, program by G4BMK on Rom cartridge. Ready to go: £110 ovno. Price includes callsign change. G0BUV, QTHR. Evenings Birmingham area near NEC. (Coleshill) 0675 464402.

AOR3000, PSU, boxed: £400. R2000: £350. Tel evenings, John. (Diss) 0379 652043.

ARCHIMEDES 310M, 40 HDD, Pcemulator, pipedream, WP, Sats, Packet, FAX, Monitor, disks, manuals, mags: £350. G3BHT, QTHR. (Sutton Coldfield) 021 308 4764.

ATARI STE 4Mbyte Designer programme. Multi - role for PCB design, complex pictures, filing cabinet etc. Multiple overlays and catalogued: £15. Also RTTY and Morse Transceive for 520+: £10. Write to Mr V McClure, 43 Roman Way, Seaton, Devon, EX12 2NT.

ATTENTION DXers and QRPers for sale, INSECT Filter. Dig out Dx even on a dead band, hardly used: £65. Call David, G4YVM, NOT QTHR. (Salisbury) 0725 552664.

AVO CT38 VVM: £40. Stoddart NM52A 300-1000MHz: £150. Matching PSU NM52A: £60. AR22 Rotator +Control: £15. Stolle Memomatic +Control: £17.50. Pye AM25B lowband: £25. Pye FM10B/6CH 145MHz: £35. CRT CV2431/DG7 new: £25. Another 2nd/OK noburn: £10. Mu-Met Scn+ Base, two: £5. Solarscope CD1014 DB/100ms/1mic Sec: £65. Handbooks Pye AM10/25T: £5 ea. MF6AM HP1AM Cossor Commando 20: £6.50 ea. RA17: £20. Carriage/postage extra. Evenings only. (Cheltenham) 0242 524217.

BENCHER BY2 Paddle Chrome, new: £65. FRG7 Battery Unit, new: £10. MFJ 948 ATU: £100. MS1 Kenwood Mobile charger: £30. Nicad Pack for Kenwood 2500: £25. LAR VHF ATU: £25. Martin. (Cambridge) 0954 719262.

BNOS 50MHz Linear and Pre-amp, 10W i/p, o/p 50W, RF and PTT switching. Exc condx: £95 ono. G6MXL. (Poole) 0202 665284.

C828 + VFO, All 2 metres, Antennas, M/M: £60. Avo-8A: £25. Buyer gets parts for HF Linear, free. (Birmingham) 021 747 8489.

CENTURY 21-D solid state Rx 0.5-30MHz, AM/SSB/FM, Digital Freq readout, as new: £100. H-P 130C Scope 4.5inch, vgc. G3CFR. (Axminster) 0297 33062.

CHSHCRAFT R5 20 - 10m Vertical Antenna, gd condx, genuine sale: £100. Byuer inspects, collects. Norman, G0IRK, QTHR. (Surbiton) 0390 2650.

CLEARANCE. Icom 740, PS1S, boxed: £400. Trio TW4000A, D/Bander, boxed: £275. Tower 60ft H/D: £350. Rotator Kenpro KR600RC: £100. Welz AX38M, Welz SP350 ATU, SWR/Power Meter: £40 each. Tiny-2 TNC: £90. G0LRH, QTHR. (Bungay) 0986 781582.

COLLINS 30L-1 HF Amplifier 1Kw PEP, spare valve: £450. TenTec 580 Delta HF: £200. 40ft Tiltover Mast with Rocket Head and Bearing: £150. 40ft Fixed, 4 section Mast, base plate: £100. Four 10ft Mast sections: £50. Kenwood TS830S: £550. AT230: £140. SP230: £40. TS130SE with CW Filters plus DFC230 Digital VFO: £435. Phone daytime, ask for Mike. (Evesham) 0386 442899.

COMPLETE STATION SALE. DXCC honour roll station available now. Emigrating. Special Tennamast. TET HB33SP Antenna. FT107M, seperate Power Supply Speaker, Heatherlite Hunter, new 3-500. Datong FL3. CNW419 Daiwa Tuner. Daiwa N660P. Ham Four Rotor etc, etc. All 100% working condx. Phone Mike, GM4KLO, QTHR. (Glasgow) 041 639 2729.

COMPUTER CLEAROUT! BBC "B", 40/80 Trk Twin D/D, lots of accessories and books: £225. Tandy FD1200 Laptop IBM Computer: £200. Software packages, Z-Soft paintbrush 4+: £10. Lifetree Totalword WP & DTP: £15. PFS 1st choice WP/SS/DB: £15. Elonex (2 off) MS Windows V3.0: £15 ea. Buyer collects. Peter, G3UXH. (Nr Rochester) 0634 250562.

COTTAGE STONE 2 Bed, kitchen, Din/room Lounge, modernised, VGC, exc village situation N/E Mendips. Electric Strumech wind-up Tower with planning. Small garden, garage, new workshop power points lined. House double glazed. Apply agents (Nr Frome) 0373 453592.

CTE1600 2M 'No frills' H/held, thumbwheel Freq change, NO memories, repeater shift, 2.5w o/p, charger, new batteries, gwo: £100 ono. Ring Brian, G0OAE, QTHR. (Melton Mowbray) 0664 65855.

DELL NL25 Notebook PC, 386/25MHz, 60Mb HD, 4Mb Ram, c/w Mouse, Win. S/ware, Mains PSU/charger, carrycase, H/book, gd condx. Very reliable and effective system: £745. Dowty Quattro Modem V.22BIS, c/w h/book: £85 ono. FT211RH 144-158MHz FM Tx/Rx, 40w, c/w H/book: £145. Marconi Portable Deviation/Modulation Meter TF2303 25-520MHz: £75 ono. Epson FX-1000 Wide-Page Printer: £55. Kevin, G4BUW, QTHR. (Bracknell) Tel: Day 0344 762616. Evenings 0344 862874.

DETACHED Two Bedroom Bungalow, GCH, garage, very gd order, village location near Holywell, North Wales. Easy access to coastal resorts, mountains, Chester and Manchester. 750ft ASL, exc take-off across NE Wales, N England, N Midlands. Antennas for 70cm, 2m, 6m and HF, negotiable. Garden space. Photos available. Reasonable offers considered. Derek, GW0UDJ. (Holywell) 0352 781311.

DIAWA MR750P Rotator with Controller. 30ft Tennamast 2.5 inch SHS Mast and Base Section with Winch etc. As new, never used. Buyer collects. No time wasters please: £250 ono. (Langholm) 03873 80327.

DIGITAL FREQ Counter 50Hz - 150MHz, Mains or recharge battery: £60 buyer collects. Call G3PTN, QTHR. (Leeds) 0532 654644.

DRAKE L4B Linear Amplifier: £500. (Wolverhampton) 0902 491033.

DXMAR 2m fully synthed, covers all FM channels S8-23, all Repeaters + 144.5, 144.83MHz, working, 10w o/p: £55. TAIT 500 lowband Synthed 25w with Mic: £35. Marconi TF2950 Radio Test Set, working order: £95. Marconi Sig Gen 10-520MHz TF2015A, excl condx: £195. Marconi Mod Meter TF2015A: £95. Hygain 3 ele 20m Mono Beam, excl condx: £160. Alinco 510E Dual Bander, 70cm/3m Mobile 35/45w, exc cond: £250. (Washington) 091 417 3006.

EDDYSTONE 770U Mk1, 150 - 500MHz, gd condx, c/w handbook and spare tubes: £50 ono. G4JTR, QTHR. (Reading) 0734 476873.

EDDYSTONE 888A Ham Bands only, gwo, c/w Spkr and handbook: £75 ono. Eddystone 770/R c/w Handbook: £60 ono. Dave, G4MDN. (Chalfont St Peter) 0494 873158.

F1-CORD Reel to Reel, Battery Tape Recorder, with charger, instructions, etc. Working, collectors item, once much favoured by reporters: £40. G0JFU, QTHR. (Gloucester) 0452 862773.

FREE 50FT MAST with QTH and Business. Rural General Store on Norfolk Coast. No competition, two bed Bungalow attached, overall plot 0.8 Acre. Serves 200 homes. Nearest town 4 miles, schools nearby with pickup at shop. Gd trade all year round. Aerials for 2/70/6, Full Planning. Price: £49,000 Freehold. Fresh air included in price. Ian. (Stalham) 0692 580201.

FT ONE Tx/Rx fitted SSB, FM and AM, gd condx: £700. FC102 ATU: £100. Yaesu Ear Phones: £10. 300W Dummy Load and SWR Meter: £10 (incl). All for clearance with book, manuals. (Chesterfield) 0246 819803.

FT101ZD Mk3, WARC, CW Filter, FM, fan, FC902 ATU, PWR/SWR Meters YD844A, Desk Mic, all boxed, manuals, exc: £480. TR9130 2m M/mode, incl Mobile mount, boxed, manual, exc: £290. Western PM2000A 2KW Power SWR Meter: £40. Contact Phil. (Ipswich) 0473 226709.

FT101ZFM, WARC bands, fan, gd work horse, not used for 3 years, so needs servicing, original owner: £200. (Bude) 0288 356781.

FT102 Tcvr AM/FM: £465. FC902 ATU: £125. SP901 Spkr: £25. All items immac. Price for whole station: £550 plus carriage. (Llwynypia) 0443 437345.

FT102 with FM: £475. Icom 740 with FM, ATU: £550 oto. Both gd condx. Star Masterkey, cost £99, accept: £50. G0DXX. (Pershore) 0386 561990.

FT290R as new, carrying case, charger, etc: £250. Tokyo HL32V 2m Linear: £50. AEC Power/SWR Meter: £15. Rotator: £25. Gould Advance Electronic Power Supply, 10A: £40. (Stafford) 0785 211225.

FT726R 2m, 6m, 70cm and Satellite Modules: £750. Mutek 144MHz to HF Transverter: £150. MFJ1278T M/mode Data Controller: £150. Call Mike. (Guildford) 0483 223060.

G-WHIP FLEXITEN, ten band Mobile Antenna: £50. RTTY PNP MF2DX Decoder and Interface: £30. Heathkit Code practice oscillator: £10. Datong RFA RF Broadband Amp: £18. Advance TC12A 15MHz Freq Counter/Timer: £15. Heathkit RF-1U RF Sig Gen: £10. Amstrad/Pace RS232 Serial I/F including Commstar S/ware plus Thorn/EMI Prism 1200/75 Modem with leads and handbooks: £30. Amstrad Discs, books. G4DYM. (Weston Super Mare) 0934 833478.

GAP ANTENNA, 80 trou 6m, 33ft Vertical, pulls in the DX on 80 + 40, only 3 months old: £150, P&P extra. Nasty neighbours forced sale. Tokyo Amp, 70cm, 1-15w i/p, 60w o/p: £120. (Ashby de la Zouch) 0530 560598.

GOING QRT. FT290, FT727, 6mtr Transverter, Tiny 2 Packet, Spectrum Computer, various Antennae, books, cables, Test Equip: £550. Phone for details. (Farnham) 0252 716356.

HEATHKIT HR-1680 Amateur Bands 80-10m, SSB/CW Receiver: £110. Lake Electronics DTR-1 160m Tcvr (built/tested): £115. SEM Top Band Receive Converter: £28. All exc condx. No telephone, write to Noel Cameron, EI4DZ, 16 St Mary's Crescent, Westport, Co Mayo, Eire.

HEATHKIT SB200 HF Linear Amp, with spare valves, manual: £350 or exchange for gd 2Kw ATU. Phone anytime. (Feltham) 081 890 4666.

HEATHKIT SB303 and SB401 seperates, 100W o/p on 80-10m, gd condx, gd working order: £80. Buyer collects. G0UNQ. (Preston) 0772 38402.

HEATHKIT. Multi Meter, RLC Bridge, RF Oscillator, Signal Tracer, Valve Voltmeter: £35 each. Heathkit PS: £20. Sinclair PFM Freq Counter: £25. PDM Multi Meter: £25. Taxan Monitor: £15. Panasonic Portable b/w TV:

£40. H/B Video Terminal Unit: £25. Resistance Bridge: £8. Multi Meter, 20,000opv: £8. Dragon 32 Computer, PS, handbook: £30. Radio Mags, items, vgc, sensible offers considered for items. Collect or carriage extra. (Exmouth) 0395 265059.

HOWES HC266 6m Transverter, 10w o/p, 2m IF, handbook, instructions, as new: £60. Ted, G4TLY, QTHR. (Malmesbury) 0666 822935.

HY-GAIN TH3JRS 3 el Beam, 10-15-20 metres, boxed, never assembled: £225. (Leeds) 0532 661802.

HYGAIN TH3 Mk3 3 ele Beam 10/15/20 metres, vgc, worked over 250 countries: £300 ovno. G3WCY. (Ruislip) 0895 677017.

IC735 HF Tcbvr with Yaesu FP757 Switched Mode Power Supply and extra 500Hz CW Filter: £680. Kevin, G4HHA. (Shottisham) 0394 411957.

ICOM 251E 2m M/mode, 12V or mains, Mutec front end, Icom SM5 Desk Mic, boxed with manuals, all in nice condx; Yaesu G250 Rotator with Cushcraft 4 ele 2m Boomer Aerial: £400 CASH. Can be seen working. Sorry no offers. G4PHC, QTHR. (Minehead) 0643 706936.

ICOM 751A, Mic, Power Supply: £950. Drake TR-7: £450. Kenwood PS52 PSU, boxed: £200. G0UUT. (London) 081 455 4119.

ICOM IC725 HF Tcvr, Gen Cov Receive, FM and Narrow CW Filters fitted: £600. Icom AH-3 All weather Auto Tuner: £100. Icom AH-2B Mobile HF, all band Antenna: £100. Jaybeam Mini-Max HF Triband Antenna, 2 years old: £250. MFJ 949D crossed needle 300W HF tuner: £100. PK232 MBX M/mode TNC with S/ware: £250. Much more to clear. Dick, G0LFF, QTHR. (Burgess Hill) 0444 248423.

ICOM IC735 Gen Cov TX/Rx, Mic, manual, 250HZ CW Filter, exc cond: £650 ono. Simon, G0GWA. (Lancaster) 0524 847959.

ICOM U101 70cm 20W mobile Tcvr, 12 chan, brand new, used only once, boxed, warranty: £160. AEA PK232 M/mode TNC, mint, boxed, many leads, S/ware: £230. Deecom 70cm Colinear: £25. G6DMQ. (Birmingham) 021 707 7572.

