Radio Communication

The Journal of the Radio Society of Great Britain

January 1994

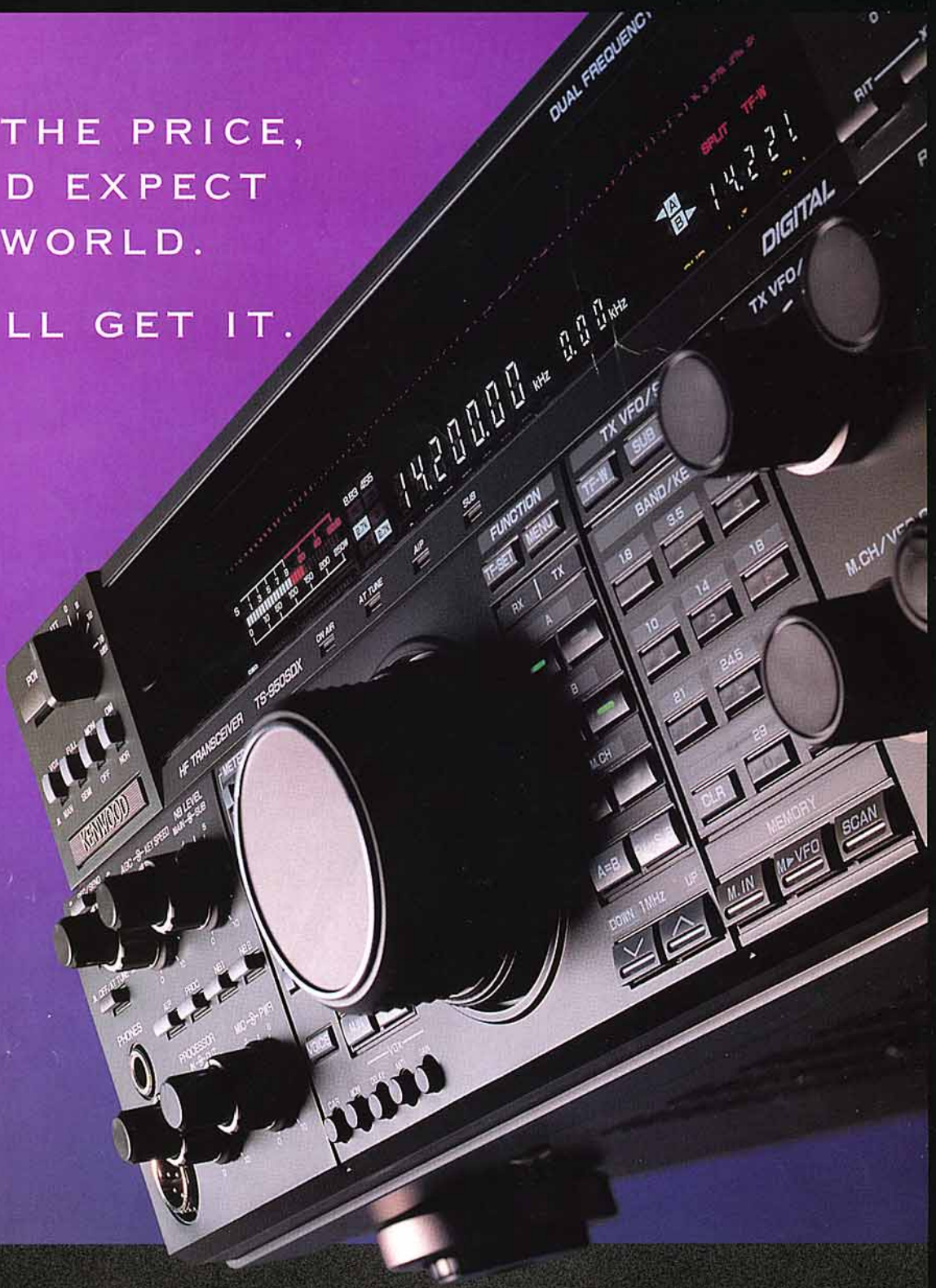
Volume 70 No 1

THE VOICE OF AMATEUR RADIO FOR 81 YEARS

Arthur Milne 1907 – 1993 G2MI

FOR THE PRICE, YOU'D EXPECT THE WORLD.

YOU'LL GET IT.



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Radio Communication

NEWS AND REPORTS

TECHNICAL FEATURES

COVER PICTURE
Arthur Milne, G2MI, dedicated his life to the furtherance of amateur radio, and to the RSGB. His activities were first mentioned in the *T&R Bulletin* in 1926 and he was Senior *GB2RS* News Reader at the time of his death in 1993. Part of this month's *QSL* column features his Bureau work (see page 33). Photographs: G3UMI, G3HCT and RSGB Archives.

REGULARS

REVIEWS

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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UK associate member under 18: £16.00. Family member: £14.00
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:
0707-659015

The RadCom Leader

A New Year Resolution

I HAVE OVER THE PAST few months received a large number of letters from concerned amateurs with regards to the standard of operating throughout the amateur radio spectrum. Below is an extract from a letter I received recently which clearly highlights the problems that many amateurs are encountering:

Earlier today, two of my sons and I were disappointed to hear members of an 80m net swearing during transmissions. Naturally, I called into the net to voice my disapproval. I explained that my eight and five year-old sons had also been listening – expecting the members of the net to acknowledge that such behaviour was not in the spirit of our hobby. My expectations could not have been more different to the events that actually took place. I was told that they (the operators) were all friends and that they would say what they liked, when they liked. It was then suggested by a net member that my sons and I "go and listen somewhere else" – which of course was what we did.

With hindsight, I suppose that I need not have got involved. Perhaps I should just accept that the use of foul language on the amateur bands is just part of a wider social trend, combined with a more liberal approach to the access and use of the amateur radio service. As we know, swearing and smutty exchanges have been commonplace on the 2m amateur band for many years. But it comes as a shock to hear amateurs doing likewise on our cherished low frequency bands.

Not so very long ago, radio amateurs operated their station in a manner which recognised that other people, including young short-wave listeners, were probably monitoring their transmissions. They respected the feelings and values of their 'audience' and phrased their messages accordingly. They had worked hard for their licence and acknowledged that the individual – and the amateur service as a whole – was judged by the way in which the operator presented himself on the air.

With the declining standards of on-the-air protocol, and a lack of adequate policing of the amateur bands. Something needs to be done to bring the miscreants into line. If nothing is done, prospective 'new blood' will find an alternative, more 'respectable' pastime.

As a 12 year-old SWL, listening to 40m phone, I had the privilege of listening to enthusiastic experimenters who 'sold' me amateur radio – just by being there.

Today, my 8 year-old son had the 'privilege' of hearing foul language and a message to go somewhere else.

Clearly a few are spoiling it for many. Profane language in any environment is offensive; over the air it is doubly so. The Amateur Radio Service is self policing, therefore it is up to us all to take the necessary steps to clean up our act.

This is traditionally the time to make New Year resolutions. One of mine this year is to improve my operating standards. May I ask you all to consider the same.

Actions such as those described in the letter will bring amateur radio into disrepute. We cannot afford to let that happen. Please help to improve operating standards. We will all benefit in the end.

Peter Kirby, G0TWW
General Manager

NEWS & REPORTS

● STOLEN: Yaesu FT-730R, Icom IC-240, Three Tiny-2 TNCs with TheNet software, Marconi sig gen TF2005, Marconi mod meter TF2300 battery portable, Cossor 'scope CDU150, and Zetagi Mod430 Power/SWR meter. All items postcoded CF6 1BJ. Any information to GW8HEZ, QTHR.

● THE HUNDRED of Hoo School near Rochester, Kent is a registered City & Guilds RAE/NRAE centre. Details from Peter Carey, G3UXH, on 0634 251443.

● SAKO HASEGAWA, JA1MP, who was the founder of the Yaesu Musen Company died in June, aged 64.

John Forward

JOHN FORWARD, G3HTA, left Council on 31 December 1993 after serving a three year term as an Ordinary Member.

A keen DXer, John served the Society well during his spell in office and worked tirelessly at any task that would best serve the interests of the Society and its members. A good colleague and supporter of amateur radio in all its many forms John will be a difficult act to follow. We wish him well in the future.

This Month's *RadCom*

THERE'S A DIFFERENT look to *RadCom* this month. Firstly, the Band Plans which are normally published in March have been brought forward to clarify the changes made at the 1993 IARU Region 1 Conference. In order to accommodate these 12 pages, some of the regulars have had to be cut down. Normal service will be resumed next month.

Also, there are some permanent changes. The featured technical project can now be found towards the front of the magazine, just after the *News & Reports* pages. And there are other more subtle changes, most noticeably different shaped column logos. I hope you find these enhance your enjoyment of *RadCom*.

Mike Dennison, G3XDV
Managing Editor

All resolutions carried at RSGB Annual Meeting's second successful visit to UMIST

Manchester Meeting Fast and Friendly

THE SOCIETY's Annual Meeting was a success, with over 100 attending a friendly and efficient meeting at Manchester's UMIST.

In the business parts of the meeting – the Annual General Meeting and the Extraordinary General Meeting – all five motions were carried overwhelmingly. During his commentary on the RSGB's finances, the Honorary Treasurer remarked that the Society had been very successful in its aim to balance income and expenditure, and that finances were healthy.

So efficient were the formal meetings that the President found himself giving his review of the year much earlier than he had planned. He spoke mainly of his representation of the Society overseas and of his involvement with international negotiations and lobbying connected with EMC.

Trophy winners were then announced as follows:

The **Ostermeyer Trophy** for the best article in *RadCom* (July 92 – June 93) for home constructed equipment: Bernie Pallett, G3VML, for 'A 2M SSB/CW Transceiver'.

The **Wortley-Talbot Trophy** for outstanding experimental work in amateur radio: Charles and Petra Suckling, G3WDG and G4KGC for their 10GHz activities.

The **Fraser Shepherd Award** for research into microwave applications to radio communication: Andy Talbot, G4JNT.

The **Pilot Officer Norman Keith Adams Prize** for the most original article published in *RadCom* (July 92 – June 93): Bob Pearson, G4FHU, for 'How Big is a Bad SWR?'.

Questions

AFTER THE tea break, the meeting took on a more relaxed air as questions from the floor were taken on a wide variety of subjects including: the clash of the RSGB VHF Convention and the Trafford Rally, aeronautical mobile, the GAM1 beacon, policy on termination of membership by Council, analysis of data on lapsed members, membership without *RadCom* or with *D-i-Y Radio* instead, Raynet, a recent editorial in *Wireless World*, the RSGB Annual Exhibition, SSL's recent policy on lapsed licences, RSGB as licence issuer, range of technical articles in *RadCom*, *D-i-Y Radio* included with *RadCom*, the Codeless Licence survey, and electronic mail or a public database at HQ.

The full Minutes of the meetings will be published in *RadCom* as soon as possible.

MORE NEWS & REPORTS ON PAGE 7

Council Election Result

THE VOTES cast in the election for the 1994 – 96 Council were as follows:

Ordinary Members

J D Forward, G3HTA . . 606
D W McQue, G4NJU . . 266
G R Morris, GW1ATZ . . 184
D A Evans, G3OUF . . . 882
D J Young, G8ZQJ 164

D A Evans, G3OUF, is elected.

Zonal Members

D J Gourley, G0MJY, is elected unopposed for Zone B

C N Trotman, GW4YKL, is elected unopposed for Zone E

F D Hall, GM8BZX, is elected unopposed for Zone G

The number of votes which could not be allowed totalled 146. These were late (30), unidentified (89), subscription in arrears (12), invalid category (8) or spoilt (7).

A full list of the 1994 Council appears on page 4.

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VALID 1st JAN UNTIL 28th FEB 1994

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COUPON VALID FOR PURCHASES MADE BETWEEN 1st January and 28th February 1994.

RAE/NRAE Centre in Peterborough

AS PART OF their commitment to cadet training in radio communication, the 115 (Peterborough) Squadron Air Training Corps now have a City and Guilds approved test centre for the Radio Amateurs' and Novice Radio Amateurs' Examinations.

The schedule for the coming year is as follows: RAE 9 May, closing date for entries 7 March; NRAE 14 March, 6 June and 12 September, closing dates for entries 25 January, 7 April and 25 July respectively. Costs are: £45 to take the RAE and £21 for the NRAE.

Anyone can take the exams at this centre, they do not have to be associated with the ATC in any way. Facilities exist for disabled candidates, too. Enquiries should go to Robert Maskill, G4JDL, c/o 115 Squadron ATC HQ, Saville Road, Westwood, Peterborough, Cambs.

Italy Revisited

LAST MONTH'S article 'CQ – Italia' by GM0IYL was included as a light-weight item for our Christmas edition. It was submitted some time ago and, of course, the licensing requirements have now been superseded by the CEPT TR61-01 agreement whereby a reciprocal licence is no longer needed.

Award

RSGB Member and *RadCom* author Roberto Craighero, I1ARZ, is President of the Sestri Levante ARI Club and he has sent details of the Marconi Tower Award. Ten points are required for the award as follows: five points for working club station IY1TTM which is located at the tower, and a further one point for each of five stations located in the following towns of the Tigullio Gulf facing the tower: Sestri Levante, Lavagna, Chiavari, Zoagli, Rapallo, Santa Margherita Ligure and Portofino. Send a log extract and US$7 or equivalent in IRCs to: ARI Club, POB 5, 16039, Sestri Levante (Genova), Italy.

Just a small part of Martin Lynch's new shop which was filled with well-wishers, young and old, male and female, suppliers and customers, at the official opening on 6 November.

Another Intruder Watch Success

REPORTS ORIGINATED by monitoring stations of the RSGB's Intruder Watch (part of the IARU Monitoring Service) have led to the elimination of an interfering broadcast harmonic on the 14MHz band. The interference was identified as coming from a broadcaster on 7.120MHz so the RA Monitoring Station at Baldock was informed. The RA discovered that the culprit was Radio Russii near Moscow and contacted the appropriate local administration in Russia. Three weeks later a reply was received stating that steps had been taken to eliminate the interference. Intruder Watch stations confirm that the QRM has now gone.

Lapsed Licence Advice

IN A RECENT circular letter, Subscription Services Ltd, who issue amateur licences as agents of the Radiocommunications Agency, stated that if a licence lapses through late payment it is necessary to produce the original pass slips before the licence can be reinstated.

At the Society's Annual Meeting, LAC Chairman John Bazley, G3HCT, reported that the RSGB had protested about this to the RA. It is recognised that, since there has never before been a requirement to produce original documentation, many members will not have this to hand. the Society advises licensees to retain their most recent Validation Document and to use this if necessary as proof of having been licensed.

GB2CW Schedule Updates

SOME CHANGES have recently been made to the schedule for the RSGB's *GB2CW* Morse Practice Service, which is detailed in the *1994 RSGB Call Book*.

For the East Midlands, the *GB2CW* schedule is now: Mondays at 2000 by G4NZU in Nottingham; Tuesdays at 1900 by G0FOG, also in Nottingham; Wednesdays at 1900 by G0NZA who is at Kirkby in Ashfield; and Fridays at 1900, again by G4NZU. All of the East Midlands transmissions are on 145.250MHz using FM.

For South-east England, the *GB2CW* transmissions by G0JMI on Tuesdays and Thursdays have been discontinued. An additional transmission on 433.450MHz on Fridays at 1930 is now being transmitted by G0DQI from Kingsdown, Kent.

Full details of all the other *GB2CW* Morse Practice transmissions are given on page 84 of the *1994 RSGB Call Book*. An up-to-date copy of the schedule is available by sending a SASE to the GB2CW Coordinator David Pratt, G4DMP, 11 Moorleigh Close, Kippax, Leeds LS25 7PB.

Additional volunteers for the Morse Practice Service are invited, particularly from people able to provide national coverage on the 1.8MHz band. Volunteers are also needed for transmissions on the 144MHz band in areas where there is an identified local need. Anyone interested is asked to contact David Pratt, G4DMP (see above).

The RSGB — Working for You

All Raynet Groups, Please Note

WOULD ANY RAYNET Group – regardless of affiliation – which has not already made contact with the RSGB Emergency Communications Officer by packet or ordinary mail please do so as soon as possible.

Information regarding contact names, addresses and telephone numbers is urgently required. Also, the ECO has a number of enquiries/requests for assistance outstanding in a number of areas. He may be contacted on packet (G0MAM @ GB7CHS) or by ordinary mail at: The Emergency Communications officer, PO Box 98, Northwich, Cheshire CW9 5SZ. Please treat this as urgent – your group may be one of those with which contact is being actively sought.

Volunteers' Expenses

AT THE ANNUAL General Meeting, a breakdown of volunteer expenses was requested for the financial year 1992/93. As promised at the meeting, the Honorary Treasurer, Richard Horton, G4AOJ, has provided the following for publication:

Council expenses	£20,418
Committee expenses	£36,774
Other	£3,268
Total	£60,460

The figure for committee expenses includes all the Society's committees (around 20). The two largest items, as you would expect, are the Finance and Staff which is responsible for the running of HQ, and Membership Liaison. These two account for just under half the total of £36,774.

The expenses include room rental where meetings take place outside of Potters Bar, travelling and subsistence and office-type expenses such as photocopying, postage and stationery. Committee and Council members are volunteers and receive no remuneration for their services.

'Other' includes items such as the propagation beacon GAM1, the costs of the Audio Visual Library and sundry expenses of personnel such as RLOs.

● THE RSGB was represented at a reception at St James' Palace in London. It was held for all those associated with the record-breaking Fiennes and Stroud South Pole expedition.

AROS Under Review

FOR MANY years the the Amateur Radio Observation Service (AROS) has actively monitored the frequencies allocated to the Amateur Services, primarily to alert amateurs to unintentional mistakes in the use of facilities specified in the RA's Terms, Provisions and Limitations booklet *BR68*. In recent years the role has also included the collection of data relating to deliberate jamming and contraventions of the Wireless Telegraphy Act. AROS has a totally different role to the Intruder Watch which monitors unauthorised transmissions in the exclusive Amateur allocations.

The Society wishes to acknowledge and record its appreciation for the work done by Geoff Griffiths, G3STG, and a fairly small band of observers and in recent years the assistance they have given to the Radiocommunications Agency (RA).

There has been, amongst the amateur community, a considerable amount of discussion on the effectiveness and approach of AROS. Council has considered this and has now decided that it is time to review the structure and role of AROS. Consequently the current AROS organisation has been dissolved. In the meantime any urgent reports should be addressed, c/o RSGB Headquarters, to the Chairman of the Repeater Management Group or the Licensing Advisory Committee, as appropriate.

A working group will be formed to examine the role of AROS within the Amateur Service in the light of changing technology and patterns of activity. It will examine, amongst other things, the American system of Official Observers, the issues of anonymity, and how any future organisation should interact with the Authorities.

Tokyo 10m Rig is OK to Use

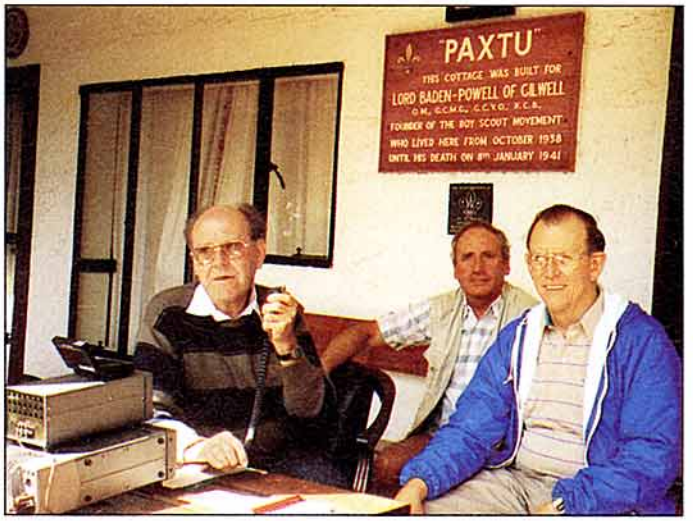
FOLLOWING THE *News & Reports* item 'Single Band 28MHz Equipment' (*RadCom*, July 1993, p 7), the RA have advised us that they did, in fact, issue a permit to a London based firm in 1988 to import the Tokyo single band 28 – 29.7MHz (10 metre) amateur transceiver.

This particular set can therefore be freely purchased and used in the UK by amateurs without the need to obtain from the Agency and individual authority for importation.

Queen Elizabeth II On Air

FOR THE FIRST time, there will be HF amateur radio operation on the liner *RMS Queen Elizabeth II*. The ship's Principal Medical Officer Dr Andrew Eardley, G3UXO, will test the station over the Christmas and New Year period during the QE2's Caribbean Cruise and then operate throughout a World Cruise which commences on 3 January from New York. The liner returns to New York on Wednesday 13 April, having circumnavigated the globe.

Equipment in use will be a Kenwood TS-850SAT and a magnetic loop antenna supplied by AA&A Antennas Ltd in a special marine weatherproofed version. Operation will be on SSB on the bands 14MHz and above. Due to the demands of Andrew's paid job, he cannot give dates and times of operation but he will be on the look-out for UK and US stations in particular. If the operation is a success, there may be another. QSL cards, carrying a picture of the ship and endorsed 'QE2 World Cruise 1994' are likely to become collectors' items.



One of the three Jamboree On The Air stations provided by the Radio Society of Kenya was this one, 5Z4LBP. Located at 'Paxtu', the cottage in which Lord Baden Powell spent the last three years of his life, the station contacted 43 JOTA stations in 22 countries. Operating are (l to r) Goran, 5Z4XW; Don, 5Z4FN; and Bill, 5Z4BP.

Midlands Air Ambulance Appeal

FOURTEEN AMATEUR radio clubs from the Midlands will be cooperating this month in order to raise money for an air ambulance, an MBB B0105 helicopter based at Cosford, Wolverhampton. The service, which is funded entirely from public subscription, provides a very cost effective and rapid response to emergencies.

A number of special event callsigns using the suffixes CAA, FFL AAS and AA (see also page 89) will be active from 0900 on 29 January to 1800 on the 30th, using HF and VHF.

An award is available for working four participating stations (only one station is needed for overseas applicants). The cost of the award is £2.50 and applications should be made to Geoff Woodford, G0KNM, QTHR, from whom event details can be obtained.

New 2m Data Comms Frequencies

THE RSGB's Data Communications and VHF Committees recognise that the recent changes to the 144MHz band plan (see this month's supplement and *VHF/UHF News*) may cause inconvenience. It has therefore been decided to change the effective date of the new arrangements to 1 February 1994. It is emphasised that anybody planning to use the new frequencies for packet radio should first consult local users of these frequencies.

North Wales EMC Coordinator

THE TELEPHONE number of Dr Chris Barnes, GW4BZD, is 0248 671428. He is one of the Society's EMC Coordinators for North Wales.

New LAC Chairman

PETER CHADWICK, G3RZP, is to be Chairman of the RSGB Licensing Advisory Committee from 1 January. He takes over from John Bazley, G3HCT, whose second stint as Chairman has lasted four years. John will continue his involvement with licensing as the committee's Minutes Secretary.

The Society would like to thank John Bazley for his hard work in this essential role. All radio amateurs, whether members of the Society or not, have benefited from his efforts as LAC Chairman.

DARC Prize

RUDOLPH HORKHEIMER was one of the first radio amateurs in Germany and his name is a synonym for "the active amateur who earns merits of amateur radio in a selfless manner", according to a press release from the German national society DARC.

The prize bearing his name can be awarded to one or more people, or a group, and is not restricted to members of DARC. Any member of an IARU national society is entitled to be nominated. The winner will receive an etched glass plate together with prize money which *must* be spent for the advancement of amateur radio.

Proposals containing the name and address of the nominee (you cannot nominate yourself!) and information supporting the nomination must be submitted by 31 January to: Referat fur Technologie des DARC, Prof Dr Hans-Hellmuth Cuno, DL2CH, Birkenstraße 11, D-93164, Laaber, Germany.

The prize will be awarded at HAM-Radio 1994, Friedrichshafen. See page 89 for details of how you can visit the show.

STELAR is Born

A NEW ORGANISATION will be launched this month. The Association of Science Education meeting at Birmingham University 7 – 9 January sees the birth of STELAR (Science and Technology in Education through Links with Amateur Radio) which is designed to stimulate the teaching of science and technology in schools and colleges by promoting all aspects of amateur radio use. For further information, fax Richard Horton, G3XWH, on 0423 568893 or those attending the Meeting can visit the RSGB stand.

FIRST IMPRESSION

PACKAGE PRICE PROMISE

The old adage a leopard never changes his spots, is very true. The only IMAGE we've changed at Martin Lynch is the size of the showroom! Moving to much larger premises has enabled us to hold even more stock, with even more choice. What hasn't changed is the courteous service, after sales back-up and customer care. Prices too, haven't changed, they're still the most competitive in the country. If you see your new rig advertised at a better package deal elsewhere, but would rather have 'peace of mind' buying from someone who has always cared, then give my sales team a ring. If it's a genuine quote, we'll match it.

Wouldn't you rather buy from Martin Lynch?

Second Hand Equipment

People print lists. Little lists. If you want to see 1650 sq ft of space crammed full of good clean gear, then call in. If you're overseas or can't make the journey then send for your FREE LIST. It goes on & on & on... Yes it is all guaranteed, yes we can offer INTEREST FREE ON MOST OF IT, (Many part time companies cannot), and we will willingly take other goods as trade in. We are still collecting clean used gear FREE OF CHARGE IN THE U.K., (if you've got the original packing), so get dialling for a quote and our courier will be around the same day.

Due to the increase in space, we now have a very large selection of books on show. With titles from the RSGB and many other publishers, you will be sure to find the title you are after. PW & Short Wave are also available!

Try before buying, make full use of our EIGHT demonstration benches.

Martin's January Bundles

MID TO UPPER RANGE USER

Yaesu FT990DC

Buy a brand new FT990 100W HF base station and we'll throw in a matching MD1-C8 BASE MICROPHONE! - and let you pay for it OVER A WHOLE EIGHTEEN MONTHS, FREE OF INTEREST!!

Deposit only £468.00, with eighteen payments of £79.50, total £1899. ZERO APR.

Kenwood TS-850S

With or without Auto ATU and three years after it's introduction, read Rob Mannion's report in this issue to see why the men at KENWOOD are pleased with themselves. Similar spec. to the Yaesu FT990, the choice is yours - they're both excellent! Add £149 for the auto atu.

Deposit only £439, with 18 payments of only £70.00. Total £1699. Zero APR.

Ideal for the starter or second station

Yaesu FT840

The latest HF all band transceiver from Yaesu. Looks like an FT890, without a few of the trimmings. *free Yaesu microphone included in this one!* Include a good 13.8V supply and a VCI antenna tuner plus a 1/2 size G5RV antenna and you are away!

Deposit only £325, with only twelve payments of £66.25. Total £1120.00 ZERO APR.

MID RANGE HF OPERATION

Icom IC737

I said it was good before Peter Hart & Rob Mannion did. If you want names, I've got plenty. Satisfaction comes guaranteed with this one. 100W of pure HF power and a synthesiser that's smoother than Roger Halls head! With a free matching SP21 speaker worth £65 !!

Deposit only £409, with twelve payments of only £95.00 Total £1549.00 Zero APR

Kenwood TS-690S

Either with or without six metres, the TS450/TS690 is the ideal mid-ship package. Offered with a 13.8V 20A power supply, you can have one in your shack soon!

Deposit €439.00 with twelve payments of only £105.00. Total £1699. Zero APR

MOBILE & PORTABLE H.F.

Kenwood TS-50S

It broke all records when it was introduced and it still has no competitors. The TS-50S really does push out a cool 100W, covers 500khz-30mhz and operates on all modes. Buy one during December & January and we'll include the carriage - free!

Deposit £195, with twelve payments of only £66.66. Total £995.00 Zero APR.

Icom IC707

Yes, you're right, Yaesu did have a 707. But that was 11 years ago and that was an FT. For simple operation on H.F. with Icom's unrivalled performance, try the NEW IC707 for size.

Deposit £195, with twelve payments of only £50.00. total £895.00. Zero APR.

DUAL BAND VHF

Yaesu FT530R

The very best in Dual Band Handie operation. The only thing to change on this one is the price. YAESU U.K. have bought it DOWN!! So have I... Dual RX, extended receive, auto repeat, it's got it all including CTCSS. Buy one on FREE FINANCE and claim your FREE YAESU EXTRA ACCESSORY worth loadsa money!!!

Deposit £99.00 with twelve payments of only £33.33. total £499.00 Zero APR

ICOM IC-W21ET

For those of you that don't like all the buttons, then maybe the IC-W21E, (without KeyPad), is the one for you. Lots of trick functions and easy to operate. Excellent value for money.

Deposit £49.00 with twelve payments of only £33.33. Total £449.00 Zero APR.

Kenwood TH78E

Still one of the best selling Dual banders, the TH78E comes complete with nicads, charger & antenna. The only Handie with "Alpha-Tag" for memories.

Deposit £89.00 with twelve payments of only £33.33. Total £489.00. Zero APR.

Alinco DJ-580

Setting the standard for dual banders, Alinco have helped keep the prices down and given you more features at the same time! Free case and INTEREST FREE?

Deposit £79.95 with twelve payments of only £33.33. Total £479.00 Zero APR.

SINGLE BANDERS

NEW!!

Yaesu FT-11R & FT41R

The very latest on the single band scene, Yaesu have introduced two new Handies for either 2M or 70CM. These include full "paging" facilities, extended range, (with AM AirBand RX for the FT-11R) and a host of other features. Truly palm size, these two will set the standards for other one banders.

Deposit £39.00 with twelve payments of only £22.50. Total £309.00 (FT-11R)

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

140-142 NORTHFIELD AVE

S RULE THE MIND

USE YOUR YAESU CASH BACK COUPONS HERE

Excellent savings on all Yaesu, Kenwood, Icom, Alinco and other well known brands, extended low or zero interest finance, even "buy now pay later" schemes are available across the entire range of products over £200.

Gift Vouchers

If you haven't bought your partner, friend or relative a Christmas present, then why not treat them to a Martin Lynch GIFT VOUCHER. At only £25 each, there is no time limit and you can add to it whatever you like. Postage is FREE and they're available now! Payment by credit card, cash, cheque or real money!

Alinco DJ-180

Still leading the field in simple to use "I should own a 2M handie" bracket. No frills just great value. C/W Nicads & charger etc.

Deposit £38.00 with twelve payments of only £16.75. Total £239.00 Zero APR.

Icom IC-2iE/4iE

Still the smallest single bander on the market next to the TH-22, this machine really is the size of a packet of cigarettes!

Deposit £48.00 with twelve payments of only £16.75. Total £249.00 (IC-2iE)

Kenwood TH-22/44

The very latest in "pocket" two way. Remember the TH-217 this is the nineties version. No fiddle bits, just 100% FM Communication.

Deposit £38.00 with twelve payments of only £16.75. Total £239.00 (TH-22)

DUAL BAND MOBILES

Yaesu FT5200

The only Dual bander with a quick release front panel. Down in price and up in spec! All FT5200's sold in January will have wide band receive and a free remote mounting kit! Plus Interest Free!

Deposit £148.00 with twelve payments of only £41.75. Total £649.00 Zero APR.

Kenwood TM-732E

Sells faster than Brenda used to hand out her coffee! A Dual Bander with everything, including remote panel facility. Free wide band RX. (If you talk to Chris or Tony nicely)

Deposit £158.00 with twelve payments of only £44.25. Total £689.00 Zero APR.

VHF MULTI-MODES

Yaesu FT-736R

We sold hundreds last year and that's no wind up. With or without muTek. I'll offer you a deal on this one that will make your BNC's drop off! You thought the mob down south were giving you a deal - forget it! For genuine buyers call into the shop. I won't quote a price on the phone, so get travelling.

Deposit £ to obscene to print. Monthly payments £ complete bewilderment!

Kenwood TS-790E

The favourite amongst DXers. Dual band 2/70 with a 23CM option. It's full 45W output on 2/70 is first rate as is the receiver.

Deposit £469.95 with twelve payments of only £115.00. Total £1849.95 Zero APR

Icom IC970H

When Icom build something to beat everyone else, they sure do it in style! You may have to trade in the kids, but who cares! You want the best? Then you can have it and pay me over a whole 18 MONTHS - FREE FINANCE !!

Deposit £670.00 and eighteen payments of only £110.00. Total £2650 Zero APR

Yaesu FT290R mk11

I remember when these 2.5W transportable 2M multi-modes were the starter's dream. Then someone jacked the price through the roof... well it's back down to earth again and I'm giving FREE Nicads & charger and FREE FINANCE!!

Deposit £99.00 with twelve payments of only £33.33. Total £499.00 Zero APR.

Yaesu FT790R mk11

Just like the FT290, if you're a NOVICE and want the ultimate in 70CM multi-mode communication, Yaesu and my new price is a real winner! O.K. so you'll still get FREE NICADS & CHARGER in the deal!

Deposit £110.00 with twelve payments of only £40.75. Total £599.00 Zero APR.

Icom IC-275H/475H

The best in single band 100W base stations! A deal offering you either on a specially extended 18 month free finance offer for January only!

Deposit £389.00 with EIGHTEEN payments of only £55.55. Total £1389 (IC275H)

RECEIVERS

Yaesu FRG-100

Remember when Yaesu introduced this excellent "second receiver" for the shack and then the price shot up? Well I've got fifteen pieces at a give-away price AND you can still buy on FREE FINANCE!!

Deposit £99.00 with twelve payments of only £33.33. Total £499.00 Zero APR.

The full range of MFJ Products are now in stock

Here are just a few examples of their unbeatable range:

MFJ-249 Digital SWR Analyser	£229.00
MFJ-1786 Super Mag. Loop	£299.00
MFJ-949E Antenna Tuner with load	£169.00
MFJ-948 Antenna Tuner	£149.00
MFJ-1278BX All mode Packet Controller	£339.95

Antenna, Cables and Accessories

Moving to a bigger premises means loads more hardware. the full range of Yaesu Rotators, coax from all the best manufacturers, antenna mounting hardware, including Chimney lashings, poles, clamps, rawlbolts, we've got it all. Include antennas from: Diamond, Comet, Create, Tonna, KLM, CushCraft, Capco, Outbacker, DeeComm, Sandpiper, Panorama, the list is endless. Mail Order no problem.

Vectronics VCI Antenna Tuners

Direct from Canada, the antenna tuners from Vectronics offer incredible value. Most buyers say they couldn't be bothered to run round and get all the bits at these prices!

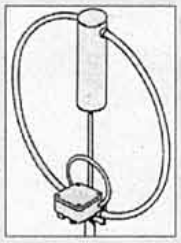
VC-300DLP
300W ATU with metering, PEP, Dummy Load, Bal/Unbal + open Wire £149.95
HFT1500
3KW ATU, version of above, without Dummy Load. £399.00

Packet & Decoders

Moving to a larger premises has also enabled us to show off our massive range of new & used datacomms equipment. Here is just some of the range stocked:

AEA PK-900	£549.95 Free Finance!!
AEA PK-232MBX	£385.00 Free Finance!!
AEA PK-88	£169.95
Tiny 2 TNC	£139.00
KAM	PHONE!!
KPC-3	£139.00
MFJ 1278	£339.95
Universal M400	£399.95
M900	£529.00
M1200	£399.95
M8000	£1279.00
Momentum	
MCL 1200	£229.00
ERA Microreader	£189.00

STOP PRESS !!!



As from the first of January, Martin Lynch will be able to supply the full range of Tony G4OGP's AA&A 'CAPCO LOOPS'. For years my customers have been telling me how good they are. I've recently visited many owners who've been using them and the results are staggering. Whether you're using a FT747 or a top flight FT1000, if the space is limited, try the new range of CAPCO LOOPS for yourself. For a limited period I'm offering them on interest free, it couldn't be easier!

Magnetic Loops
AMA-3 200W 13.9 - 30 Mhz
AMA-4 100W 1.8 - 4.2Mhz
AMA-5 150W 3.5 - 11Mhz
AMA-6 150W 6.9 - 24Mhz

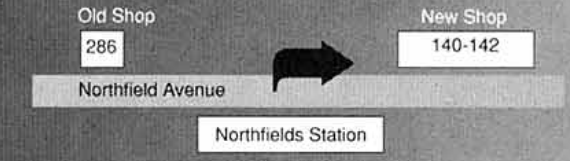
Antenna Tuning Units
SPC-300D Roller Coaster, 300W RMS, 1kW pep
SPC-3000D Roller coaster 1kW RMS, 3Kw pep

VFA
Variable frequency antenna

And don't forget the high power range of baluns, all ratio's.

Telephone 081 566 1120

FAX: 081 566 1207



By Tube, still the same Piccadilly line and get off at Northfields, but turn RIGHT, (instead of left for the old shop), walk less than five hundred yards and the showroom is on your left hand side. For those of you who know RUPERT'S Vintage Wireless shop, we're opposite! By car, much the same as before, i.e the same road, still between the M4 & the M40 motorways. Phone for precise details.

HOW TO GET HERE

NEW OPENING HOURS!!
Monday - Saturday
9:30 till 6:00,
late night shopping
Thursdays, till 8 o'clock

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(PICKETTS LOCK)

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Edmonton,
London N9

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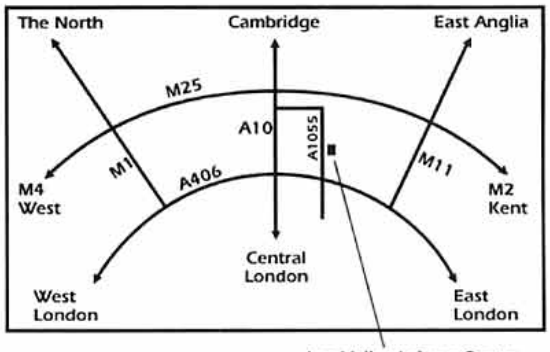
Lee Valley Leisure Park



By public transport, take bus W8 from Edmonton Green BR station

RadioSport Ltd,

126 Mount Pleasant Lane, Bricket Wood, Herts AL2 3XD

The London Amateur Radio & Computer Show is presented by RadioSport Ltd, in co-operation with the Radio Society of Great Britain and Southgate Amateur Radio Club

THIS MONTH'S LEADING PROJECT

The Yearling Beginners' Receiver

A simple radio for 20m and 80m by Paul Lovell, G3YMP

READERS WILL BE familiar with the RSGB's beginners' magazine *D-i-Y Radio*. Back in 1992, a simple 20m receiver was designed to mark the first birthday of the magazine, hence the name 'Yearling'. It had to be easy to build, with good performance and a reasonably low component count. Also the parts had to be readily obtainable. The circuit is shown in **Fig 1**.

The Yearling proved so popular, that a follow up article was written to add coverage of the 80 metre band, using a simple front-end filter. Sensitivity is good enough for just a short length of wire and this is helped by independent control of RF gain and front end tuning.

BACK TO BASICS

DIRECT CONVERSION WAS the first option considered. This type of receiver has the merit of simplicity, but unless carefully designed *and* constructed, can suffer from problems such as strong breakthrough from broadcast stations on nearby frequencies. Also, a stable VFO at 14MHz, whilst certainly not impossible, is not something to be under-

continued on page 16 ▶

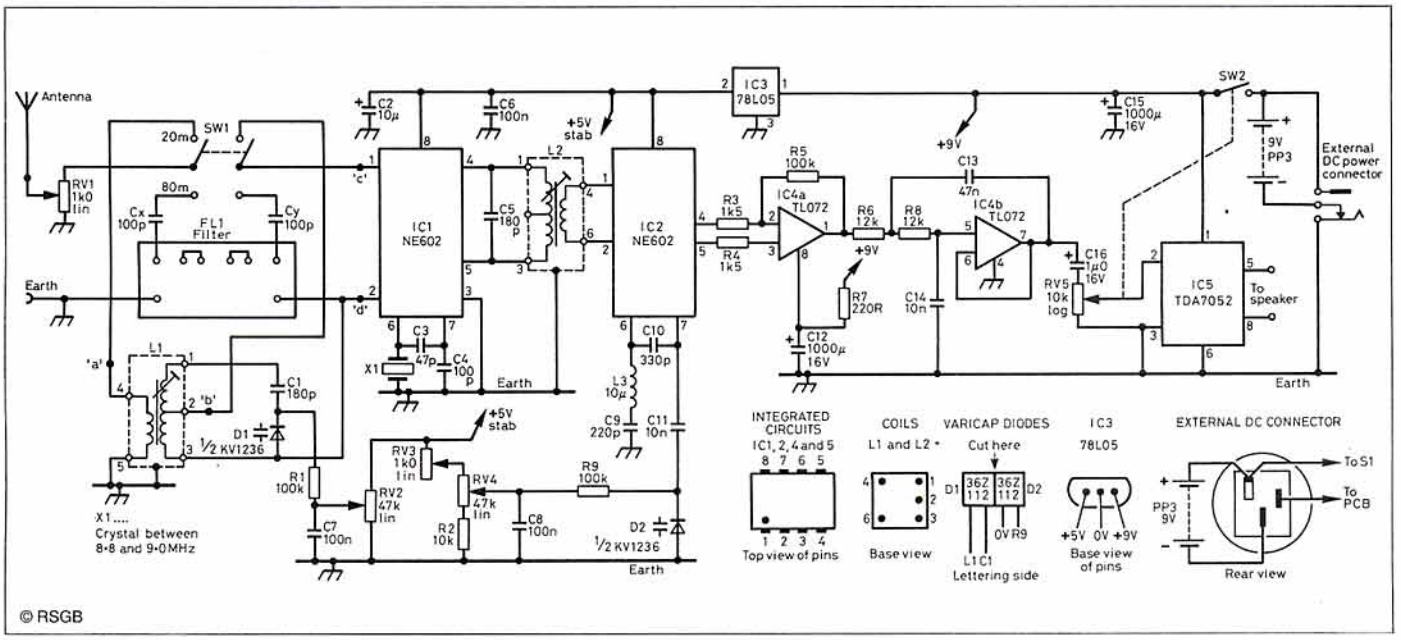


Fig 1: The Yearling receiver gives good performance, as well as being simple to construct and align.

NEVADA

NE
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STARTEK
FREQUENCY COUNTERS

New ATH™ Series – say goodbye to random counting and false readings. A new range of advanced, inexpensive portable counters from the USA. All come complete with telescopic antenna and UK power supply. Hands-free operation, automatic read and hold signal within 80ms. One-shot feature for lock and display.

Model ATH-50
5Hz – 2800MHz, one shot, high speed £289

Model ATH-30
1 – 2800MHz, one shot, high speed £269

Model ATH-15
1 – 1500MHz, high speed, auto drop-out £199

Model 1350
1 – 1300MHz, 3 gates, economy model £129

New AOR General Coverage Receiver AR3030

A revolutionary classic Short Wave Receiver with hi-tech Direct Digital Synthesizer design and Collins mechanical filter inside. We will be one of the first to stock these receivers – ring for latest delivery and price information.

EXCLUSIVE! NEW VIDEOS ON AMATEUR RADIO

Getting Started in ...

Ham Radio	£19.95
Packet Radio	£19.95
Amateur Satellites	£19.95
DX-ing	£19.95
Radio Clubs – buy all 4 for the price of 3	£59.00

NEW FULLY ADJUSTABLE HANDHELD STAND

Neat and simple!
Complete with fly-lead and BNC.
An ideal accessory

£19.95

CHEQUE NOW - PAY LATER

SEND 3 CHEQUES TODAY..... AND HAVE ONE OF THESE TOMORROW

ICOM 737

LASTEST HF RIG with auto ATU.
★ 100W output
★ Gen. cov. receive
★ Excellent performance

Price £1495

1st cheque = £499
2nd & 3rd cheques = £498 each

YAESU FT-5100

Twin band mobile 2m/70cm
★ Dual receive
★ 50W output
★ Small, neat design
★ Easy-read display

Price £499 SAVE £200

1st cheque = £167
2nd & 3rd cheques = £166 each

ADI AT48-70cms Handheld

NEW MODEL

★ Ideal for novice user
★ DTMF pager option
★ Ext. DC power socket
★ c/w 2 battery cases

Price £199

1st cheque = £67
2nd & 3rd cheques = £66 each

KENWOOD TS-50S

Micro-sized 100W HF Rig
★ Programmable function mic
★ 100 easy-use memories
★ Matching auto ATU
★ All mode – inc. FM
★ Best p/x price on your old rig

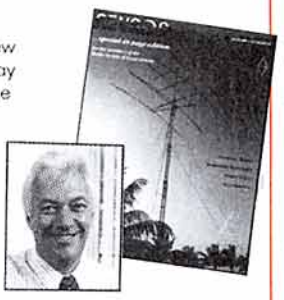
Price £999

1st cheque = £333
2nd & 3rd cheques = £333 each

G7EDI WINS!

Mr. Hugh Thurgood, G7EDI, of Sandsacre, Bridlington was our second PRIZE DRAW winner. Hugh has already received his MS1000 VHF/UHF Scanning Receiver. Thank you, Hugh.

The NEVADA/RSGB exclusive catalogue continues to be a great success, with members constantly on the phone, discussing the merits of products that have caught their eye. We have just a few copies left for those who may have mislaid their's. Just give us a call.



73

Mike Devereux
G3SED

FROM AUSTRALIA WE INTRODUCE . . . OUTBACKER

Outstanding new mobile antennas from Australia. A commercial design, proven in the Outback for 22 years. If you are going mobile, this antenna is all you will need. The Outbacker covers from 160 thru' to 10m, inc. WARC bands, without the need for an ATU. Catch Paul GOAFF using his on top band and 17m!

OUTBACKER
1.7m long, 300W 80 thru' 10m.. **£189.95**

OUTBACKER (T)
As above but inc. top band..... **£219.00**

OUTBACKER JNR.
1.2m long, 100W, 80 thru' 10m.. **£179.95**

PERTH
2.1m long, 300W, 80 thru' 10m.. **£199.95**

PERTH (T)
As above but inc. top band..... **£235.00**

HEAVY DUTY BASE SPRING £59.95

NEW TS ANTENNAS FOR VHF/UHF

TSM1002, 144MHz mobile	**£22.95**
TSM1309, 2/70cms mobile	**£29.95**
TSM1022, 70cms mobile	**£19.95**
TSM1316, 2/70cms mobile	**£21.95**
TSM1339, 2/80cms mobile	**£26.95**
TSB3002, 144MHz base	**£39.95**
TSB3301, 2/70cms base	**£79.95**
TSB3603, 2/70/1200 base	**£99.95**
TSB3302, 2/70cms base	**£69.95**

EXTENDAMAST

10m Retractable Mast, suitable for dipoles, long wires, VHF/UHF beams, G5RV, and many other antennas. A new and expensive aluminium retractable mast for home and portable use. Erect in minutes. Includes steel guy-rings for your own individual guying requirements (guy wire not included). A base plate is available as an optional extra.

Introductory price £69 + £8 p&p

VECTRONICS SPECIAL OFFER

– only £129.95 + £4.75 p&p
- Canadian-built ATU
- 1.8 – 30MHz
- 150W & 300W PEP
- 300W dummy load
- Dual reading SWR/PWR
- 3-way antenna switch

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NEW VHF MODELS

2 MTR ADI MODEL AT-18 HANDHELD

A new fully functional handheld with direct keypad entry and LCD display. All the usual facilities are included, tone burst, memories, ext. spkr. mic sockets, optional CTCSS and DTMF pager boards. Each radio comes c/w 2 empty battery cases, carry strap, belt clip, rubber duck antenna.

. . . selling fast

RF Output 5W with 12V DC

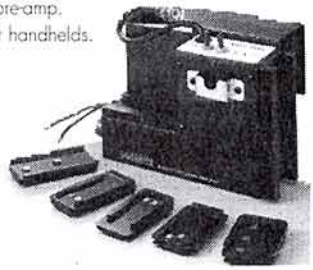
£179.00

144 MHz DOCKING BOOSTER

MODEL NBC-50R

50W RF output with built-in 18dB GaAs FET pre-amp. Supplied with a range of adaptors for popular handhelds.

Introductory price only £99.95



MOBILE AMPLIFIERS

A complete new range of economically priced 2m amplifiers each with built-in 18dB GaAs FET pre-amp.

NB-30R, 2m 35W Amp **£69.95**
NB-50R, 2m 65W Amp **£99.95**
NB-80R, 2m 100W Amp **£119.95**
NB-100R, 2m 110W Amp **£149.95**

NEW PRODUCT!

THE NOISE KILLER!

The advanced, Digital Signal Processor Noise Filter newly arrived from TIMEWAVE TECHNOLOGY INC.

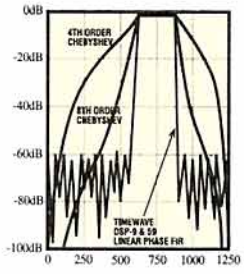
Eliminate hetrodynes, reduce noise and interference. Produces razor sharp audio!

TW DSP-9 CW/SSB Filter
Designed for the ham who wants CW and SSB, the easy-to-operate TW DSP-9 features selectable switching between 1.8, 2.4 and 3.1 khz SSB filters, and between 100, 200 and 500 Hz CW filters.

DSP-9 **£169**

TW DSP-59 Multi-Mode Filter
With 320 filter variations, the unique TW DSP-59 has filters for all operational modes the amateur may encounter including RTTY, SSTV, AMTOR, PACTOR, HF, Satellite, EME, SSB, CW, AM and weak signal VHF.

DSP-59 **£299**



TRADING POST

We buy as well as sell new and used radio equipment, please feel free to call Paul or John on our Hotline for an instant quote on either P/X or Buy-Ins.

HF Transceivers

Drake TR7+PS7 PSU/MS7 Spkr	£1125
Icom 701 HF and matching PSU	£545
Icom IC725 mobile HF	£625
Icom IC730 mobile HF TX	£495
Icom IC737 ex-demo, as new	£1325
JST 135 HF TX/RX 150W PEP	£775
Kenwood TS430/S HF TX	£675
Kenwood TS530/S HF TX	£549
Kenwood TS940S AM, Mems (ATU)	£1495
Sommerkamp FT101ZD	£495
Tokyo HX240 2m-HF transvertor	£185
Tokyo HT115 15m monobander	£195
Yaesu FT One HF base TX	£1050
Yaesu FT707 HF mobile TX	£475

Hand-helds

Alinco DJ560 dual band handie	£340
Alinco DJ580 dual band hand-held	£385
CTE Sender 145 2m hand-held and nicad	£155
Kenpro KT22 2m hand-held, vgc	£115
Kenwood H215 2m hand-held	£135
Kenwood TH26 2m hand-held, boxed, vgc	£155

Mobile Transceivers

Icom IC28E 2m mobile TX/RX	£185
Kenwood TM221E 2m 25W mobile	£215
Standard C5800 2m mobile RX/TX	£195
Standard C7800 70cm mobile, 25W	£185
Ten-Tec Scout 40m mod. ex-demo	£499
Yaesu FT227 memoriser 2m mobile	£185
Yaesu FT230R 2m mobile, boxed	£175

Scanning receivers

Alinco DJ-X1 hand-held, vgc	£215
AOR 2100 base scanner 20 channels	£199
AOR AR1000 hand-held, 1000 channels	£185
Bearcat 200XLT hand-held, c/w 900MHz	£165
Fairmate HP100 scanner	£175
FDK TM568 2m. Xtal receiver	£65
Icom R100 mobile scanning RX	£425
Kenwood RZ1 mobile scanner	£315
Yaesu FRG9600 scanning RX	£365
Yupiteru MVT-7100 almost new	£315

Shortwave receivers

Drake R8E "as new" condition	£750
Icom IC71E shortwave receiver	£675
Kenwood R2000 RX+VHF conv	£525
Lowe HF225 c/w keypad RX	£395
Sony SW55 portable RX	£219
Trio JR500/S basic S/W RX	£95
Trio R1000 general coverage receiver	£295
Yaesu FRG7 RX, old but faithful	£195
Yaesu FRG7700 digital S/W RX	£425
Yaesu FRG7700 shortwave RX	£395

Station Accessories/Microphones/ Amps/Speakers

Adonis AM508 desk mic, boxed	£75
Microwave modules 144/100S	£95
Microwave modules 2m transvert	£85
Microwave modules 70cms transvert	£95
Nevada TM1000 high power ATU	£75
Tokyo HL1K/6 6m high power amp	£695
Vectronics VC300 ATU+pwr mtr	£85
Yaesu FL2000B HF amplifier	£350

Call us now – even if we haven't listed your radio, for what we know to be unbeatable P/X deals.

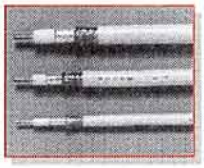
PAY BY POST DATED CHEQUES – INTEREST FREE

Simply divide the price into 3 equal payments. Write 3 cheques dated in consecutive months starting with todays date. Write your telephone number and cheque card number/expiry date on the back of each cheque.

Post them to us enclosing your name & address and we will (subject to status) send your goods immediately.

The hardest part is deciding what to buy!

LOW LOSS CABLE



Superb Japanese low loss cable with aluminium foil and braid double earth screening, tough weather resistant yet flexible. Fantastic low loss – suitable for high power and frequencies up to 3GHz.

5D-FB (8.1mm – 0.055dB/mtr)	£0.75/mtr
8D-FB (11.1mm – 0.039dB/mtr)	£1.79/mtr
10D-FB (13.1mm – 0.031dB/mtr)	£2.75/mtr

Losses quoted at 100MHz

EARTALKER

A completely new concept in microphone technology. The Eartalker is a combination of earphone and microphone which is worn within the ear. It provides outstanding transmitted audio quality and is suitable for all leading brands of hand-held (Call for details on your particular model). Separate volume, PTT switch and control box..... **£29.95**

SHOWROOMS: 1A MUNSTER ROAD, NORTH END, PORTSMOUTH PO2 9BS ***OPEN 6 DAYS A WEEK!***

MAIL ORDER: 189 LONDON ROAD, NORTH END, PORTSMOUTH PO2 9AE

The Yearling Beginners' Receiver

continued from page 13

taken lightly by a beginner. The superhet was then considered. This overcame some of the problems with direct conversion, but created others such as the need for a rather expensive IF filter. So the result was a happy compromise which, in effect, is a direct conversion receiver preceded by a frequency converter. This means that the VFO runs at about 5MHz instead of 14MHz, so stability is much better.

DESIGN FEATURES

INCOMING SIGNALS AT 14MHz or 3.5MHz are selected by the tuned circuit L1/C1/D1 or filter FL1. Note that the 'Ant Tune' control isn't needed on 80m as FL1 does all the work! Tuning on 14MHz is carried out by RV2 which adjusts the voltage on varicap D1. This is one half of diode type KV1236 – note carefully the polarity of this component.

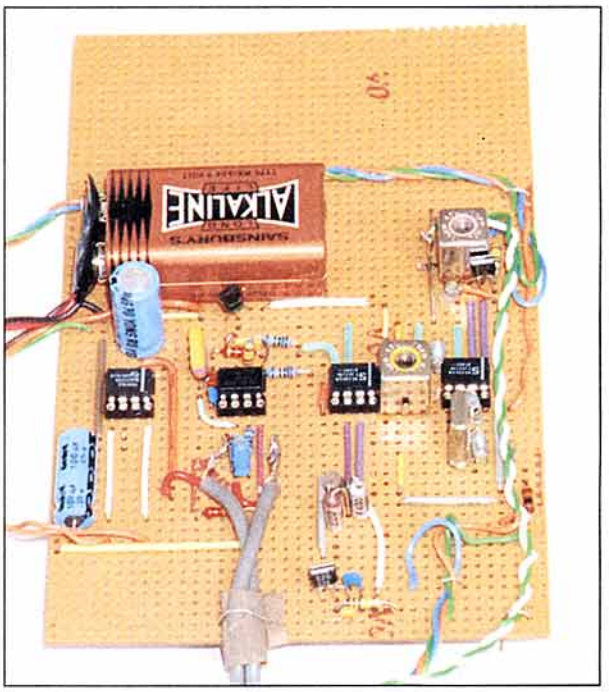
A Philips NE602 (IC1) converts the signal to the range 5 to 5.5MHz (approx) by means of its internal oscillator. This has a crystal (X1), working at about 8.9MHz. In fact any crystal between 8.8 and 9.0MHz will be satisfactory, but a frequency of 8.95MHz will give greatest accuracy on the dial. More observant readers will note that D1 is in fact forward biased over part of its voltage range. However the circuit as it stands performs quite adequately.

The signal output from the mixer in IC1 then passes to the intermediate frequency (IF) filter, formed by C5 and L2. The tuned circuit is damped by the rather low output impedance of IC1, and this gives a nice compromise between selectivity and insertion loss. The balanced output of the tuned circuit is applied to IC2, another NE602 mixer/oscillator which acts as a product detector.

The main VFO uses the oscillator section of IC2, which covers a range of approximately 5.0 – 5.5MHz. Assuming the use of a 9MHz crystal for X1, the 20m band will track within the range 5.00 – 5.35MHz and the 80m band from 5.2 – 5.5MHz. Note that the LF ends of the respective bands will be at opposite ends of the dial, since 20m makes use of the sum of the receiver's two oscillator frequencies, and 80m uses the difference between them.

Main tuning is carried out by RV4, and RV5 provides the bandspread control. Tuning is varied by means of the voltage on varicap D2 which in association with C9, C10 and L3 determines the frequency of oscillation. The varicap is a dual type – cut it in two with a sharp knife. Voltage regulator, IC3, in the supply lines to the early stages makes stability surprisingly good.

The audio output from IC2 is amplified by IC4a, and filtered by low-pass filter IC4b, before being further amplified to speaker level by IC5.



As an alternative to the PCB supplied with the kit, the Yearling may be built on a prototype board.

CONSTRUCTION IS EASY

MANY YEARLINGS HAVE been built from kits with no problems, and I know of a number of constructors who have successfully used a prototype board instead of the PCB. The prototype was built using just such a method, and is illustrated in the photograph above. No special precautions are needed but, as with any radio, neat wiring makes the tracing of faults a much easier process.

Fig 2 shows the connections to the gain and tuning controls. Screened cable should be used for the leads to the volume control, but stranded bell wire should be OK elsewhere. Incidentally, there was no problem with using IC sockets for all the 8-pin devices. The coils are colour coded with L1 having a pink core, and L2 yellow.

It is rather easy to wire the varicaps incorrectly but, if you're using the PCB, the lettering on D1 should be next to coil L1 and the lettering on D2 should be facing resistor, R7. **Fig 3** shows the bandchange switch and the 80m filter which is glued to the side of the case. Holes for the five controls are 10.5mm diameter, and the speaker and power connectors have 6.3mm and 11mm holes respectively. The antenna and earth sockets need 8mm holes.

SETTING IT UP

CONNECT A 9V BATTERY and a reasonable antenna, and when you switch on, you should hear some stations – or at least some tuneable whistles! I suggest starting with the 20 metre band, and making the adjustments before fitting the controls and sockets to the case.

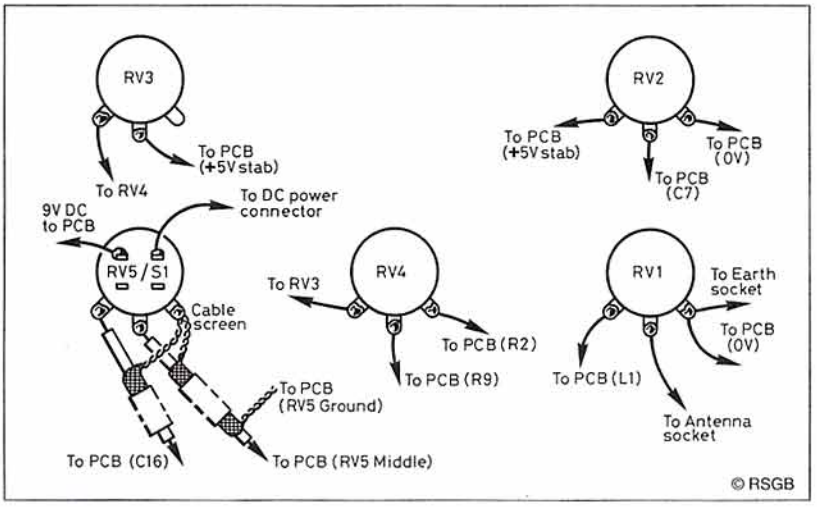


Fig 2: Rear view of the variable resistors. Check the connections carefully to make sure the wires fit the correct holes on the board.

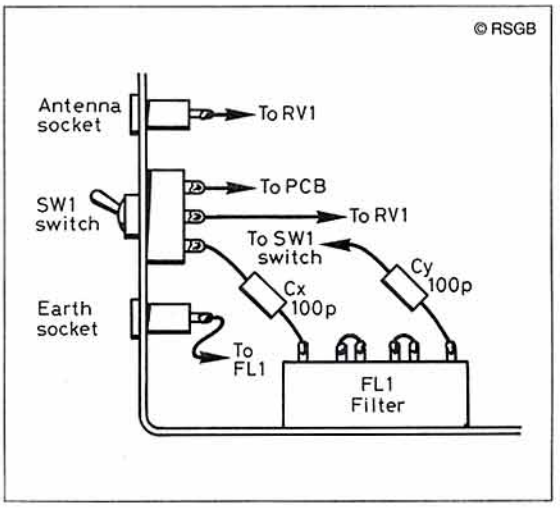


Fig 3: Internal view of the Yearling case. The 80m filter is attached to the base with glue.

A signal generator is useful of course, but not essential to get the receiver working. Carry out the following steps and your *Yearling* should burst into life.

(a) Set the core of L2 to mid-position.

(b) Set RV1, RV2 and RV4 to mid-position and rotate the core of L1 until you hear a peak of noise. Now adjust L2 for maximum noise.

(c) Tune carefully with main tuning control, RV4, until you hear amateur signals. Adjustment of the bandspread may be needed to clarify the speech.

(d) Switch off the receiver, and fit the controls and sockets to the case.

(e) Finally, adjust the tuning knob so that the pointer roughly agrees with the dial. Due to the spread of varicap capacitance values you may find the tuning a little cramped. This is easily fixed by adding a resistor (try 22k to start with) in series with RV3 or adjusting the value of R2.

(f) Check the 80m band – this should work without further adjustments to the coils. **Fig 4** shows the additional connections for 80m as the Yearling was originally for 20m only.

(g) Lastly, fix the PCB inside the case (double-sided sticky tape works well).

LAST BUT NOT LEAST

I HOPE THAT YOU get as much enjoyment from building the Yearling, as I did. It certainly goes to show that amateur construction doesn't have to be complicated to be effective.

The *D-i-Y Radio* team designed a self adhesive front panel decal for the Yearling which gives it a very smart appearance. This is included with the kit, or is available free from the *RadCom* office at RSGB HQ on receipt of an A5 SASE. Happy listening!

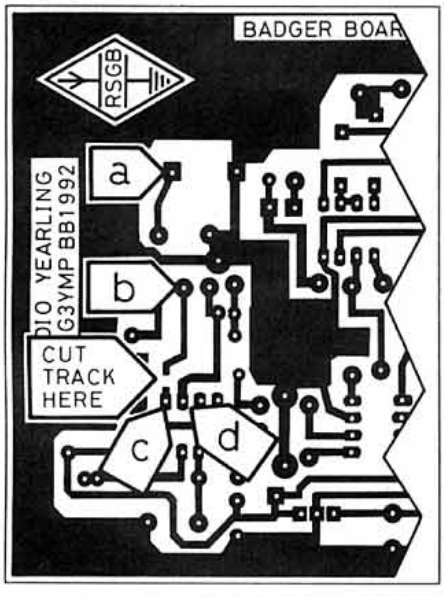


Fig 4: The underside of the PCB. Wires are connected from the switch and filter as shown.

COMPONENTS LIST

Capacitors
All rated 16V or more

C1,C5	180pF polystyrene 5% or better tolerance
C3	47pF polystyrene 5% or better tolerance
C4,Cx,Cy	100pF polystyrene 5% or better tolerance
C9	220pF polystyrene 2% or better tolerance
C10	330pF polystyrene 2% or better tolerance
C6,C7,C8	100nF ceramic
C11,C14	10nF ceramic
C13	47nF 5% polyester
C16	1µF electrolytic
C2	10µF electrolytic
C12,C15	1000µF electrolytic

Resistors
All 0.25W 5%

R1,R5,R9	100k
R2	10k
R3,R4	1k5
R6,R8	12k
R7	220R
RV1,RV3	1k linear
RV2,RV4	47k linear
RV5	10k log with switch (SW2)

Inductors

L1	Toko KANK3335R
L2	Toko KANK3334R
L3	10µH 5% tolerance (eg Toko 283AS-100)
FL1	Toko 237LVS1110 Low pass filter

Semiconductors

IC1, IC2	Philips NE602 or NE602A
IC3	78L05 5V 100mA regulator
IC4	TL072 Dual op-amp
IC5	Philips TDA7052 Audio amp.

Additional Items

Varicap diode	Toko KV1236 (cut into two sections).
Crystal	Between 8.8 and 9.0MHz. An 8.86MHz type is available from JAB Components, Maplin etc.
Wavechange switch.	DPDT changeover type

8-pin sockets for IC1,2,4 and 5.
4mm Antenna (red) and Earth (black) sockets.
3.5mm chassis mounting speaker socket.
DC power socket for external power supply (if required).
4 knobs approx 25mm diam with pointer.
Tuning knob with pointer eg 37mm PK3 type.
Printed circuit board (PCB) or prototype board.
Plastic case approx 17 x 11 x 6cm eg Tandy No 270-224.
Speaker between 8 and 32Ω impedance (or headphones).

KITS

A complete kit of components including PCB, wire, knobs, sockets, case, etc is available from JAB components – for £39.95 (including P&P). Please note that the colour of the case is subject to availability.

JAB Electronic Components, The Industrial Estate, 1180 Aldridge Road, Great Barr, Birmingham B44 8PE. Tel: 021 366-6928.

The PCB is available separately from Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield, B74 4JF. Tel: 021 353-9326.

HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham B17 8QB

FIRST OF ALL – a very happy and DX-full New Year to everyone! Secondly something to put in your diary – please note that the **1994 RSGB International HF Convention and IOTA's 30th Birthday Party** will take place on 7, 8, and 9 October at the Beaumont Centre in Old Windsor. If you are interested in LF or HF DXing this is a *must*....

An important note. It seems that there was an unfortunate typographical error in the IARU Region 1 Conference in De Haan report on page 28 of November *Radio Communication*. It has caused much anguish so please note that the 'Digimode' sub-band on 3.5MHz is **3.58 – 3.62MHz** and *definitely not* 3.56 to 3.62 MHz !

LEBANON

THE LATEST LIST of legally licensed amateurs in Lebanon, supplied by OD5CN (via G4GKO) is dated 18.9.93 and contains the following callsigns: OD5s: AQ, AR, AW, BC, BE, CN, EP, ET, FE, FG, FH, FI, FZ, GB, GC, GI, HC, HO, HQ, HP, HU, IM, IR, IU, IZ, JA, JE, JI, JL, JM, JP, JO, JU, JW, JY, JZ, KB, KC, KE, KI, KL, KM, KP, KS, KT, KV, KU, KW, KZ, LE, LW, MB, MD, MG, MH, MI, MJ, ML, MM, MT, MU, MW, ND, NE, NF, NT, NW, OA, OD, OK, PL, QH, QS, RA, RF, RH, RS, RT, SA, SB, SC, SF, SK, SH, XY, YL, YT, YU, ZB, ZM, ZN, ZZ, and RAK. Arif Mansour, OD5CN, who is the President to the Association des Radio Amateurs Libanias, suggests that stations with these callsigns should not be reported (or treated as) pirates.

DX NEWS

IN THE TENTH of a series of monthly reports the ARRL DXCC Desk announced on 1 November that the number of unprocessed applications at the end of October was 95 – representing 9,222 QSLs. The processing time is now less than one week. An ARRL News Release on 5 November said that the following had been accepted for DXCC credit from the dates shown: 9G1XA (23.8.93), 9H3RU (9.8.93), BV/K4IQJ (19.5.91), C21/KC6DX and C21/KC6ZM (7.7.93), CY9/WV2B and CY9/WA0UJH (9.7.93), CY9R (2.9.93), ET3RP (20.9.93), JT1/JE7RJZ (5.1.93), JT/JE7RJZ (19.8.93), SV5/N6MZ (16.6.93), T5/N3HQW (31.8.93), UA0S/JE7RJZ, UA0S/JM1SVJ, UA0S/JJ2HVK, and UA0S/JK2NBE (28.10.93), VS6/K4IQJ (27.5.91), ZB2/DL7URA (6.4.93), and ZB2/DL7VEE (5.4.93).

Now for a rumour! It comes from *RSGB DX News Sheet* (from a Packet Cluster message from G0CGL) who says that it was reported on Channel 4 World News that Somaliland had declared independence from Somalia and that this 'country' has been in existence for several months. Many years ago the present Somalia was two countries – British Somaliland and Italian Somaliland.

Long Island DX Bulletin says that FT4WD on **Crozet Island** likes to operate near 18.135MHz on Sundays between 1200 and 1400. ET3YU, in **Ethiopia**, often appears near 21.033MHz at around 1500. If conditions are poor he goes to 14.033MHz. According to *RSGB DX News Sheet* 3B9FR, on **Rodrigues Island** is limited to the use of 10, 18, and 24MHz! However he was hoping to get on other bands when he has antennas. Favourite operating times were given as 24MHz between 1330 and 1630, 18MHz between 1700 and 1900, and 10MHz from 0130 and 0230UTC.

More information about new callsigns in the former USSR republics. Various sources say that the following prefixes have now been assigned: Armenia = EK, Azerbaijan = 4J and 4K, Belarus = EU and EW, Georgia = 4L, Kazakh = UN and UQ, Moldova = ER, Kirghiz = EX, Russia = UA-UI, UN-UQ, RA-RZ, and 4K, Tadzhik = EY, Turkoman = EZ, Ukraine = EM, EO, and UR-UZ, and Uzbek UJ-UM. Some of the old prefixes seem to be still in use.

KH4/N7NTL is supposed to remain on **Midway Is** until 6 January and to be on all bands from 1.8 to 28MHz (including WARC) using CW and SSB.

Roger, G3SXW – who was ZD9SXW recently – says that the only active stations on **Tristan da Cunha** are Andy, ZD9BV, and his wife Lorraine, ZD9CO. Gervace, G4URJ, may operate as ZD9GC at weekends until sometime this month. Andy and Lorraine have been found mostly on 14 and 21MHz SSB but antennas are now available for 7, 10, 18, and 24MHz as well. Alan, ZD9CQ, was active on SSB only from Gough Island – he left the island in October and his replacement is not licensed. The South African meteorological station is manned by a seven man team which is changed each October. Mike Wadsworth, G3UOF, is presently on **Ascension Is** as ZD8M and mainly active on CW but also occasionally SSB, RTTY, AMTOR, PACTOR, on all nine bands plus 50MHz, 144 and 432MHz and satellites! He will be there until mid-March and his home address for QSLs is in 'QTH Corner'.

SUDAN

'ALI' – ST2/G4OJW – has written to say that he gets on the air as often as possible to try to give as many as possible a QSO with Sudan. This means that he usually operates 'pile-up' style and makes many contacts. He cannot afford to reply to QSLs unless return postage is included. There is no bureau in Sudan and his system therefore is to reply to QSLs accompanied by US $1 or at least one IRC, and to ask stations in the west to try to send an extra coupon to contribute towards the postage on the bulk mailing of QSLs to eastern European bureaux. He will accept two *mint* first class stamps from the UK. His usual pattern of activity is to be on 14.062MHz daily between 0400 and 0600 and on Saturdays to Thursdays (except Friday) from 0700 – 1200 on 18.069 or 21.002MHz listening up one kHz. He occasionally goes on 28MHz but not 1.8, 3.5, 7, 10,

BAND REPORTS

THIS MONTH I have to thank G2HKU, G3s GVV, KKJ, GM4CHX, GW4KGR, G4s MUW, OBK, G4PDQ (for supplying information from the UK DX Packet Cluster), and G0MHC. As always stations using CW are listed in italics:

1.8MHz
0000 *C51A, HH2PK, KP2/CT1BOH, SU2MT, TA2BK, UL7OB.*
0600 *TI4CF, VP2EC, VP5/K8JP, ZL2JR, ZL3GQ, 3A/DK6AS.*
0700 *FK8CP, KT3Y, K0RF, WA3EUL, ZL2ADX.*
1600 A61AD.
1800 *A45ZZ, ZL2ADX.*
2000 *RA9LE, S21ZW, UJ8JI.*
2100 *JH3FYC, SV5/GM3YOR, ZD9SXW.*
2200 *JA4LKB, JR6PGB.*
2300 *FG5BG, HV4NAC, UH8EA, VQ9KC, VQ9QM, ZD8VJ, 4X4NJ, 9K2MU, 9V1ZE.*

10MHz
0000 *VQ9UN, ZD8M, ZF2VV, 9K2MU.*
1400 *KE2PF/NH2.*
1600 *BY1QH, TA6JM, TL8NG.*
1900 *A71CW, S79MX, ZD9SXW, 3B9FR, 8Q7AS.*
2100 *FY5FP, LU2EW, P40L, TA2DS, VQ9NY.*

14MHz
0700 *C21/ZL1AMO*, JT7AA, NL7RK, P29JC, VR6KC.
0800 BY4RSA, FK8KAB, FO4OK, V73JT, VK9ND, WL7BQ, *3C1EA.*
0900 D2EGH, FO5JV, ZX0F, 3D2AG (Rotuma), 8R1K.
1400 VK9XZ.
1500 A61AD, EP2MHB, HS1BV, 9M8BL.
1600 C91S, ET3SID, FR5DX.
1700 KL7XD, ZD8VJ, 3X0DEX, 4J0GAT.
2000 VR6BD, 9G1MR.

18MHz
0800 *ZD8VJ, ZD9SXW.*
0900 T5JC.
1000 A25/OH7XM, *FS/JL1MUT, ST2/G4OJW*, V73C, VK4BM.
1300 3B9FR.
1700 A61AD, *VQ9KC*, ZS8MI.
1900 *DP0GVN.*

21MHz
0700 S21ZW.
0900 BZ4DGE, 3X0DEG, 4S0DX.
1000 BY5RT, *BV7JA*, P39QW.
1100 A71AN, DU9XA, ET3SID.
1200 P49T, *ST2/G4OJW, 9D5CW.*
1300 ZS9A.
1500 C91BH.
1800 FY5FP, W6-W7, 5Z4PL.

24MHz
1300 A61AD, C91BH, *S79MX*, TL8NG.
1400 PJ8AD, *3B9FR.*
1500 C51A, *VQ9QM*, ZS8MI.
1600 *A25/OH7XM*, KL7MG, *ZD9SXW.*

28MHz
0700 D2SA, VI6CKB, 3B8FQ, 5Z4FO, 7Q7ZZ.
0900 A61AD, 5R8DG.
1000 J28GR, TU5DX, ZA/OK2PSZ, 9M8DB.
1100 FJ8AB, TR8/F5JDE, 9G1MR.
1200 A61AD, C51A, P40L, ZS8MI, 7Q7XX.
1300 C91J, FH8CB, KP2A, V47NS.
1400 N2HIG/FJ, J80F, VP2EC, 8R1K.
1500 FR5EL, TJ1GG, ZF2JI, ZS4NS/ZS9.
1600 C93BM, HK0HEU.

QTH CORNER

J25AK	PO Box 359, Bissau, Guinea Bissau.
KH4/N7TNL	via W1OO, Landean H.Bailey, 224 Holmes Rd, RFD 3, Scarborough, ME 04074, USA.
ST2/G4OJW	PO Box 4016, Khartoum, Sudan.
VQ9KC	via AA9KC.
ZD8M	Mike Wadsworth, 5 Frobisher Mews, Churchdown, Glos, GL3 1NQ.
ZD9BV	W4FRU (see ZD9CO)
ZD9CO	W4FRU, J Parrott, Box 5127, Suffolk, VA 23435, USA.
ZD9CQ	ZS6SA.
3B9FR	Robert Felicite, Box 31, Rodrigues Is, via Mauritius.
9J2BO	via W6ORD
9M2/G3NUG	Neville Cheadle, Further Felden, Longcroft Lane, Felden, Hemel Hempstead, Herts HP3 0BN.

1993 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G3KKJ	**140**	**198**	**157**	**495**
G3IZD	100	149	115	364
G3IAR	118	141	98	357
G3SXW	125	127	73	325
G4XRV	115	118	52	*285
G0MHC	60	125	63	248
G2AFV	96	91	51	238
G4OBK	79	103	32	214
GJ4GG	37	63	41	141
G4MUW	2	71	46	119
G3IQF	45	41	17	103
G0KDS	2	75	3	80
G4CMZ	17	–	–	17

* CW only

or 24MHz but he is hoping to be on the 7MHz band soon, and also to use RTTY, AMTOR, and PACTOR.

SUPER DUPER

PAUL O'KANE, EI5DI, advises that he has released a separate version of his logging programme to cover both the UBA and REF contests for both home and DX entrants. Registered users of Super-Duper can have the new programme by sending a blank formatted 3.5in disk and two IRCs to Paul at 36 Coolkill, Sandyford, Dublin 18, Ireland. For new users the price is £25 or US$35, plus £2.50 or $3.50 for airmail postage outside the UK. Super-Duper already caters for many RSGB and International HF Contests and was highly recommended in its September 1993 *RadCom* review.

EXPEDITIONS

THE PLANNED EXPEDITION to **Peter 1 Island** seems to be on schedule. At the beginning of November two tons of equipment had already been loaded on to the expedition vessel and the down-payment had been made on the hire of the boat. One more CW operator was being sought and a further US$75,000 towards the US$ 200,000 budget was needed. The expedition seems as though it will begin about 1 February and the callsign *may* be 3Y0PI – although there was a wish not to announce it until arrival to discourage pirates. In view of the fact that 3Y0PI was 'leaked' it may have been changed! Logging will be computerised and programmes are set to 'kill' QSOs for more than two same band/same mode contacts. The programme will also print only three QSOs per label, and only two cards can be included in one envelope – which will cost about US $1.45 in postage.

The visit to **Nepal** by UT4UZ and UB4LRQ which was expected to take place earlier has been postponed and a new departure date of 7 December has been given. Since the anticipated stay was to be two weeks they may still be on the air.

Roger, G3SXW, managed to make a staggering total of 23,300 contacts from ZD9SXW on **Tristan da Cunha** – all of them on CW! This was a truly extraordinary performance.

Neville, G3NUG, will be visiting **West Malaysia** this month. His schedule will be as follows: AS-072 Pangkor Island 14 January to 21 January, AS-058 Langkawi Is 22 to 28 January, and AS-015 Penang Is 29 January to 10 February. His callsign will be 9M2/G3NUG and his preferred operating frequencies 14.260MHz and 18.140MHz (both ± 5kHz) SSB only. He will listen for Europe from 1400 and 1600 on 14.260MHz *and there will be no lists*. Neville says that there has been no activity on Pangkor or Langkawi for about three years. All direct QSL requests will be cleared by the end of February (see *QTH Corner*).

Roger, G3SXW, operated as 2D9SXW from Tristan da Cunha in October, making 23,300 QSOs on CW.

CONTESTS

ARRL RTTY ROUNDUP

1800 1 January – 2400 2 January

All bands 1.8 to 28MHz (no WARC) using Baudot, RTTY, ASCII, AMTOR, and Packet (attended operation only). Exchange signal report and serial number from 001. Ws and VEs will give their state/province. One point per QSO (with anyone) with a station on each band. Multiplier is each US state (not KH or KL), each VE province, and each DXCC country. W and VE do not count for country credit. Packet QSOs via digipeaters or gateways are not allowed. Entries must be postmarked no more than 30 days after the contest and sent to ARRL. Logs may be submitted on disk. I have copies of the detailed rules – SASE please.

HA DX CONTEST

0000 – 2400 16 January

1.8 to 28MHz (no WARC). CW only. Exchange RST and serial QSO number (from 001). Hungarian stations will give a two letter code showing their county (HA/HG1 GY, VA, ZA, HA/HG2 KO, VE, HA/HG3 SO, TO, BA, HA/HG4 FE, HA/HG5 BP, HA/HG6 NG, HE, HA/HG7 PE, SZ, HA/HG8 BE, BN, CS), HA/HG9 BO, HA/HG0 HA, SA.) Members of the HA DX Club give their membership number and not the two letters. QSOs with HA/HG count six points, elsewhere three. Multipliers are number of different counties and club members worked per band. Separate logs for each band plus summary sheet with signed declaration must be sent within six weeks to HADX Club, PO Box 79, Paks, H-7031 Hungary. I have copies of the rules – SASE please.

JAPAN INTERNATIONAL DX CW CONTEST

2200 7 January – 2200 9 January

This is the Low Bands section – the High Bands section takes place from 9 to 11 April. 1.8, 3.5, and 7MHz. Only 30h operation allowed and breaks must be at least 60 minutes long and marked in the log. Exchange RST and *CQ* zone number (UK is 14). Japanese stations will give their JARL Prefecture number. QSOs with Japan on 1.8MHz count four points, on 3.5MHz two points and on 7MHz one. Multiplier is the number of prefectures (plus Ogasawara) worked on each band. Logs have to be sent before 30 April to Five-Nine Magazine, PO Box 59, Kamata, Tokyo 144, Japan. I have copies of the (1993) rules (SASE please).

AGCW-STRAIGHT-KEY-PARTY

1600 – 1900 5 February

3.510 – 3.560MHz CW only *using hand keys only*. Call "CQ HTP". Four Classes – A = maximum output 5W, B = maximum output 50W, C = maximum output 150W, and D = listener. Exchange serial number (from 001), class, name, age (YLs = XX). Class A entrants earn nine points for a QSO with another A, seven with a B and five with a C. Class Bs earn four for working another B and three with a C. Class C with Class C counts two points. I can supply copies of rules (SASE please). In the 1993 QRP Winter Contest VLP section GM3NUF came third with 24,428 points. G3TXZ was ninth with 13,282, G4XNP 20th with 2,790, G3DOP 28th with 935, and G4WQW 34th with 312. In the QRP section G4BUE headed the list with 67,914 points G3WGN scored 35,925, G3FNM 31,833, G3DNF 31,595, G0OGN 12,510 G4ZFE/P 8,268, G4GLC 7600, G4WGR 1,638, GM4HQF 1,320, G3DOT 1,056, G0IJZ/P 646, G3JRY 492, and G0ADH 270.

Results of the **1993 Helvetia Contest** are now out. G4IQM scored 25,137 points, G3ESF

DRAKE R8E
Communications Receiver

FEATURES FITTED AS STANDARD

★ Wide frequency coverage (l00KHz to 30,000KHz) plus additional VHF bands (35-55MHz and 108-174MHz) with the optional VHF converter. Multi-mode reception includes AM, FM, RTTY, CW, USB and LSB.
★ Five built-in filter band widths... for reception of most signals under virtually any conditions.
★ Synchronous detector... for improved quality of received AM signals, especially under severe fading conditions.
★ Non-volatile memory . . . for information retention during power outage.
★ Built-in, multi-voltage power supply... for operation in most parts of the world on nearly any type of power line voltage.

★ RS232C serial interface... for remote control of receiver functions.
★ Multiple scan functions... for scanning by carrier, time or seeks modes of frequency or selected memories.
★ 100 channel memory capacity... for storing of frequency, band, and mode data.
★ Two operating VFOs... for increased flexibility and convenience.
★ Built-in pre-amp and attenuator... for improved reception of extremely weak signals, as well as very strong signals.
★ Timer function . . . for automatic operation. Very useful for recording purposes.
★ Dual time zone built-in clock.
★ Built-in dual mode noise blanker... for reduced electrical interference.
★ Passband offset... for the reduction of nearby interfering signals while maintaining maximum intelligibility.
★ Selectable AGC . . . for improved reception of fading signals.
★ Built-in speaker. ★ PLL synthesised.
★ Dual antenna inputs.
★ Optimum tuning step selection for each operating mode.
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HAPPY NEW YEAR PARTY

0900 – 1200 1 January

CW only, 3.510 – 3.560, 7.010 – 7.040, and 14.010 – 14.060MHz. Four classes – (1) max output 250W, (2) max output 50W, (3) max output 5W, and (4) listener. Exchange RST and serial number. AGCW members give their membership number. QSOs count one point and the multiplier is one for each QSO with an AGCW member. Send logs before 31 January to Stefan Scharfenstein, Himberger Str 19a, D/W 5340 Bad Honnef 6, Germany.

CQ WW 160M CONTEST

2200 28 January – 1600 30 January

Unfortunately no information is available on this year's event. Presumably the rules will be the same as in 1992.

AWARDS

THE JUBILEE DIG-PA AWARD

For working PI4DIG and ten other DIG members every month for a ten-month period between 1 February 1994 and 30 June 1995. They do not have to be consecutive months. All bands and modes or mixed and it is available to listeners. Send application together with GCR list and 10 IRCs to Marten de Jong, De Dammen 13, NL 8701 ZN Bolsward, Netherlands, before 30 June 1996. PI4DIG can be found every Monday on 3.67MHz at 1800, and on 145.575MHz at 1900.

DIPLOMA SWEDEN

Issued by Nykoping ARC for contacts/reports since 15 June 1978. It is the Swedish equivalent of the WAB Award. A basic award needs a minimum of 100 parishes and there are more than 2,500 in Sweden! All bands/modes. A special record book is needed and can be obtained from NSA Diploma Manager, Box 25, S-611 22 Nykoping, Sweden. It costs US $13 or 18 IRCs within Europe. I have copies of the full rules available in exchange for an SASE.

MINSK AWARD

Issued by the Minsk Radio Club to those who have worked stations located within the metropolitan area of the city of Minsk since 1 January 1959. Europeans need ten on the HF bands, five on 1.8MHz, two on VHF, and one satellite QSO.

WSPHCM AWARD

For contacting/hearing members of the SPHC since 1 October 1959.

European applicants need forty for first class, twenty for second, and ten for third. Send certified list plus US$ 5 or ten IRCs to Ciereszko Mikolaj, PO Box 13, 05-100 Nowy Dwor Maz, Poland. I have a list of members – SASE please.

PROPAGATION

THIS MONTH G8KG says: "The moderate surge in solar activity late in September and the first half of October did much to save the higher bands from a rather sad start to the 1993/94 DX season. Subsequently the daily solar flux figures have been mostly in the 80s and 90s, just touching 100 sfu at the time of writing in mid-November.

The geomagnetic field was very disturbed in the last week of October and again a week or so later but sandwiched in between was a short period of very settled magnetic conditions. These, combined with a good deal of help from 'short skip' (E region) propagation, fortunately for those concerned just happened to coincide with the CQ WW SSB Contest.

During that weekend even 28MHz was open to all continents, albeit only briefly to some locations, and with a goodly number of countries making their appearance. At the same time, the settled conditions gave low levels of absorption on the lower bands resulting in some very strong DX signals and lots of activity.

After the disturbance on 4 November conditions settled down to a typical winter pattern with 21MHz providing the best overall daylight performance and DX on 'Ten' being mostly from directions to the south of the East-West line. With the Sun one can never be sure what is in store superimposed on the undoubted downward trend but it seems likely that the pattern of those weeks may be typical of what we can expect for the rest of the season."

THANKS

TO ALL REGULAR supporters of the column and specially to the editors of *RSGB DX News Sheet* (G4DYO), the *Lynx DX Bulletin* (EA2KL), *DXPRESS* (PA3FQA), and the *Long Island Dx Bulletin* (W2IYX).

Please send everything for the **March** issue to reach me no later than **20 January.**

SWL NEWS

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

ON A PERSONAL note, I have qualified for the Society's 50MHz 100 Countries Award (Certificate No 9). It took six years to hear 100 countries and get them confirmed. The most pleasing aspect, however, was that the Award was achieved only using dipole antennas in the loft.

Several months after the Lighthouse Award weekend, I was still receiving comments about how the event fired many SWLs' imagination. To note just a few, BRS88921, RS95258, RS95349, BRS93563, BRS94964 and RS94973 wrote to say how much fun the event was. The Ayr Amateur Radio Club must be congratulated on their efforts. They are to hold a similar event next August, when stations overlooking eleven Scottish Firths will be active. More information nearer the time.

SWL CONTESTS

I MENTIONED the UBA and White Rose SWL contests last month, and here are a few more details.

The UBA event will be held from 1300 on 29 January until 1300 on the 30th. The aim of the contest is to hear as many Belgian and other amateurs and to act as a spur to claiming the Belgian Provinces Award and the European Community Award. 160m is not used in this contest, but stations may be logged on any of the other five main (non-WARC) amateur bands. Full details can be obtained by sending me an SASE.