JAYBEAM Minimax Tri-Bander Antenna complete, Emotator 747-SRX Rotator as new, both FREE. You remove 35ft. Ring for details. (Uxbridge) 0895 234126.

JRC JST125 HF Tcvr, 9 bands, Gen/cov: £575. TenTec Argosy 2 with PSU: £70. TenTec Triton 2, HF Tcvr with PSU: £130. Eddystone EC10 Mk2 Rx: £60. Standard C8900 2m FM Tcvr 144/148: £125. HF J-Beam Tribander TB3: £150. Catronics CT100 RTTY Terminal Unit: £25. ASCII to Morse Converter, send CW from Keyboard direct to Rig: £60. Prefer buyer collect. G0MHQ, QTHR. (Peterborough) 0733 230088.

KENWOOD MC50 Desk Mic: £10. Trio Dynamic Hand Mic: £50. Set of three new valves for Trio TS830S, 1 driver, 2 PA: £30. Diawa N660P Twin needle SWR/PWR Meter: £30. Mobile 80m Whip: £10. G0ELH, QTHR. (Basingstoke) 0256 473508.

KENWOOD TM731 Tcvr, 2m & 70cm mobile, CTCSS fitted: £400. Kenwood TM241 2m mobile: £250. EP925 20A Power Supply: £65. HP Spectrum Analyser 182T Mainframe plus 8558 Plug-in 1-1500MHz: £1,250. Jaybeams: 6 ele 2m Quad: £25. 4 ele 4m Yagi: £25. Rotator CD45: £45. Tamron Fotovix slide and negative to video: £250. Texet colour Monitor(10 inch) with video sockets: £75. (Harpenden) 0582 715549.

KENWOOD TS440SAT W/PS, CW Filter: £750. Drake L-7 Linear (160-10): £850. JPS Auto Notch Filter: £100. Carl. (Northants) 0280 705676.

KENWOOD TS50 as new, hardly used: £750. G3NOH, QTHR. (Ealing) 081 723 4905.

KENWOOD TS50 HF Tcvr, 100W, exc condx, little used: £650. G0DLP, QTHR. (Croydon) 0737 553920.

KENWOOD TS530S, narrow CW Filter, Mic, manual, boxed: £475. Eddystone 730/4, needs slight attention: £30. G-Whip 40/20/15/10 with Base: £35. Microset 13V 12A PSU: £35. Yaesu Mobile Whip 40/15/10: £20. Wideband Aerial Matching Unit (50 Ohm i/p, any o/p): £45. Eddystone GDO coils (set): £20. 110/240V Transformer: £10. Buyer inspects/collect or carriage extra. (Andover) 0264 353145 after 7pm or weekends.

KENWOOD TS530SP owned from new, spotless, new Hand Mic, boxed, manual, original finals, hence: £385 ono, plus carriage. GD0ADV, QTHR. (Isle of Man) 0624 822144.

KENWOOD TS530SP, AT230, SP230, gd condx, little used: £650 ono. NO Split. Arthur, G4UZJ, QTHR. (Cleobury Mortimer) 0299 270536.

KENWOOD TS690SAT HF +6m, Auto ATU, YK88S1 2.4KHz SSB Filter, boxed, handbook, all original accessories, mint condx, little used: £1,300. G0SMG. (Lincs) 0529 304842.

KENWOOD TS850S HF Tcvr in prestine condx, rarely used on Tx or Rx, boxed, manuals: £1,200 ovno. (Manchester) 061 793 1291.

KENWOOD TS850SAT, manuals, boxed, mint: £1,350. Fairmate HP100E Scanner and JIM PSU: £150. Mutek TVVF 50a Transverter 28MHz IF, 10w o/p on 6m, gd condx: £175 ono. G6JFU, QTHR. (Aldbrough) 0964 527175.

KENWOOD TS930S as new: £900. Kenwood TL922 Linear, two hours use only: £1,200. Kenwood MC80 Mic: £35. Kenwood Hand Mic: £10. 3KW ATU with LP Filter: £50. Trio Monitor Scope: £175. Atlas 210X Tcvr, with 30A PSU(3-15v): £375. SEM Z-match: £60. 200W ATU: £40. 30ft Trellis Mast: £40. Osker SWR Meter: £25. Telephone 0534 42548 or (Kendal) 0539 726406.

KLM KT34A 4ele 10-15-20m Beam, rated 4KW, used 3.5 years, cost over £400, yours for: £250. G3TTC, QTHR. (Warwick) 0926 490897.

KW2000B PSU manual needs attention. Receives not transmit. Re-alignment would make it go. Any reasonable offer plus carriage. G3OKY, QTHR. (London, SE20) 081 659 5231.

LOWE HF150 Rx with Keypad: £280. Datong AD370 outdoor Active Aerial: £50. ERA Microreader Mk2, Rev4.2: £150. All as new. (Olney, Bucks) 0234 241698.

MMT144/28R 2m Transverter, 25w: £125. BNOS L144-3-100 144MHz Amp: £100. Trio TM201A 2m FM Tcvr: £150. FT690 + A200 Amp for 6m: £200. FT200 + PSU for HF Not working: £75. HF Amp 2x 813 H/B: £100. Maxon 70cm FM, new: £40. All ono. (Devon) 0363 83471.

MOSLEY TA33JR plus WARC Kit, used three years, planning permisson denied, packed original cartons plus assembly instructions: £300. Buyer Collects. G3DCO. (Lower Shiplake) 0734 404602.

MUTEK TVVF144A Mk1 2m Transverter, still under warranty: £225. Pip Tone and Electronic Keyer Units, cases match Datong FL3 etc: £20. The pair 12V PSU leads for TS700: £2. Suncomm Joystick and Game card for PC, brand new: £20. Wanted TS790/PS31/UT10 23cm Module and Control box for Yaesu G5400B AZ/EL Rotator. Can collect. G4JBH. (Yeovil) 0935 28341.

NAVICO AMR 1000 2m Rx/Tx, also Navco PSU 1208 12.6V: £200 ono. Microset RS25 2m 1-4w/30w: £60 as new. Mickey Scanner Base 70-88MHz, 140-176MHz, 12V: £40 ono. (St Asaph) 0745 583258.

NEAR LEICESTER. Three Bedroom House, GCH, large garage and standing for caravan. Greenhouse and garden. 40ft Mast and shack. Gd access to motorways: £63,000. G3YZU. (Leicester) 0533 878813.

NRD525G Receiver, immac: £650 ovno. Olivette Computer M24, 10Mb HD: £100. Minor Miracles WS2000 Modem, external, brand new: £30. (Kettering) 0536 522007.

OPUS PC 5 40Mb HDD, 3.5/5.25 FDD, VGA Monitor, Maths Co-Pro, Genius Mouse, Star LC24-200 Printer: £350. Amstrad PCW8512 with S/ware: £100. 2m High Power Linear 2x 8560AS, contact cooled 19inch Rack mounted: £100 ono. G & G PSU 0-14V, 40A: £50 ono. (Wimborne) 0202 695370.

OSCILLOSCOPE HAMEG, dual beam, DC-20MHz(-3db), exc condx, boxed, with manual: £200. G4GRN, QTHR. (Waltham Cross) 0992 631698.

OSCILLOSCOPE Telequipment Servicescope Type D33, all valves replaced recently, complete with x1 Probes, vgc, size 12H x 8W x 18D inches: £45 ono. (Lancs) 0772 633638.

OSCILLOSCOPES; Beckman 9020, unused, retirement gift: £150. HP140: £100. Solartron CD1400: £30. Spare Amps, Tubes and PS for CD1400. Serviscope working but needs attention: £5. CT71 Curve Tracer: £150. Many other items; Test Gear and components, attenuators (switched), cabinets, capacitors - fixed and variable, fans, valves, meters, transformers, regulated power modules, etc. Would swap for gd R1475, 770R, Quad 34 FM3. (Bexleyheath) 081 303 1879.

PRINTERS; Epson FX85: £40 ono. Microline 93: £40 ono. Burroughs E000211 Colour: £60. Hewlett Packard HP85, c/w ROMS, HP1B and Serial Interface, documentation and S/ware. Offers! Commodore CBM3032. Charles, GM8LMA, QTHR. (Aberdeen) 0651 882283.

PSION 2 LZ Organiser with Thesaurus Dictionary, games, Ram Pack, Printer, mains adaptor, books and leather cases: £150 ono. Contact GU4EON, QTHR. (Guernsey) 0481 722333.

QRP STATION Shimizu Denshi SS1055, 80-10m HF Tcvr, Mic, supply leads, PSU 7A, SEM Z-match ATU, PWR/SWR Meter: £300 plus P&P. Write with telephone number to: D Kinrade, PO Box 149, Douglas, Isle of Man IM99 1NQ. Will phone back. GD4EBA, QTHR. (Douglas, IOM).

QSL CARDS, 2,000 incl 240 Prewar, offers. BC-221 with Charts, circuit: £35. 1928 ARRL Handbook: £15. Buyer inspects, collects. G3OGK, QTHR. (Bromyard) 0885 482929.

RACAL RA17, working order, mechanically very gd: £105 ono. Buyer views and collects. (Bideford) 0237 421072.

RACAL RA1792 HF Rx, backlit with Bite 2-7-6-USB-LSB plus full Filter Compliment, as new: £1,100. Eddystone 1650 as above, like new: £1,000. Rhode & Schwarze, type EKO7D/2 Short Wave Receiver, best German valve Receiver, excl condx. Offers over £450. Inspect, collect HEAVEY. (London M4) 081 813 9193.

RACAL RA17L, full set spare Valves, RA98 SSB/ISB Adaptor, handbooks and leads: £225. G0UOO. (Canterbury) 0227 474216, daytime.

RACAL SYNCAL 30, 1.5-30MHz, 5w l/p, 20w h/p, near mint condx, plus 12V to 24v PSU. G0NUO, QTHR. (Tavistock) 0822 614682.

RECEPTION SET R206 Mk2 ZA24141, s/n 943 and PSU No 33 ZA28020, s/n 953, large and heavy: £75. G4ADE. (Hornsea) 0964 534365.

SELLING on behalf of friend owing to illness. TS950SD, ATU, 1.8KHz Filter, SP950, MC60, HS-5, boxed as new: £1,900. FL7000 Linear, same condx: £700. SW200 PEP SWR Meter covers HF/VHF: £50. Altron Telescopic Mast, max hight 43ft, complete with Rotator Head Unit, buyer dismantles: £300. Cushcraft A3-S as new, but several parts missing: £125, buyer collects. Yaesu G-1000 SDX Rotator with 20 metres control cable and spare set mast clamps: £250. ERA Mk2A Microreader: £85. Yaesu FF501DX LPF: £15. SEM HF Wavemeter: £30. Drae Wavemeter VHF: £15. Kent Morse Key, Brass: £25. Give away parts of 40m add-on Kit for A3-S, Books etc. Contact GW3TMP. (Clwyd) 0352 771520.

SEM QRM Eliminator: £30. Icom HF Tcvr 12/250v, WARC: £650. Robot 400 SSTV Tx/Rx: £120. Video Special Effects Gen: £30. Mains 12V Generator 1.8KVA, brand new Yanmar: £450. Linear 2m 100w o/p: £55. Yupiteru Scanner, covers everything: £215. New Rabbit Handset: £30. 7ft Satellite Dish: £50. Satellite Radio Rx, new, boxed: £35. WANTED; Astronomical Telescope and R/C equipment. Steve, G4MVL. (Nuneaton) 0827 713652.

SEM VHF QRM Eliminator, as new. Works better than DSP on strong signals. QRM source gone: £80 PPD. G4EZG, QTHR. (Wimbledon) 081 946 9553.

SHACK CLEAR-OUT. IC726 with CW/narrow + 6m: £650. IC-260E 2m M/mode: £220. Alinco DJ560 2/70 H/held: £280. Tiny 2 Mk2 with DCD: £120. SX100: £50. SX400: £50. Datong FC3: £80. MFJ704 CPF: £25. Bencher Crome Paddle: £40. C-Mos Keyer: £20. Trap Dipole: £30. Desktop Compressor Mic: £40. (Preston) 0772 785673.

SONY AN1 Active Antenna, vgc, handbook, prefer buyer collects: £25. Squeeze Paddle Hi-Mound MK704, purchased June 93, little use, vgc: £15. (Shepperton) 0932 784971.

SPECTRUM ANALYSER Marconi TF2370 110MHz, working order, Two man lift!: £1,100. Phone Dave, G7GZC, QTHR. (Tiverton) 0884 259276.

SUBMARINE RECEIVER, 10KHz - 200KHz, Marconi/McMichael,. Digital Synth, super spec, SSB, ultra selectivity NATO 916-4903. Rare: £175 with data. Racal RA17L: £120. Racal RA117: £150. HRO, All coils: £120. Sig Gen TF144H: £50. Scope CD1400: £50. Datron 1041 Precision Digital Voltmeter: £40. TF2700 110MHz Spectrum Analyser: £600. HP 141T Analyser: £800. Marconi TF2700 Bridge: £90. Many other items. (Sunningdale) 0344 27869.

TEKTRONIX 7603 SCOPE, Dual Time Base 7B53A, Dual Trace Amplifier 7A26, Differential Comparator 7A13 and six manuals (Operators and Service), OFFERS! Telequipment D-beam Scope, type D43 with Amp type "A" and "C": £50. KW500 Linear Amp, two 813: £150. Marconi TF1342 Low Capacity Bridge: £15. PRO-2005 Scanning Rx with manual: £100. G3OXV, QTHR. (Daventry) 0327 702265.

TENNAMAST Heavy Duty 42ft, exc condx. Specially made, mast insulated from groundpost. Autobrake winch. Feed as Vertical. (Nottingham) 0623 797119 evenings.

TENTEC CENTURY 21, CW HF Tcvr, no WARC bands. Output variable 0 - 25W, gwo: £130. Tel: G0IUD. (Nr Bristol) 0454 318539.

TENTEC SCOUT 555 50W HF Tcvr plus 20m Module and Hand Mic: £475 incl carriage and insurance. G0GPO, QTHR. (Canterbury) 0227 711261.

TEST EQUIPMENT. Bench space needed!. Scope DC-20MHz, D/trace, HP140A: £25 ono. Signal Gen 10-480MHz CW/AM HP608E: £50 ono. Buyer collects. G3TQF, QTHR. (Leicester) 0533 878561.

TOKYO HX240 Transverter, box, handbook, exc condx: £195. Transverts 2m M/mode to 10, 15, 20, 40 and 80 metres, 40W o/p. (Coventry) 0203 462035.