The White Rose ARS contest is the other main SWL event of the period. The contest normally attracts about 20 entries, but the society is setting itself higher sights this year. David Whitaker, BRS25429, has taken over as Contest Manager and is arranging for certificates to be printed if there are enough entries. The contest, which takes place on 1.8, 3.5 and 7MHz, starts at 1200 on 15 January and runs to 1200 on 16 January. Participants must take a six-hour rest period. The object is to log a maximum of five stations on each band from as many countries as possible. The full rules can be obtained from David, enclosing an SASE, at 57 Green Lane, Harrogate, North Yorkshire HG2 9LP.

SWL	Countries	Points	Checked Score
BRS32525	93	134	12,462
BRS95258	62	95	5,890
BRS8841	59	89	5,251
RS94781	33	89	2,937
BRS52543	29	40	1,160

Result of *SWL News* 18MHz Challenge.

CONTEST RESULTS

MY 18MHz CHALLENGE in August attracted only five entries, but it showed that there is a growing interest in this new 'WARC band'. 104 countries were reported during the month. Some of the best DX being in the shape of AL7I, D68AY, FH5CB, FK8CP, FW1DJ, FT4WD, HL93BUV, KC6IL, KH2FT, S92YL, T30NJ, XX9AW, ZK3DM, ZS9/DJ2JS/P, 3B8CF, 3D2CK and 9J2HN. This array of DX should prove to all those of you that have yet to stray from 'good old faithful' 20 metres, that 18MHz is well worth a serious look, and soon! The results are shown at the foot of this page.

DX NEWS

IT WAS GOOD to hear again from Peter Cain, BRS36554. He has been a correspondent – off and on – since 1977. He has now heard 313 countries and is particularly interested in Award Hunting. He has the K1BV Awards Directory, mentioned in an earlier issue, and confirms its usefulness. Peter applied for the very attractive ATA Award from Taiwan after seeing details in the column, and attained Certificate 'SWL-001'.

The CQWW Contest at the end of October provided the main talking point this month, and attracted a sizeable number of logs at the time of writing this column. As the sunspot numbers for the weekend were only 91, conditions were remarkable with lots of DX heard, especially on 10 metres. Outside the contest, the bands were very quiet and little really good DX was heard. Exceptions were ZS8MI on 10 and 20m, S21ZW on 80m. T30DP on 17m and 3B9FR on 12m.

FINALE

NEWS, VIEWS, comment, etc for the **March** issue must be with me no later than *15 December.*

Out of PBBS memory? Not any more!

The KPC3 128 is here!

More mailbox....no extra charge

More people than ever are choosing the Kantronics KPC3 TNC for their packet radio system. Due to the immense popularity of the KPC3, Lowe Electronics have negotiated a special UK issue of the unit which is now fitted with 128k of RAM at NO extra charge.

So you now get the equivalent of the RAM128 memory expansion chip with a RRP of £22.50 absolutely FREE.*

The KPC3 now offers:-

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SOUTH WEST
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Devonport, Plymouth, PL1 4PQ
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Fax 0752 607285

LONDON - HEATHROW
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Langley, Berks, SL3 8XB
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FT2200	£369.00
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FT912R	£549.00
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That's right ! You've probably got used to price increases over the last few months but here is a genuine initiative from Yaesu. These are genuine prices, lower than you have seen for quite some time. Yaesu are really surprising us all these days - super new models like the low-cost FT840 HF rig to the tiny FT22 handheld. Come and try them out at Lowe's, your new, leading Yaesu dealer.

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RSGB NATIONAL VHF CONVENTION

Sandown Exhibition Centre, Esher, Surrey

SUNDAY 20 FEBRUARY 1994

● One Day Exhibition and Lecture Programme ● Specialist Groups ● Full Lecture Programme on VHF, UHF and Microwave Subjects ● Morse Tests ● Presentation of Trophies ● Comprehensive Trade Exhibition

PROGRAMME

1030	Convention opens. Enter through main entrance.
10.30	AGM Remote Imaging group
11.00	Refreshments. Snack bar in the hall will be open from 1100 to 1800 and the licensed bar will be open throughout the convention.
1130	AGM 6m Group.
1330	Convention address and presentation of trophies by RSGB President I D Suart, GM4AUP.

LECTURE PROGRAMME

Detailed arrangements for lectures will be notified on arrival

	A	B
1415	Update on the New Amateur Radio Satellites *Ron Broadbent, G3AAJ*	10GHz Comes of Age *Mike Walters, G3JVL*
1515	Spread Spectrum Techniques *James Vincent, G1PVZ*	Microwave EME *Charles Suckling, G3WDG*
1615	VHF Contest Committee Forum *Chaired by Bryn Llewellyn, G4DEZ*	Microwave Committee Forum *Chaired by Steve Davies, G4KNZ*
1715	Lecture Sessions End	
1730	Trade Exhibition Closes. Convention Ends.	

ADMISSION

Admission will be by payment on entry as follows:

Convention and Exhibition £3.00	(over 65)	£1.50
	(under 18)	£1.00
	(under 14)	Free

ACCESS MAP TO SANDOWN PARK

RAIL TRAVEL:
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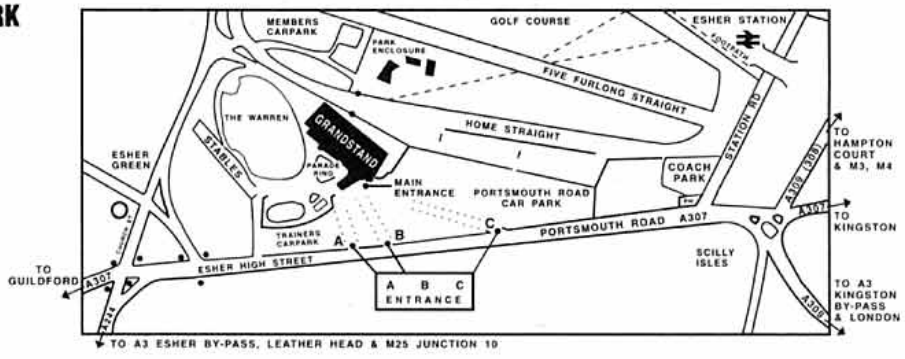
TALK-IN STATION:
GB2VHF:
Channels S22 SU22

STAND BOOKINGS:
Les Hawkyard G5HD
Tel: 0409-281342

DETAILS:
Geoff Stone G3FZL
Tel: 081-699 6940



Map by courtesy of United Racecourses

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

FIRST, MAY I wish all readers a Very Happy New Year. From late October there were some rewarding periods of tropospheric and auroral propagation. The second leg of the ARRL EME Contest created good activity. There is news of additional channels for data modes on 2m.

144MHZ PACKET

HERE IS AN official statement from the VHF Committee arising from decisions agreed during the meeting on 13 November. It was broadcast on *GB2RS* on 28 November.

"In view of the current congestion on 144MHz packet radio, as a temporary measure, the VHF Committee recommends that 144.5125 – 144.6875MHz be used for digital communications. The Data Communications Committee of the RSGB will recommend the modes to be used on specific frequencies.

"This gives seven 25kHz channels from 144.525 to 144.675MHz. The VHF Committee will urge the DCC to recognize the current designation of 144.600MHz for FSK RTTY. Stations contemplating the use of these additional frequencies should first consult other local users of the 144MHz band. The VHF Committee is committed to the IARU policy of using other VHF, UHF and microwave bands for linking."

That is the end of the official statement. It is most important that anyone contemplating using these additional packet channels should liaise with other local users. It would be quite unacceptable for a packet transmission to start on a frequency already in use for other modes. Clause 4(2) of the licence is relevant here.

As a longer term objective the VHF Committee would like to see FSK RTTY moved to around 144.525MHz which would become the centre of a part of the band to be devoted to narrow band data communications modes. This is unlikely to take place until a review of the band plan for 144.0–145.0MHz is completed. This review was initiated by the recent IARU Region 1 Conference but will probably not be completed until the next IARU Region 1 Conference in 1996.

FIRSTS

THIS MONTH we make a start with British 'firsts' for 144MHz, from information supplied by Pat Allely, GW3KJW. This is about a fifth of the list, so more next month. For completeness we would like to know when the very first Es, auroral, MS and EME QSOs on 2m were made from the various British countries. Please send information to GW3KJW at Dwyfor, Rhiw, Pwllheli, Gwynedd, LL53 8AE.

The data are callsigns, time, (if known), and date. G2AHU-5B4WR 1800 10/4/78; G2FMF-DL4OK/P 3/49; G6RH-DM2ABK 13/10/61; G2JF-EA1AB 2224 11/6/64; G6DH-F8OL 2030 10/11/48; G6VX-G2XC 1/9/48; G3WW-GC3EBK 2100 2/3/53; G?-GD3DA/P 15/5/52; G3BW-GI2FHN 29/6/49; G5BM-GM3OL 2205 28/3/49; G5BM-GW2ADZ 6/49; G3CCH-HG2RD 0200 17/11/64(MS) and G3TOZ/G2JF-HB9LN 21/11/64.

THE TABLES

THE FIRST listing of the 1994 Annual Table will be in the May issue, using the rules and format as for 1993. Entries are based on claimed counties and countries worked; possession of QSLs is not required. The counties are the 77 listed in the latest *RSGB Call Book* and up to three different stations in each Scottish region may be included. The countries are the current ARRL DXCC ones, plus Sicily, IT9. Packet radio, satellite and repeater QSOs are not allowed. If you need a copy of the rules, send me an SASE.

The Squares Table will continue to alternate with the annual one. The following entries have not been updated for a year: G0HDZ, G0MGA, G0NFH, G4MUT, G4OBK, G4RRA, G4TIF, G4YTL, G6MXL, G7JAF, G8LHT, GM0GDL, GW4LXO and GW4VEQ. Please send your latest totals otherwise it will be assumed you no longer wish to be included.

PUBLICATIONS

THE OCTOBER issue of *Pack Rats Cheese Bits*, the newsletter of the Mount Airy VHF Radio Club of Southampton in Pennsylvania, includes a description of a low noise 144MHz preamp. Author Paul Drexler, WB3JYO, uses a low-cost NE72084 GaAsFET device. With the drain current set to 40mA, he claims a noise figure of 0.7dB, gain of 25dB, 1dB compression point of +18dBm and third-order intercept point of +26dBm.

The October *Report* published by the Six and Ten Reporting Club contains much useful propagation data which seems not to be available elsewhere. For anyone interested in the more abstruse physics of VHF propagation, solar and geomagnetic data, a subscription is worthwhile. The editor is Ray Cracknell, G2AHU (HWR), and the printer/distributor is Ian Brotherton, G2BDV (See page 18 in the December 93 *RadCom* for details).

METEOR SCATTER

RAY SOIFER, W2RS, explained what constitutes a valid MS QSO on his side of the pond. He states: "Under the North American protocol, a MS QSO must be made by ear, in 'real time.' As Ed Tilton, W1HDQ, wrote many years ago in *QST*, 'If you have to play it back to see if you have a complete QSO, you don't'." The chance of completing a real time *double-hop* MS sked between Europe and North America would seem to be virtually nil. The only possibility might be during a meteor storm, like the Leonids in 1966 when a visual Zenithal Hourly Rate (ZHR) of 155,000 was recorded. Ray suggested that N1BUG might be interested in trying transatlantic MS; he is QRV on the 20m EME net.

The first major shower of the year is the Quadrantids, with a ZHR of over 100. The predicted peak is on 3 January at solar longitude (LS) 283.1°, according to the *1994 Meteor Shower Calendar* published by the International Meteor Organization (IMO). Last year the radio peak occurred around midday, which suggests this year it might happen around 1800. The best directions at that time are NE/SW and E/W.

MOONBOUNCE

144MHZ

Since his comprehensive article 'An Introduction to Moonbounce' was published in the May 1992 *RadCom*, W2RS has worked several more stations using 150W and a single 19-ele Yagi; he now has 32 initials in his log on 144MHz. Taking advantage of mutual ground gain, he recently worked his first two-Yagi station, K2QE.

Roy Reed, G3ZIG (JO02), has been QRV off the Moon since 1987 and now has eight 3.2 wave-

ANNUAL VHF/UHF TABLE JANUARY TO DECEMBER 1993

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Points
G6HKM	57	56	–	–	72	29	41	17	20	10	302
G0TRB	56	33	25	3	32	10	42	13	–	–	214
G3FDW	31	32	47	6	45	6	–	–	–	–	167
G3FIJ	1	17	30	4	54	12	25	8	3	1	155
G0EHV	–	–	30	4	54	14	25	8	–	–	135
G1SWH	6	14	23	5	37	14	19	3	2	2	125
GW6VZW	65	57	–	–	–	–	–	–	–	–	122
GI4OWA	16	35	–	–	45	25	–	–	–	–	121
G7EWL	27	21	3	1	46	9	8	4	–	–	119
G4OUT	–	–	42	7	55	14	–	–	–	–	118
G8XTJ	23	32	–	–	45	9	–	–	–	–	109
GW0PZT	–	–	–	–	72	32	–	–	–	–	104
G1UGH	13	32	–	–	44	14	–	–	–	–	103
G3UOL	2	1	–	–	62	13	–	–	–	–	78
G7CLY	11	18	–	–	14	5	1	2	–	–	51
GU4HUY	–	–	–	–	36	11	–	–	–	–	47
G3FPK	–	–	–	–	32	12	–	–	–	–	44
G6ODT	–	–	–	–	4	1	24	7	–	–	36
G3YHF	–	–	–	–	–	–	29	7	–	–	36
G1JDU	1	18	–	–	–	–	–	–	–	–	19

British counties are those listed on page 65 in the January 1993 *RadCom*; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI counties. Countries are the current DXCC ones plus IT9. Deadline for the final 1993 scores is 27 January.

length DL6WU Yagis. 25 recent contacts included N1BUG, K2GAL, K5GW, WB5LBT, W5UN, K6OIQ, KB8RQ, AF9Y, W0HP, VE7BQH and JA4BLC. He has made some interesting QSOs with 2.5s pauses with G4SWX and G4PIQ. In the second leg of the ARRL EME Contest on 6/7 November, Peter Blair, G3LTF (IO90), completed with 14 stations, gaining ten multipliers. His station comprises a 2 x 4CX250B PA, MGF1302 0.4dB preamp and four 6m DL6WU long Yagis. The antenna is so low that the reflectors brush the ground.

John Regnault, G4SWX (JO02), completed with five more initials in the contest to bring his band total to 240; they were DL7AKA, IK1FJI, K8BHZ, N0XX and WD5AGO. The period was troubled with auroral conditions and QRM from the Marconi Memorial CW Contest. When the Moon was below 30° elevation, high levels of atmospheric absorption reduced most signals into the noise. John's final tally in the two legs was 64 completed QSOs with 31 multipliers, compared to 53/28 in 1992.

432MHZ

G3LTF runs a K2RIW PA, FHX3S LX 0.4dB preamp and 4.3m polar mounted dish. In the two legs of the contest, Peter completed 34 QSOs with 21 multipliers. VE3ONT was very loud and was worked on SSB with 58/59 reports. 9M8WB at 0100 on 7 November was initial number 287 on the band and a new country.

Ian White, G3SEK (IO91), is back on the band with 12 x 15-ele DL6WU Yagis. They are rear-mounted to allow ±90° polarization rotation. The elevation drive is an 18in satellite TV actuator but the DC motor required additional suppression and a home built position indicator. He combined six pairs of Yagis with balanced feeder made from 0.25in aluminium tubing. The six balanced feedpoints are joined to the main power divider using impedance-transforming sleeve baluns and identical lengths of 'Superflex' 50Ω coaxial cable.

Conditions on the 6 November morning were excellent with very little Faraday rotation or polarization spreading. Star QSO was with 9M8BV which needed some polarization rotation due to the lat/long difference. Ian had to end at 0915 due to a TVI complaint (The RIS has since exonerated the G3SEK equipment, so his neighbour is making some changes at his end). Sunday morning conditions brought severe spreading of received signal polarization and Europeans were coming in with about 40 degrees offset. Although he could hear VK3UM on all polarizations, he had to use vertical to work Doug.

1.3GHZ

G3LTF uses his 4.3m dish on this band with an NE32184A 0.5dB preamp. The PA consists of six 3CX100A5s, water cooled. In the contest, Peter worked VE3ONT for initial number 94. In the two legs he completed with 36 stations for 22 multipliers. His grand total points for the event was 445,200, his best score for some years.

The 1/2 January weekend is a favourable one, particularly for 2m, as the average sky temperature is only 218° K. The average signal degradation is –0.32dB and the average declination is +6°. These are the data from the VK3UM EME Planner program.

50MHZ

THE BAND IS in the doldrums now, so there were few reports. On 6 November, Roger Betts, G0TRB (SFD), found EH3MO and EH3IH (JN11) at midday. On 30 October Ted Collins, G4UPS (DVN), copied signals from DL, EH3 and 7, F, I0 and 2, OM3, S5, YO and YT1 between 1000 and noon. Between 1030 and 1330 on 6 November, there was propagation to EH1 and 3, F, I0, 1, 3, 4 and 8 and 9A and beacon CT1WW was S9. Ken Osborne, G4IGO (SOM), suggests that G4UPS's QSOs with Arne, SM7AED, are almost certainly MS, using the frequent, weak reflections that are always evident in the mornings. Unless you are conducting a schedule, such reflections go unnoticed. In his report to the Six and Ten Reporting Club, Arne refers to these as MS QSOs.

Ted Collins, G4UPS (DVN), reports that Frank van Dijk, PA3BFM, is the QSL manager for UC2AA, including Ben's EV8A operation. Frank's QTH is Middelaan 24, NL-3721 PH Bilthoven, Netherlands. Send him an addressed envelope and IRC if you need a card. F6AML handles UC2AAA/EV9A QSLs; he skeds Larry daily on 10,120kHz. 4N0SIX (KN04FU) is another Balkan beacon which could be QRV by now on 50.022MHz; probably about one watt to an omnidirectional antenna.

In a letter to Ted, ES5MC gave details of two Estonian beacons. ES0SIX (KO18PO) is on 50.037MHz running 15W of A1A continuously to a horizontal dipole 20m AGL, 30m ASL; ES0CB is its keeper. ES6SIX (KO37MT) is on 50.0113MHz and runs 10W output to a ground plane antenna 12m AGL and 85m ASL; keying is continuous A1A. The keeper is ES6QB.

144MHZ

ALEC TRUSLER, G0FIG (SXW), took advantage of the good tropo on 30/31 October working I2FAK (JN54), HB9MIN/P (JN37), I2FHW (JN44), IW2BDH (JN45), DB6GY (JN37), DK8SG (JN48) and OK1UBR (JN69). In a southerly opening on 16 November he contacted F5ADT (IN94), EA1BCB (IN63) and EA1GJP (IN53). In the aurora on the 18th he worked GM3JFG (IO77), GM4ZET (IO86) and GM7LVJ (IO85).

Ian Cornes, G4OUT (SFD), operated in the Cumulatives leg on 1 November, best DX being DF7KF (JO30) at 622km and DL6XA (JO40) at 718km. A couple of minutes before the start he contacted LX2DX (JN29). Conditions in the Marconi Contest on 6/7 November were quite poor compared to previous years, but even so, he worked some respectable distances, best being DK0BN/P (JN39) at 745km.

On 1 November, Ela Martyr, G6HKM (ESX), worked Germans in JO50 and 51, and OK1UBR. On the 17th, conditions were good to Scandinavia with LA2PHA (JO38), LA6VBA (JO48), LA1EKO (JO16) and a couple of GMs worked. Beacon GB3LER was S3. Next day GB3LER was still a good signal but Ela could not raise SM4UKC (JP70), who was heard working G3KEQ (JO01).

Ken Willan, G7IKM (MSY), runs an FT-290R, 30W amplifier and 8-ele Jaybeam at 35ft AGL. On 28 October he worked PA0LMD and PA3FVE (JO21), on the 30th F1MOZ/P (JN27), 31st F1CYB (JN17) and F6IFR (JN09) and on 2 November DG1DBK (JO31). John Hill, G7CLY (HBS), has been having transverter troubles again so hasn't done too well this year.

Darrell Mawhinney, GI4KSO (DWN), first noticed the good tropo spell on 25 October when Dutch beacon PI7CIS was S9 most of the morning. His first QSO was at 1151 with DL1KTP (JO30), followed by many DL, F, ON and PA stations till close-down at 1739. From 28 October to 2 November, there was good tropo to DL, F, ON, PA and LX but in GI, they did not experience the widespread openings to Italy and Scandinavia enjoyed by stations as close as GD and GW.

PHOTOGRAPH: G4NJU

Seen at the 1993 BATC Convention: Mike Wooding, G6IQM, the editor of *CQ TV* and the UK rep for *VHF Communications*.

Joe Ludlow, GW3ZTH (GNM), summarized his October portable operation from IO81FP at 1800ft ASL. In nine days he made 341 QSOs with 328 different stations in 18 countries and 79 squares. By far the most numerous were DLs, followed by PAs and Fs. Best directions were: 19th SM7, OZ and northern DL; 25th, central DL, JO41/61; 28th JO31, 33, 41 and 51; 29th IP90, IO99, JO76-62 and an LA in JO48; 30th IN96/97, HB9 in JN36/37; 31st GM to southern DL, OE, OK, SM7 and OZ.

Edward Allely, GW0PZT (GDD), reckons the period 25 October to 23 November to have provided the best mixture of propagation modes and DX since he was licensed. It started with a week of almost non-stop tropo all the way across Europe, best DX being DG9NBT (JN49) at 1071km. A strong aurora, lasting 90min, started at 1600 on the 25th. At first GB3LER was S9A but GB3ANG was not auroral at all. However it became auroral later, peaking to S7A. Even so, there was almost no activity on CW and only a couple of stations on SSB.

The tropo returned on the 28th to DL, F, ON and PA but nothing further than JO41. These conditions were repeated next day with HB9RDE worked; best DX was DL7AKA at 1220km. On the 30th, only well-elevated stations each end of the path were able to work each other; Edward made QSOs with stations in JN25, 35, 28 and

07, best DX being I2FAK at 1332km and F6FGO (JN25) at 1090km.

The greatest spread of DX was on the 31st, the band being open all day from JN36 to JO76. OZ5QF (JO45) was a new square and country and SM stations in JO65, 66, 75 and 76 provided new squares. On 1 November the band was wide open to OK and OE but activity seemed low. Best DX were OK1UBR at 1295km and OE5XDL (JN78) at 1406km. On the 15th there was an opening to EA with contacts into IN53 and 63; the EA1VHF beacon was audible till the 18th. Activity was poor in the strong aurora on the 18th. SP1JVG (JO84) at 1439km was a new square. LA1EKO and SM5BSZ (JO89) had big pile-ups.

430MHZ UP

THE FOLLOWING reports are for 70cm which was the band of the month for G0FIG who worked seven new squares. On 31 October, Alec contacted OE3XUA (JN77), DL9NDD (JN59), DF4UE (JN48) and DD0PX/A (JO40) and next day DG5NEX (JN49), DK6AS (JO52), DF0RB (JO51) and F5MCC (JN17). On 16 November he copied new beacon FX3UHB (IN78) on 432.916MHz and worked F5PAU (IN88) and F1CYB.

Rob Briggs, G0TDF (WMD), sent copies of his logs for the October legs of the Cumulatives. He made 32 contacts on the 13th, best DX being GM4JJJ (IO86) at 408km. The session on the 28th coincided with the excellent tropo and resulted in 60 scoring QSOs with many contacts over 600km; best DX by far was DL5OWF (JO71) at 1099km and his 100th square. The third leg on 12 November brought absolutely flat conditions and poor activity. Very heavy rain seriously affected the VSWR on his antenna system and a small fire in the shack added to his problems. Nevertheless, he made 29 contacts, the sole continental being DD9EN (JO31). On 1 November, he worked lots of Germans plus LX1JX (JO30) and OE5VRL/5 (JN78).

In a long letter, Rob reckons that many operators are equipped for the band but are not prepared to come on in 'normal' conditions. But in tropo events, or strong auroras, activity increases almost to the point of band congestion. He suggests resurrecting the 'alphabet' type award scheme tried in the mid-1980s to try to create some regular activity. He mentions that Monday night is supposed to be activity night on the band, a hang-over from this scheme. Unfortunately, Monday night is CW activity night on 2m. He would like to see novice licensees encouraged to enter more contests, suggestions being to give them double points and/or a separate section. Your comments on these ideas would be welcome.

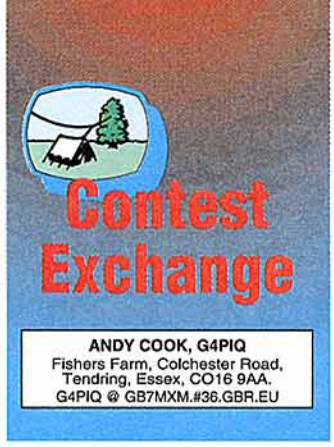
Running 5W to a 19-ele Yagi, Chris Skelcher, G3YHF (WMD), worked into DL, F, GD, ON and PA in the end-of-October lift, best DX being DG9NBT at 860km. G6HKM was QRV on 1/2 November and contacted lots of continentals. Ela's best DX included DL3SBH and DG5SCC/P (JN48), DG9NBT, DG5NEX, DL4MDQ (JN58), DG1NZ (JN59), LX1JX, LX1DB (JN39), F8ZW (JN38), OE5MKN (JN78) and EI4AEB (IO63). On the 17th she worked LA6VBA, after a QSY from 2m, and next day GU6EFB (IN89). On 23cm G6HKM worked DL6NAQ/P (JO40), DL4EAU/P (JO51) and three DLs in JN49. Ela also worked ON5NY (JO10), DC8UG (JO30) and LX1DB, all on 1 November.

Back to 70cm and to GI4KSO who took advantage of the good conditions on 28 October. Darrell's DX included ON4GG, ON4ANT (JO20), DK5DQ/P, DF2JQ (JO31), DK5KO (JO30) and PA3BAS (JO21). On the 31st he contacted DK8SG who was only running two watts, for best DX of 1183km. On 1/2 November he worked DF0RB, DL9AAK/P (JO51), DK3FB (JO31), ON4YZ (JO20), PA0GHB (JO11), DL3YEE (JO42) and PA0RDY (JO22).

GW3ZTH/P was QRV on 28 October for the Cumulatives but operation was curtailed when vandals set fire to a car on the access path to IO81FP; he only made six QSOs. On the 30th, conditions were very good to the north, southwest and southeast. Contacts were completed with F5PAU, F6CBH (JN19), F1DBE (JN09), F6CCH and F6CRP (IN96). Conditions were even better next day, but Joe blew up his GaAsFET preamp after two QSOs.

COPY DATES

THE DEADLINE for the March issue is 27 January – don't forget your final 1993 Annual Table scores – and for the April edition it is 24 February. The fax machine is on 081 763 9457, the BT Gold mailbox is 76:MSX021, my CompuServe ID is 70630,603 and the Internet route is 70630.603@compuserve.com. Or there's always 'snail mail' of course. Have a Nice Year!



ANDY COOK, G4PIQ
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G4PIQ @ GB7MXM.#36.GBR.EU

YOU WILL OFTEN see in contest rules that 'dupe sheets' are required, and you may wonder what these are. These list, for each individual band, the stations worked in alphabetical order and with a serial number sent, or contact time, listed beside them. Apart from it being a mechanism for you to check that no duplicate contacts have crept into the log (these are penalised at a heavy rate – often ten times the claimed score), it also gives the adjudicator a valuable reference to check against. Many of the computer logging packages generate these lists automatically and, although dupe sheets are only specifically required for a small number of HF contests, the VHFCC in particular would appreciate it if you would submit them whenever possible. If you have a computer based system, it takes virtually no effort on your part, and makes it much easier for the adjudicator to do a thorough check on the logs of all contestants (your opponents!).

HOOKING THE CASUAL TUNER

IN THE JUNE 93 *Contest Exchange* I attempted to explain how the casual non-contesting operator could tune around the band and have fun by giving a few points away. From the contestants' side of the fence, perhaps the question you should be asking is "How can I persuade these people to call *me*?". As always there are a number of factors which come into play here, such as sounding enthusiastic, being loud and so on. However, there is also the issue of how to avoid putting people off calling you, and I have received a few letters from non-contestants on this subject.

Rodney, G0EUC, finds it irritating that, even when contestants were not busy, some would not provide a name and QTH when asked. He also found the practice of always giving 59 reports not to be useful since he was trying to assess the radiation pattern of his antenna. At VHF, I am pleased to say that real signal reports tend to be given, but at HF where the pressure is often much higher, 59 tends to be the norm. My view is that this is not for any particularly well founded reason except where QSO rates are *very* high. However, it is difficult to break the mould since many of the computer logging packages will not allow you to enter an outgoing signal report. However, in defence of contesters, the vast majority will give a 'real' report if specifically asked for one although this is easier and quicker on SSB than CW.

Another subject associated with contest behaviour which has raised several comments is that associated with bandplans. As everyone knows, our bands have a number of frequencies allocated to particular modes, such as SSTV, RTTY, beacons, QRP and the like. The people who use these frequencies quite justifiably get somewhat infuriated if an SSB or CW contest station takes up residence there. Now, while it is quite possible for a contest station just to be awkward and not move, if they thought a little harder they might realise that it is probably not in their best interests to remain there and alienate a group of people who were potential QSOs for them in the contest! The other side of this is that the specialist frequency users cannot expect to maintain a huge guard band around 'their' frequency, particularly during major contests – so don't go expecting a hole for SSTV on 20m from 14220 – 14240kHz in CQWW! The same situation applies at VHF, and in spite of not being a big fan of the general usage of the calling frequency of 144.300 on 2m SSB, I reckon it's pretty antisocial to sit less than about 5 kHz away from it in a contest!

The long and short of this is obvious – contests are about QSOs – QSOs come from other people, the majority of whom are non-contestants – so don't wind them up – be polite, both inside and outside the events.

Those are my thoughts for this month. I would appreciate any feedback from you on the contents of the column. You can reach me by traditional mail or, preferably, by packet radio @ GB7MXM. I must apologise that due to pressure of time, I may not be able to reply to individual queries except through the column – however – replies through packet radio are quicker to generate! I would also appreciate any contest related photographs which you may have – people and/or stations in action, and big antenna systems all work well.

HF F-LAYER PROPAGATION PREDICTIONS FOR JANUARY 1994

The time is represented vertically at two-hour intervals GMT 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 / / GMT	28MHz 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 024680246802
** EUROPE								
MOSCOW	....1553....	....2775....	....59982...	....89994...	...188888..	42.566568622	88564333888	++53....25++
MALTA	....1432....	....3655....	....68875...	....89887..	...187789..	562665568974	99874223689	+++4....3+++
GIBRALTAR	.....221....	.....4431...	....17765...	....48887..	....888886.	232.866678 63	89866333579	++++3...25++
ICELAND	.....11....	.....331...	.....2663...	.....5886...	.....8889..	.1..576788 2.	67516544677 5	++++32.235++
** ASIA								
OSAKA	....	....	....2.....	....51.....	....74.....	1..164123211	1...311136 64	45
HONGKONG	....21.....	....43.....	....762.....	....774.....	...15652....	1...233432 1.	1...1.13664	.........4+4
BANGKOK	....474.....	....6862....	....7885 1...	....16887 3...	...136667 ...	3...334642 3	3....1.13677	.........4+5
SINGAPORE	....4763....	....6885....	....6888 1...	....15888 3...	...126667 ...	2....334642 4	2.....13776	.........4+4
NEW DELHI	....553.....	....6751....	...17873....	...26775....	...235662...	51...234522 4	73.....13678	5.........45+
TEHERAN	....6763....	....7885....	...28888 1...	....47688 4...	1..543567 1..	6423113366 45	8731....13788	+5........45+
COLOMBO	....6764....	....7886....	....16788 2...	....24588 5...	...112567 1..	22....336645	61.....13778	3.........45+
BAHRAIN	....6653....	....7775....	...277882...	...455784...	2..522567 21.	7422..236766	873.....13688	+5........455
CYPRUS	....6775 1...	....8987 3...	....19999 6...	....38898 1..	32.766678 621	88564335788 7	9973111257 88	++4.....24++
ADEN	....6655....	....7777 2...	...266785...	...444687 1..	3..411368 532	8321....36887	872.....13687	+4........455
** OCEANIA								
SUVA/S	....	.....21.....	.....143.....	.....3661...	.....6665...	.....343463..	.....31113 3..	....
SUVA/L	....1.....	....321.....	....7531.22.	.1..875325 41	.1118655557 41	..135323551.	....131..22..	....
WELLINGTON/S	.....1.....	....231.....	.....563.....	....1776....	....46664...	.....643461..	....311132..	....
WELLINGTON/L	....	....	....21....1.	....531..221	.11.753225 31	....163234 41.	....31..21..	....
SYDNEY/S	....2222....	....5444....	....7777....	....8878 2...	....166666...	.....433462..	.....11.1351.	....3..
SYDNEY/L	....	.....1.....	.....31...1.	....1631.13.	....4653255 1	....432347 31	....11.1241.	....2..
PERTH	....5532....	....7754....	....17877 2...	....25878 5...	....126567 1..	1....333664 3	.....1.13762	....44.
HONOLULU	....	....	....	.....1..	.....4..	.11.112134 1.	..32311132..	....4..... .....
** AFRICA								
SEYCHELLES	....1254 1...	....3367 2...	....144785...	....3336871..	3..211368 632	831....36887	84.....13688	+2........45+
MAURITIUS	....2655 1...	....4777 3...	....156786...	....2346882..	32.111368 742	851....36898	83.....13688	5.........4++
NAIROBI	....5455 2...	....6577 4...	....165687 1..	....3444783 1.	42.411158 863	9831....26898	873.....3688	+5........355
HARARE	....1245 3...	....3467 5...	....4567821.	11.144468 531	55.311137 885	9831....14899	872.....2688	+4........3++
CAPETOWN	....1266 4...	....2377 61..	....4567842.	11..444577 52	6512211258 87	9842....2699	873.....378	+4........4+
LAGOS	....5766 5...	....7877 72..	....8766852.	22..754587 52	6612521258 97	8975 2....2699	7883.....488	4++.....5+
ASCENSION Is	....1633 51..	....3755 73..	....6755752.	11..754457 52	663.621126 87	9984 4....379	8885 1....158	+++2.....2+
DAKAR	....1775 51..	....2877 73..	....5876762.	.1..775467 41	554.742137 86	8883 51...1489	8787 2....268	54+4.....3+
LAS PALMAS	.....6655...	....1887 72..	....598885..	....7888872.	233.8766 4	8884 74334799	9898 52112589	++++2....25+
** S. AMERICA								
Sth SHETLAND	.....1123 1..	....1334 43..	....456665 1.	.1..676555 31	343.764323 44	4562531...13	23332.....	....
FALKLAND Is	.....1245 1..	.....3466 3..	....266664 1.	....576444 31	344.763112 34	68826....13	46653.....1	.343..... .....
R DE JANEIRO	.....2111 1..	.....4323 3..	.....753451.	....174334 31	334.552112 55	8892 62....37	88873.....14	+++4..... .....
BUENOS AIRES	.....1131..	....2324 3..	....1454541.	....365333 21	223.763111 33	7882 63....14	68873 1....1	3++4..... .....
LIMA	.....665 1..	.....876 3..	.....8764..	.....8544 1.	..2.115211 12	4571533....3	58863 1....1	2++5..... .....
BOGOTA	.....565 1..	.....776 3..	.....8765..	.....8644 2.	..1.125311 22	4471433....4	68864 1....2	3+55..... .....
** N. AMERICA								
BARBADOS	.....665 1..	.....876 3..	.....3876 51.	.....5854 52.	..1..652124 2	6571333...36	88763 1....4	+545.....2
JAMAICA	.....265 1..	.....476 3..	.....7864..	.....7754 1.	..1.116421 31	446.433 1..14	68854 1....2	4+54..... .....
BERMUDA	.....365 1..	.....587 3..	.....7875..	.....1776 62.	.....464344 1	446.243 1.136	88854 1....15	+++55.....2
NEW YORK	.....541..	.....176 2..	.....4885..	.....6876 1.	.....166554 1	345.133322 34	88853 1.1..14	+++5..... .....
MEXICO	.....441..	.....662..	.....874..	.....8641.	.....2631 1.	235.223 31..1	37844 1.1....	.5+4..... .....
MONTREAL	.....441..	.....176 2..	.....4885..	.....6876 1.	.....1665 64.	345.133323 44	88843 1.1..14	+++5.....2
DENVER	.....3...	.....51..	.....173..	.....385..	.....6642.	244.111332 22	47843 1111..1	.5+5..... .....
LOS ANGELES	.....1...	.....2...	.....52..	.....741.	.....1641.	134.12.341.1	26833 1.11...	.3+5..... .....
VANCOUVER	....	....	.....11..	.....331.	.....661.	243.12.264 21	36833 1.1311	.3+4..... .....
FAIRBANKS	....	....	....	....	....1..23..	231.132357 31	34513 1113532	.234....2..

The provisional mean sunspot number for November 1993 issued by the Sunspot Data Centre, Brussels was 34.8. The maximum daily sunspot number was 69 on 30 November and the minimum was 10 on 1 November. The predicted smoothed sunspot numbers for January, February and March, are respectively: (classical method) 44, 41, 39 (±10); (SIDC adjusted values) 25, 22, 20 (±5).

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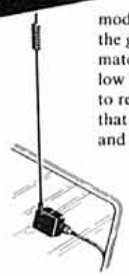

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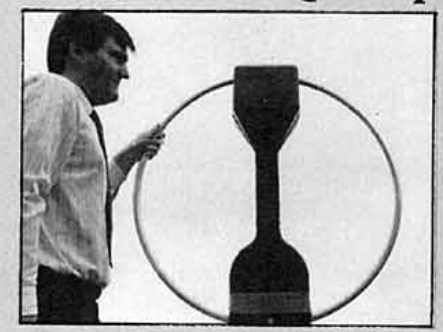

** 6 Bands 10MHz-30MHz* ** 36" Diameter*
** Remove control* ** 150 Watts*
** Fits in loft easily*

£299.95

It works because we've been testing it ourselves! It fits easily through the average loft trap door. It's also weatherproof for outside and comes with mounting hardware for mast plus control box and AC adaptor. Simply plug adaptor into 240V socket, connect it to control box and run a coax cable between control box and loop. No other connection is necessary. The control box gives you slow and fast tuning plus built in VSWR and Power meter. A complete aerial system in one package.

Gives good low angle radiation for DX and some high angle for local work. Mount it vertically for DX and horizontal for local work. Performance is very similar to a dipole erected at a similar height. However, unlike a dipole, it still works well at low heights of only a few feet. Ideal for portable work. For the full information send today for the specification sheet.

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A budget class 70cm handheld from the market leaders!

IDEAL NOVICE RIG

The Spectrum Display

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- ** 2m Tx/Rx*
- ** 70cms Rx*
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- ** Rx 400-510MHz*
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- ** AM/FM select*
- ** DTMF*
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- ** 5W on 12V*
- ** 80 Memories*

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The most exciting rig to hit the market with the unique spectrum display. See the activity on adjacent channels, on adjacent memories, or check 2m and 70cms repeaters at the same time! You get channel activity and signal strength. You also get nearly 400MHz of receiver coverage! Now look at the features:

AM/FM — switchable over the whole receiver range; **Channel steps** — programmable and self correcting; **Memory Erase** — clears individual channels; **Programmable Scan** — you set the upper and lower limits; **Memory Skip** — select memories to be ignored; **Channel Scope** — gives you a spectrum display of 7 memories or channels; **CTCSS Encoder** — gives you selective repeater access; **Reverse Repeater** — lets you listen on the input; **Crossband Transmit** — gives you transmit on 2m and listen on 70cms; **Illuminated dial** — either 5 seconds or continuous; **Auto Power Off** — no more flat batteries; **Low Battery Indicator** — now you know when to charge it; **Battery Save** — for extended operation; **Full DTMF** — for selective calling; **Beep Tone Off** — for peace and quiet!

DJ-480E

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- ** 2m Tx/Rx*
- ** 400-510MHx Rx*
- ** 10 Memories*
- ** 200 Memory option*
- ** Full scanning*
- ** Auto Power Off*
- ** Programmable Steps*
- ** Rotary Dial*

A wolf in sheeps clothing might be apt. For its budget price hides a high performance rig from the market leaders of hand-helds. Amazingly low cost for a rugged and well tested radio that has dominated the Japanese market for some time. And no wonder when you look at the value you get. Slip it into your pocket or brief case and you can keep in touch through the many UK repeaters. If you hold a Novice licence, you will find this fits the bill perfectly. You get ALINCO reliability, tough construction and one of the hottest receivers you have ever heard. You'll work to the limits with this one! And if you fancy a go at mobile operation on the cheap, simply purchase the low cost 12 volt adaptor and you're ready to go. Make no mistake, this 70cms rig is the business. The latest ALINCO test and extended "burn-in" production line ensures that your rig will be trouble free for many years to come. But for further reassurance you also get our written 12 month warranty. So order your "no-risk" no-compromise radio today.

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Ten-Tec Scout £499

SSB/CW 1.8MHz - 30MHz Capability!

* 5 - 50Watts Output SSB/CW
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* VSWR, Power & S-meter
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Just arrived from the USA. It's the cheapest HF rig with the famous Ten-Tec Pedigree. Just pay for the bands you want. Extra band modules £39.95. Measuring 2.5" x 7.25" x 9.75" it is ideal for mobile, base or portable. Only available direct from us. Plus a full 12 month UK backed warranty.

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Price Crusher!

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* Full scanning

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£199 (2m Version)

We've cut the price to the bone on these rigs. You get great value, guaranteed reliability and superb performance. Fully featured, these rigs are well recommended for the beginner or experienced user. You get two dry packs, one taking 4 AA cells, the other 6 x AA cells. The 70cms model is ideal for the NOVICE operator. By direct selling these we have been able to offer you the very best value. Includes aerial and belt clip. Ni-cads and chargers extra.

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We used one with a handheld and the quality was superb with low car noise. The performance will amaze you.

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LED display Power 0.3-5 Watts
BNC connector
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The only ones you can mount vertically without loss! Super Japanese quality.

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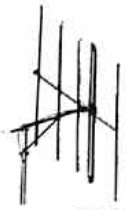

144-WH5, 5 el, 2m	£29.95
144-WH8, 8 el, 2m	£41.95
435-WH8, 8 el, 70cms	£29.95
435-WH15, 15 el, 70cms	£44.95
KSB-50, Vertical mounting kit	£9.95

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Cuts out almost all noise including power lines, static, ignition, hetrodynes etc. Pass bands down to 30Hz and bands to suit Packet, RTTY and Amtor etc. Brings the wanted audio up and reduces the noise by several S-points! It can make an SSB signal with band noise sound just like a local FM signal! Amazing device that has rocked the USA. It's not cheap at £299 but when you hear it you'll realise how much it can cut down listening fatigue.

LED's are OUT!

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10Hz - 2.4GHz

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LED's are heavy on battery current and poor in daylight

The latest counter from OptoElectronics gives you a low current LCD display. This means low battery consumption, longer life between charges and 100% visibility even in bright sunlight. This latest counter from the leaders in the USA, is bristling with features. You get 3 memories and a built-in microprocessor to filter out random noise and unstable signals. Only genuine signals are displayed. You get a bargraph signal strength meter and a choice of 6 gate times. Sensitivity peaks at 300uV so you can read rf frequencies at distance no other counter can match! You also get free AC charger and telescopic antenna. Available now.

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10 Modes World Leader **£339**

The most advanced and best value product of its kind on the market. Ideal for TX or just receive, you will be enthralled for days with the capabilities of this item. All you need to add is an IBM PC, receiver or transceiver, and software. Most modes can be operated using shareware or **MFJ-1284** pack at £29.95. For Fax & SSTV you need the 1289 software pack for **£69.95**. Come and see our demo unit in action. There's lots of activity (14.065-14.080) and data comes through at speeds faster than you can type! Even when signals are weak. All in a narrow bandwidth that even 250Hz filters can pass!

1kW 50 Ohm Load

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Just fill with transformer or vegetable oil, and you have a really robust load. 1MHz - 400MHz with SO-239. Will withstand 1kW for ten minutes!

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£229.95

25MHz - 550MHz
800MHz - 1300MHz
AM - FM

We've managed to purchase the last production run of this receiver at a special price. Full coverage of all the popular channels including the full aircraft marine and ham bands etc. Compare the cost of its competitors! This is a fully specified scanner that comes from the most respected name, Yupiteru. 100 memories and a highly sensitive receiver.

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VHF WAVEMETER for 6 & 4M
Our wave absorption meter for the 50 & 70MHz Bands reads fundamental plus up to 210MHz on harmonics. Meets licensing requirements. Can be used as field strength meter within its range. Requires PP3 battery (not supplied).
Model WA2... only £29.96 + £1 p&p (inc VAT)

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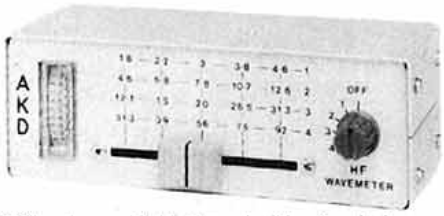
Covers 120MHz to 450MHz in 2 ranges. Fundamental for 2M. Meets licensing requirements. Very sensitive. Can also be used as a field strength meter. Requires PP3 battery (not supplied).
Model WA1... only £29.96 + £1 p&p (inc VAT)



HF WAVEMETER
1.8-92MHz. Ideal absorption wavemeter for law abiding operator. Requires PP3 battery (not supplied). 2 yr guarantee.
MODEL WA3... £54.95 + £1 p&p (inc VAT)

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Antenna Tuner

The new **HOWES CTU150** has been introduced to meet the demand for a higher powered version of our much liked CTU30 30W ATU (kit: £39.90). The CTU150 is designed for use with the popular 100W HF transceivers and covers 1.8 to 30MHz. The "T match" configuration (using 2 high voltage tuning capacitors and 12 switched inductance settings) gives a wide matching range and useful extra RF filtering. It suits coax fed and long-wire antennas. The optional hardware pack is styled to match our other equipment and enables you to achieve a smart finish for your project.

CTU150 Kit (£49.90) + **HA150R** hardware (£16.90) = **£66.80**

DFD4 + CA4M

ADD DIGITAL READ-OUT!

Add digital accuracy to your analogue radio! The **HOWES DFD4** is am excellent way to bring older equipment up to date. Suits FRG7, FT101, TS520 etc. etc.

DFD4 kit: **£49.90**. **CA4M** hardware pack: **£24.90**. Optional **PMB4** allows extra 5 IF offsets. PMB4 kit: **£9.90**

Other kits are also available to give digital read-out with our communications receivers, transmitters and transceivers.

EASY TO BUILD RECEIVER KITS

TRF3 Shortwave Broadcast TRF receiver. Great fun to build and use, educational too! As featured on BBC World Service "Waveguide" programme. AM/SSB/CW reception. Makes a great present for the junior op.
Complete electronics kit plus hardware pack: **£41.40**

DXR10 Three band (10, 12 & 15M) Amateur radio SSB & CW receiver. Matching transmitter kits available to enable expansion into transceiver. Complete receiver kit with HA10R hardware pack and DCS2 "S Meter": **£64.30**

TRF3 + HA33R Hardware pack

DXR10 + DCS2 Kits + HA10R Hardware

TRANSMITTERS

		Kit	Assembled PCB
AT160	80 & 160M Bands AM/DSB/CW 10W PEP adjustable	**£39.90**	**£62.90**
CTX	QRP CW Transmitter, 40M or 80M versions	**£15.50**	**£22.90**
MTX20	20M 10W (adjustable) CW Transmitter	**£29.90**	**£39.90**
HTX10	10 & 15M SSB/CW Exciter (inc crystal filter)	**£49.90**	**£79.90**
HPA10	3/10W PEP Linear Power Amplifier to suit HTX10	**£39.90**	**£58.90**

Matching VFO kits are available for all the above

ACTIVE ANTENNAS AND PRE-AMPS

AA2	150kHz to 30MHz Active Antenna Amplifier	**£8.90**	**£13.90**
AA4	25 to 1300MHz Active Antenna	**£19.90**	**£27.90**
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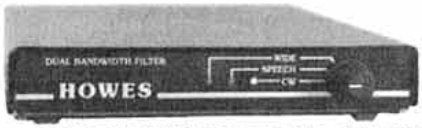
SPA4	4 to 1300MHz Receiver Pre-amplifier	**£15.90**	**£22.90**



CLEAN UP YOUR RECEPTION!

DUAL BANDWIDTH AF FILTER: £29.80

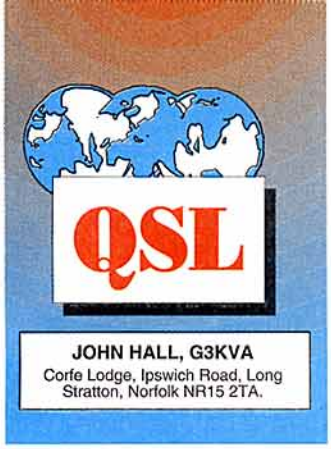
• Reduce noise and interference! • Sharp SSB/Speech filter with faster roll-off than IF crystal filters! • 300Hz bandwidth CW filter • Printed and punched front panel • All aluminium case • Simply connects between radio and external 'speaker or 'phones • Suits all general coverage receivers and transceivers • Excellent receiver upgrade!

ASL5 Filter Kit (£15.90) + HA50R Hardware (£13.90) = £29.80

PLEASE ADD £1.50 P&P for kits or £4.00 P&P if ordering hardware.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our **free catalogue** and specific product data sheets. Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.



GREG LOVELOCK, G3III, (now there's a callsign to conjure with) tells me the probable reason for sending QSL cards destined for 9H4 to a separate address is because they would only have to be sorted and repacked for transmission to Gozo if they were originally sent to Malta. It's as simple as that.

RSGB BUREAU HISTORY II

ARTHUR MILNE, G2MI, carried on the work of the RSGB's National Bureau from just before the war until December 1977. Arthur was a mine of information about the QSL system and was the first person to run the bureau away from RSGB Headquarters. He had enough space at his house to do so only because his radio equipment had been confiscated for the duration of the war! Despite the onset of war QSL cards were arriving from overseas well into 1942 and then the government put a ban on them. The service was not reinstated until 1946. In 1939 the RSGB had some 3,000 members but by 1946 that total had leapt to 22,000.

Arthur was in for a busy time. So busy in fact that when postcodes were issued, his house had a postcode of its own which it retains to this day. His workload was such that the local Post Office justified the employment of one sorter full-time to deal with it. They were quite unhappy when Arthur finished!

It was the size of the workload which saw the introduction of QSL sub-managers because until then all the incoming and outgoing work had been dealt with by one person! They are the unsung heroes of the system who re-sort the cards on receipt from the main bureau. They utilise their own homes for this purpose and receive an honorarium of less than 50p per week for their work! It is a good idea to keep well in with your sub-manager.

Arthur's most interesting delivery was a sackful of bank notes to the value of about £30,000 destined for the head office of a trades union located nearby. I understand Arthur dutifully sent it on to its proper destination but there are no prizes for guessing where that day's delivery of QSL cards ended up!

Arthur was never paid for the responsibility he carried for 37 years although his long suffering wife received a small salary for all the work she put in. He finished in 1977 and was, at that time, handling about 35,000 cards per week.

QSL CARDS

IF ANYONE IS interested in having a look at my own personal QSL card, it is reproduced on this page. Artwork was done on an Apple Mac. It was printed by a *RadCom* advertiser.

Despite what I told you about our success in sending cards to the former Yugoslavia we have hit snags of late with the sanctions people. The girls had been sending the cards in small packets and most were allowed through. That seems to have been stopped and we have had them returned marked 'unable to deliver'. We are holding cards now for a while to see if things improve – so expect delays in returns from that area. Sorry but there is little we can do.

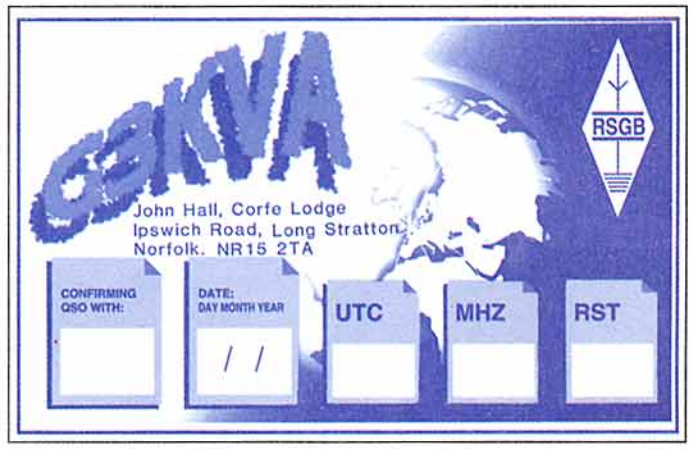
Larry Flegle, N4TMW, is QSL manager for John Gibson, HS0ZAK, and Linda Gibson, HS0ZAL, who are at the Bangkia Baptist Hospital in Thailand. John and Linda's QSL card is reproduced below and Larry tells me that they are the most active husband and wife team in Thailand. If anyone works them the route is via Larry whose address is 210 Wylie Lane, Woodstock, GA 30188, USA.

Phil Whitchurch, G3SWH, has written me a very informative letter about the QSL situation in the former USSR and in particular about Uzbekistan. Paul has had Nazim, UI8AA, staying with him for a few days. Nazim has given him a first hand and up-to-date briefing on the difficulties facing amateur radio following the break-up of the Soviet Union. Box 88 will still handle QSL cards but with a much lower level of service and this has been apparent at the bureau here in Headquarters. We used to get large numbers of cards from Moscow but this has reduced to a mere trickle.

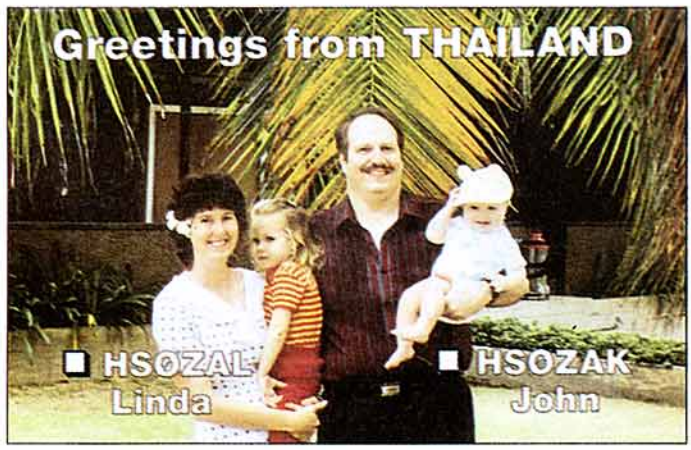
Phil says that Nazim explained that prior to the break-up, every amateur in the Soviet Union paid an annual subscription of about five roubles to their local branch of the national society who in turn paid a proportion of that to PO Box 88 to run the national QSL system. That has all gone and the new subscription is 25 roubles direct to Moscow.

In Uzbek this has led to some amateurs joining the local club in Tashkent whilst others have stayed with Moscow. The two clubs have no liaison at all! Things are in a state of confusion with, until recently, two bureaux operating in Tashkent. Hopefully the position will become stable but Phil says that sending cards to PO Box 88 is literally Russian roulette! He has given me the address of the Uzbek Bureau as PO Box 73, Tashkent 700100, Uzbekistan, CIS. I am afraid that things in the CIS are moving at such a pace that it is difficult for IARU to keep abreast of them.

I recently had a non-member write me and suggest that the Bureau was undemocratic in that it did not regard cards from G non-members sent to the Bureau and destined for other G calls as incoming therefore legitimately sent for the Bureau to handle. As most readers know the bureau does handle cards destined for G non-members received from overseas as part of an IARU agreement. It will *not* handle cards from G non-members which are *outgoing*. However, my correspondent was quite miffed when I told him I did not think much of the suggestion that cards from G non-members should be regarded as from overseas! The words "there is no such thing as a free lunch" seem appropriate to this situation.



The QSL card of our columnist John Hall, G3KVA,



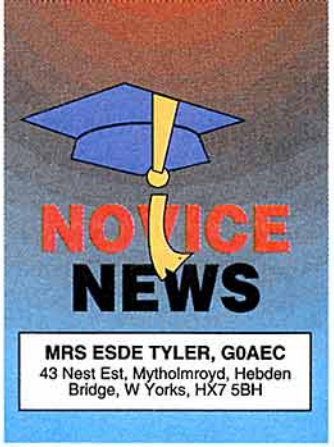
QSL Manager Larry Flegle, N4TMW, sent in John and Linda Gibson's QSL card from the Bangkia Baptist Hospital.

AWARDS

HERE IS ANOTHER HF award to go for. It's the Worked ITU Zones and is awarded for two way contacts since 1 January 1984 with land based amateur radio stations located in at least 70 of the 75 broadcasting zones as defined by the International Telecommunications Union (ITU). A successful applicant will receive a handsome plaque for such achievement.

Applications should be forwarded to: RSGB HF Awards Manager, Bill Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland NE65 8UW.

The rest of the rules and costs involved are shown on page 4 of the current *RSGB Call Book* and if you haven't got one of those then you should have (see pages 93 – 94 for ordering details).



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

THE CITY and Guilds of London Institute has issued a list of results covering all ten NRAE exams, but all the September exam figures may not be included if any papers arrived late.

The figures show that 2,559 candidates have sat the NRAE with 2,060 passes. 86.4% passed the September paper giving an overall pass rate of 80.99% since the first exam in June '91. I would assume that many of the 499 candidates who failed have since tried again and passed.

Two thousand new Novice licences gained in two and a half years – many of whom have since achieved a full amateur licence – deserve mention. Congratulations to all of them and to the dedication of their Instructors. Congratulations too to those who worked so hard to make it all possible in the first place – it must give a great feeling of satisfaction.

IT MUST BE A RECORD!

JOHN-JAMES sat the NRAE exam in September and now holds the callsign 2E1CIT. He is currently considering studying for the RAE even though he is too young to hold a full licence. He is enjoying himself speaking to amateurs in far-flung corners of the world under the supervision and callsign of his father and teacher, Lionel, G4PVV.

Lionel is J-J's full time teacher in all subjects, giving home tuition, and serious learning started early – he thrives on it!

While close by on holiday, we called in to meet him and his parents and found a well-balanced, knowledgeable boy who has taken eagerly to amateur radio. His construction projects were well made – and obviously not the work of his father. I was told they worked first time. The 'school' is licensed, so if you hear GX0TTC you stand a good chance of speaking to the young man. Now the punch line. John James had his birthday in October – when he became eight. At seven years old when he sat the NRAE he must be the youngest Novice ever.

John-James, 2E1CIT, is aged eight!

AWARDS

MANY AMATEURS enjoy their search for awards, and Novices want to join in but, with limitations on power and frequencies available, they find it less easy to achieve their aims. However I have news of two Novices who have gained awards and I am delighted to report them.

Emma, 2E0AAX, has received her DXCC Award. It is for working 102 countries – 34 on 6 metres and 68 on 10 metres. Completion is the hard part as Emma confirms – she had to work, and wait – ages to get the last ten. Congratulations, Emma.

Her letter adds more news. An 'up with the lark' operating stint before school earlier in the year raised two New Zealand contacts. Some contacts are made on SSB and some using CW. Six metres is a band Emma often uses – she has contacted three of the five continents so far. She says she has learnt a lot about propagation from using this band and recommends it to all Novices especially in Summer. To prove Novices become involved, Emma is now a UK Six Metre Group Committee member. She invites all Novices to join the group – there are already about ten Novice members. If you are interested, the annual subscription is £7 and the membership secretary is Chris Gare, G3WOS, who is QTHR.

Alex, G0DHZ, sends more news of Novice achievement. Margaret, 2E1AQS, supported by her son Robert, G4OBE, has gained the basic award from the Solent Fortifications Amateur Radio Group – the first Novice to do so. The Group – and Margaret – are delighted, I think congratulations are in order there too.

Finally, not an award – but an achievement. I met Dennis, 2E1AKM, at the Barnsley rally when he told me that he has worked 101 Novices – all different callsigns on 70cm. Makes my award (sent by A N Onymous) for working five in one evening look a bit pathetic!

Novice Note Book

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

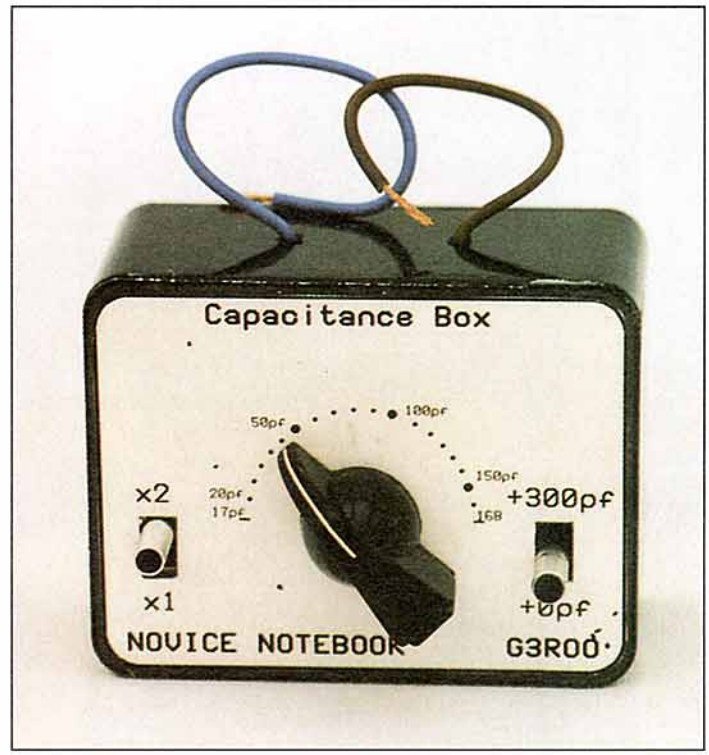
I HAVE JUST REALISED that it was thirty years ago that I built the capacitance box I have just junked! It has been such a useful little unit that I had to build another, but this time I could add a feature or two that I had missed all that time ago!

A capacitance box is just a variable capacitor with flying leads and it is calibrated in picofarads. Whenever you need to experiment and find the value of capacitance you require in a circuit, you can clip or solder it in place, make a simple adjustment and read off the value of the capacitor required! I use it all the time in resonating RF tuned circuits in experimental gear. Another use is in aerial experiments, especially if the 'box' has a sufficiently large range, where it can be used to resonate loop aerials. It is truly one of those things that you wondered how you managed without!

MAXIMUM AND MINIMUM

MY ORIGINAL UNIT used a 500 picofarad capacitor which had a minimum capacitance of 30pF, but with the stray capacity of the fly leads this increased to about 36pF, a little too high in some instances. I decided that I would use a Jackson Brothers 'OO' series of capacitor with two sections of 160pF. This gave me a minimum capacity of 17pF, a considerable advantage over the old unit. The maximum capacity on this range is 168pF. I have also included two switches, one which switches the two sections in parallel giving a range of 40 – 340pF, and the second switch adds a 300pF capacitor in parallel to give a third range of 340 – 640pF. This means that my new box can be adjusted to any value between 17 and 640pF, a very useful range indeed.

I purchased a box of these variable capacitors at a rally a few years back and I would have thought that they would be readily available from stockists but unfortunately that is not the case. Maplin stock one type which does not have the same value of capacity in each section and several others keep the 360pF single gang unit. However Bonex stock a polyvaricon which is 125pF per section and this could be used along with a 250pF fixed capacitor to give a maximum capacity of 500pF.



To obtain the lowest possible stray capacity it is important that wiring be kept as short as possible and that the switches have a low stray capacity. The best switches for this application are miniature slide switches which are readily available from most stockists. Most tuning capacitors have trimmer capacitors fitted to them and in the case of the polyvaricons these must be adjusted to their lowest value. On capacitors like the Jackson Brothers units they can be removed completely, reducing the strays even further.

CALIBRATION

CALIBRATION IS DONE using a capacitance meter. If you do not have one yourself it is almost certain that there is at least one member of your club that does own one.

The unit should be fully constructed and a piece of paper held in place under the knob using selotape or masking tape. Calibration marks are then made and the paper removed. It is then a simple matter to redraw this scale on a fresh piece of paper adding other markings as necessary using Letraset. For protection of my scales I then use bookbinding film obtainable from stationers.

If I am making a scale from a magazine article I take the magazine down the photo copy shop and ask for a copy on sticky backed paper. I then cover this copy with bookbinding film and cut it out. The backing of the sticky paper is then removed and the scale carefully positioned on the equipment giving it a very professional look.

● In December's *Novice Notebook*, D4 should be a 1N4003, not a 1N148 as stated.

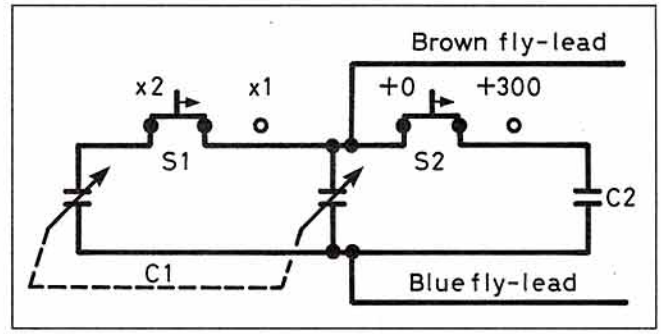


Fig 1: The circuit of the capacitance box is very simple.

COMPONENTS LIST

CAPACITORS

C1	Jackson 'OO' series 2 x 160pf or similar (see text)
C2	See text

HARDWARE

S1, S2	Double pole double throw slide switch, eg Bonex 731835
Box	ABS 78 x 58 x 35 internal, eg Bonex 140050

SOURCES

Bonex, 12 Elder Way, Langley Business Park, Slough, Berkshire, SL3 6EP, telephone 0752 49502.

I have a number of the Jackson Capacitors, please contact me on 0304 821588 for availability and price.

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Pat Hawker's Technical Topics

"KEYBOARD INJURY DOES NOT EXIST"

KEYBOARD/MORSE KEY users must have raised their eyebrows when, within a few days of the publication of the November *TT* item "RSI, Keyboard cramp & glass arm", they were told by a High Court judge that the condition of repetitive strain injury does not exist and that keyboard users forced to give up their jobs because of aching muscles and joints were "eggshell personalities who needed to get a grip on themselves"!

That judgement may of course be overturned on appeal and in the meantime, it remains prudent for those using keyboards and keys over long periods under conditions of stress to minimise the risk of falling victim to "non-existent" [yet well documented in the 1930s by Colonel Prynne, a retired Chief Medical Officer of the GPO] telegraphist's cramp that does not appear to be confined to "eggshell personalities".

One *TT* reader who believes that sensible precautions should be taken to minimise the risk of RSI is Bob Mersh, G8JNZ, who has been a professional RTTY telegraphist for close on 30 years and in similar work as a police controller for the past four years; a job that can be extremely stressful – taking calls from distressed or irate members of the public or controlling a vehicle or foot chase or dealing with bomb incidents etc. He writes:

"In my control room there are three operators coping with seven telephone lines, a radio system and three computer systems – often calls come in on all of these at the same time. At certain times of the day the telephone lines never stop – a continuously stressful environment.

"Our Health & Safety people recommend a 'stress break' of ten minutes in every hour which I endeavour to practise although work circumstances often dictate otherwise. I think this practice is a good idea and should be followed by amateur computer buffs who sit straining over the beastly thing for hours at a time. Go for a wander, make a cup of tea/coffee and, importantly, have a good stretch of one's limbs and let the mind relax.

"A comment on Fig 2 of the November *TT* depicting 'The right way to work'. A simple rule of thumb to gauge a good operating position is that the forearm should be horizontal as this does not put too much strain on the wrist and fingers. I was taught this at the Post Office training school. However, I have not previously heard of the recommendation that the upper arm is kept vertical and would suggest that unless one is able to tailor-make the operating position this may not be possible. For those of us with beer bellies it will be an impossibility! Let your arm hang vertically and your forearm horizontally and see where your hands end up unless you have extraordinarily long forearms.

"Fig 2 has the screen at the correct height but does not stress this in the notation, merely saying 'tilting screen'. The point is that the screen should be positioned only slightly below eye height so that one does not have to lower or raise the chin making for an unnatural position of the head, giving rise to neck-ache.

"It is also felt that VDUs should be placed sideways-on to any windows to reduce glare. My control room has indirect fluorescent light which is bounced off the ceiling by a strange suspended structure, rather like plastic guttering with the tube laying in it. It works very well and gives a nicely diffused lighting on a dimmer control of course . . . . Indirect, and somewhat dimmed lighting is infinitely preferable to the 100W bulb in the ceiling lamp which illuminates many shacks.

"There are varying views on the usefulness of polarizing filters. The VDUs in our control rooms have special anti-glare glass on the CRTs and are reasonably non-reflective. For my own VDU, however, I have fitted a good quality American glass polarizing screen which is a definite improvement and makes the colour screen less harsh on the eyes.

"My personal theory as to why RSI seems to strike at VDU operators is that modern keyboards are harder on the fingertips than the old fashioned sprung keys of a typewriter or teleprinter with a long travel. On most teleprinters the keys never had to be depressed their full length before activating the print mechanism. Modern computer keyboards come to an abrupt halt at the bottom of a short travel and are somewhat akin to drumming ones fingers on a table top for ten minutes. [This could also explain the reason why Col Prynne found that glass arm was seldom experienced in the USA with their different design of manual Morse keys – *G3VA*]

"To sum up, my own experience has shown that the *TT* advice to keep calm in front of the machine is sound. Because I use a computer for my living *and* when I come home, I have a strict rule in the house: the minute I start to feel irritated or even minutely stressed by the beast it gets turned off and I go and do something else. It's not worth suffering mental stress over a hobby. I get paid for the stress of my job!"

JUNK BOX CROWBAR

GEOFF SWITZER, VK2SR, in *Amateur Radio* (November 1993, p15) shows how an effective over-voltage crowbar can be added to a high-current 13.8V PSU without the use of an expensive heavy-duty silicon controlled rectifier (SCR) by anyone with a junk box stock of rugged transistors such as the 2N3055. The arrangement he adopts (**Fig 1**) is for an over-voltage to fire a light-duty SCR which then turns on as many power transistors as needed to blow the fuse quickly and reliably.

VK2SR suggests that a current of 3A per 2N3055 would be suitable (he uses eight 2N3055s for his highest current PSU). Since they conduct for only as long as it takes to blow the fuse no heat sinks are necessary. He writes:

"The sensing circuit is conventional and the 200Ω resistor could be a preset of, say, 500Ω to adjust the protection voltage. The values shown sense an over-voltage of 14.5V. The 180Ω base resistors are desirable and can be found in many junk boxes. Some care should be taken in selecting the 15kΩ and 250Ω resistors across the incoming supply. These values provide a standing bias to the 2N3055s which should draw only a few mA for the group and should therefore stay cool.

"When fired, the C196 SCR effectively short-circuits the 15kΩ resistor and the whole input voltage, say 25V, is applied to the bases of the power transistors. At the same time the 250Ω resistor is placed directly across the supply and will carry 100mA until the fuse blows. This should be only a few milliseconds but the power dissipated for this time is 2.5W. The 0.1µF capacitor on the C106 gate prevents false spikes. A smaller value will reduce the time constant.

"The idea is presented as a basis for experiment but could provide a valuable outboard attachment to commercial PSUs which do not include over-voltage protection."

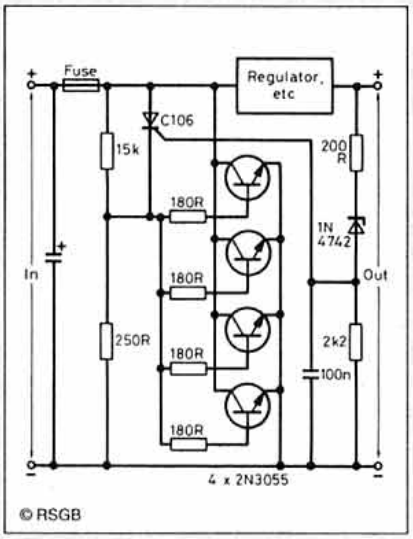


Fig 1: The 'junk box crowbar' as described by Geoff Switzer, VK2SR.

CRYSTAL FILTERS FOR HIGH-PERFORMANCE MIXERS

THE *TT* ITEM ON 'G3SBI's high performance mixer' (October 1993, pp55-56 with correction to Fig 3 in the November *TT*, p48) referred briefly to the problem that as the intercept point of the mixer is raised, a limitation to overall performance of the receiver is likely to be set by the linearity of the crystal filters available on the amateur market.

This was also mentioned in the September *TT* in connection with the N6NWP mixer; as a result of which Peter Chadwick, G3RZP,

wrote: "IMD in filters should not come as a surprise. It was first mentioned in a paper by Malinowski and Smythe of Motorola in a paper at the 1973 Frequency Control Symposium: the next known mention was in *TT* in July 1977, p533 in a letter I wrote which appeared under the heading 'Receiver IMD and crystal filters' and which began "We all like to think that quartz crystal filters are passive, linear, reciprocal, two-port networks. In practice they are two-port and passive; but they are far from linear or reciprocal! Typically an HF SSB crystal filter will have an intercept point of +15 to +18dBm. Turning it round will often alter the intercept point. The IMD products in the passband are more of a problem than those removed by 10 or 20kHz . . . ."

"Since then, the problem has become 'recognised' professionally. Incidentally, SAW filters are very good because they don't stress the quartz, while transformers have no effect unless they are badly designed. The main cause of IMD appears to be the electric field stressing the crystals beyond the point where Hooke's Law holds, and this explains why higher frequency filters are worse than low-frequency filters; the crystal is thinner, so the volts/mm exceeds the point where Hooke's Law applies at a lower voltage.

"A more pertinent point in connection with the latest high-performance mixers is whether their good intermod performance can be used in practice. In a well-designed receiver, the IF selectivity, the phase noise and the IMD limited instantaneous dynamic ranges should be the same. Thus in a receiver with a 10dB noise figure, a 2kHz-wide IF has a noise floor of –131dBm. If the intercept figure is +40dBm, two signals at –17dBm will produce an IMD product at the noise floor. For the phase noise from a 17dBm signal to equal the noise floor, the phase noise must be 147dBc/Hz (this is derived from the intermod ratio (114dB) plus the bandwidth ratio – in this case 33dB. Getting –147dBc/Hz from an HF/VHF oscillator (especially a synthesizer) is not easy, particularly close in, such as at 20kHz spacing, even if you spend £10,000 on a good signal generator! So extremely good mixer performance is not in practice usable: the designer is up against the classic problem of improving one thing and then needing to improve another."

Colin Horrabin, G3SBI, accepts that if the performance of his H-mode mixer (October *TT*) is to be translated into a practical super-linear receiver then new thinking must be applied to both the IMD performance of crystal filters and to reducing the phase-noise of synthesized oscillators (with the more ready availability of direct-digital-synthesis (DDS) chips). As a start he has been investigating the performance of 9MHz post-mixer low-loss crystal ladder filters. The following notes are based on his report of this work carried out at the SERC Laboratory:

The H-mode FET switching-mode mixer has been shown to be capable of a +53dBm input intercept. However, experimental measurements have also shown that the input intercept of budget-priced half-lattice-type crystal filters available in the UK were not up to this performance but that the ladder-type filter might give better performance, although at that time no detailed measurements had been made. He writes:

"A number of stock 9MHz crystals (ref A164A) were purchased from IQD Ltd (Crewkerne, Somerset). This crystal is specified as 9MHz with 30pF parallel capacitance and is in an HC49 holder. Measurements have shown that series resonance is about 8.9975MHz so that ladder filter designs need a series capacitor for each crystal to move the passband centre frequency to exactly 9MHz. An important measurement showing the high quality of these crystals is that the series resistance is typically under 9Ω enabling very low-loss ladder filters to be constructed: less than 1dB insertion loss for 2.5kHz bandwidth, –60dB 15kHz, ultimate attenuation –80dB, Rt 450Ω.

"Measurements made on a number of ladder filters of different bandwidth using these crystals have enabled a typical input intercept for the filter of +40dBm to be achieved with input signals of 0 and +10dBm (still showing a 3:1 slope on a log plot). This is about the same as good commercial 9MHz SSB filters made for the amateur market by IQD Ltd. If

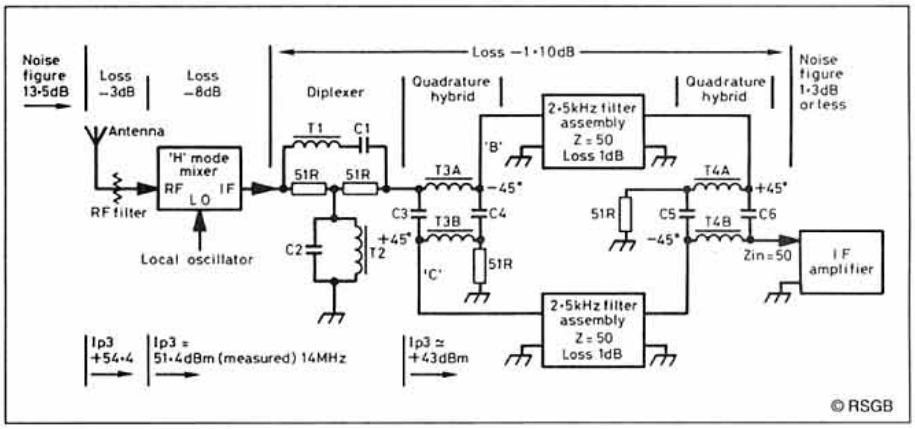


Fig 2: High-performance front-end based on the G3SBI, H-mode mixer and low-loss 9MHz crystal-filter system without a post-mixer amplifier. 13.5dB noise figure. Component details: C1, C2 330pF + 18pF Suflex. C3, C4, C5, C6 150pF + 15pF Suflex. T1, T2 (0.88μH) 16t of 0.5mm (Bicelflux RS Components) wire on Fairite T50-10 toroid (Cirkit Components). T3A, T3B, T4A, T4B (0.88μH) 16 bifilar turns of 0.31mm Bicelflux enamelled copper (RS Components) on T50-10 toroid (twist wires together using hand drill to a twist of about 1 turn on 0.1inch). The 2.5kHz filter assembly is shown in Fig 3.

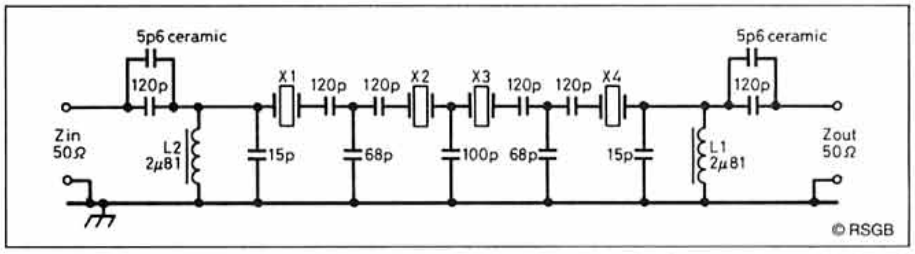


Fig 3: 2.5kHz crystal filter assembly (SSB). Components X1, X2, X3, X4 IQD (Crewkerne) stock No A164A 9MHz 30-pF parallel resonance HC49 holders. All capacitors except 5.6pF ceramic 2.5% Suflex. L1, L2 (2.81μH) 31 turns of 0.31mm dia Bicelflux wire (RS Components) on Fairite T37-6 toroids (Cirkit Components).

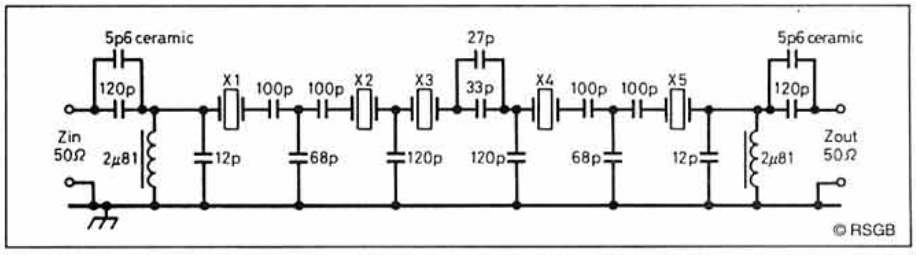


Fig 4: Five-section ladder filter (SSB). Performance –6dB at 2.2kHz, –60dB at 8.5kHz, insertion loss 1.4dB, ultimate stopband –95dB. Components X1-X5 IQD Stock No A164A (9.0MHz in parallel with 30pF). All capacitors 2.5% Suflex except those shown as ceramic. Inductors (2.81μH) 31 turns 0.31mm dia Bicelflux enamelled copper (RS Components) on T37-6 toroids (Cirkit components).

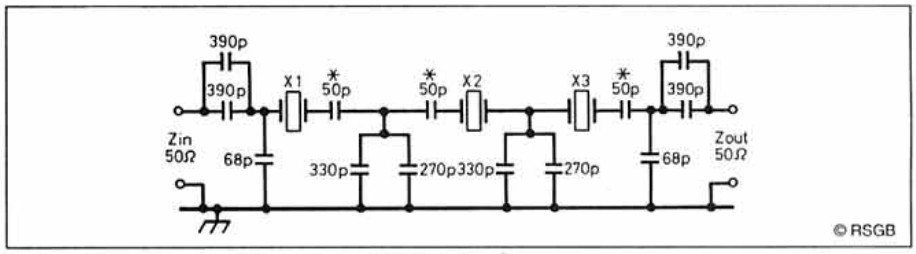


Fig 5: Three-section ladder filter (CW). Performance –6dB at 400Hz, –60dB at 4kHz, insertion loss 4.0dB, ultimate attenuation –90dB. All capacitors 22.5% suflex. Capacitors marked * adjust the pass band centre frequency, in this case 8.9993MHz which is the centre frequency of a lattice filter to be used further down the IF chain. A fixed capacitor plus ceramic variable could be used.

such a filter were used with the H-mode mixer plus a 10dB-gain post-mixer amplifier, the effective mixer input intercept would be reduced from 53dBm to about +38dBm. A better approach is to eliminate the post-mixer amplifier and instead go straight from the mixer into a home-made ladder-filter quadrature hybrid assembly as shown in **Fig 2**. The quadrature hybrid and diplexer system will always present a 50W termination to the mixer, masking the impedance changes of the crystal filter with frequency. Using the design approach shown in Fig 2 enables an antenna input intercept of about +54dBm for a noise figure of 13.5dB to be achieved, giving a two-tone dynamic range of 120dB for a 2kHz bandwidth. This could be increased to about +56dBm if crystals of better intermodulation performance could be obtained, but this slight improvement would not really justify the likely cost compared with the stock IQD crystals used.

"Ideally, the output load to the low-noise post-filter IF amplifier should be of better shape-factor SSB and CW filters than can be expected from low-loss ladder filters. However, if this amplifier could be configured as a cascode-connected dual JFET, AGC could be applied fairly easily since the amplifier itself is likely to have an output intercept of some +30dBm. If the gain were 20dB its input intercept would be +10dBm so that coming down the slope of the ladder filter by 30db (with a filter input intercept of +40dBm), the antenna intercept figure would be +54dBm for interfering signals more than 3kHz off the receiver tune frequency using a four-section SSB ladder filter. Performance would degrade closer to the tune frequency giving an in-band intercept of about +20dBm at the antenna. This approach could prove an acceptable compromise to avoid the complication of high-intercept amplifiers based, for example, on 7GHz transistors with feedback and PIN diodes for AGC control.

"Improvements to the close-in intercept figures for both SSB and CW could be obtained by having post-mixer ladder filters with selectable bandwidth. It is possible that a five-section SSB ladder filter could be standard (1.4dB loss) with a 600Hz ladder for CW (3dB loss). However it should not be forgotten that a local oscillator system with compatible phase-noise performance (better than 150dBc/Hz) would be needed if this degree of close-in signal path is to be achieved.

"All of the ladder-filter designs used for these measurements were based on the information in *Amateur Radio Techniques*, 7th edition, pp68-69 [*ART7* is £6.38 to members, plus postage, see *Book Case* pages – *Ed*] stemming from an article by J Pochet, F6BQP, in *Radio-REF* (May 1976) and are maximally flat designs. Jack Hardcastle, G3JIR has found that the original theoretical work used by F6BQP was done by J E Colin (France)

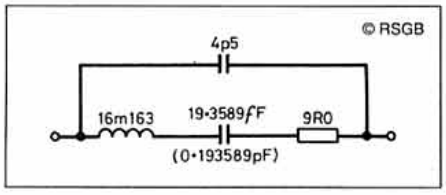


Fig 6: Typical parameters for an IQD A164A 9MHz crystal.

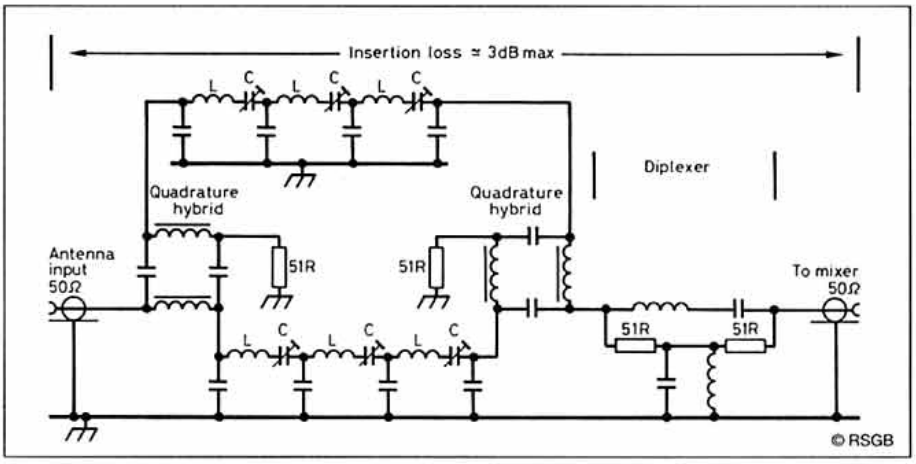


Fig 7: Antenna input filter. One circuit per band is required. Note that the bandpass filters are ladder networks with the capacitor coefficients with impedance the same as for the crystal ladder filters. L/C ratio determines bandwidth. Up to four sections of ladder could be used.

whose paper gives coefficients for the capacitors for up to six crystal ladders (F6BQP provided coefficients for only up to four crystals). In terms of insertion loss, the four crystal units proved the best in terms of loss per crystal used, but a five section filter is probably the best compromise for insertion loss versus shape factor. **Fig 3** shows a four-crystal 2.5kHz SSB 9MHz filter in which a parallel L network is used to obtain the 50Ω match. A five-section filter with 2.2kHz (-6dB) bandwidth is shown in **Fig 4**. A CW roofing filter is shown in **Fig 5**.

"All of these filter designs were first computer-simulated using a schematic entry package, Microcap 3. It was gratifying to find that the measured results were identical to the simulation. The crystal parameters were obtained by measurements on a Hewlett Packard 4195a network analyser with an equivalent circuit-function facility. The individual crystal parameters used for simulation are shown in **Fig 6**.

"From this work it is possible to conclude that a low-insertion-loss crystal filter is necessary (ideally less than 1.5dB) if it is to be used immediately following an H-mode mixer in order to avoid a noise-figure penalty. The SSB ladder filter described has the required low loss. To improve on this would require filters with better shape factors so that the intercept performance of the post-filter amplifier would be of less importance. Some work now needs to be done on a cascode amplifier to confirm that a noise figure of 1dB can be achieved with some 20dB gain for an output intercept of +30dBm. This approach would lead to a relatively simple and low-cost front-end of high performance. If a pre-mixer RF amplifier were to be used to provide increased sensitivity, a push-pull design similar to that shown in Fig 7 of the September *TT* would be needed to give a high output third-order intercept.

"The measured mixer input intercept performance on 14MHz when used with the circuit shown in Fig 3 is +51dBm, a reduction of only 1.5dB over a mixer output terminated by a 50Ω resistor (straight into the spectrum analyser). The question of the antenna input filter design has been investigated and it is likely that two identical LC filters coupled through quadrature hybrids and followed by a diplexer would be needed for each HF band (**Fig 7**) to maintain a broadband 50Ω impedance match to the input of the H-mode mixer. Alternatively a single LC filter followed by a diplexer could be tried. However, there would be impedance variations at the edge of the filter passband, so that a 20kHz two-tone test may be satisfactory yet tones at 1MHz separation may show poor intermodulation performance. The question of implementing a low phase-noise local oscillator remains to be addressed if full advantage is to be taken of the excellent signal-path dynamic range shown to be possible.

RECYCLING COMPONENTS

I SUPPOSE THAT MOST of us who entered amateur radio in the era of valved equipment soon came to appreciate the pleasure that stems from having well-filled junk boxes of recycled components recovered from discarded radio and TV receivers. These could (and can) be used to build the tolerant circuits of CW and AM transmitters or simple HF receivers. War surplus gave us the opportunity to turn swords into ploughshares for many years! It comes as a surprise that so many of later generations seem to believe that faulty electronics is now a consumer disposable - admittedly, recovering parts from crowded printed circuit boards and especially those tiny surface mounted devices is not as easy as in the days of metal chassis construction.