TR751E CW/SSB/FM, 12 mths old, never used mobile, price includes 6 ele Beam: £550 ono. FT720R 70cm, price includes Duplexer for 70cm/2m: £120 ono. Also FT411 2m H/held with 2 battery packs, 12V Adaptor, Boom Mic: £180. IBM PS1 PC286 Computer with DOS6, V6Log and Callbook installed: £250. Buyer inspects and collects. Vince. (Chester) 0244 538522.

TRIO R-2000 fitted with VHF Unit: £450. Also OPTO 2300 Freq Counter: £120 ono. (South Shields) 091 454 3297.

TRIO TS530S, new PA's last year, Narrow SSB Filter, Desk Mic, exc condx: £495. Buyer must collect. Matching Spkr and ATU optional extras. Alinco DJ120E 2m H/held, vgc, boxed, extra SP/Mic: £140. Datong PC1: £60 plus M/Modules 2m/10m Converter: £209.(used together). (Stockport) 061 477 5303.

TRIO TS830S mint condx, HF Tcvr, WARC Bands, SSB/CW, bargain at £450 ovno. (Northwich) 0606 47552.

TRIO TS830S, SP230, AT230, MC50, Dip Meter, Hi-Mound Key, all leads, manuals, coax, original packing, clean: £750 ono. G4KAT, QTHR. (South Humberside)

TRIO TS940S Auto ATU, MC42S Mic, boxed, with all manuals, immac: £1,150 ovno. (Milton Keynes) 0908 614105.

TS430S HF Tcvr, immac, Gen coverage Rx, fitted AM filter, MC42S Mic, DC leads, original box, manuals etc: £550. G3NJK, QTHR. (Nr Grantham) 0780 410022.

TS530SP, YK88SN Filter: £425. FT270R 2m FM Mobile, 25W: £175. Both A1 condx, manuals, boxes. Multiband HF Vertical Ant: £60. G0HRU. (Shrewsbury) 0743 231690.

TS690SAT 6-160m, + Auto ATU and matching PSU. TR751E 2m M/mode. Cushcraft R5 10-30m all band Vertical. All virtually unused on transmit and receive. Cost £2,600 for Sale at: £1,600 (Will Split). Can be demonstrated to callers. John, G0OQX, QTHR. (Wantage) 0235 765275.

TS830S Tx/Rx, CW Filter, Mic, complete with manual, boxed, little used: £480. Buyer inspects, collects. Bob, G3JJU. (Fleet) 0252 615831.

TS930S little used, gd condx, both manuals, a bargain: £750. (Welwyn Garden City) 0707 326105.

TS940S Tcvr, exceptionally clean condx, all HF bands, 100w, self contained: £1,000 plus shipping and insurance. G4BKI, QTHR. (St Ives, Cornwall) 0736 796088.

UNIVERSAL M900 Decoder, new £530, bargain: £450 ono. Under guarantee, reason for sale, upgrade. Also Monitor available. G7JAI, QTHR. (Kenilworth) 0926 54556.

VERSATOWER BP60, Base plate ground post, sell at £150. Possible exchange for H/D Rotator or Tri-Bander. Tel: Graham, G0SUB. (Stroud) 0453 757467.

VERSATOWER complete with Moseley 3 Band Beam, Rotator Direction Indicator and cable mounted on Vertical Post with 2 Winches 6ft above ground, 6ft below ground. Buyer must dismantle and remove. Yaesu Rotator as new: £350 the lot. G3JWK. (Winsford, Cheshire) 0606 592466.

VERSATOWER P40 Tower, complete head unit, top bearing etc. Need slight attention, ground post cut, hence: £175. Buyer Collects. John. (Reading) 0734 451240.

VINTAGE COMMUNICATION EQUIPMENT - A lifetime's collection:- Domestic Receivers (1920's to 1960's), wooden and bakelite cabinets. Valves & Transistor portables (including pocket sets). Television sets - (1940's - 1960's). Amateur gear (SB301, SB401). Headphones. Microphones. Telephones. Morse Keys and unique Morse practice sets. Test gear - (Civilian & Military). Calculators. Computers. Record Players & Record Decks. Radiograms. Tape-Recorders. Military Receivers. Batteries & Accumulators. Valve Audio amps & pre-amps. Grampian P.A. system. Specialised Resistance, Capacitance & Inductance units from Torpedo Experimental Establishment at Greenoch. Early Video Recorders with tapes (cassette & reel to reel). Video Cameras. Loudspeakers. Valves (about 2,000). Miscellaneous gear. Magazines:- (1930s - 1980s) including 1939-1975 bound volumes of Wireless World. Books. Fully comprehensive list available for SIX 2nd class stamps. (Truro) 0872 74788.

WEHRMACHT VALVES by Lorenz, 2 off each, RD2.4Ta, RD12Tf. Unknown condx. Orig boxes, stored past 40 years. Any Offers? Phone G3IJW. (Bexleyheath) 081 303 1879.

MEMBERS' ADVERTISEMENTS

YAESU 2100B, HF Linear Amp, as new, boxed, with manual: £450. G4GLH, QTHR. (Ramsbottom) 0706 822090.

YAESU 902DM gd condx: £450 ono. Ft101ZD also gd condx: £350 ono. FC902 ATU: £100. FTV901R Transverter 430, 144, 50MHz: £300 ono. Yaesu YO101 Monitorscope: £50. Rotator L/D Altai: £40 as new. G4EOW, QTHR. (Romsey) 0794 512475.

YAESU 9600 0-950MHz cont Coverage Receiver, USB/LSB/AM(N)/AM(W)/FM(W)/FM(N). Raycom Conversion (sealed) ERA Morse Reader ERA, bandwidth filter CW/SSB/AM. Hamgear Tuner 1.8-28MHz. Spectrum+3 Computer, disks/tapes for SSTV/Locator/Logbook plus many Amateur Radio Programs on disk/tape, not enough space plus AlphaCom 32 Thermal Printer, +4 paper rolls plus Interface/Video screen grabber Vidi ZX on disk plus cassette data recorder. Every Item has complete instructions: £400. (Edmonton) 081 482 4906.

YAESU FRG7700 Communications Rx, 0-30MHz, CW/SSB/AM/FM, internal 240v PSU, digital display, manual, boxed, little used: £200. Close M25. (Orpington) 0689 831908.

YAESU FRG7700 HF Rx with matching Tuner and VHF Converter, mint condx: £325. Yaesu FRG7000 HF Rx, mint condx: £195. Both with Manuals and original boxes. G0PUR. Tel: 081 391 0514 or (Ashford, Middx) 0784 259149.

YAESU FT B Tcvr, digital, FC700 ATU, Datonc S/Processor, PSU, Laptop Nel Computer LCD Screen. (Lancs) 0704 880345.

YAESU FT101E with Mic, DC leads, handbook, vgc: £250. KW E-ZEE Match, vgc: £60. Phone Alf, G4JIF. (Loughborough) 0509 502569 evenings.

YAESU FT225RD 2m Tcvr: £475. MML 144/100 2m Lin Amp: £85. 9 ele Tonna: £25. G3WBN. (Croydon) 081 654 2761.

YAESU FT480R 2m, H/book, Mics, boxed, perfect condx: £265. 12V PSU available if required. G4JFU, QTHR. (St Austell) 812571.

YAESU FT747GX with FM and H/Mic: £480. Amstrad PPC640 Computer: £75. Kent Morse Key: £25. G4DXN. (Leamington Spa) 0926 423348.

YAESU FT757GX Mk2: £450. G3POX. (Huntingdon) 0480 811549.

YAESU FT757GX Tcvr, matching FC757AT Auto ATU, Mic, manuals, boxes, excl condx: £700. G4VLZ, QTHR. (Sheffield) 0742 391169.

YAESU FT767GX HF rig, exc condx, hardly used as second rig: £695. Bargain. Phone Jack. (Dorking) 0306 887057.

YAESU FT77 100W: £285. FV700 Digital Scanning VFO: £80. FP700: £80. FF501LPF: £15. Datong FL2 M/mode Filter: £60. G4DYM. (Weston Super Mare) 0934 833478.

YAESU FT902DM, gd cond with Desk Mic, manual, boxes: £450. Also alloy Poles and fittings 3el HF Triband Yagi Beam: £65. Prefer buyer inspects, collects. Jack. (S. Glamorgan) 0446 747223.

YAESU FT902DM, Spkr, manual,workshop manual, excl condx: £485. FC902 ATU, manual: £110. Silver Eagle Mic: £70. Yaesu YP150 Dummy Load Wattmeter: £50. Enquiries welcome. Collect or carriage extra. (Aberdovey) 0654 767367.

YUPITERU MVT7000 with Discone Antenna, 30 metres coax: £225 ono. Kenwood R1000 with Lowe F.E. Chvrsn: £275 ono. Sony ICF6800W WO but needs dial lights: £135 ono. (Coventry) 0203 403353.

WANTED

ANTIQUE WIRELESS Equipment, Crystal Sets, Horn Spkrs, Valves, Pre-war Television, Valve Hi-Fi, Books. G4ERU, 5 Luther Road, Winton, Bournemouth BH9 1LH. (Bournemouth) 0202 510400.

AP1086 Issue 1 (RAF-Radio Stores Ref No's). Also Air Publications relating to Radio, Radar equipment. Exc price offered. Would purchase Post-War to current Magnetrons, Klystrons, T/R cells, Photo-Multipliers, Thyratrons, Ignitrons, Planar Ceramic, Microwave and Special CV types. Required Rx Type R1355 10D/13032 unmodified. Also R3002-3, R3120-1, ABK-ABK1, SCR695A, SCR695AZ, Control Unit Type 17 or 18. Phone anytime. (London) 071 511 4786 or 071 790 2846 or Fax 071 511 4786.

DRAKE MN2700 ATU, Kenwood PS52 PSU, Hy-Gain TH6, and/or Mono band Yagis (damaged considered). Chris, G3VBL, QTHR. (Preston) 0202 841258 evenings.

ATU to Tune Top Band Doublet. (Balanced). Home Brew etc no problem, WHY. Peter, G4VUN, QTHR or work (9am -4.30pm) 0287 634397.

BASE FOR VCR97 6inch CRT plus/or Pin connections and operating voltages. Alternatively loan of booklet "Inexpensive Television" circa 1947. G7RGI, QTHR. (Crewkerne, Somerset) 0308 868598.

BIRD-43 Thruline Wattmeter elements in the following sort of values 100-2500w HF, 10-100w VHF, UHF or WHY?. Dave, G0OIL. (North Notts) 0777 248080.

CAN ANYONE HELP with Collins TCS8/12 Plugends to connect Power Supply. Sea Cadet Unit Project to resurrect Rig. Robin. (Hamilton) 0698 423934.

CIRCUIT and information on BC348. Also HF Quad 3 or 4 element or Spider/s & Spreaders. Will refund expenses. (Brightlingsea) 0206 302382.

COLLINS KWM2A, Accessories, Manuals etc. Anything in this Series considered, eveny faulty. Please WHY. Terry, 7 Cavendish Drive, Clowne, Chesterfield, Derbys.

COPIES OF:- Hams Interpreter by OH1CU(?), ARRL Antenna Book and Simple Low Cost Antennas by W6SAI/W2LX. (Sleaford, Lincs) 0529 413547.

CUSHCRAFT R5 or R7, HF Antenna in gd condx. Also wanted Racal RA1792 Rx plus spares, manual WHY. G4BOH, QTHR. (Congleton) 0477 500296.

DRAKE. Still looking for Receivers DSR2, MSR1, MSR2 and RR3. Any info on whereabouts, any condx, working or not. Would import. (Shrewsbury) 0743 884858.

EX-PMR RIG for Packet. Only must be converted to 433.65MHz. Also wanted External VFO for FT75. (Hatfield, Herts) 0707 275920.

FT290R-1 CPU PCB PB-2236C or non working FT290R with gd PCB. Phone Clive. (Brownhills) 0643 370663.

HEATHKIT RG1, GR64, GR78. Un-made or made-up. Eddystone EC10, EC10 Mk2, EB35, 960 etc. Cash waiting. Contact Lepino. Fax 0372 454381 or Tel: (Leatherhead) 0374 128170.

KENWOOD 13V, Argonaut 509/515 or Scout. Kent Paddle Key. Kenwood ATU or similar equipments considered. Tel: weekdays. (London) 071 935 7119.

KW EQUIPMENT WANTED. ATU, PSU, Rig's. Anything considered, working or not. Contact G0UGQ. (Whiston) 051 426 7975.

KW201 KW202, KW2000B, VFO4B, working or not. G3RKZ, QTHR. Tel: (Derby) 0332 883035.

KW204 Tx in gd condx. To complement my KW202 Rx. Fair price paid. Write or phone. GM3TBV, QTHR. (Blairgowrie) 0250 872520.

MINIMITTER. Information, circuit etc on Minimitter VFO and associated products made by Minimitter Company, London NW2. Will pay for photo copies, post etc. G0RDV. (Kettering) 0536 514544.

MVT7100 Scanner, Cushcraft R7 HF Vertical, Yaesu SP980 Spkr, Daiwa Power Meter, Dummy Load and various other HF accessories. (Plymouth) 0752 790557.

OLD PO TELEPHONES REQD. Tele 26/59/88, Tele 162/232, Tele 150/121. Bell sets 1/25/26, only genuine items in gd condx - Complete. Not necessarily working. No reproductions. Also interested in PO "Tapper" Linesmans Phone and Military Teles D & F. NO Rubbish though. (Cheltenham) 0242 524217.

PMR for 70cm, preferably UHF Motorola MC80 or Pye Olympic 212. Please phone Paul, GW0TSW, QTHR. (Chester) 0244 818758.

Q MAX HOLE Cutters for B7G, B9A and International Octal Valve Bases. Also TH41 valve. G4IAD, QTHR. (Bolton) 0942 817556.

ROTARY DIPOLE 10/15/20 metres, also medium duty Rotator, Controller and HF bands ATU. Cash waiting, will collect. G0GXJ, QTHR. (Sheffield) 0742 465713.

SP230 or Simmilar Speaker to match my Trio TS530S. Price to include postage. Phone G4LQO. (Poole) 0202 631603.

TS680S, preferably with 500Hz CW Filter. G3IXZ, QTHR. (Hereford) 0568 84868.

VALVE DET8 Pentode to reconstruct 1934 Tx. Also 1 + 1 MF Eddystone capacitor. Pete, G4JNU, QTHR. (Reading) 0734 477573.