However, Gordon Sweet in an article in *Vital Spark* (the monthly journal of the Hastings Electronics and Radio Club) June 1992 wrote enthusiastically on the continuing possibilities of 'Recycling Components' as the following extracts show:

"In this age of increasing environmental awareness I find it a great shame that more is not done to reclaim components from faulty and disused equipment, especially among the amateur experimenters. I have little sympathy for those buying equipment at our local junk sales for a pound or two, who complain that it does not work, when the value of the components is ten times what they paid for the lot in the first place.

"Most of my collection consists of such gear, some obtained as job lots. I consider it a tragedy to see someone present a shopkeeper with a long list of components re-

quired for some pet project, often to be told that many of them are not in stock, when a rummage through reclaimed bits and pieces would solve the problem. Many will point out the risk of damaging components during removal. The answer is to check them before use. In my experience there is often no real guarantee that brand new components will be any more reliable.

"A good multi-meter is essential to check resistors and it is worth building a simple C/R bridge to check capacitors etc, plus perhaps a simple gadget to check the leakage and approximate gain of transistors. A simple ohmmeter test for diodes, transistors and rectifiers should show polarity and whether the junctions have broken down. Remember that silicon components show higher resistances than germanium .... The main danger probably comes with higher voltage electrolytic capacitors since after a long period of disuse the voltages applied should be raised gradually over a period to allow the component to reform, preferably using a current-limited variable voltage supply. Once the working voltage has been reached the leakage current should be measured [for a high-voltage electrolytic capacitor the leakage current after reforming should not exceed about 1mA per microfarad, and preferably less - *G3VA*].

"I find it best to use the larger, hotter soldering irons and in view of the increased amount of wear involved it is not a bad idea to use one of the cheaper, imported irons. I have little patience with the various desoldering gadgets, unless the component is extremely valuable .... The big problem is the multipin chip. Surprising though it may seem, I employ a small methylated spirit blowlamp, though I must admit it gets too hot to handle after a while, and the jet is liable to clog. The little butane blowlamps should be ideal. Most of the chips that I have prized off using this method have been usable after cleaning.

"They are best stored by pushing them into large polystyrene panels for ease of identification, with a coat of silver foil first for the CMOS types to prevent static damage ...."

HERE & THERE

A PATENT BATTLE may be fought over the Innovations 'Battery Manager' charger for disposable batteries (noted in *TT*, November, p48) with *New Scientist* reporting that although Innovations filed a patent application for a 'dry cell recharger' on June 3, 1993, it may have been stymied by a patent application filed in January 1992 for a similar technique of carefully monitoring the state of the batteries under charge. The use of pulsed or dirty DC for charging dry batteries, with circuit diagram, was advocated by G3BY in *TT* many years ago, based on work in Holland in the 1950s. Attention was also drawn to advice on recharging carbon-zinc dry cells from the US National Bureau of Standards:

"From time to time attention has been turned to the problem of recharging dry cells. Although normally considered a primary battery it may be recharged for a limited number of cycles under certain conditions .... (1) The operating voltage on discharge should not be below 1.0 volt per cell when the battery is removed from service for charging. (2) The battery should be placed on charge very soon after removal from service. (3) The ampere-hours of recharge should be 120 – 180 per cent of the discharge. (4) Charging rate should be low enough to distribute recharge. (5) Cells must be put into service soon after charging as the recharged cells have poor shelf life. See *ART7*, p250.

A paper 'Effects on portable antennas of the presence of a person' by Jørn Toftgård et al of Aalborg University, Denmark in *IEEE Trans on Ant & Prop* (June 1993) discusses the influence the presence of a person has on the performance of antennas for hand-held portable telephones at 900MHz and 1900MHz, although the results would seem generally applicable at VHF/UHF. As generally recognised the results show that a shadow effect in the far field pattern occurs in the direction of the user.

It is shown that: (a) the resonance frequency of a quarter-wave antenna drops when it is used by an operator; (b) the radiation pattern changes significantly, and considerable cross-polarization takes place. The main radiation mechanisms is diffraction around

continued on page 44 ▶

DATA INTERFERENCE ON 144MHZ MOBILE

P R KEMBLE, G3UYK, draws attention to a problem that can affect 144MHz mobile reception in town centres caused by insufficient pre-mixer selectivity in many transceivers – and points the way to a solution. He writes: "The (Standard) transceiver in my car has always been prone to suffer from occasional bursts of interference, particularly in town centres. This takes the form of bursts of data lasting about five seconds and can swamp the reception of 144MHz signals. More recently I discovered that while a Yaesu FT-530 worked perfectly on its normal rubber duck antenna, it suffered similar interference when connected to a collinear antenna on the roof. FT23 and FT470 handhelds were also susceptible to this interference when connected to an antenna having some gain. It appears that the problem is caused by overload of the receiver due to the strong signals from the network of paging transmitters operating at 153 – 154MHz when close to these transmitters.

"A simple notch-filter using quarter-wave sections of RG213 coaxial cable proved unsuitable because of the closeness of 153MHz to 144MHz, but I am glad to report that a three-pole strip line filter as described in the *Radio Communication Handbook* (page 7.51) has cured the problem. Instead of using copper strip, however, I used some scrap double-sided, copper-clad board with the two sides bonded at each end. [**Fig 8** outlines this type of filter. Full constructional details are given in *RCH – G3VA*]

"The only snag for many amateurs is the problem of aligning the filter properly, which would be virtually impossible without adequate test equipment. Fortunately I have access to an RF sweeper. With its help, the filter achieved between 144-146MHz a 1.5dB insertion loss, 23dB return loss, and gave 18dB rejection at 153MHz. The only operational disadvantage is for those using dual-band transceivers with a single output connector. Such amateurs would need always to remember to remove the filter when transmitting on 70cm!

"Many others must have experienced this type of 144MHz interference. I hope this will at least identify the cause and suggest a simple-to-build cure. The long-term answer is for transceiver manufacturers to improve front-end selectivity."

American magazines are carrying advertisements for a new Orion three-stage helical filter claimed to reduce signals outside the American 144MHz band (144-148MHz) by at least 40dB with an automatic sensing circuit to switch filter out. Connection to a hand-held or mobile rig is stated to be fast and easy and the advertisement asks the question: "Is your 2m radio receiving signals that you do not want?"

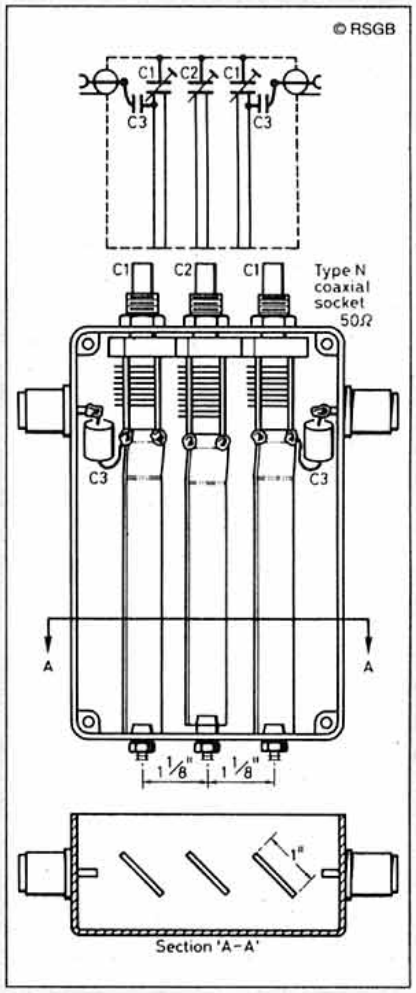


Fig 8: 144MHz strip-line filter as described in the *Radio Communication Handbook* (p7.51). Line lengths for 144MHz 6 1/8th inch (centre line slightly shortened to allow for rib in the cast box and longer capacitor) 2.5in for 432MHz. Both in 1-in flat copper strip. Capactor values for 144MHz C1 50pF, C2 60pF, C3 4.4pF.

THE PETER HART REVIEW

Ten-Tec Omni-VI HF Transceiver

TEN-TEC IS THE only remaining manufacturer of a broad range of HF amateur radio equipment outside of Japan. They have succeeded in this business, where others have failed, by building a reputation for excellent RF performance and covering product areas such as QRP which are not well covered by the 'big three'. As a consequence, Ten-Tec have a loyal band of followers from the DX and contest field as well as QRP enthusiasts. In 1984, I reviewed the Ten-Tec Corsair. I was sufficiently impressed to buy it as my main HF rig and it has continued to give good service ever since. Several years later, the Corsair was replaced by the Omni and since then, I have been frequently asked when I intended to review this model.

The latest model in the Omni series, the Omni-VI was introduced during the Summer of 1992. It is an amateur bands only transceiver with crystal mixed local oscillator, trading general coverage operation for improved adjacent channel performance and phase noise. It is a fully featured 12V operated radio with some new innovations.

PRINCIPAL FEATURES

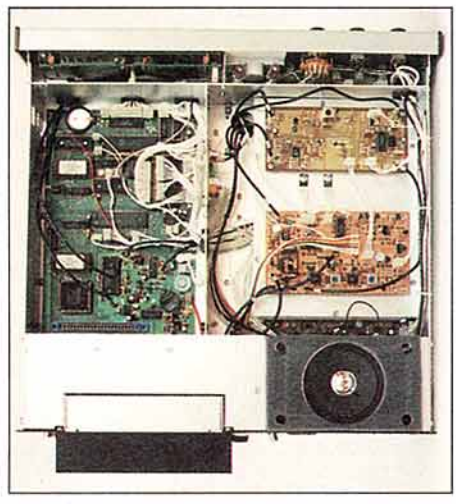
THE OMNI-VI TRANSCEIVER covers the amateur bands in twelve 500kHz segments with 30kHz extra at the upper and lower band edges. Modes covered are USB, LSB, CW, FM and FSK. There is no provision for AM. True FSK is transmitted with a fixed 170Hz shift but the manual fails to indicate the design receive tones or how the frequency display relates to the transmitted tones. AFSK is handled using SSB.

The 50mm diameter weighted flywheel tuning knob tunes smoothly at a fixed 5.12kHz per revolution in 10Hz steps. For more rapid changes in frequency, UP/DOWN keys step the frequency in 100kHz increments. Alternatively, the frequency may be entered directly from a numeric keypad. Separate buttons are used to select each amateur band, returning the last used frequency, mode, filter setting and RIT status on that band. A second press of the band button returns an alternative set of data for that band and further key presses toggle between these two settings. This is particularly useful when working both CW and SSB.

Twin VFOs are provided which may be operated split frequency (and also split mode and band if needed). Although the band registers do not store split frequencies, it is possible to hold one split frequency across all the bands. The usual A/B switching and equalisation is provided and, to simplify split frequency netting, a single touch selection and of reception on the transmit VFO (REV button) similar to the Kenwood TF-SET facility is also included.

100 memories are provided and a single scratch-pad. These will store frequency, both simplex and split, mode, filter selection and RIT/XIT offsets. The scratch-pad provides a single touch store and recall of one set of operating data without having to go into the main memory bank. The memories are very comprehensive and easy to use. The contents may be previewed before selection, and storing to memory may be done either by entering a channel number or automatically to the next empty location. Recall may be done, either by entering the channel number or by tuning through sequentially. Memory scanning is also provided and scanning between two frequency limits.

RIT and XIT give independent control of the receive and/or transmit frequency over a range of +/- 9.99kHz in 10Hz steps. Separate RIT/XIT offsets may be set for each VFO and the offsets may be simply cleared.



The view inside with the top removed.

The Omni-VI is provided with passband tuning and IF filters for 2.4kHz bandwidth at both the IF frequencies. A range of additional filters are available as optional extras but it is surprising that a radio of this quality (price) is not fitted with at least some CW filters as standard. Optional filters include 1.8kHz, 500Hz and 250Hz bandwidths for both the 9MHz (first) and 6.3MHz (second) IFs. Up to three optional 6.3MHz filters may be fitted and one optional 9MHz filter. This latter filter is selected as NAR and gives improved CW skirt selectivity and more effective passband tuning on this mode when the 500Hz or 250Hz filter is fitted. The IF filters may be selected independently of mode.

One new innovation in the Omni-VI is the DSP based audio filter. This is used to implement an automatic notch filter which will eliminate multiple heterodynes at the touch of a button. A tuneable manual notch filter is also provided. On CW, the DSP provides a low pass filter with five selectable bandwidths from 600Hz to 1400Hz.

Receiver functions not already mentioned include dual speed AGC, 20dB input attenuator, noise blanker and squelch on FM. A front panel switch selects either the main antenna or auxiliary antenna for receive.

Transmitter functions not already mentioned include audio based speech processor, VOX, variable power output and CW full break-in with selectable fast recovery or slow recovery with variable delay. A tune button gives transmit carrier output for tuning linears and ATUs; a simple function but omitted on so many rigs. A built-in iambic keyer is included, selectable Curtis type A or B, with adjustable weight and speed variable over the range 10 to 60WPM. The CW transmit offset (pitch) is

adjustable over the range 400 to 990Hz and the sidetone tracks but the IF filters remain centred for the default frequency of 700Hz.

On transmit, the S meter shows either forward power, SWR, PA current or processor level. ALC is indicated by an LED. The frequency is indicated using 7 segment LED displays, amber for the main digits and green for the 10Hz digit. Smaller amber displays show RIT/XIT offset and similar smaller green displays show either the time from a built-in clock or memory channel number. The overall display brightness is adjustable to 16 levels. Audio annunciators are provided for key presses and a ten minute ID timer may be enabled. These can be turned off (thank goodness!). These settings and a number of other parameters are set from the User Options Menu.

The rear panel carries an array of phono connectors for key, PTT, audio in/out, linear control etc. Separate key jacks are provided for normal keying and for the keying paddle associated with the built-in keyer. Two "SPORT" serial interface ports are provided operating over the range 1200 to 19200 baud. One is a standard 25 pin D connector RS-232 compatible and the second is Icom CI-V compatible requiring a level converter. The serial control commands emulate an Icom IC-735 but advantage can be taken of an extended command set. Standard Icom software should control this radio. The serial port interface is also used to provide automatic band changing and control of Ten Tec accessories such as auto ATU and linear amplifiers. The rear panel also contains the heatsink for the PA. There is no fan so this can get quite hot in operation.

A substantial 100-page manual is provided with the Omni-VI. This combines full operating instructions and a service manual. Full circuit descriptions and diagrams are given with photographs of all the PCBs and alignment instructions. The only omission is an overall block diagram. Software control is also described in detail.

DESCRIPTION

THE OMNI-VI IS a base station sized radio, measuring 375mm (W) by 146mm (H) by 432mm (D) and weighing 7.25kg. The construction uses a traditional chassis-panel with easy access to the PCBs and plenty of aluminium screening. The case is in two parts with the 7cm diameter speaker pointing upwards in the rear of the top part.

The principal performance limitation of virtually all current radios is the close-in dynamic range. This is a direct consequence of adopting an up-conversion architecture and a wide range PLL frequency synthesizer to achieve the quest for true general coverage operation. By dispensing with the need for general coverage, an architecture can be used which yields superior close-in performance. Such an architecture is certainly not new, it was standard in the pre-synthesizer days. In a more modern implementation it forms the basis of the Omni-VI.

The receiver is double conversion with IFs of 9MHz and 6.3MHz (455kHz on FM). Full channel selectivity immediately follows the first mixer unlike the wide roofing filters found in up-conversion radios. The RF amplifier

OMNI-VI MEASURED PERFORMANCE

RECEIVER MEASUREMENTS

FREQUENCY	SENSITIVITY SSB 10 dB s+n:n	INPUT FOR S9	IMAGE REJECTION
1.8MHz	0.45µV (–114dBm)	100µV	49dB
3.5MHz	0.25µV (–119dBm)	56µV	47dB
7MHz	0.4µV (–115dBm)	56uV	52dB
10MHz	0.25µV (–119dBm)	63µV	55dB
14MHz	0.2µV (–121dBm)	63µV	42dB
18MHz	0.2µV (–121dBm)	50µV	60dB
21MHz	0.18µV (–122dBm)	50µV	66dB
24MHz	0.18µV (–122dBm)	50µV	52dB
28MHz	0.16µV (–123dBm)	50µV	49dB

S-READING (14MHz)	INPUT LEVEL
S1	0.4µV
S3	1.6µV
S5	6.3µV
S7	20µV
S9	63µV
S9+20	560µV
S9+40	14mV

FILTER	IF BANDWIDTH –6dB	–60dB
2.4kHz	2300Hz	3070Hz
2.4kHz+NAR	550Hz	1120Hz
500Hz	510Hz	1230Hz
500Hz+NAR	440Hz	800Hz
FM	15.7kHz	26.3kHz

NB: NAR is 500Hz bandwidth 9MHz filter

FM sensitivity (28MHz): 0.35µV for 12dB SINAD 3kHz peak deviation

AGC threshold: 0.6µV approx (soft characteristic)

80dB above AGC threshold for +5dB audio output

AGC attack time: 5ms

AGC decay time: 0.6–0.7s (fast), 2–3s (slow)

Max audio before clipping: 1.7W into 4Ω at 2% distortion

Inband intermodulation products: –20 to –25dB

FREQUENCY	INTERMODULATION (50kHz TONE SPACING) 3rd ORDER INTERCEPT	2 TONE DYNAMIC RANGE
1.8MHz	+8dBm	88dB
3.5MHz	+9dBm	92dB
7MHz	+7dBm	88dB
14MHz	+10dBm	94dB
21MHz	+9dBm	94dB
28MHz	+10dBm	96dB

TONE SPACING (7MHz BAND)	3rd ORDER INTERCEPT	2 TONE DYNAMIC RANGE
2kHz	+7dBm	88dB
5kHz	+7dBm	88dB
8kHz	+7dBm	88dB
15kHz	+7dBm	88dB
>15kHz	+7dBm	88dB

FREQUENCY OFFSET	RECIPROCAL MIXING FOR 3dB NOISE	BLOCKING	TX NOISE IN 2.5kHz BANDWIDTH
3kHz	86dB	–10dBm	–83dBC
5kHz	86dB	–10dBm	–87dBC
10kHz	see text	–10dBm	–96dBC
15kHz	96dB	–7dBm	–97dBC
20kHz	96dB	–3dBm	–98dBC
30kHz	96dB	+3dBm	–98dBC
50kHz	97dB	+3dBm	–99dBC
100kHz	97dB	+3dBm	–99dBC
200kHz	97dB	+3dBm	–100dBC

TRANSMITTER MEASUREMENTS

FREQUENCY	CW POWER OUTPUT	SSB(PEP) POWER OUTPUT	HARMONICS	INTERMODULATION PRODUCTS 3rd order	5th order
1.8MHz	98W	96W	–60dB	–32dB	–40dB
3.5MHz	100W	100W	–60dB	–35dB	–35dB
7MHz	100W	100W	–45dB	–30dB	–32dB
10MHz	97W	97W	–65dB	–27dB	–30dB
14MHz	94W	95W	–65dB	–26dB	–32dB
18MHz	100W	99W	–50dB	–16dB	–32dB
21MHz	100W	99W	–66dB	–18dB	–35dB
24MHz	103W	100W	–64dB	–20dB	–38dB
28MHz	104W	102W	–60dB	–17dB	–35dB

Carrier suppression: see text. Sideband suppression: 70dB @ 1kHz. Transmitter noise: see table above. Transmitter AF response at –6dB: 310–2820Hz (USB), 130–2585 (LSB). Transmitter AF distortion: <0.3%. Microphone input sensitivity: 3mV for full output. T/R switching speed (SSB): mute–TX 10ms, TX–mute 10ms, mute–RX 26ms, RX–mute 1ms, Power into load mismatch: 2:1 VSWR 62–100W, 3:1 VSWR 43–87W

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB with the receiver preamp switched in and operating from a 13.6V PSU. All two-tone transmitter intermodulation products quoted with respect to either originating tone.

and mixer post amplifier each use four parallel grounded gate FETs and the first mixer is a high dynamic range diode mixer. On transmit, SSB is generated at 9MHz and mixed to final frequency.

The local oscillator drive for the signal frequency mixer is derived by mixing a low noise 5 – 5.5MHz source against a crystal oscillator with a bank of crystals, one for each band. The 5 – 5.5MHz source is obtained from a frequency synthesizer tuning 200 – 220MHz divided by 40. This technique reduces the phase noise of the basic oscillator by a factor of 40 (32dB). The oscillators are locked to an oven stabilised source for increased accuracy. The RAM and real time clock on the logic board have lithium battery back-up which is easily accessible.

The 12V power lead provided with the radio seems very thin and, although I carried out no tests for voltage drop, it is probably advisable to minimise the length as much as possible.

MEASUREMENTS

MEASUREMENTS WERE made with the OMNI-VI powered from a 13.6V PSU and are detailed in the table. Additional comments are as follows.

RECEIVER MEASUREMENTS

Sensitivity

The sensitivity of the receiver is a little down on the lower bands but this is of no real consequence to the overall sensitivity.

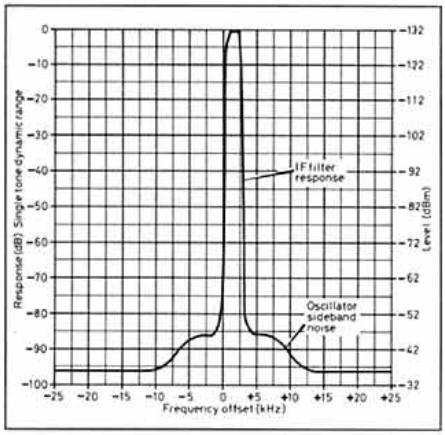


Fig 1: The overall result of IF selectivity and reciprocal mixing.

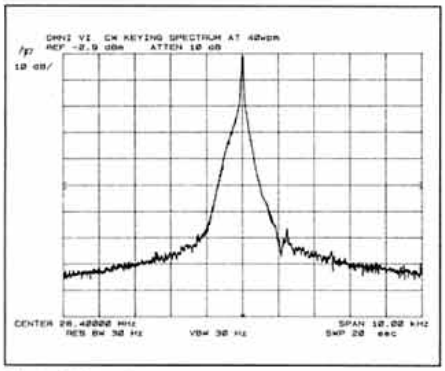


Fig 2: CW keying spectrum at 40 WPM. Horizontal scale 1KHz/div; vertical scale 10dB/div.

S-Meter Calibration

The S meter calibration was approximately the same on all modes. A good result up to S9+20dB, above which it becomes compressed.

Spurious Rejection

The image rejection is rather poor and at the levels measured could give rise to spurious signals. Rejection of the 9MHz IF is in excess of 80dB with no detectable response at the 6.3MHz IF. Quite a few spurious birdies were found particularly on 15m and 10m, although at a fairly low level.

Selectivity

The skirt selectivity of the SSB filter is extremely good, as is CW when both 500Hz filters are fitted.

Strong Signal Performance

The front-end dynamic range/intercept is good but I have measured better. However, the figure does not degrade close-in, yielding a dynamic range approaching 90dB even with tones as close as 2kHz. This is by far the best result I have measured on any receiver. The reciprocal mixing performance is also good close-in but I have seen it bettered at 3kHz (eg IC737), although closer in still it may excel. A receiver spurious response prevented measurement at 10kHz off-tune. The overall result of IF selectivity and reciprocal mixing is shown in **Fig 1**.

Wideband second order responses at 21.1MHz (test signals 11.6 and 9.5MHz) and

14.3MHz (test signals 7.2 and 7.1MHz) showed a response some 2 – 5dB worse than the normal 3rd order 50kHz spacing test.

TRANSMITTER MEASUREMENTS

CW Keying Performance

Fig 2 shows the CW keying spectrum at 40WPM. Fast and slow QSK gave similar good results.

Power Output

The power output was variable down to zero. The forward power meter was only accurate to within 20% and increasingly less accurate below 25W. Low level sidebands at about –70dB were seen at +/-1.2kHz with lower levels at +/-2.4kHz, +/-3.6kHz etc.

SSB Performance

The distortion is rather poor on the higher bands but does not degrade when the processor is switched in. The carrier suppression on the review sample was only 44dB on USB, 26dB on LSB although the specification is 60dB. This was most likely due to incorrect alignment.

ON-THE-AIR PERFORMANCE

PRIOR TO RECEIVING the review radio, I had great expectations for the Omni-VI due to its reputation and pedigree. Certainly I was not disappointed. The radio performed impeccably. It was a joy to use in crowded band conditions and the receiver performed very well in and around pileups. The 'warts' noted in the measurements, such as poor image response, were really not significant. However, the 15m 'birdies' were evident on a quiet band, although not moving the S meter, and on 10m the noise floor lifted whilst turning the tuning knob. The main virtue of the receiver, the excellent close-in adjacent channel performance, really made for a clean sounding receiver. Also, the filter skirts were excellent and well worth the cost of fitting the narrow second IF option.

The ergonomics were very good and well thought out and clearly the true needs of the DX and contest operator have been well researched. The tuning was entirely free of clicks and other quirks although there was a noticeable drift for the first minute after switch-on whilst the oven stabilised. Selecting slow AGC, when that speed had not been used for some time paralysed the receiver for up to 4s. I normally used fast AGC in all situations and it seemed to have an ideal characteristic.

The auto-notch filter was rather amazing. On SSB it completely eliminated multiple and drifting heterodynes and much of the deliberate QRM sadly experienced on DXpedition operations. It is not so effective for removing CW interference on SSB as it takes a brief time to lock on. Similarly, it is not suitable to use on CW mode as it tends to eliminate the wanted signal, but the manual notch filter is effective in this situation. Both notch filters suffer from the problem common to all audio notch filters, in that strong carriers still capture the AGC and reduce sensitivity.

The transmit performance was also excellent. Good quality reports were received on SSB with and without the processor, and the CW spectrum was clean and narrow. Fast QSK on CW also performed very well with no character shortening experienced.

Overall I find it difficult to find fault with this radio other than some really rather minor points.

CONCLUSIONS

THE TEN-TEC OMNI-VI is a very interesting radio. For serious competitive HF working it ranks amongst the very best. In terms of the close-in dynamic range, it is probably the best radio on the amateur market at the present time, with reciprocal mixing and two-tone dynamic ranges approaching 90dB at only 2kHz spacing. It is also a joy to use, with well thought out ergonomics. Although there are some technical imperfections, these are quite minor in comparison.

The current list price is £2599 inc VAT with microphone, PSU and CW filters extra. The additional IF filters cost £69 each. To the non-discerning this may seem a high price to pay for a radio without general coverage operation, AM etc. Indeed, the complete package price in the UK is similar to the top of the range Japanese radios with dual receivers.

ACKNOWLEDGEMENTS

THANKS TO Waters and Stanton for the loan of the equipment.

Technical Topics

continued from page 40

and scattering from the head; (c) 45% of the power is lost in the head at both 900 and 1900MHz. It is suggested that on average a system loss of 3 – 4dB should be included in a link budget, and there is considerable fading, even in a radio-anechoic chamber, when users move around in a natural manner.

MONOPOLE LOADED WITH FOLDED DIPOLE

ON A NUMBER OF OCCASIONS in the past, *TT* has discussed antennas loaded with resistances in order to widen the effective bandwidth. an interesting and novel derivative of this approach is described by Dr Edward E Altshuler (Hanscom AFB) in 'A monopole antenna loaded with a modified folded dipole' (*IEEE Trans Ant & Prop*, July 1993, pp 871-876). This notes that a travelling-wave distribution of current can be produced on a linear antenna by inserting a resistance of approximately 240Ω one-quarter wavelength from its end to form an antenna which is very broadband and has much weaker mutual coupling than a conventional linear antenna. A travelling-wave antenna or section of an antenna is where the current and voltage remains substantially the same along its length as in the terminated rhombic or terminated long-wire antenna. Travelling-wave antennas may also have directional properties useful for special applications, such as Beverage-type antennas. Dr Altshuler points out that the main disadvantage of the resistance-loaded travelling-wave antenna is that it is only about 50 per cent efficient because part of the input power is absorbed by the resistor [unless the element(s) are very long so that most of the energy is radiated before it reaches the resistive termination – *G3VA*]. He points out that it is possible to replace the resistor with a resonant antenna having a radiation resistance approximately equal to the matching resistor, ie in this case about 240Ω. the input section still has a travelling-wave distribution of current up to the inserted element, but the power previously dissipated in the resistor will now be radiated, although since the impedance of the folded element is more frequency sensitive than that of the resistor, the antenna will not be so broadband as with purely resistive loading.

This new form of loaded antenna may be implemented either as a loaded dipole or a loaded monopole over a ground plane. The article describes a model monopole antenna (1.2GHz) in which the folded section is a modified folded dipole; by adjusting the length of this element, a radiation resistance of about 240Ω can be obtained.

The horizontally polarized patterns are similar to those of a horizontal dipole over a ground plane, and vertically polarized patterns in a plane orthogonal to the folded element are similar to those of a monopole over a ground plane. Dr Altshuler presents input impedance, current distribution and radiation patterns as computed using the Numerical Electromagnetics Code (NEC); input impedance and radiation patterns were also measured in a model antenna range. Results are obtained for half-lengths varying from 0.35 to 2.0 wavelengths at a frequency of 1.2GHz on a monopole antenna loaded with a modified folded dipole as shown in **Fig 9**.

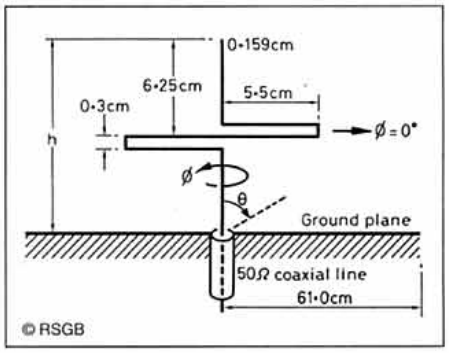


Fig 9: Monopole antenna loaded with a modified folded dipole resulting in the lower segment having a travelling-wave distribution of current so that it can be of virtually any length. A similar (even more broadband) effect can be achieved by inserting a non-inductive 240Ω resistor (of suitable wattage) in place of the folded dipole, but this will reduce radiated power by up to 50%. Dimensions are for the 1.2GHz antenna were measured in a model antenna range. Such antennas can be implemented as monopoles or dipoles etc.

CORRECTION

STEVE ORTMAYER, G4RAW, points out that the 'Tuna Checker' circuit (*TT*, Dec 98, Fig 8) should have the output pin of the 74LS73 as 9 (not pin 8 which is unconnected) and the 5.1V connected to pin 14. ***G3VA***

UK Amateur Radio Band Plans

Notes to the HF Band Plans:

1. The expression "phone" includes all permitted forms of telephony.
2. If transmitting very close to a band edge, take care not to radiate outside of the band.
3. Before transmitting, all operators are requested to check that the frequency is not already occupied. The normal advice is to use the phrase "Is this frequency in use?" on SSB and "QRL?" on CW.
4. Digimodes are defined as including: AMTOR, PACTOR, CLOVER, ASCII, RTTY (Baudot) and packet.
5. LSB is to be used on 3.5 and 7MHz bands, while USB on the 14, 18, 21, 24 and 28 MHz bands.

1.8MHz (160m)

UK Band Plan	Status of allocations in UK to: Amateur Service	Status of allocations in UK to: Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
1.810				
CW only				
1.838				
Digimodes (and CW) *but excluding packet radio*	Primary. Available on the basis of non-interference to other services (inside or outside the United Kingdom)	(Not allocated)	15dBW (1.830-1.850 only: 26dBW)	Morse Telephony RTTY Data Facsimile SSTV
RTTY (Baudot) is the preferred digital mode on this band. *Phone may be used above 1.840*				
1.842				
Phone (and CW)				
2.000				

Note: packet radio should not be used on the 1.8MHz band.

3.5MHz (80m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Status of allocations in UK to: Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
3.500					
CW only	3.500 – 3.510 *priority for CW intercontinental working*				
	3.500 – 3.560 *CW contest preferred segment*				
3.580					
Digimodes (and CW)	3.590 – 3.600 *preferred packet radio frequencies*				
(Phone may be used and has priority above 3.600)		Primary. Shared with other services	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV
3.620					
Phone (and CW)	3.600 – 3.650 *phone contest preferred segment*				
	3.635 – 3.650 *used by CIS stations for intercontinental working*				
	3.700 – 3.800 *phone contest preferred segment*				
	3.730 – 3.740 *SSTV/fax recommended*				
	3.775 – 3.800 *reserved for intercontinental phone working*				
3.800					

7MHz (40m)

UK Band Plan	Status of allocations in UK to: Amateur Service	Status of allocations in UK to: Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
7.000				
CW only				
7.035				
Digimodes (+ CW, SSTV, Fax)	Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV
(Phone may be used above 7.040)				
7.045				
Phone (and CW)				
7.100				

10MHz (30m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
10.100					
CW		Secondary	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV
10.140					
Digimodes	*(Unattended digimode stations should avoid the use of the 10 MHz band.)*				
10.150					

Notes: The 10MHz band is allocated to the amateur service only on a Secondary basis. Therefore IARU have agreed on a worldwide basis that only CW and digimodes, being narrow bandwidth modes, are to be used on this band. Likewise this band is not be used for contests or news bulletins.

14MHz (20m)

UK Band Plan			Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
14.000						
CW only	14.000 – 14.060	*CW only contest preferred segment*	Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV
14.070						
Digimodes (and CW)	14.089 – 14.099	*packet radio preferred frequencies*				
14.099						
Beacons only	14.099 – 14.101	*reserved exclusively for beacons*				
14.101						
Digimodes (+ phone and CW)	14.101 – 14.112	*packet radio preferred frequencies*				
14.112						
Phone (and CW)	14.125 – 14.300	*SSB only contest preferred segment*				
14.250	14.225 – 14.235	*used for SSTV/fax*				
Phone (and CW)				(Not allocated)		
14.350						

18MHz (17m)

UK Band Plan			Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
18.068						
CW only			Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV
18.101						
Digimodes (and CW)						
18.109						
Beacons only	18.109 – 18.111	*exclusively beacons*				
18.111						
Phone (and CW)						
18.168						

21MHz (15m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
21.000					
CW only					
21.080					
Digimodes (and CW)	21.100 – 21.120 *packet radio preferred*				
21.120					
CW only		Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV
21.149					
Beacons only	21.149 – 21.151 *beacons exclusive*				
21.151					
Phone (and CW)	21.335 – 21.345 *used for SSTV/fax*				
21.450					

24MHz (12m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
24.890					
CW only					
24.920					
Digimodes (and CW)		Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV
24.929					
Beacons only	24.929 – 24.931 *beacons exclusive*				
24.931					
Phone (and CW)					
24.990					

28MHz (10m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
28.000					
CW only					
28.050					
Digimodes (and CW)	28.120 –28.150 *packet radio preferred*				
28.150					
CW only	28.190 – 28.199 *beacons operational*				
28.199					
Beacons only	28.199 – 28.201 *beacons exclusive*				
28.201					
Phone (and CW)	28.201 – 28.255 *beacons operational* 28.675 – 28.685 *used for SSTV/fax*	Primary	Primary	26dBW	Morse Telephony RTTY Date Facsimile SSTV
29.200					
Digimodes (+ phone and CW)	29.200 – 29.300 *preferred for packet radio (FM 2.5kHz)*				
29.300					
Satellite downlinks	29.300 – 29.500 *Reserved exclusively for satellite downlinks*				
29.550					
Phone (and CW)	*Some experimental FM repeaters may be established in IARU Region 1.*				
29.700					

50MHz (6m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
50.000					
CW only	50.020 – 50.080 *beacons* 50.090 *CW calling*	Primary. Available on the basis of non-interference to other services (inside or outside the United Kingdom. Antennas limited to 20 metres above ground level. No Maritime Mobile operation	(Not allocated)	20dBW ERP	Morse Telephony RTTY Data Facsimile SSTV
50.100					
SSB and CW only	50.100 – 130 *DX window – note1* 50.110 *intercontinental calling: note 2* 50.185 *cross-band activity centre* 50.200 *SSB calling* 50.300 *CW MS calling* 50.350 *SSB MS calling*				
50.500					
All modes	50.510 *SSTV* 50.550 *Fax* 50.600 *RTTY (AFSK)* 50.630 – 50.750 *packet radio – note 3*				
51.000					
SSB and CW only	51.110 *VK / ZL calling*	Secondary. Available on the basis of non-interference to other services outside the United Kingdom. Antennas limited to 20 metres above ground level. No Maritime Mobile operation			
51.125					
All modes	51.210 *Note 5*				
51.410					
FM simplex channels Note 4	51.410 – 51.590 *FM telephony* 51.510 *FM calling* 51.530 *Note 6*				
51.830					
All modes	51.940 – 52.000 *Note 5*				
52.000					

1: Only to be used for QSOs between stations in different continents.
2: No QSOs on this frequency. Always QSY when working intercontinental DX.
3: 20kHz channel spacing. Channel centre frequencies start at 50.630MHz.
4: 20kHz channel spacing. Channel centre frequencies start at 51.410MHz.
5: Emergency communications priority.
6: Used by *GB2RS* news and for slow morse transmissions.

70MHz (4m)

UK Band Plan		Status of allocations in UK to: Amateur Service	Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
70.000					
Beacons	70.030 *personal beacons*	Secondary. Available on the basis of non-interference to other services outside the United Kingdom	(Not allocated)	22dBW	Morse Telephony RTTY Data Facsimile SSTV
70.030					
SSB and CW only	70.150 *meteor scatter calling* 70.185 *cross-band activity centre* 70.200 *SSB / CW calling*				
70.250					
All modes	70.260 *AM / FM calling*				
70.300					
Channelised operation using 12.5 kHz channels	70.3000 *RTTY/ fax* 70.3125 *packet radio* 70.3250 *packet radio* 70.3375 *packet radio* 70.3500 *Note 1* 70.3625 70.3750 *Note 1* 70.3875 70.4000 *Note 1* 70.4125 70.4250 70.4375 70.4500 *FM calling* 70.4625 70.4750 70.4875 *packet radio*				
70.500					

1: Emergency communications priority.

144MHz (2m)	UK Band Plan		Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
			Amateur Service	Amateur Satellite Service	PEP	
144.000						
CW only	144.000 – 144.035	*moonbounce*				
	144.050	*CW calling frequency*				
	144.100	*MS CW ref. freq. – note 6*				
	144.140 – 144.150	*CW FAI working*				
144.150						
SSB and CW only	144.150 – 144.160	*SSB FAI working*				
	144.195 – 144.205	*SSB random MS*				
	144.250	*Notes 1 and 2*				
	144.260	*Note 3*				
	144.300	*SSB calling frequency*				
	144.395 – 144.405	*SSB random MS*				
144.500						
All modes non-channelised	144.500	*SSTV calling frequency*				
	144.5125 –144.6875	*Note 7*				
	144.600	*RTTY calling frequency*				
	144.600±	*RTTY working (FSK)*				
	144.625	*packet radio TCP/IP*				
	144.650	*packet radio mailboxes*				
	144.675	*packet radio*				
	144.700	*fax calling frequency*				
	144.750	*FSTV calling and talkback*				
	144.775 – 144.825	*Note 3*				
144.845						
Beacons	144.850	*Note 4 (not telephony)*				
144.990						
FM repeater inputs	145.000 R0					
	145.025 R1					
	145.050 R2					
	145.075 R3					
	145.100 R4					
	145.125 R5					
	145.150 R6					
	145.175 R7		Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV
145.200						
FM Simplex channels	145.200 S8	*Note 3*				
	145.225 S9	*Note 3*				
	145.250 S10	*Note 2*				
	145.275 S11					
	145.300 S12	*RTTY AFSK*				
	145.325 S13					
	145.350 S14					
	145.375 S15					
	145.400 S16					
	145.425 S17					
	145.450 S18					
	145.475 S19					
	145.500 S20	*FM calling channel*				
	145.525 S21	*Note 1*				
	145.550 S22	*Note 5*				
	145.575 S23					
145.600						
FM repeater outputs	145.600 R0					
	145.625 R1					
	145.650 R2					
	145.675 R3					
	145.700 R4					
	145.725 R5					
	145.750 R6					
	145.775 R7					
145.800						
Satellite service						
146.000						

1: Used by *GB2RS*.
2: Used for slow Morse transmissions.
3: Emergency communications priority.
4: Used by Emergency communications subject to 14dBW ERP limitation. This note will eventually be deleted from the band plans.
5: Recommend frequency for rally and exhibition talk-in.
6: CW meteor scatter operation can take place up to 26kHz higher than the reference frequency.
7: Frequencies in the range 144.5125MHz to 144.6875MHz may be used for data communications subject to the requirement that sidebands do not spread outside this range of frequencies. The use of frequencies beneath 144.600MHz for data communications is a temporary measure pending a complete review of the band plan for 144.0 – 145.0MHz scheduled to be completed in time for the 1996 IARU Region 1 Conference. Before any use is made of frequencies beneath 144.600MHz for data communications operators must make every effort to consult with existing operators using that part of the band.

Notes on UK 50MHz, 70MHz,144MHz and 430MHz Band Plans
The beacon and satellite service must be kept free of normal communication transmissions to prevent interference with these services.
The use of the FM mode within the SSB/CW section and CW and SSB in the FM-only sector is not recommended.
Repeater stations are primarily intended as an aid for mobile working and they are not intended to be used for DX communication. FM stations wishing to work DX should use the all-modes section, taking care to avoid frequencies allocated for specific purposes.

430 – 440MHz (70cm)	UK Band Plan	Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
		Amateur Service	Amateur Satellite Service	PEP	
430.000					
All modes Note 1	430.400 – 430.800 *Note 8* 430.825 – 430.975 *Note 9*	Secondary			
431.000				16dBW ERP	
All modes Note 1		Secondary. Not available for use within 100km radius of Charing Cross, London (51°30'30"N, 00°07'24"W)			
432.000					
CW only	432.000 – 432.025 *moonbounce* 432.050 *CW centre of activity*				
432.150					
SSB and CW only	432.200 *SSB centre of activity* 432.350 *microwave talk-back*				
432.500					
All modes non-channelised	432.500 – 432.600 *Note 2* 432.600 – 432.800 *Note 3* 432.500 *SSTV activity centre* 432.600 *RTTY (FSK) activity centre* 432.625 *packet radio* 432.650 *packet radio* 432.675 *packet radio* 432.700 *fax activity centre*				
432.800					
Beacons		Secondary	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
432.990					
433.000					
FM repeater outputs in UK only Note 1	433.000 RB0 433.025 RB1 433.050 RB2 433.075 RB3 433.100 RB4 433.125 RB5 433.150 RB6 433.175 RB7 433.200 RB8 433.225 RB9 433.250 RB10 433.275 RB11 433.300 RB12 433.325 RB13 433.350 RB14 433.375 RB15				
433.400					
FM simplex channels	433.400 SU16 433.425 SU17 433.450 SU18 433.475 SU19 433.500 SU20 *FM calling channel* 433.525 SU21 433.550 SU22 *Note 4* 433.600 SU24 *RTTY AFSK* 433.625 *packet radio* 433.650 *packet radio* 433.675 *packet radio* 433.700 *Notes 5, 6 and 8* 433.725 *Note 5 and 8* 433.750 *Note 5 and 8* 433.775 *Note 5 and 8*				
434.600					

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See page 56 for notes to the 430 – 440MHz band plans.

430 – 440MHz (70cm)

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UK Band Plan	Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
	Amateur Service	Amateur Satellite Service	PEP	
434.600				
FM repeater inputs (in UK only) Note 1. and fast scan television Note 7 434.600 RB0 434.625 RB1 434.650 RB2 434.675 RB3 434.700 RB4 434.725 RB5 434.750 RB6 434.775 RB7 434.800 RB8 434.825 RB9 434.850 RB10 434.875 RB11 434.900 RB12 434.925 RB13 434.950 RB14 434.975 RB15	Secondary	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
435.000				
Satellite Service and fast scan television. Note 7		Secondary		
438.000				
Fast scan television 438.025 – 438.175 *Note 8* 438.200 – 439.425 *Note 1* 438.425 – 438.575 *Note 9*		(Not allocated)		
439.800				
Packet radio				
440.000				

* See page 56 for notes to the 430-440MHz band plans.