WANTED for Pensioner when you have passed Novice exam, your RAE correspondence course. Phone (Stoke on Trent) 0782 372158

EXCHANGE

ECHO Model M23 (1933). Marconiphone Model T11DA. Murphy 'Baffle' Model A122. Offers? Exchange 70cm H/held, 6m Rig, WHY. Bill, GW3DGT. (Narberth) 0834 83369.

EXCHANGE AR900 Handheld Scanner, 108-174, 220-280, 300-380, 406-470 & 830-950MHz, AM/FM switchable, for AOR2002 or similar. Tony, G8TEE. (Bracknell) 0836 326983.

EVENTS DIARY

CLUB NEWS

DEADLINE - Items for inclusion in the December 1994 issue must be sent to HQ marked 'Club News - DIARY', to be received by 28 October latest. If news is received by the published deadline, it should appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

NOTE: This is primarily a service for clubs affiliated to the RSGB, to whom priority will be given.

AVON

NORTH BRISTOL ARC - Tuition for RAE and Morse is available at every meeting. Details 0272 513573.

RSGB CITY OF BRISTOL GROUP - 25, Annual General Meeting; Nov 29, Construction evening. Now meets last Tuesday in every month at New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol, BS16 1BG. Details 0272 672124.

SOUTH BRISTOL ARC - 5, CW with Club members (in house); 12, Make your own PCs by G4YQH; 19, Home Construction (Judging) for Trophy; 26, Simple Computing Programming (2nd Workshop). Details 0275 834282.

WESTON-SUPER-MARE - 3, Radio Quiz night; 17, Workshop. Details G8WAR, 0934 415700.

BEDFORDSHIRE

SHEFFORD & DARS - 6, Members Activity night; 13, CQ World Wide planning; 20, Quiz Night by G4PSO; 27, Junk Sale; 29/30, CQ WW Contest. Details 0462 700618.

BERKSHIRE

BRACKNELL ARC - 12, Invited Speaker; Nov 9, Junk Sale. Details 0344 420577.

NEWBURY & DARS - 26, Computerised Radio Contest Logs; Nov 23, Talk 'Forensic Science' by Mike Fereday. Details 0635 863310.

READING & DARC - 13, Construction Contest (Make something on the night); 15/16, JOTA Peter, G0PUB; 20, Annual Dinner; 27, Talk 'The Global Positioning System (GPS)' by David Rumble, from Andews Hydrographics. Details 0734 698274 eve.

READING & WEST BERKSHIRE RAYNET G - The club is urgently seeking new members. Net every Monday evening on 144.775MHz at 7.30pm (local). All contacts welcome. Details Denis, G4KWT 0734 698526.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 5, Talk 'Microwave Engineering' by G8EOW; 19, Discussion evening; Nov 2, IBM Computers (Part 1) by G6CDV. Details 0296 81097.

CHESHAM & DARS - All meetings take place in the Top Floor Meeting Room at The White Hill Centre, White Hill, Chesham, Bucks at 8.15pm. Details 0494 676391.

MILTON KEYNES & DARS - 10, Annual General Meeting at Drill Hall; 24, Meeting at Blechley Park. Meets on 2nd Monday of each month at Drill Hall, Wolverton and 4th Monday each month at Blechley Park. Details 0908 672920.

CENTRAL

STIRLING & DARS - Meets every Thursday at 7.30pm in the Clubrooms, Bandeath Industrial Estate, Throsk, Nr Stirling. Morse instruction available when requested. Details 0324 636235.

DOLLAR ACADEMY ARC - Club meets most afternoons at the Academy after 3.30pm. Details Geoff GM0LOD 0259 742126.

CHESHIRE

CHESTER & DARS - 11, Talk 'Deep Space radio waves'; 18, Avionics by John, G1LML; 25, Surplus Equipment Sale. Details 051 608 3229.

MID-CHESHIRE ARS - 5, Construction/On Air night; 12, Talk 'Raising the Mary Rose' by G1ABZ. Details 0606 592207.

STOCKPORT RS - 12, Talk 'Directional Properties of Antennas' by G4FAS; 26, The G3FYE Memorial Lecture - History of SRS by G4ZDO. Details 061 439 4952.

CLWYD

RHYL & DARC - Meets every 2nd Monday in the month, Wellington Community Centre, Wellington Road, Rhyl at 8pm. Details (GW3UTG) 0745 351362.

NORTH WALES R Rally C - Activities include Novice courses, Morse instruction, Club Station on Air and a City & Guilds Approved Examination Centre. All radio enthusiasts are welcomed to visit. Practical Construction Course being arranged for the Autumn and Winter periods. Meets each Thursday at 7.30pm, YMCA Building, Colwyn Bay, Clwyd. Details 0492 513246.

WREXHAM AR - 4, HF Activity night; 18, Junk Sale; Nov 1, Video night. Details from David, GW1MVL.

CO ANTRIM

CARRICKFERGUS ARG - Club meets every Tuesday at 7pm in Downshire Secondary School. Details 0960 351807.

CO ARMAGH

ARMAGH & DARC - Meets 2nd and 4th Wednesday of the month at County Armagh Golf Club, Newry Road, Armagh at 8pm. Details 0762 870423.

CORNWALL

CORNISH RAC - 6, Talk 'Repeaters and their maintenance'. Details 0209 820118.

PENZANCE RAC - Regular meetings on Mondays, also 2nd Morse Test centre, via RSGB only. Details Brian, 0736 61427.

POLDHU ARC GB2GM, GX0PZE - Meetings Tuesdays and Fridays, 7.30pm. Visitors welcome to visit. HF net Wednesdays 7.30pm around 3.75MHz. Details 0326 290638.

SALTASH & DARC - 7, Visit to Toshiba (subject to confirmation); Nov 10, Club's 30th Anniversary Buffet night. Details Brian on 0752 844321.

DERBYSHIRE

BUXTON RA - 11, Aerial design; 25, PMR Conversion; Nov 8, AGM. Details 0298 25506.

DERBY & DARS - 3, Amateur TV Group meeting; 5, Junk Sale; 12, Visit to Trent Signal box (numbers limited); Technical Topics evening; 26, The Mysteries of TCP/IP - all is explained by Mike, G2SP; Nov 2, Junk Sale. Meets Wednesdays evenings at 7.30pm at 119 Green Lane, Derby. Details 01773 856904.

NUNSFIELD HOUSE ARG - Meets every Friday at 8pm, at Nunsfield House Community Centre, Bolton Lane, Derby. Details 0332 518256.

DEVON

APPLEDORE & DARC - 17, Bring and Buy Sale. Meets 3rd Monday of each month at Appledore Football Clubroom at 7.30pm. Details 0237 477301.

EXETER ARS - 10, Annual General Meeting. Club meets 2nd Monday in the month. Details 0392 78710.

EXMOUTH ARC - Meetings held at the Scout Hut, Marpool Road, Exmouth on Mondays at 7.30pm. Details 0395 279574.

PLYMOUTH RC - 4, Annual General Meeting; 11, Business meeting and natter night; 16, Another Chinese night (cooking); 25, tba. Details 01752 563222.

SOUTH DEVON RC - 5, Computercations Rally Preparations; 9, Rally Activities; 12, Natter night; 19, Antenna Project; 22/23, GX4SSD & GX7FDC WAB Awards station for Lifeboat, HF + VHF, for Quick return of QSL cards:- Lifeboat, SDRC, PO BOX 4, Brixham, Devon TQ5 8QH; 26, Forward Planning. Details G0CDB 01803 522995.

TORBAY ARS - Club nights every Friday at the ECC Social Club, Highweek, Newton Abbot. Details 0803 526762.

DORSET

BLACKMORE VALE ARS - ***NEW VENUE*** Now meets at Shaftesbury School, Dorset on 2nd and 4th Tuesday of each month. Details G7JIF 0963 362766.

DORSET POLICE ARS - 6, Club Project Update. Club meets at Dorset Police HQ. **NEW CONTACT ADDRESS**. Details from: c/o Pc 915 Richard Newton, Eastern Control Room, Bournemouth Central Police Station, Madera Road, Bournemouth, Dorset. Tel: 0202 552099 x2031.

POOLE RS - 14, Talk 'The Packet DX Cluster' by Colin, G6MXL. Usually meets on the 2nd Friday of each month at The College of FE, Lady Russell Cotes House, (just behind the Jellicoe Theatre), Constitution Hill Road, Parkstone, Poole. Details 01202 762110.

SOUTH DORSET RS - Meets 1st Tuesday of every month. New members and visitors welcome. Details 0305 773860.

DYFED

ABERYSTWYTH & DARS - 13, Annual General Meeting; 27, GW0ARA On the Air. Club meets 2nd Thursday each month at 8pm, Scout Hut, Plascrug Avenue, Aberystwyth. Details 0545 580675.

EAST SUSSEX

CROWBOROUGH & DARS - 27, Quiz Night. Meets every 4th Thursday at the Plough & Horses, Crowborough at 8pm. Details 0892 661807.

HASTINGS E & RC - 19, Junk Sale. Details 0424 830454.

SOUTHDOWN ARS - 3, Surplus Equipment Sale. Club meets on 1st Monday of each month at Chaseley Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. Please enquire about RAE and Morse Classes. Details 0323 484282 or G0UOI @ GB7HAS.

MID-SUSSEX ARS - 7, Annual General Meeting, Rm 4, Marle Place at 7.30pm, 7.45 start; 21, Novices night. Meets 1st and 3rd Fridays each month. Details 0444 831400.

WORTHING & DARC - 5, Talk/slides 'Tasmania to Darwin' by G3EUE; 12, Annual General Meeting; 19, Discussion Evening; 26, talk 'Droitwich Standard Phase Look Loop' by G8JVE. Meets at 7.30 for 8pm at Parish Hall, South Street, Lancing. Details 0903 753893.

ESSEX

BRAINTREE & DARS - 3, Operating evening - follow-up to last meeting. Club meets every 1st and 3rd Monday in the month, at Braintree Hockey Club at 8pm. Details 0376 327431.

CHELMSFORD ARS - 4, Annual General Meeting. Details 0245 256654.

COLCHESTER RA - 6, Annual General Meeting; 20, Talk 'Contests' by Andy, G4PIQ. Visitors and guests welcome. Details 0206 383510.

HODDESDON RC - 13, Talk by Jim Stroud, Managing Director, Amateur Radio Insurance Services Ltd; 27, Talk (with slides) 'SS Titanic' by T M White Esq. Details 0920 466639.

SOUTHEND & DARS - 7, Talk on WAB given by Bob, G4OBE. Details from: PO Box 88, Rayleigh, Essex SS6 8NZ.

VANGE ARS - 6, Junk Sale; 13, Talk 'Spurious Emissions' by Robin, G3JWI; 20, Construction Contest; 27, Talk 'First Transmitting Station' by Mike, G4BQF. Details 0268 552606.

GLOUCESTERSHIRE

CHELTENHAM ARA - Meets 1st Friday of each month at Charlton Kings Library. Details 0242 242336.

GRAMPIAN

ABERDEEN ARS - 7, Junk Sale; 14, The Power Tower by GM1TDU; 21, Wet String Listening Competition - Final Round, GM0LNQ; 28, Repair of the Sea Cadets Equipment - GM4HTU. Meets every Friday at Queen Mother House, Claremont Place, Aberdeen. Details 0569 731177.

MORAY FIRTH ARS - Meets every Thursday at 7.30pm. Details 0343 86395.

GREATER LONDON

BROMLEY & DARS - 18, Junk Sale. Meets 3rd Tuesday of every month, 7.30 for 8pm at the Victory Social Club, Kechill Gardens, Hayes. Details 081 777 0420.

COULSDON ATS - 10, 'Early Television - Radio Amateurs' Contribution' by Ray, G2KU; Nov 14, 'Early Wireless Communications from Croydon Airport' by Tom Samson - Croydon Airport Society. Details 081 684 0610.

CRAY VALLEY RS - 6, Surplus Equipment Sale; 20, RSGB Video. Details 081 850 1386.

CRYSTAL PALACE & DRC - 15, Talk 'The History of Radar, 1918 onwards' by G3GDU; Nov 19, Surplus Equipment Sale. Details 081 699 5732 or 0737 552170.

KINGSTON & DARS - Meets on 3rd Friday of every month at 8pm, at 'Alfriston', 3 Berrylands Road, Surbiton, Surrey. Details Ray, G0KXK 081 398 1128.

SOUTHGATE ARC - 13, Second Junk Sale of '94; 27, G4POI, Tutorial 'Brief Outline of TCP/IP'; Nov 10, Construction Judging for the G6QM Trophy. Details 081 360 2453.

SURREY RCC - 3, Surplus Sale; Nov 7, Talk 'Noise Fundamental in Radio Systems' by Derek, G3GRO. Club meets at 'Terra Nova', The Waldrons, Waddon, Croydon. Details 081 660 7517.

SUTTON & CHEAM RS - 6, Informal meeting (8.30pm); 20, Junk Sale at 7.30pm at Sutton United Football Club, Gander Green Lane, Sutton. Details 081 644 9945.

WIMBLEDON & DARS - 28, Annual General Meeting; Nov 25, Talk 'Microwaves' by G0OLX. Details 081 540 2180.

GREATER MANCHESTER

ECCLES & DARS - 4, Lecture 'JOTA 1994' by G7ELA; Nov 1, Lecture 'Networking computers' by G6MEI. Informal meetings every Tuesday from 9.30pm. Lectures/demonstrations 1st Tuesday of each month. Details 061 773 7899.

SOUTH MANCHESTER RC - 7, Natter night; 14, (tba); 21, talk 'GBR' by G2HW; 28, Halloween DF. Details 061 969 1964.

TAMESIDE ARS - Now meets every Wednesday night at 7.30pm at the ATC Hut, Moorcroft Street, Droylsden, Tameside. Details from: A N Laughlan, 8 Kempton Close, Droylsden, Tameside, M43 7JL.

GWYNEDD

DRAGON ARC - 3, Annual General Meeting; 17, 'An evening with the Camcorder' by Trefor, GWPZS and Norman, GW0MKP. Details 0248 600963.

HAMPSHIRE

ANDOVER RAC - RAE classes each meeting at 7pm. Meets at Wildhearn Village Hall, 1st and 3rd Tuesdays of each month. Details 0264 773547 evenings.

BASINGSTOKE ARC - 3, Annual General Meeting; 30, 2m DF Competition: OS185 - Fox G7RAU. Details 0256 25517.

HORNDEAN & DARC - 5 (Wednesday), Annual General Meeting; Nov 3, Amateur Radio - an Old Man needing the Kiss of Life, by Stephen, G4JGS, Sony Broadcast. Meets at Horndean Community School, room X5, Barton Cross, (off Catherington Lane), Horndean. Details 0705 472846.

ITCHEN VALLEY ARC - 14-16, JOTA - this year at Romsey's New Scout Hut; 28, Talk 'Radio Wave Propagation, band by band' by Nigel, G7CAW. Details 01703 732997.

WATERSIDE ARS - 25, Operations Night (On Air); Nov 22, Junk Sale. Meets at 7.30pm, Hyde Community Centre. Details 0703 783170.

WINCHESTER ARC - 21, talk by Gerry, G2DBT; Nov 21, Talk 'The Barlow Wadley Loop - Restoring a RA17L' by Frank, G0RZK. Details John, G4AXO who is QTHR.

HEREFORD AND WORCESTER

BROMSGROVE ARS - 11, Construction Competition / Home brew talk; 25, Surplus Sale. Meets on 2nd and 4th Tuesday of each month at Lickey End Social Club, Alcester Road, Burcot. Details 0527 542266.

BROMSGROVE & DARC - 14, Discussion 'EMC/Aerials'. Visitors welcome; Nov 11, Talk 'Getting started on Packet' by Peter, G4BBU. Visitors welcome. Club meets every Friday night at 8pm, Avoncroft Art Centre. Details G3MRC 0562 68782.

HEREFORD ARS - Club meets on 1st and 3rd Friday of each month. Details G4MET, QTHR.

MALVERN HILLS RAC - Now meets 2nd Tuesday of every month at 8pm at Red Lion Annex, St Ann's Road, Great Malvern. Varied programme of speakers and events, all visitors welcome. Details 0684 560490.

REDDITCH RC - 13, A talk by John, G4YZO of Badger Boards. Meets 2nd Thursday each month. WRVS Centre, Ludlow Road (opposite Liberal Club) at 8pm. Details 0789 762041.

SOUTH BIRMINGHAM RS - 5, tba; Nov 2, AGM, 8pm at HQ. Details 021 458 1603.

HERTFORDSHIRE

CHESHUNT & DARC - 5, Natter night & members Forum; 12, SSTV & JVFAX by Dennis, G3TIK; 26, Talk 'The Building of the Post Office Tower' by George, G0OXH. Details 0992 464795.

DACORUM ARTS - Now meets 1st and 3rd Tuesdays, 7.30pm at Girl Guide Meeting Rooms (next to British Legion), Queensway, Hemel Hempstead, Herts. Details 0582 766973.

HODDESDON RC - 13, Talk by Jim Stroud, MD, Amateur Radio Insurance Services Ltd; 27, Talk 'SS Titanic with slides' by G0BXL; Nov 10, Talk 'Aerials (Antennas) by Dennis, G3TIK; Nov 24, AGM. Details G7OCI 0920 466639.

STEVENAGE & DARS - 4, CW practice - HF/VHF on Air; 11, WAB - What it is & how it works by Frank, G4ISO; 18, Informal meeting (Chance to discuss your projects etc); 25, Video Night (contact Ralph, G7HFD for the directory). RAE class to start in September, contact Neil. Further details from Neil, 2E1ASZ on 0438 350882.

HUMBERSIDE

GRIMSBY ARS - 13, Annual General Meeting; 20, Committee meeting; 27, Junk Sale (Cromwell Rd Social Club). Details John, G3DOT 0472 825899.

ISLE OF WIGHT

BRICKFIELDS ARS and Vintage Wireless Museum - 1st Monday of every month, Bring & buy nights; Every Tuesday of week Novice Training & Construction evenings by Mike, G0SEB - 7.30pm to 10pm. Morse classes to be run as and when required; The Clubs Isle of Wight County Award is now Available, details Dennis, 2E1BND. Details G1VGM at GB7IOW.

KENT

DARENTH VALLEY RS - 12, Talk 'WW2 Radio' by Neil, G7AQK; 26, Talk 'Audio' by Peter, G0GIR. Details 0689 826846.

DOVER RC - During term time, club meets Wednesday evenings 6.30-10pm. Novice, full RAE and Morse classes. All ages (over 8) welcome. Details 0304 825030.

EAST KENT RS - 6, Annual General Meeting at Parkside, 8pm. Details 0227 743070.

MAIDSTONE YMCA ARS - 7, Discussion 'VHF contests etc'; 14, RAE, CW and Club night; 21, Talk 'Clandestine Radio'; Nov 4, Junk Sale. Novice tuition every Wednesday, contact Martyn, on 0622 744545. Details 0622 850277.

MEDWAY AR & TS - 7, Talk 'Spread Spectrum within AM Radio' by Keith, G7LZV; 21, Junk Sale. Meets every Friday, other evenings include construction and Morse as required plus Novice help. Details 0634 685585 or 201462.

SEVENOAKS & DARS - Details from The Secretary, Sevenoaks & DARS, c/o Council Offices, Argyle Road, Sevenoaks, Kent TN13 1HG.

WEST KENT ARS - 21, Talk 'Servicing of Electronic Equipment' by Mick, G7NOR. ***NEW VENUE*** Now meets at the Health Authority's Office, Sherwood Park, Pembury Road, Tunbridge Wells. Details 0892 664960.

LANCASHIRE

BURY RS - 4, committee meeting; 11, Construction Competition; 18, Ragchew & Operating; 25, Video evening. Details 061 881 1850 (business hours).

DARWEN ARC - Meetings every 3rd Wednesday of the month at 8pm. Darwen Catholic Club. Details Bill, G2AKK 0254 703767.

FYLDE ARS - 11, Equipment Sale; 25, Informal. Meetings held 2nd & 4th Tuesday of each month. Details 0772 635464.

OLDHAM ARC - Meets every Thursday evening at Moorside Conservative Club, Ripponden Road, Moorside, Oldham at 8pm. To run RAE and Novice Licence Courses commencing in September, a City & Guilds Test Centre for both. Details 061 652 8617 (evening) or 061 633 0550 (daytime).

ROCHDALE & DARS - Meetings held every Monday, at The Cemetery Hotel, Bury Road. Details 0706 376204.

THORNTON CLEVELEYS ARS - 3, Video of the Club Year; 10, Computer night; 24, Annual General Meeting / Old Timers evening / Two ten-minute talks. Details G4BFH, QTHR.

LEICESTERSHIRE

LOUGHBOROUGH & DARC - 4, Annual General Meeting, all welcome; 11, Visit to 'Sound Services' in Loughborough: 22 maximum, so book in; 18, Construction Contest 94; 25, HF evening. Details 0509 218259.

LINCOLNSHIRE

LINCOLN SHORTWAVE C - Meets every Wednesday at the city Engineers Club, Waterside South at 8pm. Details 0427 788356.

SPALDING & DARS - 14, Talk by G4EMK on TVI/BCI. Meetings every Friday Clubroom, Old Fire Station, Spalding at 7.30pm. Details 0775 750382.

SPILSBY ARS - **Change of date of monthly meeting**. Now held at The White Hart Hotel, Spilsby, 1st Thursday in month at 7.45pm. Details 0790 52712.

LOTHIAN

LOTHIANS RS - 12, Talk 'Was Marconi telling lies' by Geoff, GM4FH; 26, Junk Sale. Meets at Orwell Lodge Hotel, Polworth Terrace, Edinburgh at 7.30pm. Details Brian, GM4DIJ, 031 337 7311.

MERSEYSIDE

HESKETH ARC - 11, Talk 'Infamous Connectors' by David, G4TUP. Details 0704 63344.

LIVERPOOL & DARS - 4, Pre-AGM; 11, Annual General Meeting; 18, Club on the Air; 25, Surplus Sale. Meets at Churchill Conservative Club, Church Rd, Wavertree every Thursday. Now offer RAE Course, Novice RAE and Morse courses. Details Ian, G4WWX on 051 722 1178.

NORTH SEFTON ARC - Meets 2nd Wednesday of each month. Details 0704 579017 or Fax 0704 570089.

MID-GLAMORGAN

MID-GLAMORGAN ARG - Sep 29, Talk 'The Novice Licence'; Oct 6, start of Novice Course at Aberkenfig Sports and Social Club, 7.30-9pm. Details from Roger, GW3XJC on 0656 733729 or Tom, GW0TOM on 0656 736954.

NORFOLK

DEREHAM ARC - 13, Informal Junk/swap Sale; Nov 10, Converting PMR equipment by G1BBU. Meets at St Johns Ambulance Station, Yaxham Road, near Tesco in Dereham at 8pm. Details 0362 691099.

ARC FAKENHAM - 4, 'QSL Cards and Awards, bring six of your best'. Meets on 1st Tuesday of every month at Trinity Church Room, Hempton at 7.30pm. All welcome. Details 0485 528633.

NORFOLK ARC - 5, Informal - Night on Air; Construction QRP: Morse Practice; 12, Video of the Years Radio Events by Jack, G3NJQ; Informal; 23, Used Equipment Sale at The Miller Hall, Norman Centre. Doors open 10.30am, sale start 2pm; 26, Construction Contest. **NEW CONTACT** Now Mike, G4EOL. Details 0603 789792.

YARMOUTH RC - 6, Inter Club Quiz at LT; 13, Informal; 20, Talk 'Nuclear Power'; 27, Informal; Nov 3, Used Equipment Sale. Details Tony, G3NHU on 0493 721173.

NORTHAMPTONSHIRE

KETTERING & DARS - Club now meets every Tuesday at Ise Lodge Community Centre, St Vincents Ave, Kettering at 7.30pm. New members especially welcome. Details John, G3ZSE 0536 511913.

NORTHAMPTON RC - 10, AMSAT Lecture. Prospective members and visitors welcome. Meets every Thursday at RAFA Club, Grove Road, Northampton at 8pm. Details 0295 760640.

NOTTINGHAMSHIRE

ARC of NOTTINGHAM - Sep 29, Construction / Activity night. Details 0602 501733.

MANSFIELD ARS - 10, talk 'Repeaters' by Mick, G0UYG; Nov 14, Workshop Hints and Test Gear. Meets at the Polish Catholic Club, Off Windmill Lane, Woodhouse Road, Mansfield at 7.30pm. Visitors welcome. Details 0623 423697.

SOUTH NOTTINGHAM ARC - 7, Construction + (On Air HF & VHF); 14, Talk ' Packet Radio for Beginners' by Tony, G0JVW; 21, On Air HF & VHF +(Construction); 28, Open Forum - members only. Details Julie, G0SOU 0509 672734.

OXFORDSHIRE

BANBURY ARC - Now meets every 4th Wednesday of the month at the Unicorn Hotel, Market Sq, Deddington. Details 0295 253509.

VALE OF WHITE HORSE ARS - 4, Annual General Meeting. Meets 1st Tuesday of every month at The Fox, Steventon at 8pm. Details Ian on 0235 531559.

SHROPSHIRE

SALOP ARS - 6, Annual General Meeting; 13, talk '23cm the Easy Way' by Terry, G8DIQ and John, G4EAB. Details 0743 361935.

TELFORD & DARS - 12, The 23cm Band by G8DIQ/G0KTH/G4EAB; 19, Contesting Practice; 26, Basic shack measurements. Meetings take place Dawley Bank Community Centre, Telford at 7.30pm. Details (Telford) 588878.

SOMERSET

TAUNTON & DARC - 7, (tba); 21, Annual General Meeting at 8pm. Meetings 7.30pm in 'The Basement' County Hall, The Crescent, Taunton at 7.30pm. Club Net, Wednesdays, 2100 UTC, 3.750MHz+/-. Details 0823 680778.

YEOVIL ARC - 6, Using your GDO by G3ICO; 13, Club Project, the 'Coker' Receiver by G3PCJ; 20, The Mystery of Valve Equipment by G7LNJ; 27, Club station on the Air & Committee meeting. The RAE Class is also held every Thursday for beginners. Meets every Thursday at The Red Cross HQ, Grove Avenue, Yeovil at 7.30pm. Details 0258 473845.

SOUTH GLAMORGAN

CARDIFF RSGB Group - 10, Annual General Meeting. Details from GW4HWR on 0222 810368.

SOUTH YORKSHIRE

SHEFFIELD ARC - 3, Annual General Meeting; 10, Meet the NEW Committee; 15/16, JOTA with Scouts of Sheffield, GB4SCS; 17, Inter club Quiz - Dronfield RC; 24, Talk (tba); 31, Committee meeting. Meets at the Club 197, Brook Hill, located in the Sheffield University Lecturers Social Club, opposite the main University buildings. Details 0742 446282.

STRATHCLYDE

CUNNINGHAME & DARC - Come along for a natter or enrol in our RAE/Morse Classes. Meetings every Thursday at Woodlands Centre, Kilwinning Road, Irvine. Details 0563 40048.

MID-LANARK ARS - Lecture and chat nights, RAE and Morse classes, every Friday at 7.30pm, at Newarthill Community & Education Centre, High Street, Newarthill, Motherwell. Details GM7FXK, QTHR.

PAISLEY (YMCA) ARC - RAE/Morse classes, run on Tuesdays. Details Stuart, GM0UKD 0505 335195.

SUFFOLK

FELIXSTOWE & DARS - 3, Visit to Suffolk Ambulance HQ, Bramford, names to G4YQC; 17, Weather Satellite Receiver Demonstration (tbc); 31, Fish & Chip supper, names to Neil, G0ORG. Detail 0394 273507(evenings).

SUDBURY & DRA - 4, Talk 'Electrical Safety and Regulations' by Frank, G1MYD & Tony, G8LTY; 18, Natter and Nog at 5 Bells PH; Nov 1, Talk and Demonstration on First Aid by St Johns Ambulance. Details 0787 313212.

SURREY

DORKING & DRS - 25, A Talk by Graham Mytton from the BBC. Club meets at 'Friends Meeting House', South Street, Dorking at 7.45pm. Details John, G3AEZ, 0306 631236.

REIGATE ATS - 18, Lecture entitled 'Raynet' at Tilgates, Bletchingley at 8pm. Details 0342 325322.

TAYSIDE

DUNDEE ARC - 4, Holiday; 11, Construction night; 18, Members Participation evening; 25, Construction night. Meets at 7pm on Tuesday in College of FE, Graham Street, Dundee. Details from GM4FSB, QTHR.

STRATHMORE & DARC - Now meets at 2231 (Forfar) Squadron, Air Training Corp, 1 Lochside Road, Forfar, Angus every Wednesday at 7.30pm. Details Alan, GM4JCM, QTHR.