1,240 – 1,325MHz (23cm)

UK Band Plan	Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
	Amateur Service	Amateur Satellite Service	PEP	
1,240.000				
All modes 1,240.150 *packet radio (150kHz b/w)* 1,240.300 *packet radio (150kHz b/w)* 1,240.450 *packet radio (150kHz b/w)* 1,240.600 *packet radio (150kHz b/w)* 1,240.750 *packet radio (150kHz b/w)*	*FM TV input*	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
1,243.250				
ATV 1248.000 RMT3 *FM TV input* 1249.000 RMT2 *FM TV input* 1249.000 RMT2R				
1,260.000				
Satellite service	Secondary	Secondary. Earth to space only		
1,270.000				
All modes				
1,272.000				
ATV 1276.500 RMT1 *AM TV input*				
1,291.000				
Repeater input 1291.000 RM0 | 1291.375 RM15 *(UK) 25kHz spacing*		(Not allocated)		
1,291.475				
1,291.500				

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1,240 – 1,325MHz (23cm)

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UK Band Plan			Status of allocations in UK to: Amateur Service	Status of allocations in UK to: Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
1,291.500						
All modes				(Not allocated)		
1,296.000						
CW	1,296.000 – 025	*moonbounce*				
1,296.150						
SSB Narrow band DX segment a)	1,296.200	*narrow-band centre of activity*				
	1,296.400 - 600	*linear transponder input*				
	1,296.500	*SSTV*				
	1,296.600	*RTTY*				
	1,296.700	*Fax*				
	1,296.600 - 800	*linear transponder output*		Secondary Earth to Space only		
1,296.800						
Beacons exclusive b)						
1,296.990						
			Secondary		26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
1,297.000						
Repeater output	1297.000 RM0					
	1297.375 RM15	*(UK) 25kHz spacing*				
1,297.475						
1,297.500						
FM simplex c)	1297.500 SM20					
	1297.750 SM30			(Not allocated)		
1,298.000						
All modes		*Digital communications*				
1,298.500						
	1,299.000	*remote control*				
	1,299.000	*packet radio (25kHz b/w)*				
	1,299.425	*packet radio (150kHz b/w)*				
	1,299.575	*packet radio (150kHz b/w)*				
	1,299.725	*packet radio (150kHz b/w)*				
1,300.000						
TV Repeater outputs	1,308.00 RMT3	*FM TV output*				
	1,311.50 RMT1	*AM TV output*				
	1,316.00 RMT2R	*FM TV output*				
	1,318.50 RMT2	*FM TV output*				
1,325.000						

Notes on the 1,240 – 1,300MHz Band Plan

1. IARU Region 1 Band Plan
The following notes are part of the IARU Region 1 band plan, adopted at the IARU Region 1 conference in De Haan (1993), and all member societies should strongly promote adherence to the recommendations made in these notes.

1.1 Footnotes
a. CW is permitted over the whole narrow-band DX part of the band; CW exclusive between 1,296.000 – 1,296.150MHz.
b. Regional planning by the Beacon Co-ordinator only for beacons with more than 50 Watts ERP.
c. In countries which do not have access to 1,298 – 1,300MHz (eg Italy) the FM simplex segment may also be used for digital communications, if necessary.

1.2. Miscellaneous agreements
At the IARU Region 1 conference in Warsaw (1975) it was recommended that France, after their loss of the upper part of the band to other services, adopt the portion 1,238 – 1,240MHz for narrow-band operations in the same way as the rest of Region 1 uses in 1,296 – 1,298MHz segment of the band.

2. Usage
The following notes refer to the usage column in the band plan. In the right amateur spirit operators should take notice of these agreements which are made for operating convenience, but no right to reserved frequencies can be derived from a mention in the usage column or from the following notes.

2.1 During contests and band openings local traffic using narrow-band modes should operate between 1,297 – 1,298MHz.

2,310 – 2,450MHz (13cm)

2,310 – 2,450MHz (13cm)	UK Band Plan	Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
		Amateur Service	Amateur Satellite Service	PEP	
2,310.000					
Sub-regional (National band plans)	2,310.0 – 2,310.5 *repeater links* 2,310.100 *packet radio (200kHz b/w)* 2,310.300 *packet radio (200kHz b/w)* 2,310.0 – 2,310.5 *remote control*				
2,320.100					
CW exclusive	2,320.000 *EME* 2,320.025 *(moonbounce)*				
2,320.150					
CW & SSB	2,320.200 *SSB centre of activity*				
2,320.800					
Beacons exclusive					
2,320.990					
2,321.000					Morse Telephony RTTY Data Facsimile SSTV FSTV
Simplex & repeaters (FM)		Secondary	(Not allocated)	26dBW	
2,322.000					
All modes	2,322 – 2,355 *ATV* 2,355.1 – 2,364.0 *repeater links* 2,355.100 *packet radio (200kHz b/w)* 2,355.300 *packet radio (200kHz b/w)* 2,364.000 *packet radio (1MHz b/w)* 2,365 – 2,370 *repeaters* 2,370 – 2,390 *ATV*				
2,390.000					
	EME (moonbounce)				
2,392.000					
All modes					
2,400.000					
Amateur satellite service		Secondary. Users must accept interference from ISM users	Secondary. users must accept interference from ISM users		
2,450.000					

Notes on the 2,300 – 2,450MHz Band Plan

a) In countries which do not have access to the ALL MODES section 2,322 – 2,390MHz, the SIMPLEX & REPEATERS segment 2,321 to 2,322MHz may be used for data transmissions.
b) In countries where the narrow-band segment 2,320 – 2,322MHz is not available, the following alternative narrow-band segments can be used: 2,304 – 2,306MHz and 2,308 – 2,310MHz.

ISM (Industrial, Scientific and Medical).

3,400 – 3,475MHz (9cm)

3,400 – 3,475MHz (9cm)	UK Band Plan	Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
		Amateur Service	Amateur Satellite Service	PEP	
3,400.000					
Narrow band CW/EME/SSB	3,400.100 *centre of activity* *(The narrow band section 3,400 - 3,402 is preferred from January 1994)*				
3,402.000					
All modes					
3,456.000					Morse Telephony RTTY Data Facsimile SSTV FSTV
Narrow band CW/EME/SSB	3,456.200 *alt centre of activity* 3,456.800 – 3,457.000 *beacons* 3,457.000 – 3,458.000 *remote control*	Secondary	(Not allocated)	26dBW	
3,458.000					
All modes					
3,475.800					

5,650 – 5,850MHz (6cm)

UK Band Plan			Status of allocations in UK to: Amateur Service	Status of allocations in UK to: Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
5,650.000						
Amateur satellite service (up-link)			Secondary	Secondary. Earth to Space only	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
5,668.000						
Amateur satellite and narrowband	5,668.200 5,668.800 – 5,669.000	*centre of activity beacons*				
5,670.000				(Not allocated)		
5,680.000						
5,755.000						
All modes						
5,760.000						
UK Narrowband CW/EME/SSB	5,760.200 5,760.800 – 5,761.000	*centre of activity (UK) beacons*	Secondary. Users must accept interference from ISM users	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
5,762.000						
All modes						
5,765.000						
5,820.000						
All modes				(Not allocated)		
5,830.000						
Amateur satellite service (down-link)			Secondary. Users must accept interference from ISM users	Secondary. Users must accept interference from ISM users. Space to Earth only	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
5,850.000						

10,000–10,500MHz (3cm)

UK Band Plan			Status of allocations in UK to: Amateur Service	Status of allocations in UK to: Amateur Satellite Service	Maximum Power: PEP	Permitted Types of Transmission
10,000.000						
All modes (ATV, data transmission, FM simplex, duplex and repeaters)	10,006 – 10,026 10,006 – 10,026 10,040.000 RT101 10,065.000 RT102 10,100 10,110.200 RT101 10,150.000 RT103 10,150 – 10,170 10,150 – 10,170 10,210.255 RT102 10,310.250 RT103	*packet radio* *repeater links / control* *FM TV output* *FM TV output* *wide band beacons* *FM TV input* *FM TV output* *packet radio* *repeater links / control* *FM TV input* *FM TV input*	Secondary	(Not allocated)	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
10,368.000						
Preferred narrow band CW/EME/SSB/ Beacons	10,368.100 10,368.200 10,368.800 – 10,369.000	*Centre of activity (UK)* *SSB centre of activity* *narrow band beacons*				
10,370.000						
All modes	10,400	*wide band beacons*				
10,450.000						
Amateur and amateur satellite service (all modes)	10,450 - 10,452	alternative narrowband CW/EME/SSB		Secondary		
10,500.000						

Notes on the 10,000 – 10,500MHz Band Plan

In those countries where the narrow-band segment 10,368 – 10,370MHz is not available, the segment 10,450 – 10,452MHz is suggested as an alternative narrow-band segment.

24.0 – 24.25GHz (12mm)

UK Band Plan		Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
		Amateur Service	Amateur Satellite Service	PEP	
24.000.000					
Amateur satellite service	24,025.000 *preferred operating frequency wide-band equipment* 24,048 – 24,050 *narrow band operating*	Primary. Users must accept interference from ISM users	Primary. Users must accept interference from ISM users	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
24,050.000					
All modes		Secondary. May only be used with the written consent of the Secretary of State. Users must accept interference from ISM users	(Not allocated)		
24,150.000					
All modes	*24,192 – 24,194 Narrowband operating (UK)*	Secondary. Users must accept interference from ISM users			
24,250.000					

47.0 – 47.2GHz (6mm)

UK Band Plan		Status of allocations in UK to:		Maximum Power:	Permitted Types of Transmission
		Amateur Service	Amateur Satellite Service	PEP	
47,000.000					
	47,088.000 *centre of narrow-band activity*	Primary	Primary	26dBW	Morse Telephony RTTY Data Facsimile SSTV FSTV
47,200.000					

Other amateur bands allocated in the UK are: 75,500 – 76,000, 142,000 – 144,000, 248,000 – 250,000 GHz.

Notes to the Schedule

(a) Maximum Power refers to the RF power supplied to the antenna. Maximum power levels will be specified by the peak envelope power (PEP).

(b) In the case of frequency bands above 1000 MHz, since high intensities of RF radiation may be harmful, the following safety precaution must be taken. In locations to which people have access, the power flux density on transmit must not exceed the limits recommended by the competent authorities (currently, this limit is 10mW per square centimetre).

(c) **Primary, permitted and secondary services**

For the purpose of this Licence, frequency bands allocated to the Amateur Service and the Amateur Satellite Service on a primary basis cannot claim protection from Harmful Interference or Undue Interference from any other authorised services, such protection being afforded only to users whose frequencies have been registered nationally or internationally. In the United Kingdom, individual frequency assignments are not registered in the Amateur Service, except for beacons and repeaters. This applies equally to bands allocated on a secondary basis where stations of the Amateur Service and the Amateur Satellite Service are also required not to cause Harmful Interference or Undue Interference to stations of a primary or permitted service to which frequencies are already assigned or to which frequencies may be assigned at a later date.

(d) Any modulation technique (except for pulse emissions below 1000 MHz) may be used for the types of transmission specified in the sixth column of the Schedule which are defined as follows:

Morse: hand or automatically-sent international morse code

Telephony: speech, including selective calling signals

RTTY: radio teletype and AMTOR

Data: digital codes representing numbers, text, speech, images, measurements, computer programms or other information authorised by the Licence

Facsimile: transmission of fixed or graphic images

SSTV: slow scan (ie, reduced bandwidth) television

FSTV: fast scan television

(e) **Interpretation**

(i) Effective Radiated Power (ERP): The product of the power supplied to the antenna and its gain in the direction of maximum radiation.

(ii) Gain of an Antenna: The ratio, usually expressed in decibels, of the power required at the input of a loss free reference antenna to the power supplied to the input of the antenna to produce, in a given direction, the same field strength or the same power flux-density at the same distance. When not otherwise specified, the gain refers to the direction of maximum radiation. The gain may be considered for a specified polarisation. The reference antenna is usually a half-wave dipole. The gain may be referred to as decibels relative to a half-way dipole (dBd).

(iii) Peak Envelope Power (PEP): The average power supplied to the antenna by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions.

Amateur Radio (Novice) Licence (A) and (B) Schedule

Those licensed under an Amateur Radio (Novice) Licence (B) may not transmit on those bands between 1.950 and 28.500MHz.

1	2	3	4	5
Frequency Bands in MHz	Status of Allocations in the United Kingdom to the Amateur Service	Maximum Power DC Input (Watts)	Maximum Power RF Output (Watts)	Permitted Types ofTransmission
1.950 - 2.00	Available on the basis of non-interference to other services (inside or outside the United Kingdom).			Morse Telephony RTTY Data
3.560 - 3.585	Primary. Shared with other services.			Morse
10.13 - 10.14	Secondary.			Morse
21.100 - 21.149	Primary.			Morse
28.060 - 28.190				Morse RTTY Data
28.225 - 28.300				Morse RTTY Data
28.300 - 28.500				Morse Telephony
50.0 - 51.0	Primary. Available on the basis of non-interference to other services outside the United Kingdom. Antennas limited to 20 metres above ground level.	5	3	Morse Telephony Data
51.0 - 52.0	Secondary. Available on the basis of non-interference to other services outside the United Kingdom. Antennas limited to 20 metres above ground level.			Morse Telephony Data
432.00 - 435.00	Secondary.			Morse Telephony Data
435.0 - 440.0				Morse Telephony Data SSTV FSTV
1240 - 1325				Morse Telephony RTTY Data Facsimile SSTV FSTV
10000 - 10500				Morse Telephony RTTY Data Facsimile SSTV FSTV

Notes to the Schedule (Extract)

(a) The maximum power specified in the third column of the Schedule refers to the peak input power (PIP) and the maximum power specified in the fourth column of the Schedule refers to the peak envelope power (PEP). The Licensee may use either measurement method, provided that the maximum power specified in the fourth column of the Schedule is not exceeded.

(b) In the case of frequency bands above 1000MHz, since high intensities of rf radiation may be harmful, the following safety precaution must be taken. In locations to which people have access, the power flux density on transmit must not exceed the limits recommended by the competent authorities (currently, this limit is 10mW per square centimetre).

(c) **Primary, permitted and secondary services**
For the purpose of this Licence, frequency bands allocated to the Amateur Service on a primary basis cannot claim protection from undue interference from any other authorised services, such protection being afforded only to users whose frequencies have been registered nationally or internationally. In the United Kingdom, individual frequency assignments are not registered in the Amateur Service, except for beacons and repeaters. This applies equally to all bands allocated on a secondary basis where stations of the Amateur Service are also required not to cause undue interference to stations of a primary or permitted service to which frequencies are already assigned or to which frequencies may be assigned at a later date.

(d) Any modulation technique (except for pulse emissions below 1000 MHz) may be used for the types of transmission specified in the fifth column of the Schedule which are defined as follows:

Morse:	hand or automatically-sent international morse code
Telephony:	speech, including selective calling signals
RTTY:	radio teletype and AMTOR
Data:	digital codes representing numbers, text, speech, images, measurements, computer programs or other information authorised by the Licence
Facsimile:	transmission of fixed or graphic images
SSTV:	slow scan (ie reduced bandwidth) television
FSTV:	fast scan television

Notes to the 430 – 440MHz Bandplan

1: In Switzerland, Germany and Austria, repeater inputs are 430.6 – 431.825MHz with 25kHz spacing, and outputs are 438.200 – 439.425MHz. In France and the Netherlands repeater inputs are 430.025 – 430.375MHz with 25kHz spacing and outputs at 431.625 – 431.975MHz. In other European countries repeater inputs are 433.000 – 433.375MHz with 25kHz spacing and outputs at 434.600 – 434.975MHz, ie the reverse of the UK allocation.

2: IARU Region 1 Linear Transponder outputs.

3: IARU Region 1 Linear Transponder inputs.

4: Recommend frequency for rally and exhibition talk-in.

5: Emergency communications priority.

6: IARU Region 1 Fax/AFSK.

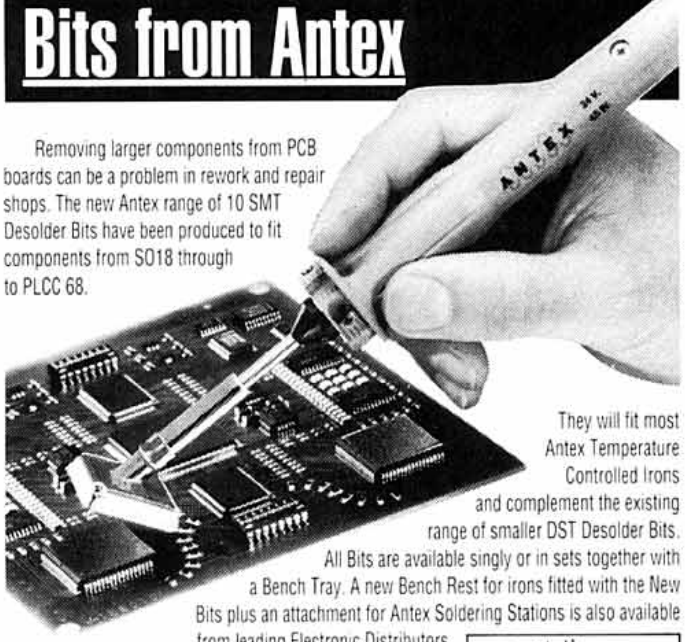
7: Fast Scan Television carrier frequencies shall be chosen so as to avoid interference to other users, in particular the satellite service and repeater inputs. IARU Region 1 recommends that video carriers should be in the range 434.000 – 434.500MHz or 438.500 – 440.000MHz.

8: IARU Region 1 Packet Radio.

9: The frequencies 430.825 – 430.975MHz may be used for low power repeater inputs with outputs 7.6MHz higher (ie in the range 438.425 – 438.575MHz). These channels will be designated R61 to R67. The existence of this footnote should not be taken to imply that such repeaters can be licensed.

New low-priced Desolder Bits from Antex

Removing larger components from PCB boards can be a problem in rework and repair shops. The new Antex range of 10 SMT Desolder Bits have been produced to fit components from SO18 through to PLCC 68.



They will fit most Antex Temperature Controlled Irons and complement the existing range of smaller DST Desolder Bits. All Bits are available singly or in sets together with a Bench Tray. A new Bench Rest for irons fitted with the New Bits plus an attachment for Antex Soldering Stations is also available from leading Electronic Distributors.

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TV COAX FOR 432MHZ?

'LOW-LOSS' TV COAX appears to have similar loss figures to UR67, but is much cheaper – why? Can I use it on 432MHz, and will the 75Ω impedance make a difference? The fact that TV coax is less obtrusive may make all the difference to my being able to get on the air at all.

IF USING THIN WHITE CABLE makes the difference between being on the air or not, the answer always has to be "Yes, go ahead." But having said that, there are some drawbacks to using TV coax, and using it successfully requires care and forethought.

The main reason for the much lower price of TV coax is that unlike professional low-loss cables such as UR67, TV coax is designed down to a price for domestic users, rather than manufactured to meet an exacting specification of military origin. It is also made in vast quantities by a range of manufacturers, and sold in a highly competitive market – all factors which drive the price down. The way they make such low-loss cable for the price is to squeeze the maximum economic value out of all the technical factors that contribute to cable loss.

The four main contributors to losses in coaxial cables are, in approximate order of importance: resistive (skin-effect) losses in the centre conductor; leakage through the shielding braid; dielectric losses in the insulating material; and resistive losses in the outer conductor [1]. The 'copper losses' in the inner and outer conductors decrease with a larger-diameter cable, and the dielectric losses decrease if the insulation is replaced by a better dielectric, or by foam or air. These factors set the stage for an intensive 'value-engineering' exercise.

Choosing an impedance of about 75Ω gives a coaxial cable with the lowest loss per unit weight, ie the best balance between performance and the amount of expensive copper required. The small amount of shield braiding likewise represents the minimum coverage required to meet standards of public and engineering decency (BS2316, and there is also a Uniradio specification URM203 for this type of cable). Mechanical performance requirements are much less stringent for the domestic product than for the professional/military equivalent.

So how good is TV coax on 432MHz? Unfortunately we are not favoured with loss data for the amateur bands, but it's very easy to work out. If you plot the matched losses for almost any coax cable (in dB/m or dB/ft, but be consistent) against frequency on log-log paper, you get a series of almost parallel straight lines. **Fig 1** shows a few examples, with URM203 TV coax included. Alternatively, if you prefer to use a calculator G6UTC [2] has correlated these data as equations of the form:

$$\text{Log } L = A + B \log F$$

where L is in dB/m and F is in MHz. The equivalent parameters for URM203 TV coax are A = –2.26 and B = 0.57 so the losses at 432MHz are about 0.175dB/m. Television coax can withstand the voltages and currents involved in low-power transmitting applications, and of course the losses are exactly the same on transmit as on receive. The above losses, however, are quoted for a matched 75Ω system, and there's the other problem: how do you achieve a matched 75Ω system when your transmitter and antenna are designed for 50Ω?

There are three options: (1) don't bother; (2) adjust the impedance 'seen' by your transmitter to 50Ω but forget about the VSWR; or (3) install a 50-75Ω impedance transformer at each end of your run of 75Ω cable. The first option is not very attractive: not only does it involve a VSWR of 1.5 (75Ω/50Ω) referred to a 50Ω system, but it can also create some bizarre impedances that your transmitter might not like. If your antenna is a true 50Ω match, then at the bottom of a random-length run of 75Ω feeder you might measure an impedance anywhere between 50Ω and 112Ω (=75²/50), with inductive or capacitive reactances in the range between. Depending on the way your particular transmitter's VSWR protection circuitry responds to the type of mismatch involved, it may not let your rig deliver the full available power output. There may also be some degradation in receiver sensitivity due to the VSWR, though that may not be noticeable in the kinds of systems for which you'd contemplate using TV coax.

Option 2 involves making sure at least that the transmitter 'sees' a 50Ω impedance, even though the VSWR on the cable remains at 1.5. You may have spotted earlier that one of the range of possible impedances obtainable at the far end of a run of 75Ω cable connected to a 50Ω antenna is indeed 50Ω. That occurs when the length of cable is an exact multiple of an electrical half-wavelength, because a half-wave of any transmission line will always reproduce the same impedance as it is connected to (ignoring minor effects due to feeder loss). In practical terms, what you'd do is to leave some extra cable at the transmitter end, and clip back the length a few centimetres at a time until a 50Ω VSWR meter shows minimum VSWR; if your antenna was well matched to 50Ω in the first place, you should be able to get the VSWR down pretty close to 1. (Note – If you were using 50Ω cable, you could snip away all day and the indicated VSWR would not change. The reason it changes when using non-50Ω cable is because the VSWR meter is designed for 50Ω systems, and is simply responding to the impedance it 'sees' at the end of the cable. A VSWR meter cannot tell you anything about the VSWR in a cable of a different impedance than the one for which the meter itself was designed.) An alternative to option 2 might be to adjust the matching at the antenna to make it show a 50Ω impedance at the bottom of your chosen length of cable.

Option 3 takes note of the fact that the loss in a mismatched cable will be greater than the matched loss quoted above [3]. In this case, for a typical 10m run of URM203 the matched loss would be about 1.75dB and the additional loss due to the VSWR of 1.5 would be about 0.1dB. If you care about this difference, there are several ways of making 50-75Ω impedance transformers involving special lengths and stubs of coax [4], but in my view that's hardly consistent with the philosophy of using TV coax in the first place.

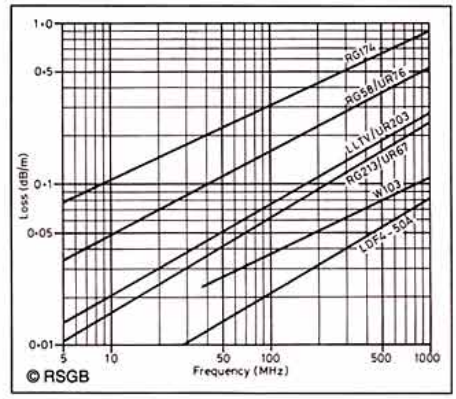

Fig 1: Cable loss and frequency are well correlated by a log-log relationship. Examples are based on manufacturers' published data.

POWER SUPPLIES – FEEDBACK

G3RMA AND LA8AK have both commented on the positioning of the 'crowbar' thyristor and fuse in November's column. There is really no need for the main smoothing capacitor to be downstream of the fuse, and the current rating of the thyristor may be exceeded if the capacitor is discharged directly through it. If the sequence is capacitor-fuse-thyristor as shown in **Fig 2**, the peak current through the thyristor is limited by the rapidly-rising resistance of the fuse. Another school of thought places the thyristor across the output terminals of the supply; although this will protect the load from over-voltage, it seems very risky for the shorted power supply, because the presence of the over-voltage must mean that the PSU is somehow not functioning correctly.

LA8AK also pointed out that extra diodes and capacitors are advisable to prevent damage that could be caused if the PSU is connected to a load which could drive current back into its output terminals, for example if the PSU is switched off whilst charging a battery, or is connected under some circumstances to an inductive load. Certainly, Jan-Martin: Fig 2 adds some real-world protection to November's simplified diagram of a regulated PSU (for details of the VDR connected across the mains supply, see the separate item). If any current is driven back through the output terminals from an outside source, diode D1 prevents damage caused by reverse-biasing of the 'pass' transistor(s) and other parts of the regulator circuitry. Unfortunately this brings a further complication: if you're charging a battery, and for some reason the thyristor triggers and blows fuse F1, D1 would then short-circuit the battery through the thyristor. D2 protects against this situation, but in normal use it also causes a voltage drop which may affect the

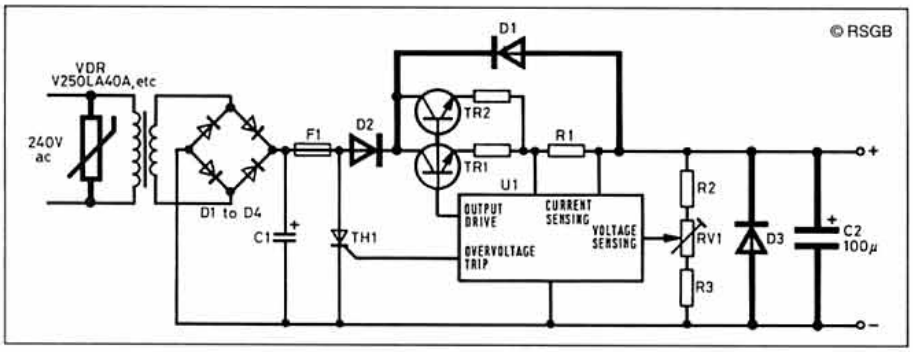

Fig 2: Protection components for a regulated power supply, with revised location of the reservoir capacitor C1. The November 1993 column explains the rest of the circuit.

voltage regulation at high currents, so leave out D2 if you do not plan to use the power unit for battery-charging.

Diode D3 across the output terminals would short-circuit any reverse-connected external current source. As for current ratings, D2 must obviously be capable of carrying the full DC output of the supply, and for safety's sake D1 and D3 should be similarly rated. Electrolytic capacitor C2 connected across the output terminals will take the sting out of any incoming current spikes, and will also help to prevent false triggering of the over-voltage crowbar circuit. If your own regulated PSU doesn't already include something along the lines of D1, D3 and C2 – and also D2 if necessary – you'd do well to add these components.

THE BATTERY ALTERNATIVE

While on the subject of 12-13.8V DC supplies, G4AKD writes to recommend a car battery as a simple, reliable high-current power supply with few of the problems of the all-electronic regulated PSU. He tried this alternative on the recommendation of Pat Hawker's correspondents in *TT*, and has been well satisfied. G4AKD's simple trickle-charger uses a 7815 regulator with two silicon diodes in series to drop the voltage from 15V, and also to protect the regulator against reverse current from the battery. When the battery is fully charged to 13.8V, very little current flows from the 7815; but when the battery voltage drops to about 13.2V after a long operating session, the charging current rises to about 1.5A (limited internally by the 7815) which keeps the battery sufficiently well charged for G4AKD's normal patterns of operation. His simple system has been running reliably for about three years.

FIT VDRs NOW

WHEN I SWITCHED ON my rig this morning, it was completely dead. The problem turned out to be a blown power rectifier diode. I suspect it might have been a voltage spike on the mains: is there anything I can do to prevent this from happening again?

WITH ALMOST ANY mains-powered electronic equipment, I strongly recommend that you connect a solid-state transient limiter across the primary of the transformer. These voltage-dependent resistors or VDRs pass very little current (1mA or less) unless the applied voltage significantly exceeds the rated operating value, but if a voltage surge comes along they switch very rapidly to a low-resistance state and absorb the transient. They are very effective in protecting your equipment from the kinds of voltage surges that can easily destroy power rectifiers and occasionally do far worse damage. Having once watched in horror as the Electricity lineman repeatedly jiggled and flashed the mains supply to our row of houses, I can assure you that surges do happen! Even if your 240V mains supply is underground, it still reaches you via overhead lines which are subject to lightning strikes during thunderstorms (or in the Thames Valley, swan strikes at any time) and you may also be sharing a supply with switched inductive loads such as electrical machinery. Everyone's equipment is subject to voltage transients now and again: it only takes *one* to do the damage.

Suitable mains transient suppressors include the V250LA . . . . series (Electromail or Farnell), eg the V250LA40A. '250' represents the AC operating voltage rating, ie the VDR does not begin to conduct until the applied voltage somewhat exceeds the peak value corresponding to 250V RMS (ie $250\sqrt{2}$ = 354V). VDRs come in a range of sizes, from the 9mm diameter LA2 series up to the 23mm diameter LA40s, the larger ones having a correspondingly greater capability to absorb current surges. The largest in the 250V range are the V250LA40A and '40B, which will handle currents up to 6500A for a few microseconds. Maplin sell smaller-capacity VDRs (similar to the LA10 series), and although these will be suitable for most applications, the larger LA40 series offer much more surge-limiting capability for only a little more cost. As shown in Fig 2, the VDR is simply soldered across the primary terminals of the mains transformer.

WHEN TO WHISTLE

IN THE NOVEMBER 1993 column you mentioned whistling into the microphone to set up a speech processor. Shouldn't you have said to use a dummy load?

PROBABLY, YES. THERE'S nothing so annoying as when you're straining to hear a weak DX signal and somebody appears on the frequency whistling or shouting "Waaaloh" to test their transmitter. Let's be clear about this: *never* go on the air without checking that the frequency is clear, and *never* make tests on-air which could equally have been carried out using a dummy load.

On the other hand, there are certain tests that do demand the use of full power into the antenna, and one of those is adjusting the transmitter drive level following the '10% Rule' mentioned in November. This is because the available output power depends on the actual impedance of the antenna and on the way that the transmitter is tuned and loaded into it; or on the way that the antenna tuning/matching unit is adjusted if your solid-state transmitter has no tuning and loading controls. So although you can – and should – set up the transmitter and its speech processor first using the dummy load, you'll have to make the final adjustments on the air at full power. Just don't forget to ask first whether the frequency is clear!

'RMS' REVISITED

CAN'T YOU PRODUCE a better explanation of 'Peak Envelope Power' which avoids the dubious concept of 'RMS RF power'?

I WAS TAKEN TO TASK by several people about my explanation of PEP (October 1993) – not about PEP as such, but about my use of the term 'RMS RF power'. It has been forcibly pointed out that RF power is "always understood" to be averaged over one complete cycle, so that terms such as 'RMS power' are not only unnecessary but also "incorrect" (to quote one of the milder comments).

If you're still wondering what PEP is, refer to your licence. It defines PEP as "the average power delivered to the antenna . . . . during one RF cycle at the crest of the modulation envelope". Note that the "power" is required to be averaged over the entire RF cycle, which is indeed the normal definition of AC/RF power. Contrary to persistent belief, our power limits do *not* apply to the instantaneous peak power at the crest of the RF cycle.

My mistake in writing the October column was not strictly technical; it was to assume that the term 'RMS power' would be interpreted as meaning 'power calculated by an *appropriate* application of RMS averaging' – as opposed to the inappropriate one that some readers assumed. I certainly did not mean to imply that root-mean-square averaging should be carried out directly upon the power waveform itself, for that is simply incorrect. RMS averaging is applied to the measured voltage and/or current waveforms, from which the power can then be calculated. To prevent this topic from developing any further towards a 'Holy War', I apologise for having used a term which evidently generated more heat than light.

UNTIL NEXT MONTH . . .

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.

REFERENCES

[1] *The VHF/UHF DX Book*, Chapter 7.
[2] 'Coaxial Cable Losses on the VHF and UHF Bands' by Giles Harrison, G6UTC. *RadCom* March 1990, p41.
[3] *ARRL Handbook*, 'Transmission Lines'.
[4] *Radio Communication Handbook* (RSGB), Chapter 13.

Simply Silicon

by Paul Lovell, G3YMP

MOTOROLA MC13176 UHF FM/AM TRANSMITTER

- UHF Current controlled oscillator
- Uses easily available crystals for reference ($F_{out} = 32 \times F_{ref}$)
- Few external parts required
- Low voltage operation (1.8 to 5V)
- Low supply current
- Power output adjustable up to +10dBm
- Differential output for loop antenna or balun
- Power down feature

ONE OF THE MOST popular devices featured in this column was the MC2833 transmitter chip described in April, last year. It hardly seems possible there could be a simpler one, but for 432MHz operation, the new MC13176 from Motorola takes some beating. Note that this IC is only available in a surface mount package (SO-16).

The MC13136 contains all the elements needed to form a phase locked loop, and even includes an on-chip voltage controlled oscillator (VCO) - just add a small inductor and you're away. There is only one tuned circuit to adjust which sets the VCO frequency range. Since this runs at the output frequency, the RF signal should have a very low spurious content.

Potential constructors may like to consider the possibilities of this device in conjunction with integrated PA modules (eg the ones manufactured by Mitsubishi), or how about using it with the 'No-tune Driver' designed by Zack Lau, KH6CP. This was described in *QEX* magazine, last year, and reprinted in *RadCom*, July 93. The manufacturer's circuit shown here, operates at a frequency of 320MHz, but an 80nH VCO coil would probably be more suitable at 70cm.

The crystal frequency is equal to the output divided by 32, so for a transmitter on SU16 (433.400MHz) the crystal would be on 13.54375MHz. This IC has an adjustable output level, so it could also be used as the local oscillator of a receiver.

MANUFACTURER'S DATA

THE MC13176 IS A ONE chip FM/AM transmitter designed for communication systems. It includes a Colpitts crystal reference oscillator, UHF oscillator, a divide by 32 prescaler and phase detector to form a versatile PLL system. Targeted bands are 260 to 470MHz and 902 to 928MHz. Other applications include local oscillator sources in UHF receivers, UHF video transmitters, RF Local Area Networks (LANS) and high frequency clock drivers.

Pin connections for the MC13176 are shown in **Fig 1**. Note that the case is surface mount (SO-16 type), Motorola style 751B-03. Full information on the device is given in *Motorola Databook* DL128/D rev 4.

A simple NBFM transmitter is shown in **Fig 2**. Item 1 (UT-034) is a 50Ω coaxial balun, 2in long. Pins 5, 10 and 15 are grounds connected to V_{EE} (point 2) which is the component-side ground plane. These pins must be decoupled to V_{CC} and decoupling capacitors should be placed as close as possible to the pins.

RFC1 (item 3) is a 180nH surface mount inductor, and the two chokes RFC2 and RFC3 are selected to have a high impedance at the crystal frequency. At 10MHz, an 8.2µH moulded inductor gives $X_L > 1000\Omega$. RFC2 is not required if a single varactor such as the MV2105 is used. The crystal (item 6) is parallel resonant, fundamental mode, 32pF load capacitance.

CURRENT CONTROLLED OSCILLATOR

VARIATION OF FREE-running VCO frequency with control current is shown in **Fig 3**. This is for a centre frequency of approx 450MHz. The oscillator gain factor depends on the operating range of the control current

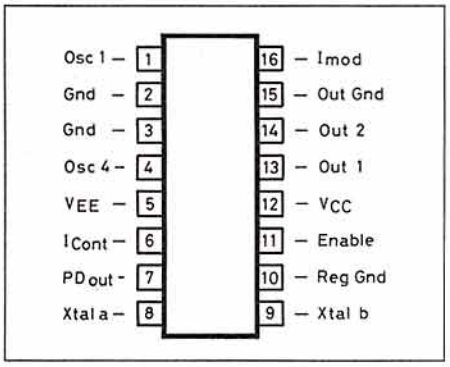

Fig 1: Pin connections for the MC13176.

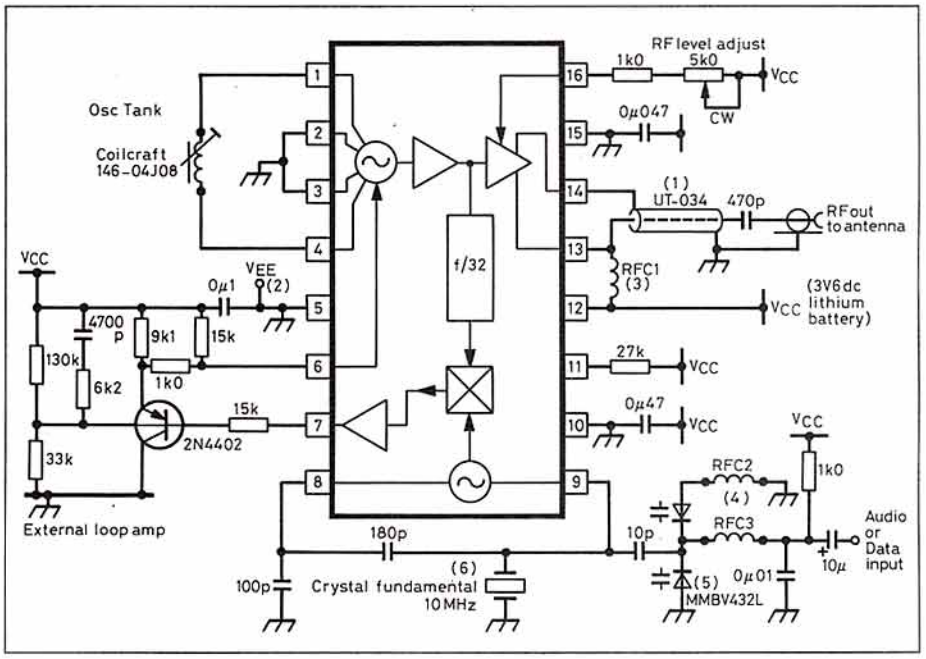

Fig 2: Typical application for an NBFM transmitter at 320MHz.

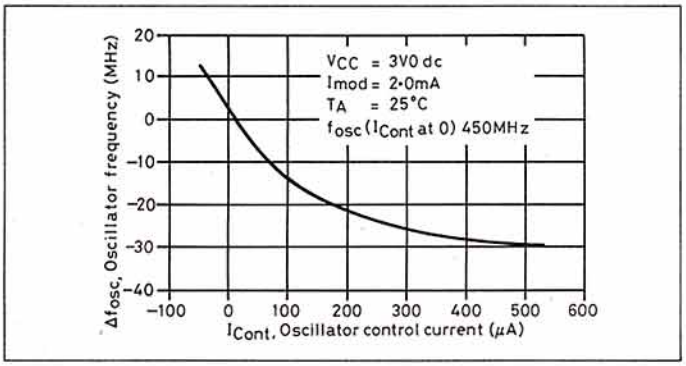

Fig 3: Change in free-running VCO frequency with oscillator control current.

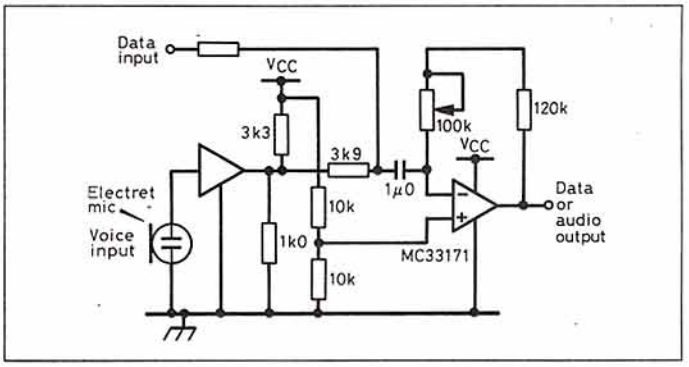

Fig 4: A simple mic amplifier. Data (FSK) can also be applied where shown.

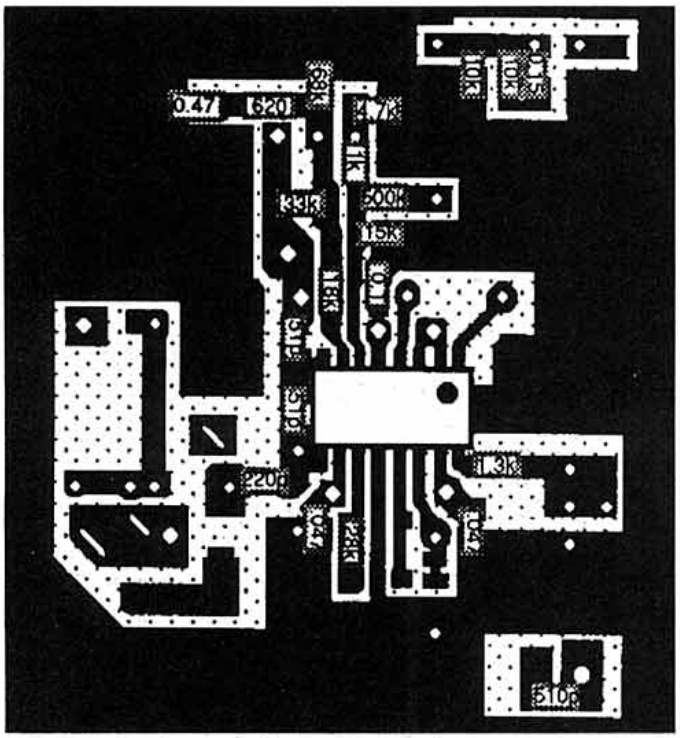

Fig 5: Surface mount component placement (on circuit side). Size increased to show detail.

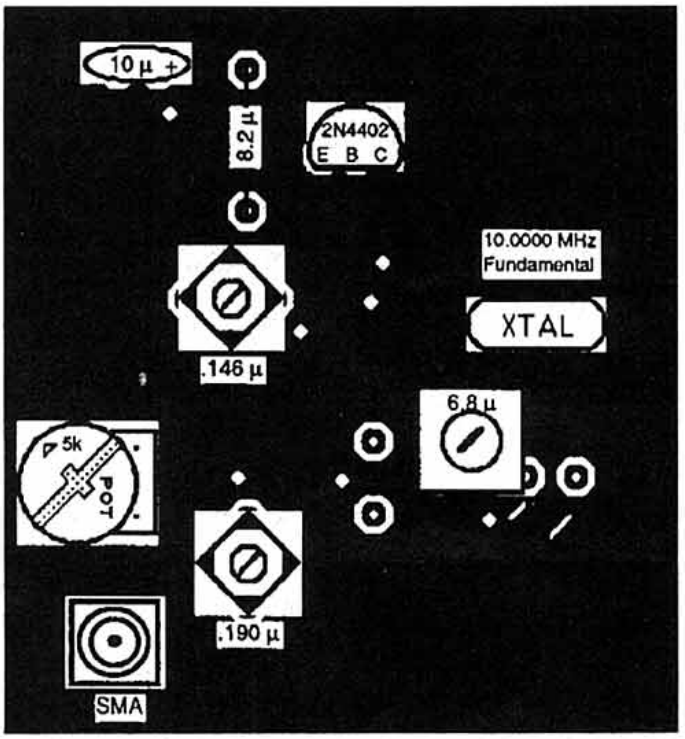

Fig 6: Radial lead component placement (on ground side). Size increased to show detail.

(ie the slope is not constant). Included in the overall CCO gain factor is the internal amplifier. This can sink or source at least 30µA of input current from the phase detector. The internal circuitry at pin 6 limits the CCO control current to 50µA of source capability while its sink capability exceeds 200µA as shown in Fig 3.

FM MODULATION

NOISE EXTERNAL TO the loop (phase detector input) is minimized by narrowing the bandwidth. This noise is minimal in a PLL system since the reference frequency is usually derived from a crystal oscillator. FM can be achieved by applying a modulation current, which is superimposed on the control current of the CCO.

For voice applications using a dynamic or an electret microphone, an op amp such as the MC33171 amplifies the microphone's low level output (**Fig 4**). The output of such an amplifier may be used with the circuit of Fig 2 for NBFM applications. The MC13176 is also designed to accommodate amplitude shift keying (ASK). ASK is a form of digital modulation corresponding to AM.

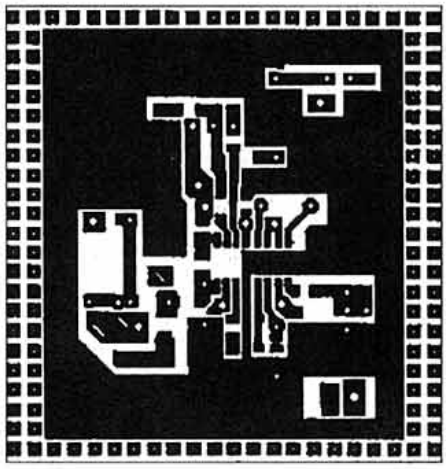

Fig 7: Circuit side view of MC13176 evaluation board. Actual size.