TYNE AND WEAR

HAZELLRIGG ARC - Meets every Monday, Hazellrigg Community Centre at 7pm. Classes for Morse, Novice and talks on various subjects held on last Monday in the month. Details 091 264 4608 after 6pm.

WARWICKSHIRE

MID-WARWICKSHIRE ARS - 11, Open Evening; 25, Members Home Brew. Meeting on 2nd & 4th Tuesdays at St Johns Ambulance HQ, 61 Emscote Road, Warwick at 8pm. Details 0926 424465.

STRATFORD U AVON & DARS - 10, Talk 'Inside your PC' by Martin, G3XZO; 24, Talk 'QRP' by Norman, G4LQF. Meets at the Home Guard Club, Main Street, Tiddington, Stratford upon Avon at 7.30pm. Details 0789 740073.

WEST GLAMORGAN

SWANSEA ARS - 2, 21/28MHz Contest; 15/16, JOTA at Upper Killay, Swansea; 22, Coach trip to Leicester Rally - names to GW4HSH on 0792 404422. Details 0792 403527.

WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC - Nov 21, Talk & Video 'Wrought Iron' by G0NOL. Meets 1st & 3rd Mondays in the month. Details 0922 36162.

COVENTRY ARS - Usually meets every Friday at 8pm at Baden Powell House, 121 St Nicholas St, Radford, Coventry. Visitors are always welcome. Details (G1ORG at GB7COV) or Tel: 0203 311468.

MIDLAND ARS - Every Wednesday, RAE & Morse classes; Every Thursday 'Night on the Air'; 2nd and 4th Monday in month, PC night; Last Friday in month Atari night. Details John, G0LAI 021 628 7632.

SOUTH BIRMINGHAM RS - 5, tba; Nov 2, AGM, 8pm at HQ. All Members please try to attend. Details 021 458 1603.

STOURBRIDGE & DARS - 3, On Air & natter night; 17, Talk 'PMR' by Castle Electronics. Meets at The Robin Woods Centre, Scotts Rd, Stourbridge. Details James French, G7HEZ, 2 Pepper Hill, Stourbridge, DY8 1BJ or packet @ GB7PZT.

SUTTON COLDFIELD ARS - 10, Quiz and natter night; 24, Project Evening CT2s; Nov 28, AGM. Details 0827 874010.

WEST BROMWICH CENTRAL RC - 2, Visit by Harry Harrison, of the 'The Black Country Bugle' for a chat and pictures, with a view an article in the Bugle; 16, Talk 'UK Band 3 Community Comms' by Geoff Wainhouse, Castle Electronics. Details 021 561 2884.

WEST SUSSEX

CHICHESTER & DARC - Club meetings at St Pancras Hall, St Pancras, Chichester at 7.30pm. Details on 0243 573541.

HORSHAM ARC - 6, Surplus Equipment Sale; Nov 3, Talk by Haydon Jones. Details 0737 842150.

WORTHING & DARC - 5, Slides/talk 'Tasmania to Darwin' by G3EUE; 12, Annual General Meeting; 19, Discussion evening; 26, Talk 'Droitwich Standard Phase Look Loop' by G8JVE; Nov 2, Video 'DXpedition to North Pole'. Meets at 7.30 for 8pm at Parish Hall, South Street, Lancing. Details 0903 753893.

WEST YORKSHIRE

HALIFAX & DARS - 18, Talk 'Novice Licence' by Esde, G0AEC; Nov 15, Talk 'Morse Testing' by Roy, G4SSH. Details 0422 202306.

KEIGHLEY ARS - 6, Natter night; 13, A brief introduction to Satellites by G7HJT; 27, Junk Sale. Details 0274 496222.

SPEN VALLEY ARS - 6, Surplus Equipment Sale; 20, MJ Components, Martin, G3ZXZ; Nov 3, Talk A complete QRP Station by Rev George Dobbs, G3RJV. Details 0924 497767.

WILTSHIRE

CHIPPENHAM & DARC - Meets Tuesdays 7.45pm, Sea Cadet HQ, Chippenham. Details Jon, G4LGZ 0225 743352.

SALISBURY R & ES - 4, Inter Club Quiz, away leg at Andover Club; 11, Talk 'QRP' by Ken Whillock of the G-QRP Club; 15/16, Jamboree On the Air weekend; 18, JOTA debriefing / QSL writing; 25, Project evening - constructing a Magloop Antenna. Details 0722 330971 (weekends).

TROWBRIDGE & DARC - 5, Talk 'The British Red Cross Society' by Mrs Taylor-Webb of the Society; 19, Social. Details 0225 864698 (evenings).

RALLIES AND EVENTS

This is a list of all rallies, hamfests, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

2 OCTOBER

BLACKWOOD & District Amateur Radio Society Rally - Community College, Oakdale, near Blackwood, Gwent. Doors open 10.30am. Features traders, bring and buy one pound per item or job-lot and raffles. Talk-in on S22. Details Norman, GW0MAW 0495 227550.

GREAT LUMLEY RADIO Rally (organised by Great Lumley AR & E Society) - Great Lumley, near Chester-le-Street, County Durham. Doors open 11am, 10.30 for disabled visitors. Features a varied selection of trade stands and a bring and buy. Entrance £1 which includes a programme, children under 14 accompanied by an adult free. Refreshments available. Details Barry, G1JDP 091 388 5936.

7-9 OCTOBER (FRIDAY-SUNDAY)

RSGB INTERNATIONAL HF & IOTA CONVENTION and IOTA's 30th Birthday Party - Details G3NUG. Tel/fax 0442 62929.

WORLD ASSOCIATION of Christian Radio Amateurs and Listeners Conference - Liverpool. Details and bookings contact G4EZU 0474 533686.

8/9 OCTOBER

THE ALL IRELAND INTERNATIONAL Radio & Hobbies Exhibition - St Patrick Hall, Cathedral Road, Armagh. A two day exhibition by Armagh & DARC and Dundalk RC. Details GI8RLE 0762 870423, Mobile 0374 122213.

9 OCTOBER

KIDDERMINSTER & DARS Rally - Stourport on Severn High School, Minster Road, Stourport on Severn, Worcestershire. Usual traders, bring and buy. Refreshments available and talk-in on S22. Details G8JTL 0384 894019, G4HFP 0299 823818 or G0RJP 0299 822206.

THE COMPUTERCATIONS'94, Amateur Radio and Computer Rally - Hillhead Campsite, Kingswear Road, Brixham, Devon. Doors open 10am. Features trade stands covering computer and radio, bring and buy, raffle. Refreshments available. Talk-in on S22. Overnight camping available, details from Bill, G6ZRM 0803 522216.

21/22 OCTOBER (FRIDAY/SATURDAY)

LEICESTER Amateur Radio Show - Granby Halls, Leicester. Doors open both days at 10am, 9.30 for disabled. Large trade presence, special group interests section. Refreshment available. Talk-in on 2m and 70cm. Details Frank, G4PDZ 0533 871086.

22 OCTOBER (SATURDAY)

RSGB OPEN REGIONAL Meeting - New Friend's Hall, Purdown, Stapleton, Bristol. Doors will open at 12.30pm, when light refreshments will be available and the meeting will commence at 2pm. Several members of Council will be in attendance plus HQ staff. Details Julian Gannaway, G3YGF, QTHR.

30 OCTOBER

HORNSEA Amateur Radio Club (East Yorkshire) Radio Rally - **(CHANGE OF DATE)** The Floral Hall, Hornsea. Doors open 11am, 10.30 for disabled visitors. Event features trade stands, bring and buy, special interest groups, ATV etc. Refreshments. Talk-in on S22. Details Duncan, G3TLI on 0964 532588.

5/6 NOVEMBER

NORTH WALES Radio Rally - Aberconwy Centre, Llandudno. Also for this year, the new North Wales Theatre will be available. Features over 60 trade stands, covering radio, electronics and computers interests, a bring and buy stall and refreshments. Admission £1.50 adults, under 14 free. Talk-in on S22. If requiring accommodation or other details contact Tony, GW0NSR on 0492 513246.

6 NOVEMBER

14th NORTH DEVON Rally - Holsworthy Memorial Hall, Holsworthy. Features a bring and buy stand, etc. Details G8MXI, QTHR.

TYNE AND WEAR Repeater Group Auction - Fence Houses & District Community Centre, Fencehouse, nr Chester-le-Street, County Durham. Doors open 10.30am for booking goods in. Auction starts at 12 noon. Details Brian, G8FBQ, QTHR 091 388 2913.

12 NOVEMBER (SATURDAY)

THE ALL MICRO Show, Radio Rally and Electronics Fair - Bingly Hall, Staffordshire Showground, Weston Road, Stafford. (Off the A518 Stafford/Uttoxeter Road) Signposted from Jn 14, M6. Doors open 10am. Features many trade stands, many computer formats supported, inc: IBM PC, Amiga, Atari ST/8 bit, Einstein, Acorn, Apple etc. Hardware, software, accessories, books, components and shareware. Radio, satellite, printers, media supplies, systems and a bring & buy stall. Refreshments. Details 0473 272002 or Fax 0473 272008.

13 NOVEMBER

BARNSLEY & DARC 4th Amateur Radio Rally - **NEW VENUE** The Metrodome Complex, Barnsley Town Centre. Venue less than 2 miles from jun 37, M1. New venue is all on one level, with excellent disabled facilities. Event features the usual amateur radio and computer dealers, radio clubs, specialist groups and a bring and buy. Ample car parking at the metrodome. Details G4LUE, QTHR or tel: 0226 716339 6-8pm, except Monday 6-7pm only.

MARS-STOCKLAND Radio/Computer Rally - Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am. Features the usual traders, local clubs, special interest group stands and a bring and sell tables. Refreshments. Admission £1, free car parking. Details Norman, G8BHE, 021 422 9787 or Peter, G6DRN 021 443 1189 evenings.

20 NOVEMBER

BISHOP AUCKLAND Radio & Computer Annual Rally - Newton Aycliffe Leisure Centre, Beveridge Arcade, Newton Aycliffe, County Durham. Doors open 11am. Details Mike, G0PRQ, 0388 766264.

27 NOVEMBER

BRIDGEND & DARC Radio Rally - Bridgend Recreation Centre, Bridgend, Mid-Glamorgan. Access off the M4 is via jun 35 or 36. Doors open 11am, 10.30 for disabled visitors. Event features a large bring and buy. Also RSGB Morse Tests available on demand, but remember to bring two passport size photographs. Refreshments will be available. Bring along the family, recreation facilities available, swimming etc. Talk-in on S22 and GB3MG RB7 (433.175MHz). Details Mike, GW7NIS 0656 722199 or Don, GW3RVG 0656 860434.

WEST MANCHESTER Radio Clubs 'WINTER RALLY' - Bolton Sports & Exhibition Centre, Bolton, (town centre). Details G1IOO 0204 24104(evenings only).

4 DECEMBER

LEEDS AND DARS Christmas Radio Electronic and Computer Rally - Allerton High School, Kings Lane, Leeds 17. Doors open at 11am, 1030 for disabled visitors. Admission by programme. Details Phil, G6HGT 0532 680006.

11 DECEMBER

VERULAM CHRISTMAS Rally - **NEW VENUE** Watford Leisure Centre, Horseshoe Lane, Garston, Watford, Herts. Details from Walter, G3PMF on 0923 262180.

22 JANUARY

OLDHAM AR Club Mobile Rally - Details Kathy, G4ZEP, QTHR.

5 FEBRUARY 1995

SOUTH ESSEX ARS Radio Rally - Details 0268 693786 or 0268 755350.

12 FEBRUARY

NORTHERN CROSS Rally - Rodillian School, A61 . Details Dave Tel: 0532 827883.

19 FEBRUARY

RSGB VHF CONVENTION - Details G3MVV 0277 225563.

25 FEBRUARY

9th TYNESIDE ARS RALLY - Details Stuart G0BEV 091 281 0999.

19 MARCH

NORBRECK Amateur Radio Electronic and Computing Exhibition - Details Peter, G6CGF 051 630 5790.

26 MARCH

THE MAGNUM Radio & Computer Rally - Details Bob, GM0DEQ on 0563 40048.

PONTEFRACT & DARS, 15th Annual Components Fair & Spring Rally - Details Colin, G0NQE on 0977 677006.

23 APRIL

BURY RS Annual Rally - Details G4KLT 061 762 9308.

14 MAY

MARS/DRAYTON MANOR Radio and Computer Rally - Details Norman, G8BHE 021 422 9787(evenings).

21 MAY

11th YEOVIL QRP & Construction Convention - Details G3CQR, 01935 813054.

4 JUNE

SPALDING Annual Exhibition and Rally - Details G4OO, 0775 750382.

11 JUNE

THE 26th ELVASTON CASTLE National Radio Rally - Details from Ken, G3OCA, 0332 662818. Trade enquiries, Keith, G1ZLQ 0332 662896.

2 JULY

YORK Radio Rally - Details Dave, G7FGA 0904 790079.

9 JULY

SUSSEX Amateur Radio & Computer Fair - Information and booking Ron, G8VEH 0903 763978 or 0273 417756 office hours.

23 JULY

COLCHESTER Radio & Computer Rally - Details Richard, G7BIV, 0376 571239.

THE 2nd HUMBER BRIDGE Amateur Radio Rally - Details or bookings Roly, G0UKS 0482 837042.

6 AUGUST

RSGB WOBURN Rally - Woburn Abbey, Bedfordshire. Details from Norman Miller, G3MVV, 0277 225563.

SILENT KEYS

WE HAVE BEEN advised of the deaths of the following radio amateurs:

G0DIF	Mr A Rawlins	12.07.94
G0DJP	Mr C Evans	07.12.93
G0MHP	Mr S Cooper	
G1ATP	Mr A J C Roker	
G2FQG	Dr K R Peattie	27.07.94
G2HGT	Mr W T Black	
G3BA	Mr T Douglas	Sept 94
G3BDK	Mr K W C Sheppard	27.06.94
G3CDC	Mr C S Harrison	02.07.94
G3DOP	Mr J J Mcdonnell	06.07.94
G3HJG	Mr D Whiteling	Dec 93
G3NMM	Mr G A Cuppleditch	04.08.94
G3RBB	Mr R B Boughton	13.06.94
G3RRB	Mr K J T Sands	02.07.94
G3XRX	Mr E H C Bone	17.05.94
G3ZLK	Mr F R Dartnall	Nov 93
G4HJA	Mr N Phelps	22.07.94
G4TUU	Mr L D Hodge	05.05.94
G4USF	Mr J A Denton	
G4YHX	Mr G S Cosh	09.07.94
G8NQS	Mr R J Abrey	19.06.94
G8UQL	Mr G Moore	
GM0HSU	Mr P Schofield	24.07.94
ON8BZ	Mr Y Klinkenbergh	14.05.94
RS92135	Mr C F Taylor	12.07.94

GB CALLS

The list below shows special event stations licensed for operation during this month and up to 29 October. It was taken from the HQ computer on 5 September. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

OCTOBER

1	GB0ICT	Iur Cinn Tra
	GB2GMM	Guglielmo Marconi Memorial
	GB2RSB	Royal School for the Blind
	GB2STC	Science Technology College
	GB4GDW	Guide Dog Week
	GB4SFG	Scout Fellowship Gathering
	GB5SR	STELAR Radio Net
3	GB0CSR	Civil Service Radio
	GB150YM	150 Years YMCA
	GB2NPS	Nant y Moel Primary Schools
7	GB30IOTA	30 Years of Islands on the Air
	GB4DHX	Dunfermline Hobbies Xhibition
	GB6HF	Houghton Feast
10	GB8RS	8th Regiment of Signals
14	GB2RCC	Radio and Caravan Club
15	GB2SR	STELAR Radio
21	GB2PG	Paul Godley
27	GB4XXX	'X' Net DXpedition
29	GB5SR	STELAR Radio Net

RSGB – at Your Service

SOME OF THE RSGB'S TEAM OF VOLUNTEER EXPERTS — AVAILABLE TO HELP YOU

Zonal Council members

Zone A (North of England): Peter Sheppard, G4EJP, 89 St Catherines Drive, Leconfield, Beverley, North Humberside HU17 7NY. Tel: 0964 550397.

Zone B (Midlands): Dave Gourley, G0MJY, 86 Upton Road, Broadwaters, Kidderminster, Worcs DY10 2YB. Tel 0562 753101.

Zone C (SE England and East Anglia): Neil Lasher, G6HIU, 8 Highwood Grove, Mill Hill, London NW7 3LY. Tel: 081 201 1578.

Zone D (SW England): Julian Gannaway, G3YGF, Dean Hill Barn, East Dean, Salisbury, Wiltshire SP5 1HJ. Tel: 0794 40008.

Zone E (Wales): Clive N Trotman, GW4YKL, 19 Park View, Dolau, Llanharen, Pontyclun, Mid Glamorgan CF7 9RZ. Tel: 0443 226198.

Zone F (Northern Ireland): Ian Kyle, GI8AYZ, 1 Portulla Drive, Pond Park Road, Lisburn, Co Antrim BT28 3JS. Tel: 01846 665034.

Zone G (Scotland): Frank Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR. Tel: 0307 467565.

For general advice and details on local clubs, or if you don't know who to contact:

Your **RSGB Liaison Officer** see January and February *RadComs*, page 91.

Specialists

Antenna Planning: Booklet free to members from RSGB HQ. Planning application refused – RSGB Planning Panel, via RSGB HQ. Planning Advisory Committee Chairman – Geoff Bond, G4GJB, QTHR.

Audio Visual: Library Coordinator – David Simmonds, G3JKB.

Awards: For contest awards, refer to the appropriate contest committee. For other awards, enquiries and applications go to either the: HF Awards Manager – Fred Handscombe, G4BWP; IOTA (Islands on the Air) Awards Manager – Roger Ballister, G3KMA or VHF (and Microwave) Awards Manager – Ian L Cornes, G4OUT. Trophies Manager – Post vacant

Band Plans and operating practices: See the *RSGB Call Book* or January 94 *RadCom* for latest bandplans. For policy, contact the appropriate spectrum manager or committee chairman: HF Committee Chairman – David Evans, G3OUF, QTHR; VHF Committee Chairman – Peter Burden, G3UBX, QTHR; Microwave Committee Chairman – Steve Davies, G4KNZ; HF Manager – Post vacan; VHF Manager – Dave Butler, G4ASR; Microwave Manager – Mike Dixon, G3PFR.

Beacons: HF Beacon Coordinator – Prof Martin Harrison, G3USF, QTHR. VHF Beacon Coordinator – John Wilson, G3UUT, QTHR. Microwave Beacon Coordinator – Graham Murchie, G4FSG, QTHR.

RSGB Contests: First contact the appropriate contest adjudicator (see the contest rules). For policy, contact the respective Committee Chairman: HF Contest Committee – Chris Burbanks, G3SJJ; VHF Contest Committee – Bryn Llewellyn, G4DEZ, QTHR; ARDF (direction finding) Committee – Brian Bristow, G4KBB, QTHR.

EMC: Advice on solving breakthrough and other electromagnetic compatibility matters: Committee Chairman – Robin Page-Jones, G3JWI, QTHR.

Emergency: Emergency Communications Officer – Greg Reilly-Cooper, G0MAM.

Exhibition & Rally Committee: Chairman – Norman Miller, G3MVV, QTHR.

History: Society Historian – George Jessop, G6JP.

IEE: Liaison Officer – Peter Saul, G8EUX.

Licensing: LAC Chairman – Peter Chadwick, G3RZP, QTHR. Licence Renewals – SSL, PO Box 885, Bristol BS2 8RH. New Licence Applications – SSL, PO Box 884, Bristol BS2 8RH. SSL Help Desk – 0272 258333.

Membership Liaison: MLC Chairman – Peter Sheppard, G4EJP, see zone A (above).

Morse: Morse Practice Transmissions Coordinator – David Pratt, G4DMP. Chief Morse Test Examiner – Roy Clayton, G4SSH.

Packet Radio: Datacomms Committee Chairman – Tom Lilley, G1YAA, QTHR.

President: Ian Suart, GM4AUP, QTHR. Executive Vice President: Clive Trotman, GW4YKL, (see zone E above).

Propagation: Propagation Studies Committee Chairman – Charlie Newton, G2FKZ, QTHR.

QSL Bureau: Outgoing cards – PO Box 1773, Potters Bar, Herts, EN6 3EP. Incoming cards – your QSL sub-manager (see RSGB Call Book or send to RSGB HQ for a list). QSL Bureau Liaison Officer – John Hall, G3KVA.

Repeaters: Repeater Management Group Chairman – Geoff Dover, G4AFJ, 31 Newbold Rd, Kirkby Mallory, Leicestershire, LE9 7QG.

Spectrum Abuse: Packet – Via Datacomms Committee. Repeaters – Via the Repeater Management group. Other – Via Licensing Advisory Committee. Intruder Watch Coordinator – Chris Cummings, G4BOH.

Technical & Publications: Committee Chairman – Dick Biddulph, G8DPS, QTHR.

Training and Education: Committee Chairman – John Case, GW4HWR, QTHR. Radio Amateur's Examination – George Benbow, G3HB, QTHR. Novice RAE – Hilary Claytonsmith, G4JKS, QTHR. Project YEAR Coordinator – G4JKS.

The Society has a large number of volunteer experts available to help and advise members on a wide variety of subjects. Each month we will be focussing on a different section of the volunteer workforce, whilst still giving brief details of the main office-holders. See also the Information Directory section of the *RSGB Call Book*.

RSGB Liaison Officers

Part 2: Counties H – Z

HIGHLAND (Zone G) – Mike Shread, GM6TAN, 2a Seatown, Gardenstwon, Banff AB45 3YQ. Tel: 0261 851339.

HUMBERSIDE (North Humberside: Zone A, South Humberside: Zone B): North: C Reynolds, G8EQZ, 49 Westborough Way, Anlaby Common, Hull, N Humberside HU4 7SW. South: (also for Lincs) Ray Degg, G0JOD, 42 Hawthorn Road, Cherry Willingham, Lincoln LN3 4JR. Tel 0522 750316.

ISLE OF MAN (Zone A) – Mr C G Baillie-Searle, GD4EIP, 2 Marguerite Place, Foxdale, Isle of Man IM4 3HE. Tel 0624 801353.

ISLE OF WIGHT (Zone D) – Doug Byrne, G3KPO, 'Lynwood', 52 West Hill Road, Ryde, Isle of Wight PO33 1LN. Tel 0983 67665.

JERSEY (Zone D) – Syd Smith, GJ0JSY, 31 Jardin-A-Pommiers, Patier Road, St Saviour, Jersey. Tel 0534 38996.

KENT (Zone C) – Fred Stewart, G0CSF, Shingles, Ingleborough Lane, St Mary's Platt, Sevenoaks, Kent TN15 8JU. Tel 0732 780721.

LANCASHIRE (Zone A) – See under Cheshire.

LEICESTERSHIRE (Zone B) – Gwynne Harries, G4WYN, 1 St Michael's Close, Ashby-de-la-Zouch, Leicestershire LE6 5ES. Tel 0530 417307.

LINCOLNSHIRE (Zone B) – see under South Humberside.

LOTHIAN (Zone G) – Tom Menzies, GM1GEQ, 31 Pentland Terrace, Edinburgh EH10 6HD. Tel 031 447 3219.

MERSEYSIDE (Zone A) – Post vacant – refer to Zonal Council Member.

MID GLAMORGAN (Zone E) – David Jones, GW1SQT, 'Beridale', 41 Penrhys Road, Ystrad, Rhondda, Mid Glamorgan CF41 7SJ. Tel 0443 435309.

NORFOLK (Zone C) – Bill Higgins, G3PNR, 65 Hayden Court, Eleanor Road, Norwich NR1 2RG. Tel 0603 629150.

NORTHAMPTONSHIRE (Zone B) – Mr D J Linnell, G0MJK, 19 Beech Avenue, Northampton NN3 2HE. Tel 0604 711647.

NORTHUMBERLAND (Zone A) – Jack Swayne, G3BLE, 12 The Haven, Beadnell, Chathill, Northumberland NE67 5AW. Tel 0665 720601.

NORTH YORKSHIRE (Zone A) – Gareth Foster, G1DRG, 19 Asquith Avenue, Burnholme, York YO3 0PZ. Tel: 0904 421392.

NOTTINGHAMSHIRE (Zone B) – Mrs Mary Lowe, G0NZA, 25 Manor House Court, Kirkby-in-Ashfield, Nottingham NG17 8LH. Tel 0623 755288.

ORKNEY (Zone G) – G M Christie, GM7GMC, Burnbank, Hillside Road, Stromness, Orkney KW16 3HR. Tel: 0856 850270.

OXFORDSHIRE (Zone D) – Post vacant – refer to Zonal Council Member.

POWYS (Zone E) – Paul Essery, GW3KFE, 287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1AR. Tel 0686 628958.

SHETLAND (Zone G) – Post vacant – refer to Zonal Council Member.

SHROPSHIRE (Zone B) – David Whalley, G4EIX, 1 Lees Farm Drive, Madeley, Telford, Salop TF7 5SU. Tel 0952 588878.

SOMERSET (Zone D) – Capt R S Atterbury, G4NQI, 14 Holloway Road, Taunton, Somerset TA1 2EY. Tel 0823 333009.

SOUTH GLAMORGAN (Zone E) – Mike Adcock, GW8CMU, 7 Channel Close, Rhoose, Barry, S Glamorgan CF62 3EH. Tel: 0446 711426.

SOUTH YORKSHIRE (Zone A) – Mr A Whitehead, G4JKW, Laburnum Cott, 3 Darley Yard, Worsbrough Dale, Barnsley, S Yorks S70 4SB. Tel 0226 299031.

STAFFORDSHIRE (Zone B) – Ken Parkes, G3EHM, 41 Goldborn Avenue, Meirheath, Stoke-on-Trent, Staffs ST3 7JQ. Tel 0782 397240.

STRATHCLYDE (Zone G) – **NW:** Alan Foulis, GM7PGT, 12 Richmond Gardens, Chryston, Glasgow G69 9PA. Tel: 041 779 1444. **SE:** Gordon Hunter, GM3ULP, 12 Airbles Drive, Motherwell, Strathclyde ML1 3AS. Tel: 0698 253394.

SUFFOLK (Zone C) – Post vacant – refer to Zonal Council Member.

SURREY (Zone C) – Post vacant – refer to Zonal Council Member.

TAYSIDE (Zone G) – Alfred Low, GM4UZP, 21 Earn Crescent, Menzieshill, Dundee DD2 4BS. Tel 0382 644597.

TYNE & WEAR (Zone A) – Post vacant – refer to Zonal Council Member.

WARWICKSHIRE (Zone B) – see under Northamptonshire.

WESTERN ISLES (Zone G) – Post vacant – refer to Zonal Council Member.

WEST GLAMORGAN (Zone E) – Mr E Hays, GW3RGL, 23 Edgemoor Drive, Upper Killay, Swansea SA2 7HH. Tel 0792 207822.

WEST MIDLANDS (Zone B) – Tony Faulkner, G0SKG, 105 Corbyn Road, Russels Hall Estate, Dudley, W Mids DY1 2JZ. Tel 0384 820616.

WEST SUSSEX (Zone C) – Jim R Harris, G4DRV, Upton, Crowborough Hill, Crowborough, East Sussex TN6 2DA. Tel 0892 655894.

WEST YORKSHIRE (Zone A) – Mr D W Allan, G0RZP, 283 Cliffe Lane, Gomersal, Cleckheaton, W Yorks BD19 4SB. Tel 0274 872244.

WILTSHIRE (Zone D) – I L Carter, G0GRI, 12 Bobbin Lane, Westwood, Bradford on Avon, Wilts BA15 2DL. Tel 0225 864698.

The LAST WORD

ROYAL TOURNAMENT FROM OUTSIDE . . .

As a rule I never win anything - I'm the type of person who always buys raffle tickets but never wins! So you can imagine my joy and surprise when you phoned me and said that I had won tickets to the Royal Tournament. My wife, Sandra, my children, Leroy, GW0ULC (15), Anna (11) and I had a fantastic time and really enjoyed a very emotional performance by our armed forces.

A week before we were due to visit the tournament, I worked the Air Training Corps special event station GB4ATC. So while up at the show I paid a visit to the ATC stand and exchanged QSL cards. So to you all at the RSGB, thank you very much once again for a very memorable and enjoyable day out.

Don Kirby GW0PLP and Family

. . . AND INSIDE

The Air Training Corps is now becoming a fixture at the Royal Tournament, as we once again became a part of the RAF stand for the 4th year with the station running the now familiar callsigns of GB4ATC, GB8RT and G3ATC.

Contacts this year were a little more difficult to get hold of through constant QRM both on the HF bands and from the closeness of the station to the main arena. QSOs were down on last year as we were asked to restrict the radio side to give the Adventure Training part of the Corps a chance to demonstrate their activities, so most of the time we limited ourselves to running just one rig. Contacts ranged from Japan to Canada and the States, but the total was down to just under the 1000 for the 11 days we were on the air.