The amplitude of the carrier is switched between two or more values in reponse to the PCM code. For the binary case, the usual choice is On-Off Keying, often abbreviated OOK [this is also the amateur CW mode, of course]. The resultant amplitude modulated waveform consists of RF pulses called marks, representing binary 1 and spaces representing binary 0.

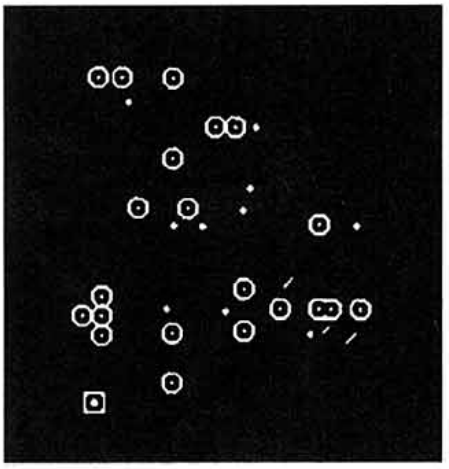

Fig 8: Ground plane view of MC13176 evaluation board. Actual size.

Finally, layout details for evaluation boards are shown in **Figs 5, 6, 7 and 8.**

Characteristic	Pin	Symbol	Min	Typ	Max	Unit
Supply Current (power down)	–	I_{EE1}	–0.5	–	–	µA
Supply Current (chip enabled)	–	I_{EE2}	–18	–14	–	mA
Total Supply Current (transmit mode) (I_{mod} = 2.0mA fo = 320MHz)	–	I_{EE3}	–39	–34	–	mA
Differential Output Power	13 & 14	P_{out}				dBm
Imod = 2.0mA			+2.0	+4.7	–	
Imod = 0 mA			–	–45	–	
Spurious outputs (I_{mod} = 2.0mA)	13 & 14	P_{son}	–	–50	–	dBc
Maximum output frequency	13 & 14	f_o	–	950	–	MHz

* Note that for the above measurements V_{CC} is ground

Table 1: Electrical Charactistics (V_{EE} = –3.0VDC, T_A = 25°C unless otherwise noted)*

AVAILABILITY

THE MOTOROLA MC13176D is available from Mainline Electronics, PO Box 235, Leicester LE2 9SH Tel: 0533 777648. Price is £5.95 + £1.50 p&p + VAT, total £8.75.

NOTE: Device characteristics and application notes in *Simply Silicon* are compiled from manufacturers' published data. Circuit diagrams are included for experimental purposes only, and have not been proven by *Radio Communication.* Transmitting equipment must be operated in accordance with national regulations. All data is copyright of the device manufacturer.

RADCOM TECHNICAL FEATURE

Filters and Ferrites in EMC

Concluding a feature by David Lauder, BSc (Hons), CEng MIEE, G0SNO, RSGB EMC Committee

THE CHARACTERISTICS given in **Fig 5** and **Table 1** were obtained from measurements made by the author except for the TNF2 range where the manufacturer's figures are quoted. In many cases, the measured performance of a typical filter is significantly better than the manufacturer's figures. Full details of test methods and response curves are given in [8].

For each filter, the performance on various amateur bands is shown by bar graphs to the nearest 5dB. One square represents 10dB and a half square represents 5dB. 'Differential mode loss' shows how good each filter is at rejecting amateur signals 'on the inner' while 'common mode loss' shows how good the 'braid breaking' is (if any). A loss of 10dB may cure minor breakthrough but in most cases 20dB, 30dB or more may be required. Six squares with a '+' represents more than 60dB.

All the filters described have a pass band which includes the UHF TV band (Bands 4 and 5: 470-860MHz) but the only filters which also pass the FM broadcast band (Band 2: 87.5-108MHz) are the AKD HPF2 and the BB1 braid breaker. The ferrite-cored common mode chokes pass differential mode signals at all frequencies.

Ideally, a filter would have no loss in the pass band but all practical filters do have a measurable pass band loss which may vary in different parts of the pass band. Where the UHF TV signal strength is high, a loss of 3-5dB may not be noticeable but if the signal is weak then even a 2dB loss could give a slight but noticeable increase in noise on the picture. Some types of filter can affect Teletext reception even although there may be no visible effect on the picture. With a Teletext TV, it is wise to check that Teletext reception is unaffected after fitting a filter.

Listed in Table 1 are a number of filters which can prove most effective for a variety of EMC problems. Where an RSGB description is given, the filter is available from RSGB Sales - see *Book Case* pages (94 and 95) for ordering details.

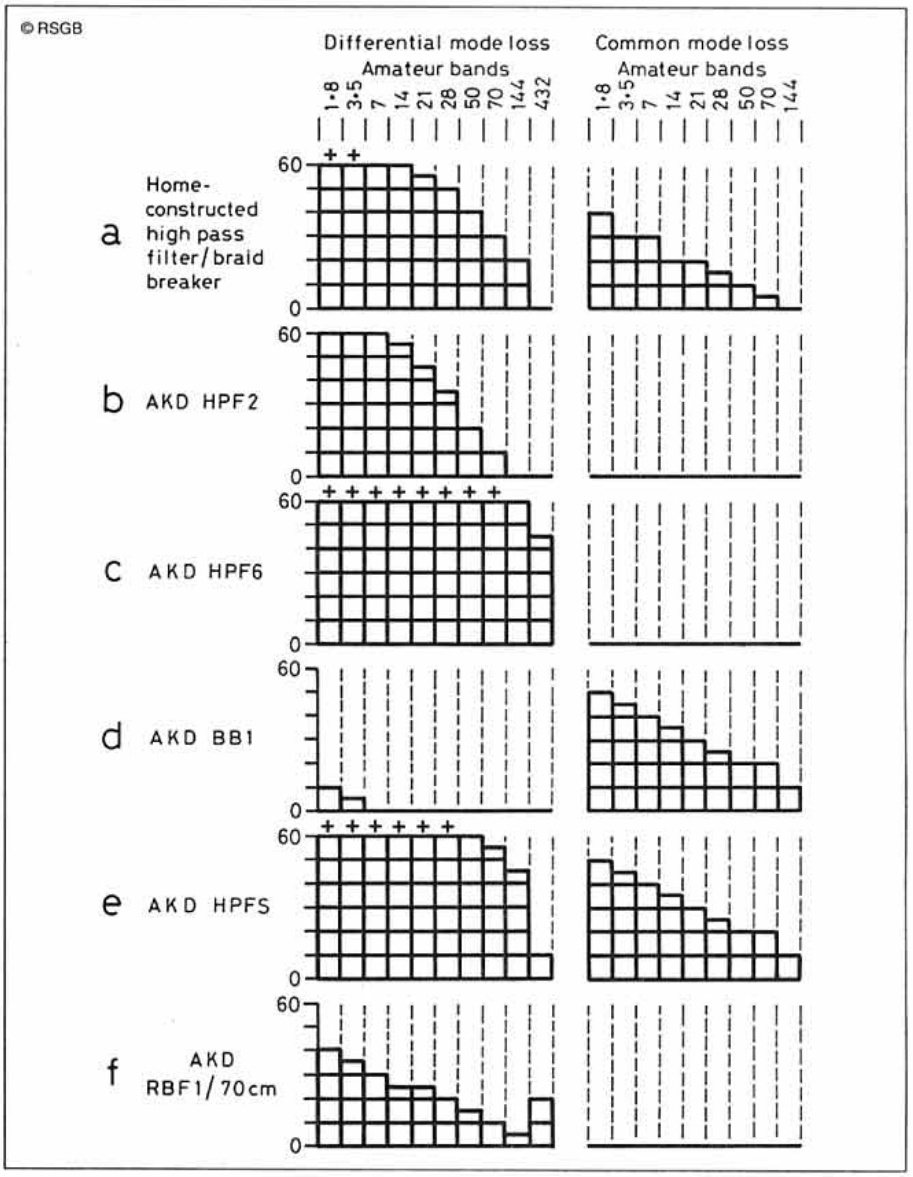

Fig 5: Filter losses on various bands.

FERRITE-CORED COMMON MODE CHOKES

VARIOUS TYPES OF ferrite ring cores (toroids), split cores or rods can be used to make common mode chokes on coaxial cables, mains cables, audio cables etc. These chokes reduce unwanted common mode signals picked up from a transmitter but any differential mode signals in the cable, whether wanted or unwanted, pass through with negligible loss. Common mode chokes can also be used to reduce interference from computer cables, etc.

To be effective, a common mode choke needs to present a high enough impedance at the frequency of operation and should preferably be lossy. This requires a suitable grade of ferrite; surplus cores of unknown type may not be suitable. At HF, 10 or more turns may be required while above 10MHz and particularly at VHF, it is important to minimise coupling between the two ends of the winding. It is recommended that ring cores should always be wound with a split winding as shown in **Fig 6**. When using this winding method, it is vital that the cable always goes through the

Home constructed high pass filter and braid breaker.

Type: Balanced L-C high pass filter (UHF TV) with capacitive braid breaking.
Pass band: Bands 4 and 5 (UHF TV).
Loss in pass band: Typically 0.5 to 2dB.
Stop band performance: See **Fig 6a**
Remarks: This filter has good rejection of HF differential mode signals although rejection of common mode signals is not as good as a transformer type braid breaker. It is only moderately effective at 144MHz. The construction details are given in **Fig 4** and are based on ref [7] (see part one).

AKD HPF 1 High pass filter and braid breaker.

Type: L-C High pass filter (UHF TV) with capacitive braid breaker.
Pass band: Bands 4 and 5 (UHF TV)
Loss in pass band: Typically 0.5 to 2dB.
Remarks: The HPF1 has similar performance to the home constructed filter above but has slightly better stopband performance. It is not available from RSGB except as part of the RFK1 filter kit.

AKD HPF 2 High pass filter.

RSGB description: Filter 2 - High pass for FM Broadcast Band 2.
Type: L-C High pass filter (FM Broadcast) without braid breaking.
Pass band: Bands 2 (FM radio broadcast), up to 4 and 5 (UHF TV)
Loss in pass band: Typically less than 1dB in most of Band 2 (2.5dB at 87.5MHz), 1 to 3dB in Bands 4 and 5.
Stop band performance: See **Fig 6b**.
Remarks: The HPF2 is intended for reducing breakthrough on FM broadcast receivers (87.5 - 108MHz), particularly from HF signals but it is also useful for rejecting 50MHz signals. It is only effective against differential mode signals as it has no braid breaking action.

AKD HPF 6 High pass filter

RSGB description: Filter 8, six section for UHF TV.
Type: Equivalent to 6 section L-C High pass filter (UHF TV), sharp cut-off, without braid breaking.
Pass band: Bands 4, 5 (UHF TV).
Loss in pass band: Typically 1-3dB (Channels 21-40), 1-2dB (Channels 41-68).
Stop band performance: See **Fig 6c**.
Remarks: The HPF6 is a high performance high pass filter with a very sharp cut off below 470MHz. This is by far the most effective filter for reducing breakthrough from the 430-440MHz amateur band and is also very effective on all bands below 430MHz. If a UHF TV mast head pre-amp is in use, the HPF6 should be fitted on the input side of the pre-amp, either by mounting it in a weatherproof box at the mast head or by putting the filter and pre-amp in a loft close to the TV antenna.

AKD BB1 Braid breaker

RSGB description: Filter 1, Braid breaker.
Type: 1:1 transformer type braid breaker only.
Pass band: Below 10MHz to over 1 GHz
Loss in pass band: Typically 2dB over most of its range but, 3 to 4dB at UHF channels 50 - 68.
Stop band performance: See **Fig 6d**.
Remarks: The BB1 is more effective against common mode signals picked up 'on the braid' than a capacitive braid breaker such as HPF1. The BB1 is particularly effective at HF although the braid breaking action diminishes at VHF due to interwinding capacitance of the transformer. A BB1 can be cascaded with other filters such as HPF2 or HPF6 which do not have any braid breaking action, although this increases the total passband loss.

AKD HPFS High pass filter (special)

RSGB description: Filter 3, High pass for UHF TV.
Type: L-C high pass filter with transformer type braid breaker.
Pass band: Bands 4, 5 (UHF TV).
Loss in pass band: Typically 3-4dB (Channels 21-40), 4-5dB (Channels 41-68).
Stop band performance: See **Fig 6e**.
Remarks: The HPFS is a BB1 and high pass filter combined. It has very effective rejection of differential mode signals on the 144MHz band and below. Due to the relatively high pass-band loss, it is not suitable for areas where the TV signal strength is low.

AKD RBF1/70 cm notch filter.

RSGB description: Filter 5, notch tuned to 435MHz
Type: Series resonant trap between inner conductor and braid. No braid breaking.
Pass band: Bands 4, 5 (UHF TV).
Loss in pass band: Typically 2-5dB (Channels 21-30), 1-2dB (Channels 31-68).
Stop band performance: See **Fig 6f**.

The RBF1/70cm is pretuned to 435MHz but is not as effective as an HPF6 on the 70cm band. The RBF1/70cm also has a high pass action with useful rejection of HF differential mode signals.

AKD TNF2 tuned notch filter range.

AKD type	RSGB Description
TNF2/145MHz	Filter 4, notch tuned to 145MHz
TNF2/70MHz	Filter 7, notch tuned to 70MHz
TNF2/50MHz	Filter 6, notch tuned to 50MHz
TNF2/28	Filter 10, notch tuned to 28MHz (10m)
TNF2/21	Filter 15, notch tuned to 21MHz (15m)
TNF2/14	Filter 20, notch tuned to 14MHz (20m)
Type:	L-C notch (band stop) filter in series with inner conductor and braid with resonant braid breaking action at tuned frequency only.
Pass band:	Bands 4, 5 (UHF TV).
Loss in pass band:	Typically 0.5-2dB (Channels 21-40), 2dB (Channels 41-68)
Stop band performance in the specified band (manufacturer's figures):	>35dB 'on the inner', >30dB 'on the braid'.
Remarks:	These filters provide rejection of differential mode and common mode signals in one particular amateur band only and have low pass-band loss in UHF TV bands 4 and 5. They are not suitable for passing FM broadcast Band 2 signals.

Where a UHF TV preamplifier or a distribution amplifier is used, a filter will generally be required on the input side of the amplifier. The TNF2 type of tuned notch filter is not recommended in such cases.

Table 1: Summary of filter characteristics.

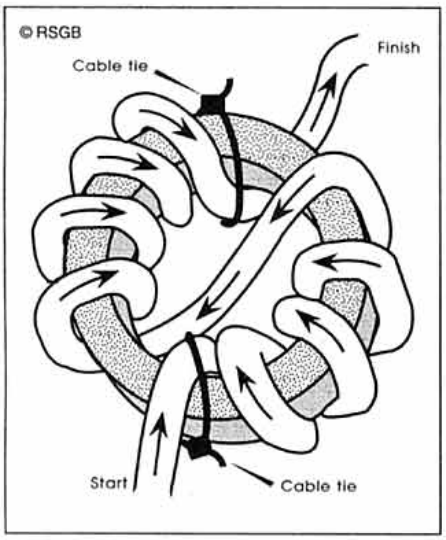

Fig 6: Recommended winding method for ferrite ring chokes.

hole in the core in the same direction as shown.

Semi-airspaced coaxial cable should not be wound onto any of the ferrite cores mentioned below as the tight bend radius may cause the cable to collapse internally and short circuit.

NEOSID FERRITE RING CORES

FOR THE 1.8 AND 3.5MHz bands, a pair of the Neosid 28-041-28 ferrite rings supplied by the RSGB (order code 'FERR') with a 14 turn winding give better performance than any of the other types of ferrite core mentioned below. The performance of such a winding is shown in **Fig 7a**. 14 turns on a pair of these rings still gives useful performance up to and including the 28MHz band. If the cable is too thick to allow 14 turns, then more rings are required to give the same effect. For maximum effectiveness with these Neosid rings on the HF bands, the number of turns squared multiplied by the number of rings should equal about 400 although 200 may be enough at 21MHz and above. This means that if the number of turns is halved, then four times as many rings are required to give the same effect.

At 50MHz, 7 or 14 turns give similar results while at 70MHz and above, a seven turn winding is recommended. At 144MHz, seven turns on one ring gives almost identical results to seven turns on two rings. For the performance of seven turns on a pair of rings, see **Fig 7b**. If wound with coaxial cable, the resulting common mode choke can be more effective than a BB1 braid breaker at 145MHz but with negligible insertion loss to all differential mode signals (such loss is only the loss in the length of coaxial cable wound through the ring and the loss in any additional coaxial connectors.) If more than about 10 turns of coax are required, a short length of miniature 75Ω coax cable will be required, such as miniature RG59 or RG179B/U. The loss in one metre of such miniature cable is less than 1dB even at the top of the UHF television band.

PHILIPS FERRITE RING CORES

A 12 TURN WINDING on a single Philips Components ring core type 4330-030-34450 gives good performance at 3.5 and 50MHz and very good performance from 7 - 28MHz, as shown in **Fig 7c**. In some cases, an 8 turn winding may be sufficient. One of these rings is wider than a pair of Neosid 28-041-28 rings but has a slightly smaller aperture (23mm instead of 25mm). It has a bright pink coating to indicate the grade of ferrite (4A11). Another useful type of Philips ring core is the 4332-020-97200 which has a violet coating and is made of 4C65 grade ferrite. The characteristics of a 12 turn winding on such a core are shown in **Fig 7d**. It has better performance than the 4A11 grade core at around 21MHz

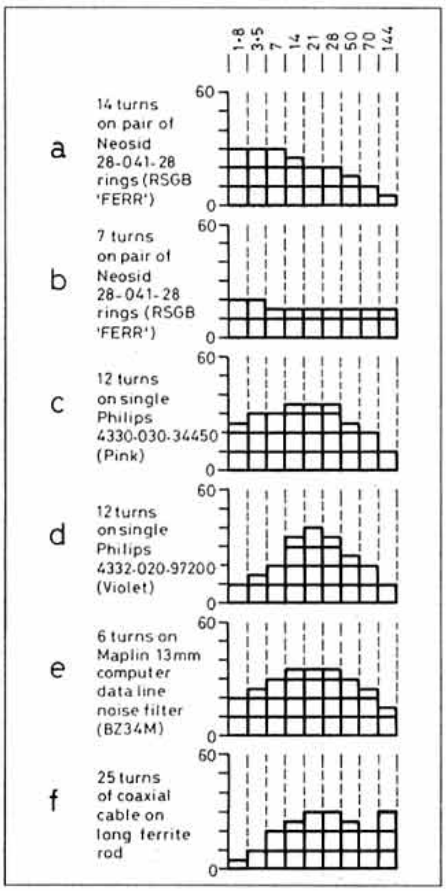

Fig 7: Ferrite-cored common mode choke losses .

but is significantly poorer at 7MHz and below due to its lower permeability.

The two Philips ring cores mentioned above are available through Philips Components trade distributors such as Hawnt Electronics Ltd. The 4C65 grade cores are more expensive than the 4A11 grade but may be more easily available.

CLIP-ON CHOKES.

A USEFUL TYPE OF clip-on choke can be found in the computers section of the Maplin Electronics catalogue and is called a computer data line noise filter (Stock No BZ34M). This is a split ferrite bead with a 13mm diameter hole which can be fitted on to a cable without the need to remove connectors. For amateur radio EMC purposes six turns are recommended and this will only be possible with fairly thin cables such as some loudspeaker, telephone or alarm cables. The characteristics of a six turn winding on a Maplin type BZ34M are shown in **Fig 7e**.

FERRITE RODS.

A MW/LW FERRITE AERIAL rod can be used to make an effective, if somewhat large, common mode choke for the higher HF bands and for VHF. A 200 x 9.5mm ferrite rod with 25 turns is fairly effective at frequencies of 14MHz and above. Ferrite rods also make effective common mode chokes at VHF because the ends of the winding can be well separated. At 145MHz, a 10 turn winding may be used on a rod 140mm long and gives better results than any of the ring cores or split cores mentioned above. A 25 turn winding on a 200mm long rod turns generally gives better results than 10 turns but requires about 1.2 metres of spare cable. **Fig 7f** shows the performance of 25 turns on a long ferrite rod.

REFERENCE

[8] *The Radio Amateur's Guide to EMC*, Appendix 3, Robin Page-Jones, G3JWI. Published by RSGB.

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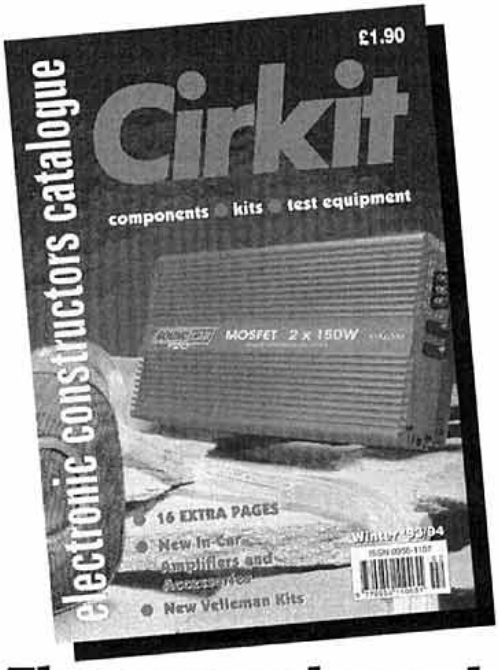

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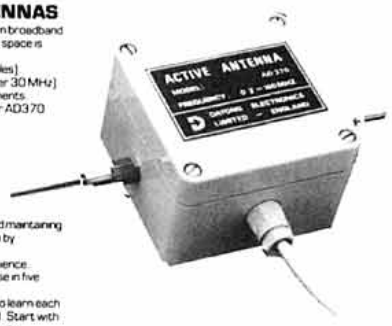

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PRODUCT NEWS

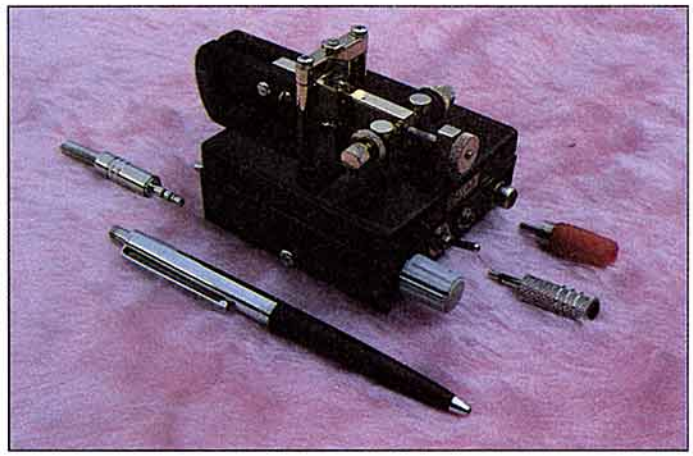
Note: Product news is compiled from press releases sent in by the manufacturers and distributors concerned. Details are published in good faith but *Radio Communication* cannot be held responsible for false or exaggerated claims made in the source material.

HE'S DONE IT again!, or so we think. **G4ZPY Paddle Keys International** have announced what they claim to be the first commercially made Single Lever Combo. Also, from February '94 another 17 keys will be added to their catalogue, making a grand total of 50.

Produced in response to popular demand, the new G4ZPY Single Lever Combo has one little extra. If you get tired of using the single lever, and would like to change over to a twin lever, there is a jack socket fitted to enable another key to use the same Iambic Electronic Keyer.

The new Combo may be purchased in four different finishes, and all have 'key-down' switches fitted.

Details from: G4ZPY Paddle Keys International, 41 Mill Dam Lane, Burscough, Ormskirk, Lancs L40 7TG Tel: 0704 894299.



LOOKING FOR something with a bit of power to cut through the QRM? Peter Rodmell Communications suggest the **HUNTER 600W linear amplifier**. It certainly sounds powerful, with a single EIMAC 3-500Z PA valve giving the full UK legal limit from 10 to 80 metres, including the WARC bands. The makers say it's very easy to tune with variable output power from the front panel.

Anti-surge circuits protect the PA on power-up and just 60-70 watts RF drive is needed for full output power. With a factory price of below £1000, the Hunter looks like becoming a very popular linear. The manufacturer points out that it is possible to pay much more for similar amplifiers from other sources.

Contact: Peter Rodmell Communications, Fieldhead, Leconfield Road, Leconfield, Beverley, North Humberside HU17 7LU Tel: 0964 550921.

HERE'S A WAY to give your local net a really informed weather forecast. The **ICS SYNOP III** gives a wealth of information in graphic form on the screen of any IBM-PC compatible computer. The unit simply connects to your HF receiver and provides information from shore establishments, oil rigs, and aircraft based observation stations.

All data is updated and broadcast every three hours by national meteorological agencies. It includes wind, barometric pressure, temperature, cloud cover etc, and the SYNOP III displays this on a fully zoomable map of Europe. The higher the zoom level, the greater the number of stations that are plotted. All plotting occurs fully automatically, and in real time. Now you can watch the weather unfold before your very eyes!

An interface from the computer to the radio is provided and there are special versions of the unit for existing users of the Kamtronics KAM and AEA PK-232 HF data decoders.

Full details from Alan Clemmetson at: ICS Electronics Ltd, Unit V, Rudford Industrial Estate, Arundel, West Sussex, BN18 0BD. Tel:0903 731101.

WHEN A RECEIVER is described as a "New Classic", it certainly has a lot to live up to. The new **AOR AR3030** is described in just such terms by its makers, and the list of high performance features certainly makes for interesting reading. Today's keen short wave listener is likely to demand very high standards, and AOR's design team have endeavoured to combine this with a high degree of user friendliness.

The AR3030 has a wide frequency coverage from 30kHz to 30MHz and receives all the following modes as standard: AM, synchronous AM, NBFM, USB, LSB, CW and FAX. It boasts two high-performance Collins filters (6kHz and 2.4kHz 8-resonator) for AM and SSB reception respectively. Bandwidth on FM is 15kHz and there is a 7-resonator 500Hz Collins mechanical filter for CW operation.

AOR believe that Direct Digital Synthesis (DDS) is the best method available for top class receive performance on today's crowded bands. In fact, the AR3030 has two DDS VFOs with minimum tuning steps of only 5Hz. The rotary tuning steps are selectable for faster/slower tuning depending on mode. 100 memory channels are provided for your favourite 'DX spots'!

Great emphasis has been put on audio quality and AOR have incorporated a 66mm 3-watt forward facing speaker in the set. Other nice touches include the ability to key in 'metres' instead of 'MHz' when selecting your waveband, and the ability to return to the last frequency tuned on a particular band. A large backlit S-meter complements the high-contrast LCD display. Power requirements are 13.8V at 0.8A. An optional internal VHF converter is planned.

As you would expect from a receiver of this calibre, computer control is possible - this is provided by a standard RS232 rear panel port. Other rear panel connections are included for high and low impedance antennas, IF output, AGC and external speaker. The headphone socket is at the front.

The price is £699 including VAT. A mains power supply is included in this price and carriage is free from AOR (UK).

Further details from: AOR (UK) Ltd, Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbyshire DE4 4BG Tel: 0629 825926.

RADCOM TECHNICAL FEATURE

The New HF Data Mode: Clover

The concluding part of a feature by Jack Hollingworth, ZF1HJ

THE HARDWARE currently available is manufactured by HAL Communications Corp., Urbana, Illinois and consists of a full size IBM PC card, designated PCI-4000. (See **Fig 7**). The host computer must be a fully IBM compatible AT 286 or higher, with a minimum of 640k RAM, a floppy and a hard drive and an MDA monochrome or CGA colour (or better) monitor. Compatibility problems have been experienced with some early, non-IBM 286 mother-boards. The Clover board requires 200mA at 5V and 20mA at +12 and –12V, well within the capability of most PC PSUs.

The external connector is a DE-9S and a 6ft cable with a mating plug and terminated in four 'RCA' plugs is provided. The connections are audio in, audio out, PTT and Selcal. The audio levels are not critical, particularly for the audio input, but a high (around 0dBm or 0.7V RMS) level audio output from the receiver, independent of the volume control, is ideal. No audio input pre-set is required or provided on the board. It is recommended that a transmitter input which can be controlled from the front panel be utilised, although the output level from the PCI-4000 is adjustable both by a pre-set control near to the DB9 connector and by an internal jumper that effectively selects 'mic' or 'high' level output ranges.

The audio input and output are both transformer isolated and may therefore be balanced if required, however the cable supplied is wired for unbalanced lines. The Selcal output is a switched transistor collector, diode protected and rated at +50V at 100mA. The PTT output is a reed relay contact with a 680Ω pull-up resistor to +12V and a series 100Ω resistor and is rated at ±50V at 100mA. If not required, the +12V pull-up may be disabled by lifting one end of a diode on the board.

A miniature jack connector is provided to supply +12V power to an external tuning indicator, such as HAL's SPT-1. This is not required if HAL's supplied software is used, as on-screen tuning aids are included.

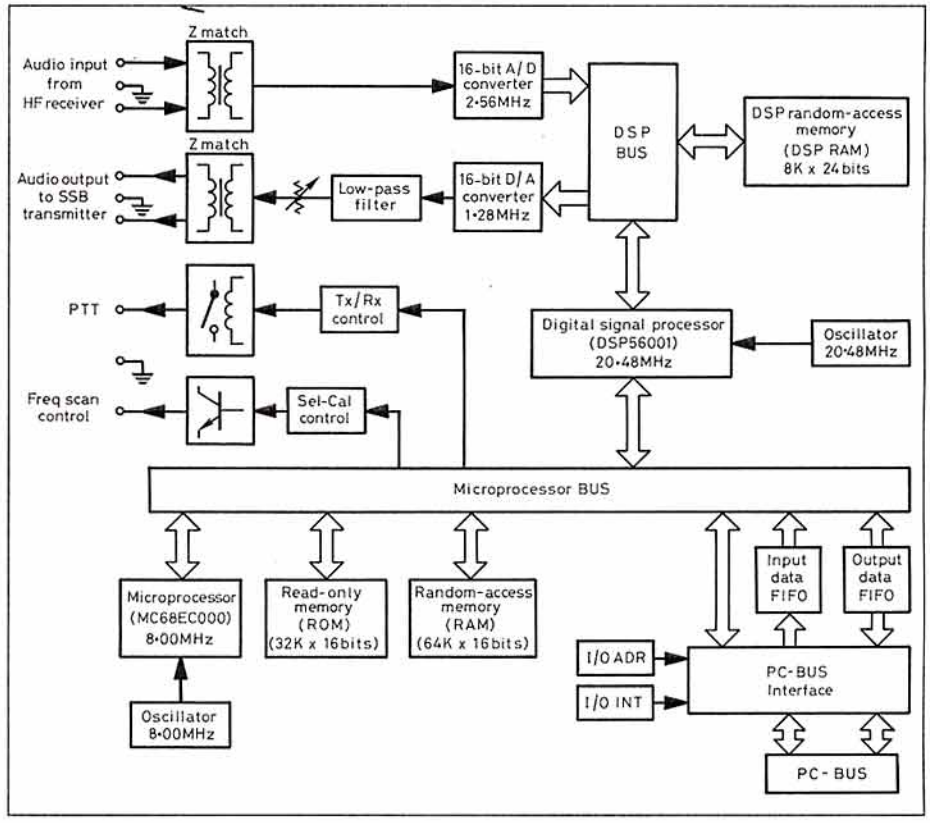
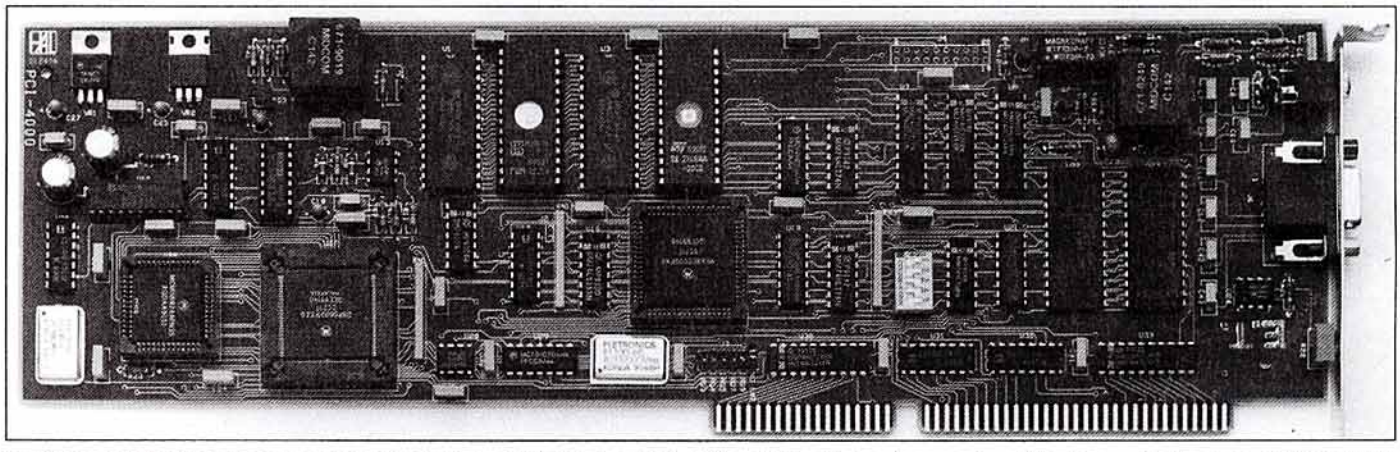


Fig 8: Block diagram of the PCI-4000 PC card which implements Clover.

The block diagram of the PCI-4000 is shown in **Fig 8**. The audio input is routed to a 16-bit A/D converter and thence to a DSP56001 digital signal processor. The DSP also generates the Clover output waveform, which is then passed through an active low pass filter. The on-board processor is a 68000 and 8k of



Currently available Clover hardware comes in the form of this full-sized PC card for a 286 or higher. It comes from HAL Communication Corp of Illinois, USA.

24 bit RAM is available for the DSP as well as 64k of 16 bit RAM for the 68000 processor. All operating software is loaded into RAM from disk rather than being in ROM, making it extremely easy to implement updates. There is 32k of 16 bit ROM used as a bootstrap loader and to hold data tables for the DSP chip. The board is mapped in PC I/O space starting at a default address of 0360h. It does not, therefore, tie up a serial port and there are unlikely to be conflicts with other hardware or software installed. Other than a DIP switch to select an alternative base address and the output level jumper and pre-set already described, there are no other on-board adjustments.

CLOVER SOFTWARE

FOUR FUNCTIONAL FILES are provided, plus a text file detailing any recent system changes. One file contains the down-load software for the on-board 68000 processor and a second file contains the down-load software for the DSP56001. The third is an *.EXE file for the operating software and the fourth a configuration file holding the current system set-up parameters and options selected. When loading, the software tests for each possible base address, starting with the default, so if an address conflict occurs with other installed hardware the only action necessary is to re-set the base address DIP switch – software configuration is automatic.

The operating software is extremely comprehensive, with both menu/help guided selections and 'hot-keys' for the expert user. A split-screen display with transmit and receive buffer displays is implemented (**Fig. 9**), together with comprehensive editing and file read/write facilities. A bar with pull-down menus provides for selection of all functions and options.

At the top left of the screen a tuning aid may be displayed. This shows the signal levels in the four received Clover tone channels as horizontal bars, the objective being to tune for equal length bars. Once the incoming signal has been decoded a message indicating the nature and origin of the signal is displayed – eg 'ARQ CQ from G4xxx'. The tuning display may be changed to a tuning error mode; this displays a scale showing the frequency offset of the received station, from –30 to +30Hz.

Tuning at this stage becomes a little critical; it is necessary (if you are the *responding* station) to net as closely as possible to the frequency of the incoming signal. As the display only updates when a CCB has been received, it is necessary to tune in small increments, say a 10Hz step at a time, until the display is as near zero as possible. If the transceiver frequency is displayed only to the nearest 100Hz this requires some care but is quite easy if the display shows 10Hz increments.

At the top right of the screen is a display showing the measured performance of the link for both stations. This data is obtained for the distant station, as has been described, from the incoming CCBs. Four lines are displayed, two for each station, showing respectively the conditions for the current and previous blocks. The data displayed is the code for the modulation mode used, the signal-to-noise ratio in dB, the frequency offset in Hz, a number representing the phase dispersion measured (low numbers being 'good'), the percentage of error-correcting capacity utilised in decoding the block and the percentage of transmitter power set by the other station. The data from this display can be automatically read to a disk file and is in a form readily transportable to proprietary spread-sheet programs for analysis and display.

As the Clover software is down-loaded from disk rather than being programmed into read-only memory, it is extremely easy to install updates – there are no ROMs to change. As experience is gained in the field and comments are received from early users, software changes are being implemented very frequently. The system is quite complex; there are many options available and as has been indicated, some of the slower but more robust modulation modes have not yet been utilised. Continuing development and constant detail improvement can therefore be expected for some time. In time, alternative software and drivers for BBSs will become available from third party suppliers – an APLink driver for Clover is already in use. Meanwhile the software supplied is comprehensive and quite adequate to get a new user on the air.

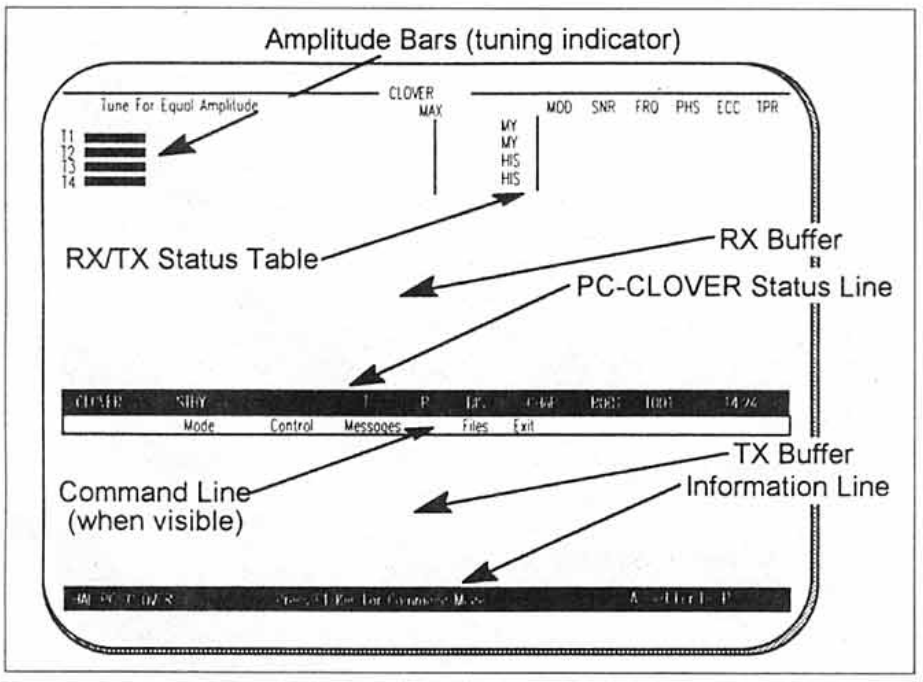


Fig 9: The split-screen display gives comprehensive facilities.

TRANSCEIVER REQUIREMENTS

CLOVER II IS NOT NEARLY as demanding on transceiver performance as the earlier Clover I development, but it is desirable to be able to tune in not more than 10Hz increments (most modern synthesised transceivers are capable of this, even if the frequency is displayed only to the nearest 100Hz) and the short and long term stability must be adequate to stay within, at the very most, 30Hz without frequent re-tuning. Most modern synthesised transceivers meet this requirement easily, even without an optional high-stability oscillator.

For most transceivers reception with a slow AGC action should prove satisfactory; fast action can cause errors in pulse amplitude assessment when the faster but less robust modes using amplitude as well as phase modulation are in use. Noise blankers should be used with circumspection; all are amplitude limiting devices in one form or another and some designs may cause severe distortion.

The Clover waveform itself is totally different to that of an FSK signal and a different approach to transmitter set-up is required. It is extremely important to preserve the shape of the Clover pulses if the inherently narrow bandwidth is to be maintained – therefore no form of speech processing or compression should be used and the transmitter should not be driven to the point where any ALC takes effect.

Clover places much less stringent requirements on the transmitter than does RTTY. The waveform is more like a speech processed SSB signal than a continuous carrier. That is, the ratio of peak to RMS power is fairly large; any transmitter that can run heavily speech processed SSB should be able to handle Clover without difficulty.

In addition, some care must be taken in the selection of filters. Usually the standard SSB (LSB) filter is adequate, except when very strong signals, outside the Clover channel but within the wider pass-band of the filter, are present. The effect of such signals is to force the AGC down, which may reduce the level of the wanted signal excessively.

Most 'narrow' or 'RTTY' filters are specified to have a –3 or –6dB bandwidth of so many Hertz, but what is important for Clover is the –50dB bandwidth! Clover needs a reasonably flat pass-band over its 500Hz, with skirts as steeply cut off as possible beyond that point. In practice a 600 or 800Hz filter may be better than one that purports to be 500Hz wide.

It is also important that the filter be properly centred; that is, a tone at the receiver input of 2250Hz (the centre frequency of the Clover pulse ensemble generated) must be at or near the centre of the filter passband. Failing

this, one of the outer Clover tones will be outside the flat top and will be attenuated by the skirt of the filter. Again, most modern transceivers will meet this requirement.

The general rule is, until you are sure of the performance of your Narrow or AFSK filter, use the LSB filter. The dynamic range of the Clover A/D converter is around 60dB, so it can handle quite strong signals slightly off frequency.

High power is rarely required and the use of linear amplifiers is not recommended. The reason is that in normal operation the transmitter power may well be turned down by the distant station to a fraction of the maximum available. The noise generated by the linear amplifier will however remain constant, thus causing a deterioration of the signal to noise ratio of the *transmitted* signal.

EARLY EXPERIENCE

TWO CLOVER BOARDS were received by the author in early December of 1992 and one was installed in an AT 486 clone computer and tested with a transceiver on dummy load. The time taken to install and test was under an hour and the first contact in ARQ mode was made the following day. Several more contacts were made during the next few days. The level of Clover activity was surprisingly high, considering that shipments did not commence until the end of November. Tests were carried out with the second board installed at ZF1GC; subsequently further controlled tests were made with two computers and transceivers connected to dummy loads.

The first impressions were that the mode did everything promised but that the early implementation of 'chat' mode in ARQ was, functionally, far too slow. In contrast, particularly under good propagation conditions, large files could be sent very quickly indeed. There were also a small number of minor 'bugs', most of which have been corrected at the time of writing. Later versions of the software have improved the ARQ mode speed substantially. The software is, as has been indicated, under continuous development, based largely on feedback from early users. The manual supplied is extremely clearly written and comprehensive and contains a wealth of information.

At the time of writing operation is mainly on frequencies of 7083, 10136, 14083, 18111, 21083, 24931 and 28183kHz – these are dial readings and assume LSB operation with standard tones centred on 2250Hz. As activity increases stations may be found 500Hz above and below these frequencies. The distinctive 'twittering' of the Clover tones and the rather 'warbly' CW ID's are quite distinctive, as also are the short bursts of data at approximately 1.3 second intervals in ARQ 'chat' mode and the longer approximately 20 second bursts in block mode. The author has on occasion copied FEC transmissions in 2DPSM mode (the most robust currently in use) when nothing could be heard on the channel even with a 500Hz filter in use. In ARQ mode adaptive power control will often reduce transmitter power to a few watts, so do not expect to hear strong signals!

TO THE FUTURE

CLOVER-II IS a complex but flexible mode, particularly so as up-dates of the operating software are so easily installed from disk. Whilst the current mode parameters have been described in some detail, these are not inflexible and considerable changes could be made if practical experience indicated that this was desirable. Continuous development of the internal workings of the Clover software can therefore be expected and possibly of the underlying modes and protocols. Full information has been made readily available to third-party programmers, so alternative software and new applications, particularly for bulletin board use, can also be expected. The ability of the mode to move large quantities of data at very high rates make it an obvious choice for BBS's and hopefully there will be a gradual transfer from Packet to Clover, reducing the demands made by BBS's on the limited HF spectrum available.

ACKNOWLEDGEMENT

THANKS ARE DUE to Bill Henry, K9GWT, of HAL Communications Corp. and Ray Petit, W7GHM, for permission to reproduce Fig. 1 from [9] and the remaining figures and tables from the PC-Clover Operator's Manual and PCI-4000 Reference Manual.