A change of rig this year brought Icom UK on to the scene with the IC-765. A slight fault developed with it, but a phone call brought an immediate response and within hours their top-of-the-range 781 was winging its way with the Marketing Manager; he also brought a back-up rig, the IC-736, in case we wanted to try 6m; many thanks to Icom for such spirited sponsorship.

Our other fairy godfathers were Martin Lynch who kindly loaned the 2m rig and power supply, and Waters and Stanton who loaned the 2m collinear. Because space was at a premium we only ran the 2m band as and when we could. Sorry the 'Bees' didn't get a taste of the honey, we will try next year.

For all the dedicated amateurs who have contacted us over the years, you will find that we have changed the format of the QSL card to one relating to the Air Cadets, and this year we have the RSGB and British Forces Broadcasting Services to thank for making it possible to have such a good card.

Last but not least, thanks to all the operators who gave up their time to come along and work the rig, to the RSGB for all the literature they once again provided and to Derek, my butcher, for loaning his moving message machine.

Hope to see you all again next year when the RAF takes centre stage.

Ray Degg G0JOD

DEFINITIVE REVIEWS

In July's *The Last Word*, a writer said he considered that the reviews of equipment were really advertisements in disguise and so should be marked as such. Adding that the magazine was breaking the code of advertising in such cases and liable to a heavy fine.

This is not a legal definition but how I see it, and it has been confirmed by the local Trading Standards Office as the way they look at it if they have to consider a case:

A review: An item written by a third party not associated with the firm, manufacturer or supplier and without payment from the forementioned. The 'review' being an independent opinion, or a statement of facts relating to the product. The 'review' can quite rightly state price, availability, source or supplier.

This definition still holds good even if the firm is aware of the review, and perhaps as a 'special favour' to readers of that magazine offers a discount. The fact that the item for review may have been loaned to the reviewer by the firm (or shop) for the purpose of doing the review does not alter the principle.

An Advert: If written to look like a review but written by the manufacturer or supplier (or person in the employment of, or paid by such), then it must be stated as being an 'advert' irrespective of if the space used to print the item is paid for as an advert or not.

Keep up the good work; keeping the members informed as to what is available is, I consider, a valid service.

Malcolm Perry, G8AKX

[I am pleased to confirm that all of our reviews conform to your definition - Ed]

TEST SITE OFFER

A more lovely place you could not live in: wonderful fishing, the views fantastic, in summer a real lamb. In winter another story - a wild lion. I have lived here for three years and I am told I haven't seen a real gale yet - although I have lost my greenhouse and seen a fishing boat broken up on the rocks!

I have now, after years of being QRT, ventured back to ham radio, putting a G5RV up for HF which should stay up, but now have a problem on 2 metres. What do I put up outside? Do any manufacturers out there think their product would stand up to gales of up to 140MPH. I would gladly test even a vertical - free of charge!

But joking apart, before paying out my hard earned cash I would like to hear from other amateurs who have tested 2 metre verticals in these conditions. I think that damage at my particular location would be due to the quick change in direction of the winds, as I can see both the Atlantic and the Minch from my QTH.

Les Norton GM4JNW

[This looks like a challenge to the manufacturers, and I'd be pleased to publish the results - Ed]

QRPERS ISOLATED

It was with great dismay that I read of the choice of 7.030MHz as an IOTA meeting frequency (*HF News*, Sept). I am a QRP operator and, putting aside any hint of 'siege mentality' cannot see how QRP can co-exist on this internationally recognised QRP calling frequency with high power stations bent on increasing their islands score. No 'non-interference basis' working will ever reassure me that I stand a chance of operating with 1 watt to a shortened dipole.

Furthermore many QRP operators use crystal control. My /P rig has ±3kHz of tuning range centred on 7.03. Even my superhet rig has a VXO first oscillator, tuning 7.020 to 7.040; we have to have our 'meet' frequency or this sort of operation is no longer practicable.

By and large we are happy to live with the general cut and thrust on a busy band and cannot, and do not, expect to receive any privileges because of our choice of operation. However, I think this is a move that will blight operation for us particularly during popular operating periods. Perhaps we will get some islands, but I suspect very few.

K J Maxted GM4JMU, G QRP Club 585

HIGHER STANDARD

I rejoice that Mr Buffham (*The Last Word*, September) is not a member of the Norfolk Novice instructors team. Yes, we can learn from the Americans; we should begin by demanding a much higher standard of technical competence before the privilege of a full licence is granted.

David J M Buddery G3OEP, Senior Novice Instructor for Norfolk

Please note that the views expressed in *The Last Word* are not necessarily those of the RSGB. We reserve the right to edit letters for publication. All letters are acknowledged and may be passed to the relevant department or committee.

FUTURE OF AMATEUR RADIO

In these times of change amateur radio seems to be under attack from all directions. I have just heard that the station at the Science Museum is to close in November; this follows news that my own Civil Service Amateur Radio Society Station, and with it our meeting place, is to close, although perhaps these days RSGB cannot influence the latter.

Of interest to a much wider geographical spread, CSARS has for many years run an open-to-comers net every Tuesday, commencing at 1930 on 144.370MHz and transferring later to 3,720MHz. One of our problems, and I understand of other clubs, is an unwillingness by *RadCom* to publicise these nets and this has hit the 2m session hard.

The recent RSGB Morse consultation exercise left aspiring HF amateurs stuck with the need to be able to have fast and accurate Morse. I was incensed that my proposal, akin to the American 'technicians' licence, of a wider qualification with a need only to be able to use slowish Morse, was totally ignored. Surely I was not the only one who suggested this type of approach, or do like-minded people just give up or not join the RSGB, or is UK so very different from the USA?

You will get my drift. Amateur radio needs to have a mix of club members, equipment makers, experimenters, people who take part in Nets and people who use every possible kind of transmission mode and frequency band. If it's to serve its purpose the Radio Society of Great Britain should assist all of these.

Peter H Poole G3ENV

[I was not aware of being unwilling to publish your, or anyone else's net details. However, I will always prioritise news (ie changing) information, as fixed data is carried by the RSGB Call Book *- Ed]*

HIGH PRICE ENTRY

Am I being rather naive when I question the prices charged by manufacturers for their basic entry level radio transceiver equipment?

I am a recently qualified 'B' licence amateur and as yet I do not have any radio equipment. My intentions being to start off with the basics and work upwards as my experience and finances improve. I find that if I chose to buy new equipment I would have to spend at least £200 to have any choice of equipment for 50MHz and above. This compares with £45 for a 27MHz FM CB radio transceiver. I am interested to know what it is that makes amateur equipment more expensive. Is it because manufacturers think radio amateurs are people willing to pay more? Or is it that amateur equipment is four times more complex at the basic level?

Obviously I will have to consider second-hand at the moment, but I feel that with the general opinion that we need to encourage more people, especially the young, into amateur radio, one way to make this easier would be to make the entry level equipment more affordable.

S P Cotterill G7SKK

NO SPOTS ON US

I was saddened to read (*The Last Word*, September) that G3TMA's sole criterion for excellence would seem to be the number of countries contacted, and fail to see the connection with business acumen, organising ability, or character generally. I trust that the remarks he makes concerning the ARRL have no foundation.

We ordinary amateurs, spotty or otherwise, engage ourselves in the many other facets of our hobby, all of which are of equal importance to five-second '5 and 9' QSOs, and I venture to suggest that some of us might even know what the hobby is about.

I do not know why Mr Buffham refers to another group of hobbyists, some of whom are possibly as mature as he is - it would be equally illogical for me to liken country-chasers and certificate-hunters to schoolboys collecting cigarette cards. Whatever happened to the ham spirit and live and let live?

E G Allen G3DRN

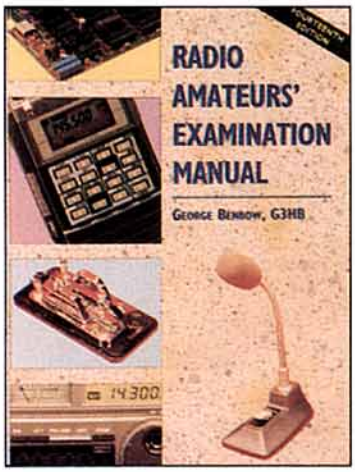
MORE DATA ARTICLES

I enjoyed the article by P N Lewis 'How to use AX25 Packet Radio Nodes' (*RadCom*, July). This is a growth area of amateur radio and there are a lot of new ideas around. In particular, I would welcome articles on: The GB7 network of bulletin boards and the facilities they offer; Trans-Atlantic packet radio and the facilities available in the States; Transmission protocols, including TCP/IP; Transmission of non-text data including data compression and programs like YAPP, KERMIT etc.

R M Boardman G7HCU

[I am already in discussion with our Data Stream *columnist about this -Ed]*

Why Not Spice Up Your Sets Life



Radio Amateurs' Examination Manual

THIS BOOK IS RECOGNISED as the standard textbook for courses leading up to the RAE. It is presented in an easily understandable format and takes you through the course topics step by step. Topics include: solid-state devices, transmitters, receivers, power supplies, propagation and antennas, transmitter interference, electromagnetic compatibility, measurements, operating practices and procedures. Two sample examination papers (with answers) are also included, as well as a refresher guide to basic mathematics.

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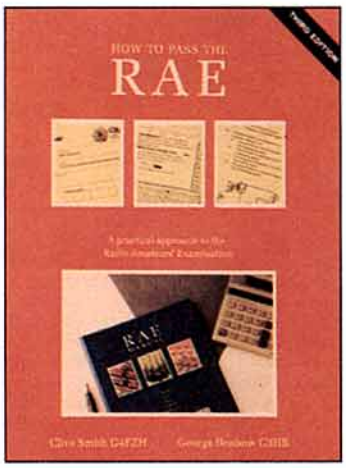

How To Pass The RAE

A COMPANION TO THE *RAE Manual*, this book explains the nature of, and correct approach to, multiple choice questions. The majority of the book is given to sample exam papers so you can familiarise yourself with the exam and assess your ability.

You are also taken through all the necessary stages of preparing for the examination, from finding a college course to the preliminary formalities in the examination room and how to fill in the examination sheet.

Members' price: Only £6.79

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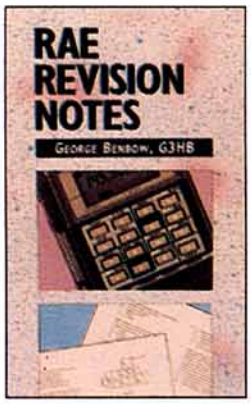

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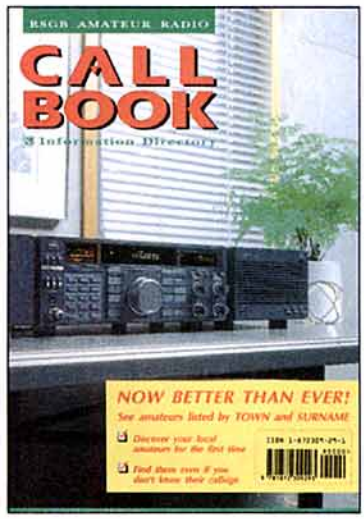

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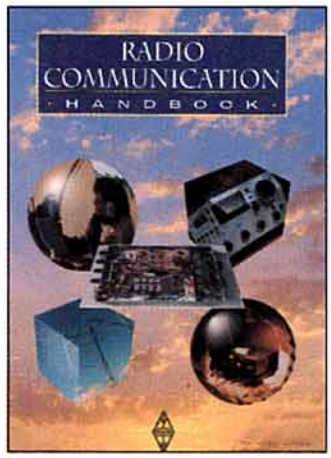

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ADVERTISERS INDEX

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The FT-900AT controls mount almost anywhere in your car, truck or camper. 100 Watt RF deck can mount in trunk, or under seat.

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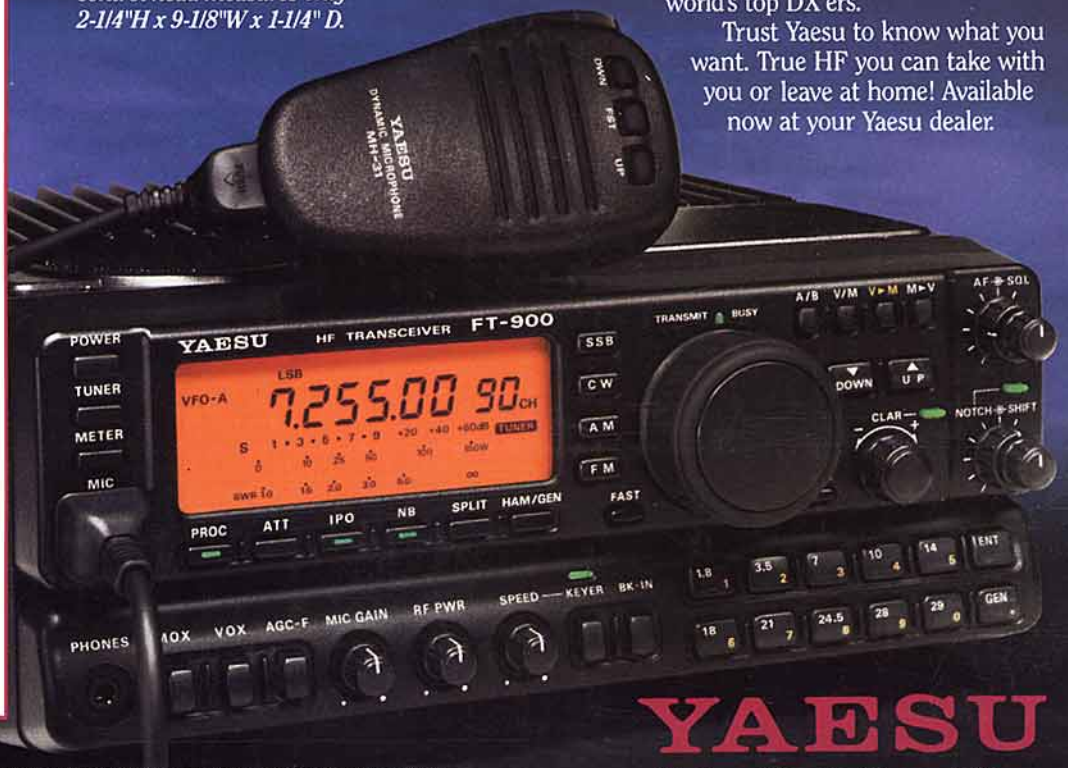

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