HAL Communications are at PO Box 365, Urbana, IL 61801 USA tel: 0101 217 367 7373.

FURTHER READING

[1] McLasky, 'The Coherent Ten-Tec: A Practical CCW Station Assembly.' *CCWN* 1975:12

[2] Woodson, 'Coherent CW ' Parts 1 and 2. *QST*, May and June 1981

[3] Ray Petit, 'The 'CLOVER-LEAF' Performance-Oriented HF Data Communications System.' *QEX*, July 1990

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[5] Ray Petit, 'CLOVER-II; A Technical Overview.' *ARRL Amateur Radio 10th Computer Networking Conference Proceedings*, 1991

[6] Helfert, Hans-Peter & Strate, Ulrich Translated by Don Moe. 'Pactor : Two Articles', *QEX*, Oct 1991 (from cq-DL, Nov 1990)

[7] D Bacon, 'FEC, CRCS and Error Correction', *Electronics & Wireless World*, May 1991

[8] Ray Petit and Bill Henry, 'CLOVER Up-Date', *RTTY Journal*, Jan 1992

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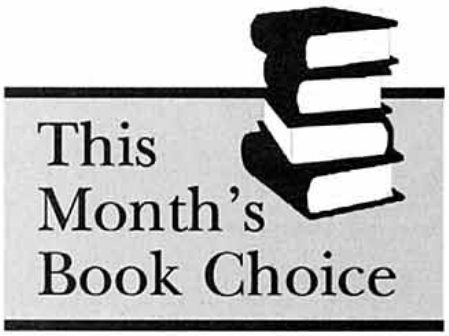

Reviewed by Rev G Dobbs, G3RJV

HOW TO GET STARTED IN QRP

by Dave Ingram, K4TWJ,

The Newcomers Guide to Low Power Communications, published by The National Amateur Radio Association, 1992 (144 pages). Available in the UK from Waters and Stanton Electronics at £9.95 plus £1 P&P.

DAVE INGRAM, K4TWJ, is well known to all readers of *CQ* magazine, his entertaining *World of Ideas* monthly column is full of enthusiasm and interesting ideas. He is a man who enjoys the hobby and his enjoyment is contagious. He is a member of the G QRP Club and I did know he was writing a 'getting started' book on QRP as we have exchanged some mail on the matter. *How to Get Started in QRP* is published by NARA (the National Amateur Radio Association) a non-profit making organisation in the USA devoted to representing Novice and Technician Class radio amateurs and encouraging young people and beginners in the hobby.

The book gets off to a good start by having a photograph of Rick Littlefield, K1BQT, on the front cover operating the MFJ-9020 QRP Transceiver which he designed (see review March 1993 *RadCom*). Many home constructors owe much to the range of NE602 generic circuit designs from K1BQT over the last several years. The range of the book is impressive, with a huge range of topics: a QRP 'Quick Start', a resume of QRP working, advice on QRP operating, commercial equipment for QRP, home built equipment, station accessories, suitable antennas, VHF and UHF QRP and battery and natural power sources for QRP operation.

The pace is breathtaking! I have never met Dave Ingram but his personal, informal, style is akin to meeting him in person. The sheer volume of information covered within the scope of a single book, aimed at the beginner market, does result in a few slips and mistakes from time to time but none of these is very serious.

The section on home-brew QRP emphasises the simpler end of home construction describing some of the well known 'fun rigs' popular in the UK and USA. I sometimes have my doubts about complete beginners using some of these simple crystal controlled transmitters. They are capable of surprisingly good results but do require a fair degree of operator skill to secure good results on the amateur bands. The book does contain good advice on running QRP with conventionally powered transceivers. The section on QRP operating, DXing and propagation effects is useful and very readable.

Perhaps the most difficult part of reviewing this book is for me to imagine how it would appeal to a beginner. I suspect that someone knowing nothing or little about QRP must surely be inspired to want to try low power operating. Well done, Dave, an enjoyable and exciting book. I hope it achieves the stated aim . . . . "Our efforts will be rewarded when you join in the QRP action and suddenly realise how very much of an exciting world of unlimited fun it really is!"

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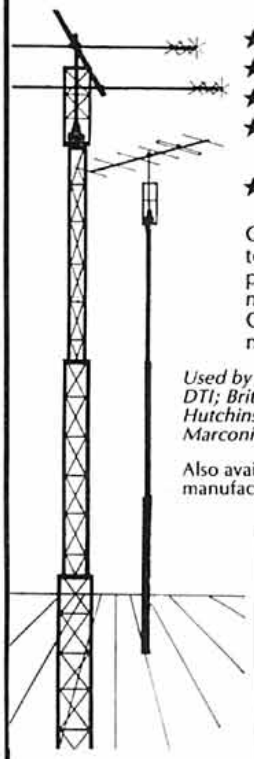

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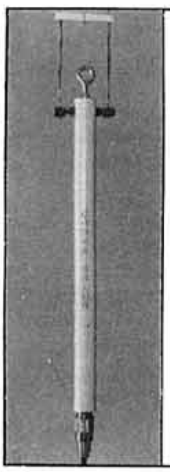

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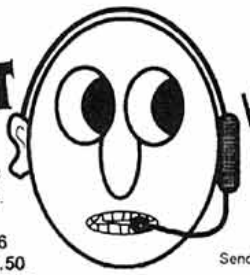

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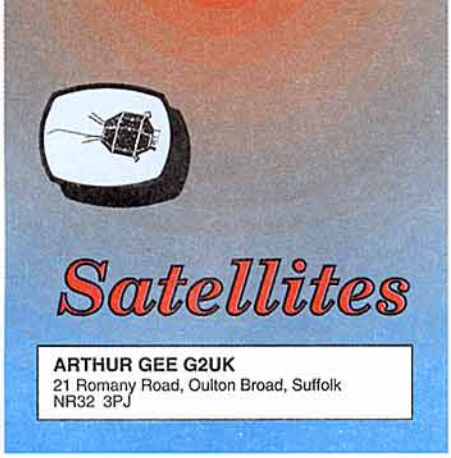

Satellites

ARTHUR GEE G2UK
21 Romany Road, Oulton Broad, Suffolk
NR32 3PJ

ONE CANNOT HELP but wonder what is the future of the 'RS' satellites, with all the upheaval going on in the former Soviet Union. Rumours abound; it seems the future looks bleak. In the past, government sources have covered much of the expenses of building and launching their amateur satellites and they have contributed to the control facilities as well. Now it seems those costs will have to come from other sources. It would indeed be a disaster if 'RS' 12 cannot be kept operational. Pat Gowen, G3IOR, kindly provided me with the latest information he has obtained.

He reports that Nico Janssen, PA0DLO, recently visited the Radio Sputnik command near Moscow, meeting Leonid Labutin, UA3CR, his son Evgeny, RA3APR; Sergei Samburov, RV3DR; and Andy Mirinov, RK3KPK. Collectively they passed on the following information on the Russian satellite programme.

For reasons of command problems, interference and the like, the radio amateur satellite systems RS-10/11 and RS-12/13 cannot presently be switched to modes other than those presently in use. Consequently for the immediate future RS-10 may be expected to continue to operate in mode A (2 metre uplink and 10 metre downlink) and RS-12 in mode K (15 metre uplink and 10m downlink). RS-11 and RS-13 will remain switched off and in 'standby' mode.

The new Russian 70kg amateur satellite system RS15 is now complete and ready for launch. It will be built into another COSMOS navigation satellite similar to the NAVSAT COSMOS-2123 that houses RS-12/13. It is not known exactly when the launch of this satellite will occur, but as soon as an older satellite in this series of navigational satellites reaches the end of its operational life the new satellite housing RS-15 will be launched into its 2,300km high 67 degree inclination orbit. This will thus give it excellent intercontinental QSO coverage, with all of North America, South Africa, Asia, the Caribbean, Central and South America being in mutual range of Europe.

RS-15's assembly consists of a mode 'A' two metre up and 10m down 5 watt linear transponder with 0.4/1.2 watt beacons at either end of the 40kHz linear non-inverting downlink passband. The antennas are quarter wave monopoles for both uplink and downlink. RS-15 has a bulletin board with 2Mb of memory, a command complex and a 64 channel metered parameter telemetry system. The frequencies to be used are: Uplink passband: 145.857MHz to 145.897MHz; Downlink passband: 29.357 to 29.3997MHz; Beacon 1: 29.398MHz; Beacon 2: 29.353MHz.

The RS-15 satellite has been built by a team under the auspices of Chief Constructor V N Arbuzov at the NPO of Applied Mechanics in Krasnoyarsk. RS-15 carries a further technical development of the now famous BRTK transponder complex series as flown in the earlier RS-10 to 13 satellites. The latest model has been designed by the Laboratory of Space Technology of the Tsiokovski Museum of Cosmonautics, club station RS3X, in Kaluga CIS by a group headed by Alexander Papkov and Victor Samkov. The Laboratory of Aero-Cosmic Technology belonging to the Russian Defence and the 'ROSTO' Technical Sports Organisation have both assisted in the coordination required for satellite launch and operation, as has the Space Laboratory headed by V S Yamnikov and the RS Control Station RS3A.

Those interested in experimental work with RS-15 are invited to contact V Yamnikov at the Laboratory of Aero-Cosmic Technology, ROSTO, ul Zemlyoi Wal 46/48, MOSCOW 103 064, Russia.

There are no plans for any further RS satellites after RS-15, and the only project that the RS team is involved in is the 'voice' experiment satellite VOXSAT. In this project, the Russian team will work together with AMSAT-LU to build this amateur system also to be built into a Russian satellite.

SCIENCE AS A TOP PRIORITY

SOME YEARS AGO I visited Moscow and Yalta with a group of doctors to see how the Soviet medical services were developing. To our eyes there was a strange mixture of old fashioned treatment at one end of the scale to the almost heroic surgical procedures at the other. I was fascinated to see the BBC's visit to Russia recently screened on the *Tomorrow's World* programme. There was good coverage of both medical and space activity in the programme and it would seem that the Russians are still giving top priority to science – particularly space science. From the Children's Computer Clubs to their latest space activities, it was obvious what their future intentions were. Science is to be a top priority in their future planning.

With this 'privatisation' policy, *cash* is now the determining factor. So no doubt this will influence their policy on amateur satellites. They will want to reimburse themselves for any further activities in the amateur satellite field. It would be wise for AMSAT Groups world-wide to consider this if they wish to see satellites such as the RS series continue. We cannot remind ourselves too often that it is the RS series of amateur radio satellites which have helped to get *newcomers* into this sphere of amateur radio activity.

● Manual/circuit diagrams for **Maxon SL70** UHF hand-portable transciever. Also a copy of programming software for IBM PCs and info/circuit of the tcvr to computer interface, cable/adaptor used to program the transceiver. All costs will be reimbursed. Any info etc to A Austin, G1JZK, 5 Stour Way, North Brickhill, Bedford MK41 7BD. or tel: 0234 360961.

● Robert Williams, EI7AF, wants a circuit diagram for the **Heathkit HW100** and the Heathkit 80 Metre Single Band Tx. Also he would like to contact David Jack, ex GW3OFV, ex Royal Signals. If you have information please write to Robert at Sanmartineus, Mountain Road, Clonwel, Co Tipperary, Ireland.

● Keith, G0OZK, wishes to thank all those who responded to his request in August *Helplines*, but still needs the manual and IC information, etc for the **Advance** TC12 and TC12A Freq Counter/Timer and the MMB-1 Mobile bracket for FT227R. Contact him QTHR or tel: 061 477 5303.

● Chas, GW3JPT, needs any advice/information for converting a Burndept BE385 Sn 287, PMR Tx/Rx for 2 metre Packet (from 170MHz). Contact him QTHR or tel: 0938 552059.

● Manual or operating instructions for the **AVO Mk 4 Valve Tester** wanted, to copy or purchase. All costs will be reimbursed. Any information to GW0BBO, tel: 0639 815467(daytime) or 0792 818100 evenings and weekends.

● An intermittent fault has developed on an **FT101B** owned by Sid, G3YQ. On CW and Tune positions of the Mode Switch, the rig goes deaf when PTT is activated, LSB, USB and AM is OK. Tx still tunes. Any information to G3YQ, QTHR or tel: 0469 576975.

● G0FTI wants a circuit diagram and/or service document/manual for a **Taylor** Model 94A TV Waveform and Alignment Generator. Any information to G0FTI, QTHR or tel: 0908 604822.

● Circuit diagram for a Redifon Receiver type **R551N** with Frequency Synthesizer **Type ARU11**. Any help would be much appreciated and all costs covered. Any information to G3XTZ, QTHR or tel: 0784 245117.

● Operating/instruction manual required for a **Sony ICL 6700L** receiver (1983 vintage) urgently required. All help appreciated and reasonable costs will be reimbursed. Please write QTHR or telephone Geoff G0HHH, on 0562-67026.

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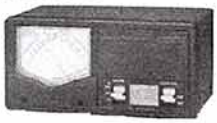

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RC5B-3, Create Bell type 360 deg, vari speed + preset	£939	C
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FIRST, I MUST apologise to Mike Scott, G3LYP, the coordinator of the southern group for having got the date of the last Southern Microwave Round Table wrong! The date, venue and arrangements could *just* have been included in the September column. Due to a misunderstanding, I read the date as being *after* the publication date of the October issue of *RadCom*.

Nevertheless the dates and venue were well published, both in the *Microwave Newsletter* and on the *GB2RS News Broadcast* in time for the event. Mike's immediate response was to send the *provisional* dates and venues of the next three southern group Round-Table events in 1994. These are as follows:

Sunday 13 March, at the Rutherford-Appleton Laboratories, Chilton, Oxon.

Sunday 19 June, at Crawley Amateur Radio Club, Crawley, West Sussex.

Sunday 23 October, at Flight Refuelling ARS, Merley, Wimborne, Dorset.

We now have no excuse that we don't know the dates of the next few southern group Round Table events! Further details can be obtained from Mike, either by post (QTHR), or telephone on 0494-881298 at any reasonable hour.

There are changes to the 'usual' VHF/UHF/Microwave calendar events at which the Microwave Committee provides a stand and problem answering service, amongst other things. For instance, the Sandown VHF Convention will be held earlier in the year than has been customary. This takes place on 20 February, 1994, at the usual venue at Sandown Park, Esher, Surrey [see page 24 – *Ed*]. Keep your eye on the Rallies and Events section of *RadCom* for more general details nearer the date.

DUBUS MAGAZINE

DUBUS MAGAZINE IS WELL known to many microwave operators, being a German publication (English text included) devoted entirely to VHF/UHF and microwave matters. The reason I mention it here is because many new microwave operators may not be aware of it and also there has recently been a change of UK agent who deals with the subscriptions.

The UK subscription for 1994 will remain at £12.50 for the four, approximately quarterly issues. Old subscribers should receive a reminder shortly whilst new subscribers should send their names, callsigns, addresses and subscriptions (cheques payable to DUBUS UK) to Dr Roger Blackwell, G4PMK, 57, Station Road, Scholes, Leeds LS15 4BY as soon as possible.

1993 ACTIVITY AND THE OPERATING LADDERS

THE CURRENT position, with about seven weeks to run in the 1993 Annual Operating Ladder (courtesy of the *Microwave Newsletter*) is as shown in **Table 1**. There have been some pretty dramatic changes since the last update in the November 1993 column. In particular, Richard, G4FCD, having undergone a change of QTH in 1993, makes a table-topping entry into the Annual Operating Ladder and two pretty good entries into **Table 2**, which is the All Time 10GHz Squares/DX Ladder. G3WDG's score, at the top of the All Time table, has now reached 10 countries included in the 30 Squares.

Again, where are the Annual Operating Ladder entries for the bands other than 10 and 24GHz? I know that there are people out there working on 1.3, 2.3, 3.4 and 5.6GHz although, by the number of reports received (zero), there aren't! In fact, the last time the Annual Operating Ladder contained entries for bands other than 10 and 24GHz was in the end-of-year table for 1992 published in the September 1993 column, so it isn't too late to make some entries!

THE 1993 TELFORD DARS EI DXPEDITION

MARTYN, G3UKV, SENT a brief report on the Telford and District ARS' microwave expedition to Eire, timed to coincide with the July 1993 Cumulative. Operation took place from the summit of Kippure (2475ft, 762m, IO63UE) for some five days, during which the weather was "wet, wet, wet, wet and windy", the only trips off the mountain (which is the site of the Dublin repeater and the RTE TV service transmitter, manned during the week) being "to do the tourist thing, taste the local beers and spirits and buy milk and bread".

The party consisted of Martyn, G3UKV; Martyn's daughter Ceri, 2E1AEC, and her cousin Anita; Tony, G8PAW; Dave, G8VZT; John, G4ZJY and Bob G7BWQ. The club callsign was, of course, EI/G3ZME/P and I was interested to note that Dave EI/G8VZT had a special permit issued to allow fast-scan ATV on both the 1.3 and 10GHz bands. He probably set a new record when, after working GW4CBW/P (near Holyhead) on 23 July at 105km, he worked GW3FYX/P at Prescelly Mountain on 24 July at 170km. This contact took over an hour as Roy, GW3FYX/P was having trouble with his camera! Dave's Tx runs about 1W output and his receiver is based on a modified TVRO LNB and 20" dish.

This 60cm satellite dish with an Amstrad horn feed was used by G3PHO/P during the 1993 10GHz Cumulatives. The SSB/CW rig is a modified 'white box' giving 250mW o/p.

On the narrowband front, the equipment consisted of either 1W solid-state or, when the PSU worked, 20W from a TWTA. The TWT PSU seemed a little temperamental and took a dislike to the extremely damp conditions and the (commercial) "other RF floating around on the site". Some eight stations were worked before the Cumulative Contest and 14 (plus one one-way) during the contest. These were as follows: pre-contest, G8SWZ/P, G8UYR/P, G3WDG, G3FYX, G3JVL (best DX at 454km), G4MAP, G3GNR and GW3PPF/P. During the contest: GW4BRK/P, G4MAP/P, G8RDX/P, G3GNR (one way), GW8UGL/P, GW4EAB/P, G8UYR/P, G8SWZ/P, GI8GJZ, G3VKV/P, G3KEU/P, G3FYX/P, G4RFR/P (Best DX at 377km), G0/WB6YLI/P and G3FNQ/P.

Martyn send his thanks to all those operators who made special efforts and travelled quite long distances especially to work the expedition on 10GHz TV and NB. He sends an assurance that all contacts will be QSL'd! Well done to all - let's hope the team and tents are repaired in time for another ambitious expedition next year!

CERTIFICATES '93

FIVE MOST UNUSUAL operating certificates were issued earlier this year by the VHF/UHF Awards Manager, Ian Cornes, G4OUT (QTHR). They are the first to be issued in two categories, the new 10GHz Intermediate Distance Award (over 300km) and the 10GHz Standard Transmitting Award (requirement 20 counties and three countries confirmed). They were also unusual in that they were awarded to the well known operating combination of Jack Brooker, G3JMB, and Allan Wyatt, G8LSD: what may be less well known is that they've "kept it in the family" (Jack, the father-in-law and Allan, the son-in-law). Anyway, in a spirit of friendly rivalry, Allan received No 1 certificates for the Intermediate Distance Award, 15 Squares Award and the 10GHz Standard Transmitting Award whilst Jack got No 2 certificates for the Intermediate Distance Award and the 10GHz Standard Transmitting Award, having previously 'pipped' Allan to No 1 in the 10 Squares Award! Jack's 10GHz Transmitting Award was a little unusual in that it was made up from a mixture of WBFM contacts (5mW, PW 'Exe', 18" dish and Penny Feed) and NB contacts (100mW, SSB Electronics transverter or 600mW, SSB Electronics Transverter plus prototype G3WDG PA).

1993 IN PERSPECTIVE

ABOUT A YEAR AGO I reviewed 1992 'in perspective' and this included WARC '92 and some of the pressures which were then believed to be imminent in the amateur bands. Looking back, the pressure was perceived to be in the 2.3 and 3.4GHz bands.

Since then, the CEPT DSI has confirmed that these pressures do still exist but in nearly all the amateur and amateur satellite alloca-

tions! However, there seems to be a little relief in the unremitting pressure, at least in the parts of IARU Region 1 covered by CEPT, by virtue of the 'set- aside' policy of recommending certain key sub-bands be kept clear, wherever possible, for amateur weak signal use. This gives us something to work at - the possibility of a few narrow, maybe Primary or exclusive, sub-bands to enable us to carry on with what, in amateur terms, has proved to be most productive: the exploitation of the weak signal narrowband modes over seemingly impossible paths, including EME contacts on the 10GHz band. What I and others have said time and time again is that only increased usage of these fascinating bands will show their true potential, and reveal possibly unsuspected new modes of propagation and also demonstrate, yet again, that the skilled amateur is capable of making positive contributions to the art and science of radio!

1993 has seen the extension of 10GHz fixed station working in particular, to exploit extended tropo openings, push up contest and Ladder scores and by the first UK EME contacts between G3WDG/G4KGC and the USA and Sweden. Although the UK 10GHz record of 1039km has not been broken in 1993, nevertheless there have been a number of DX contacts on the band and the first awards of the new RSGB distance certificates have been made. The All Time Squares Worked Ladder begins to look like an early 2m or 70cm table!

Many of these achievements would not have been possible, had it not been for the continued efforts of G3WDG, G4KGC, G4DDK and other members of the Microwave Committee who again, through their design and pioneering construction work have enabled many others to get going on the 10GHz band. I sincerely hope that this work will continue apace in 1994 and be extended to some of the other bands, as was hinted at in the November column.

1992 also saw the World Record on the 47GHz band come back to Europe: congratulations to HB9MIN and HB9MIO for extending the USA and World record of 105km to a new European and World record of 166km. Meanwhile, the Danish Activity Week, reported in the last column, produced some pretty remarkable results in the 76, 145 and 241GHz bands! The year also saw some growth in usage of the 24GHz band, with our own UK record being extended slightly from 150km to 156km by G4KNZ/P and GW3PPF/P, using WBFM. The next advance must come from the use of narrowband, and this is one of the objectives of the Microwave Committee designers this year!

Aside from this impressive narrowband work, I am well aware that there is also valuable and regular work going on, over less impressive distances, maybe, using both the 1.3 and 10GHz bands for ATV activities: I think it may have become apparent to some of the sceptics that the 10GHz band is a near-ideal band for such activities, as it would be for experiments in really high-speed data transfer - it's easier and less expensive than you might think and there are many good, simple ideas in the BATC journal *CQ-TV*!

ODDS AND ENDS

GB3MCB, THE CORNISH beacon on 1296.860MHz, has a new home and is back on air. I also confirm that the Clee Hill beacon on 1296.910MHz is still rattling away at good strength at this QTH, being 5/5 on a wideband, vertically polarised discone antenna!

A setback in beacon licensing in the 10GHz band has been occasioned by an RA decision not to licence any beacon applications in the 10300 - 10400MHz part of the band within a 100km radius of Charing Cross. The reason for this is not known at the moment and, as it clearly conflicts with the CEPT DSI recommendations, will be the subject of further discussion with the RA. It has, meanwhile, put two beacon applications (GB3NWK and GB3DUN) onto 'hold' pending further investigation with the RA.

That's about it for this month: please don't forget that for instant reporting, send your news to the *Newsletter* editors, G3PHO and G8AGN, both QTHR. My deadlines lead to slightly longer publication dates, also remembering that this column is bi-monthly.

A last reminder for the New Year: the Components Service is available from Mrs P Suckling, G4KGC, 314A, Newton Road, Rushden, Northants NN10 0SY, tel 0933 411446, at reasonable hours please!

1993 OPERATING LADDER

Band GHz	Posn	Callsign	Stns Wkd	Best DX, km	Multiplied Score
10	1	G4FCD	65	802	52130
	2	G4KGC	56	783	43848
	3	G3FYX/P	55	781	42955
	4	G3JVL	34	717	24738
	5	EI/G3ZME/P	41	454	18614
	6	G4RFR/P	42	413	17364
	7	G4LDR	20	775	15500
	8	G(W)4BRK/P	44	324	14256
	9	G0API	35	405	14175
	10	G3FYX	44	315	13860
	11	G4DDK	20	684	13680
	12	G3GNR	25	510	12750
	13	G3JMY	44	278	12231
	14	G3PHO/P	36	303	10908
	15	G8LSD/P	35	304	10640
	16	G3GRO	35	296	10360
	17	G3BNL	23	432	9936
	18	G4KNZ	37	247	9139
	19	G3ZTR/P	25	356	8900
	20	G3JMB/P	27	304	8208
	21	G3UYM/P	24	307	7368
	22	G8AGN/P	23	303	6969
	23	G3FNQ/P	21	313	6573
	24	G4JNT	18	337	6066
	25	G4BRK	23	234	5382
	26	G3UKV	18	242	4356
	27	G3NWU	10	433	4330
	28	G8KMH/P	21	197	4137
	29	G8DKK	17	234	3978
	30	G4BRK	16	221	3536
	31	G4KNZ/P	8	331	2648
	32	G4LDR/P	5	97	485
	33	G8AYY/P	2	86	172
24	1	G4KNZ/P	16	156	2496
	2	G3PHO/P	9	120	1080
	3	G3FYX/P	7	118	826
	4	G8AYY/P	9	86	774
	5	G3FNQ/P	5	120	600
	6	G3UYM/P	5	85	425
	7	G3ZTR/P	2	81	162

Table 1

10GHZ ALL TIME SQUARES/DX LADDER

Posn	Callsign	Locator	Squares Wkd	Best DX (km)
1	G3WDG	IO92RG	30	1008
2	G4KGC	IO92RG	21	792
3	G4DDK	JO02PA	18	684
4	G3BNL	IO92KA	17	1027
5	G4FCD *	IO91KX	17	802
6	G8KQW/P	IO91GA	15	390
7	G8LSD/P	IO90TV	15	304
8	G3JMB/P	IO90TV	14	304
9	G4RFR/P	IO80UU	12	414
10 =	G3PHO/P	IO93EH	12	330
10 =	G8AGN/P	IO93EH	12	330
12	G3JMY	IO81RM	12	278
13	G4FCD +	IO91JV	11	1039
14	G8APZ	JO01DO	11	1026
15	GW4MAP/P	IO82JG	11	311
16	G4PMK	IO93GT	10	739
17	G3NWU	IO94JQ	10	433
18	G3ZME/P	IO82QL	10	270
19	G4BRK/P	IO91FN	10	234
20	G0API	IO80XS	9	405
21	G4JNT	IO90IV	9	337
22	G4KNZ	IO91PJ	9	247
23	G4LDR	IO91EC	8	775
24	G0API/P	IO80UU	8	277
25	G3UKV	IO82RR	8	242
26	G3JMB	IO91WA	4	48
27	G3NWU/P	IO94MJ	3	290

* Old QTH
+ New QTH

Table 2

Data Stream

RICHARD STERRY G4BLT
1 Wavell Garth, Sandal Magna, Wakefield,
West Yorkshire WF2 6JP

I WISH TO FEATURE interesting photographs, diagrams etc, relating to datacomms and computing. If you think you have something suitable, then please do send it to me, with an SASE for return or acknowledgement.

THE 'RIGHT' HF DATA TONES

I OFTEN COME ACROSS the question, "which are the correct tones for use with HF data modes; my controller has so many?". For example, I am using a KAM-Plus multimode controller, and I can set the MARK and SPACE tones to, more or less, any frequency I like. Alternatively, I can set the MARK tone frequency, and specify the shift; eg 170Hz. So, which are the 'right' tones?

AFSK KEYING

If you are using 1200 baud packet, eg on VHF/UHF or perhaps on 10m FM, this is AFSK, (frequency shift keying of an audio tone), into an FM transmitter. The tones are standardised and in fact are 1200/2200Hz, ie a 'shift', (the difference between the two tones), of 1000Hz.

FSK (FREQUENCY SHIFT KEYING)

If you are using FSK, then the answer is that it's only the shift that matters, not the tone frequencies themselves. By 'FSK' I mean keying that is produced by direct frequency shifting of the transmitter, or by keying produced by feeding audio tones (AFSK) into an SSB transmitter, which is the most common method of achieving FSK. Confusingly, the direct FSK mode selector button on my own HF rig, a Yaesu FT990, is marked 'RTTY' and the AFSK button is marked 'PKT'. In fact, I use 'PKT' for all data modes, and in any case the direct FSK is only produced by an internal AFSK generator.

For example, if you are using 200Hz shift, which is the standard for HF 300 baud packet and also for PACTOR, it really doesn't matter which of the 'standard' 1070/1270, 1600/1800, 2025/2225 or 2110/2310Hz tone pairs you use. Indeed, you could use some non-standard pair like 1550/1750Hz if you wished. The receiving station 'sees' a signal which appears to be a carrier jumping between two radio frequencies 200Hz apart; how it was generated or transmitted is not important.

MATCHING THE TONES TO THE RIG

However, there may be good reasons for selecting a tone pair. For example, on my HF rig, I can specify the pair I am using, from the four standard pairs mentioned above. The default tones on my controller are 1600/1800Hz, so for convenience I use them. Because the transceiver has a special data mode setting, as well as standard SSB, CW etc, it can arrange that the narrow IF filters and main frequency display nicely match the tones in use. So, if I select the 250 or 500Hz IF filters, I know that the FSK tones are centred within the passband, and that the display is reading the frequency of, say, the transmitted Mark. The latter is very useful, because the frequencies of AMTOR, PACTOR and RTTY stations, (eg mailboxes), are listed by the Mark frequency, so it helps that my display reads the same. It means that I can tune to the right frequency straight away, without doing any mental calculations. I could equally well set this offset to show the Space frequency or the carrier.

I am told that, perversely, HF packet stations are usually listed by the centre frequency, ie midway between the Mark and Space frequencies! Still, it isn't too hard to add or subtract 100Hz if swapping between modes. I will elaborate further on the question of displaying data transmission frequencies, at some later date.

FT990 MANUAL

One point to note if you too have an FT990; I think there are some mistakes in my copy of the manual. The table showing the DIPswitch settings for the FSK tone pairs seems to have the settings for 1070/1270 and 2110/2310 interchanged. The same seems to be true of the 600Hz and 500Hz CW tones. Do please let me know if you agree.

SHIFT COMPATIBILITY

The shift for amateur RTTY and AMTOR is 170Hz by tradition, whereas the newer modes are 200Hz. However, these are very close, and with a transmission tuned optimally, the error is only 15Hz on each of the Mark and Space frequencies, so the two are reasonably compatible. You will find many an RTTY and AMTOR station transmitting at 200Hz shift, and also PacTOR stations transmitting at 170Hz shift. I must confess to using 200Hz shift for everything, though if you wanted to hedge your bets you could try 185Hz!

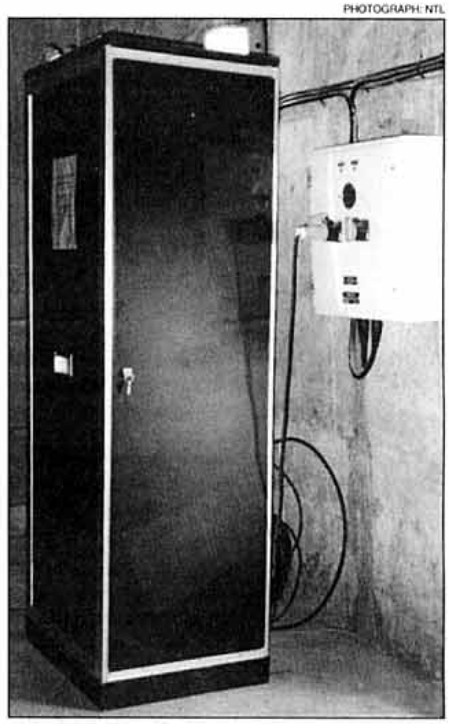
SIGNAL POLARITY

By convention, the Mark is the higher of the two radio frequencies transmitted. Originally, we in the UK used the USB mode on the transmitter, and thus the audio Mark tone generated in the terminal unit had to be the higher of the two. Nowadays, it is more conventional to transmit on LSB, (my rig does this automatically when I select a data mode, and I don't have any choice in the matter), so the audio Mark tone has to be the lower of the two. The end result is the same, as the 'polarity' of the signal has in effect been inverted (reversed) twice. In fact, unlike RTTY and AMTOR, Packet and PACTOR do not rely on any particular signal polarity, so it doesn't matter if the signal is inverted on those modes. Of course, this affects the displayed frequency on the rig, and as I mentioned above, I will return to the subject at a later date.

You can hit a snag if you wish to decode an RTTY or AMTOR signal which is being transmitted 'upside down', which usually occurs by mistake on the amateur bands. If the terminal unit or controller has some means of switching to the opposite polarity, either by means of a physical switch, or by a software command, all well and good. However, you may find that in the case of some controllers, you can only invert the tones on receive, not on transmit. This appears to be the case with the KAM-Plus, for example.

If the rig will not 'allow' you to use USB instead of LSB, for example, then you cannot call the other station, but only listen to it. This is where technology can work against you to some extent!

PHOTOGRAPH: NTL



The loneliness of the long-distance node. This shows part of the extensive packet node installation in the Emley Moor TV tower in West Yorkshire. With wide variations in temperature and humidity, it is not a friendly environment for equipment!

COMPUTER CONNECTIONS

YOU DO NOT HAVE to own a home computer for very long, before you forget just how baffling and off-putting the jargon can be. In no time at all, you are attempting to explain something to a layman friend, using all those phrases and abbreviations that you so despised a few months before! I shall not attempt to provide a glossary of all those terms, but it's worth explaining a little about some of the sockets that connect to the outside world. These are more properly referred to as 'ports', since their function is more significant than their physical appearance.

SERIAL PORT

I dealt with serial interfacing in some depth in the September column. The serial port may be referred to as V24, RS232, RS232C or even RS423. This can be used for driving packet radio TNCs or other types of data controller and modem, and many other external accessories. The connectors most commonly used are 25-way or 9-way 'male' D-connectors. These are so-called because the shape of the connector shell round the pins resembles a greatly elongated capital letter 'D'. The 9-way is much more common on

newer computers, as one rarely if ever needs the extra signals provided on the more bulky 25-way connectors. It is quite common to find IBM-compatibles fitted with more than one serial port, which can be an advantage. Some are used for connecting a mouse, (known as a serial mouse), in which case the second port is essential.

Many earlier non IBM-compatible machines had various non-standard connectors, but as long as they are referred to as RS232, RS232C or RS423, then they should be fully compatible. However, beware of ones using TTL-compatible levels, such as the Commodore C64 (see the September column for more details.) You may find the odd IBM-compatible PC with some sort of 'networking' card (optional plug-in module), and you should not confuse this with serial ports. Also, you may find an RS422 port, and this is not directly compatible with RS232/RS423.

PRINTER PORT

Some printers can be driven off a serial port, though this may not be convenient if you only have one such port. The most common standard is the Centronics parallel interface, named after the printer company that developed it, has become the *de facto* standard. On many newer computers, the connector is a 25-way female D-type, but on older non IBM-compatibles you can find all sorts of different connectors. However, as long as it is referred to as a parallel printer or Centronics port, it should be compatible with the vast majority of printers. Some printers even have both serial and parallel interfaces.

Some useful external hardware connects to the printer port instead of the serial port, which isn't very convenient if you only have one such port. However, it is possible to get round this problem using an external 2-way or 3-way switch box.

USER PORT

These don't seem to be much in fashion these days, but were once fairly common. These varied from machine to machine, but were usually a versatile programmable parallel port for connecting to various external accessories. For example, on my old Acorn/BBC machines, the user port was handy for connecting to RTTY terminal units, EPROM programmers, mice, educational robots, and so on. You can get such ports as optional extras on some machines, but I mourn their passing as standard items.

CP/M COMPUTERS

THERE ARE QUITE a few CP/M computers available very cheaply secondhand, particularly on rally junk stands. Potentially, they could be very useful for relatively undemanding applications such as dumb terminals for radio datacomms, word processing etc. The problem is, people don't know very much about them, or indeed about CP/M itself.

You can think of CP/M as the ancestor of the more familiar MSDOS, which is the Operating System for IBM-compatible machines. It is the Operating System which makes the hardware 'aware' that it is a home computer, and not a ticket machine or a drinks dispenser! CP/M stands for 'Control Program for Microprocessors', and if you type the command 'DIR' on a CP/M machine, you could be forgiven for thinking it was an MSDOS machine. Some of the commands, and the format of the filenames, are very similar. However, whereas MSDOS was written by Microsoft for the Intel series of microprocessors, CP/M was written by Digital Research for the Zylog Z80 processor. The Z80 is still widely used in packet radio TNCs, eg the Tiny-2 and other TNC2 clones such as the BSX2.

COMPLICATIONS

Things are more complicated with CP/M than with MSDOS. Firstly, CP/M comes in a variety of different versions, such as CP/M 2, 2·2, 3, CP/M-86 (for pre-MSDOS IBM machines), CP/N (peculiar to the Torch machines), and PDOS for the Amstrad 1512. CP/M 3 is referred to as CP/M Plus by Amstrad.

As if this isn't bad enough, CP/M originally came into being before floppy disk formats were standardised, and so each machine manufacturer developed its own format. This means that a disk used on one make of CP/M machine will probably not be readable on another make! Even the screen drivers are different, so there is a compatibility problem of the software itself. You may therefore need to make a few alterations to persuade it to run on another type of machine. In fact CP/M is really based around text, so there is no standard for graphics; any graphics capability present will be due to a special enhancement peculiar to that make and model of machine.

So, if you obtain an old CP/M machine, you can have serious problems obtaining suitable software, unless it is bundled with it. Many are lacking the original 'Boot' disks which are essential, so a potentially useful machine is wasted. You may come across machines like the Superbrain (the 486 PC of its day), the Osborn OCC1, Sanyo MBC1150, Torch (based on a BBC Micro PCB with Z80 co-processor), Epson QX-10 (very smart), Tatung Einstein, and the Amstrad CPC-64, CPC-128, PCW-8256/8512/9512 series.

If you do come across such a machine at a good price, and are lacking essential disks or information, what can you do? Well, read on!

CONTACTS

If you have an Osborn machine, you can write to the British Osborn Owners Group, (known as 'BOOG'), c/o Barry Towey, 42 Warwick Close, Bury, Lancs, BL8 1RT, enclosing the all-important SASE. Bear in mind that there are also Osborn MSDOS machines, so don't assume they must all be CP/M.

There used to be a thriving CP/M and MSDOS Users' Group in the UK, but alas it is no longer operating. However, Peter Catley, who used to help run the group, has a great deal of software for all kinds of CP/M machines. If you require a list of PD software available for CP/M machines, or require a missing Boot disk, then Peter may be able to help you. Regrettably, he *cannot* supply technical information or manuals, so please do not contact him about anything other than software. Peter's address is 11 Haslemere road, Windsor, Berkshire, SL4 5ET, telephone 0753 866854 at reasonable non-office hours. If you are able to format disks on your CP/M machine, then send Peter one with return postage etc, and he can send you a text file catalogue of the available software. Peter isn't a radio amateur, but some of the comms software may be suitable for use on packet radio etc.

TELEPHONE BBS

Peter still runs the Windsor Bulletin Board User Group for CP/M users, (known as 'WBBUG' and pronounced "WEEBUG"), and you can call this on 0753 868196. It supports baud rates from 300 to 2400 full duplex, including split 75/1200, and uses 8-N-1 protocol with plain ASCII scrolling text.

PACTOR BINARY FILE TRANSFER

HERE IS SOME MORE information, also courtesy of Tom Rink DL2FAK.

Among its other features, PACTOR provides error free data transfer, even in bad HF conditions, as well as an on-line data compression. It is thus extremely suitable for binary data transfer on short wave. Some store-and-forward circuits have already switched to the PACTOR mode due to its greater efficiency in comparison to packet radio or AMTOR, especially since the PACTOR-Controller (PTC) is able to transfer the complete ASCII character set without any additional software.

There are already a few programs which provide true binary data transfer. However, this software is not widespread, and since different protocols are used, there is an incompatibility regarding the binary data transfer between the different programs. An optimised and generally available standard is therefore required. The implementation of a binary data transfer option in the latest release (v2·0) of the public domain software 'MT.EXE' provided by the creators of PACTOR, SCS in Germany, meets this requirement.

'MT.EXE' is delivered with all PTCs, the original SCS PTCs as well as the PacComm PTCs, produced under licence from SCS. With the aid of the binary data transfer mode, any given file can be transmitted over a short wave channel, eg '.EXE' and '.COM' files, picture and voice files as well as any compressed files.

AR SK

'Rick' G4BLT @ GB7WRG.#19.GBR.EU or DK0MHZ (PACTOR)

CONTEST CLASSIFIED

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

HF GENERAL RULES

GENERAL RULES FOR RSGB HF CONTESTS 1994

1. These rules apply to all RSGB HF Contests, except where superseded by the specific Contest Rules.

2. UK means England, Scotland, Wales, Northern Ireland, Channel Islands and Isle of Man.

3. Entrants must abide by their licence conditions.

4. One contact only with the same station per band counts for points, regardless of that station's operator or callsign. More than one contact with the same operator using different callsigns may not be claimed. Contacts with stations who have no other contest contacts may be disallowed.

5. Duplicate contacts must be logged, with zero points claimed.

6. Cross-band contacts do not score. This does not apply to contacts within the same band where the contacted station transmits outside the receiving station's frequency limits.

7. Simultaneous contest transmissions on more than one frequency are not permitted.

8. Contacts scheduled before the contest do not count for points. Schedules may only be made during the contest (ie in contest time).

9. Proof of contact may be required. Any station may be approached, without notice to entrants, for confirmation of contact.

10. Where a contest is restricted to portable stations:

(a) entrants must operate from the same site for the whole contest;
(b) stations must not be located in a permanent building or shelter;
(c) no permanent building or structure may be used as an aerial support (trees are acceptable);
(d) power must be obtained solely from on-site batteries, portable generators or solar cells, without use of mains;
(e) no equipment, aerials or supports may be set up on site prior to 24 hours before the start of the contest - this does not apply to storage of equipment on site.

11. Only single-operator entries will be accepted unless otherwise stated. A single-operator station is operated by one person, who receives no assistance whatsoever from any other person in operating, log-keeping, checking and so on, and who does not receive notification from others by radio (including packet), telephone or any other method, of band or contest information during the contest.

12. Multi-operator entries are those not covered by rule 11; one operator must act as "Entrant" and sign the Summary Sheet.

13. All operators of UK stations must be RSGB members except visiting amateurs, not resident in the UK. UK stations may not use special (eg, GB, GX etc.) callsigns, and may not be /MM or /AM.

14. A contact consists of the exchange (and acknowledgement of receipt) of callsigns and contest data. Incomplete contacts must be logged with zero points claimed. Points are not lost if a non-competing station does not send appropriate information, but a report MUST be logged and any other exchange sent by that station must be recorded. The full contest exchange must be sent to all stations worked.

15. Multipliers, where applicable, are scored per band, and consist of

(a) for UK stations: Countries as per the DXCC countries list, except that JA, W, VE, VO, VK and ZL call areas count as separate countries.
(b) for non-UK stations: one for each UK county
(c) IOTA and SSB FD contests — see specific rules.

16. Where multipliers are applicable the Final Score is the total QSO points for all bands added together, multiplied by the number of multipliers from all bands added together.

17. Where multipliers are not applicable, the Final Score is the total QSO points for all bands plus the total Bonus points (if any) for all bands added together.

18. For contest purposes, /AM and /MM stations are treated as /M stations in their own country. Other stations are regarded as being in the call area/country indicated by their callsign as sent.

19. Errors in sending/receiving callsigns are penalised by loss of all points for the QSO. Errors in sending/receiving other data result in loss of one third QSO points per error.

20. Duplicate contacts with non-zero points claimed are penalised by deduction of ten times the QSO points. Excessive numbers of such contacts may attract other penalties, including disqualification.

21. Points may be deducted or entries disqualified or excluded for any breach of the rules or spirit of the contest. The decision of the RSGB is final.

22. UK stations must use log sheets in RSGB format. Others may use their own National Society's format.

23. Separate logs (with separate page numbers) must be produced for each band. Separate Band Summary Sheets are mandatory only for NFD.

24. Log sheets must be headed with Name of Contest, Date, Band, Callsign and Page x of n.

25. Log pages should contain 40 QSOs, with columns as follows: Time, Callsign worked, RS(T)/serial sent, RS(T)/serial received, Other Data (specific to the contest), New bonus/multiplier, QSO points. Any RS(T) column left blank will be taken as 59(9).

26. Computer-produced logs are welcome on either fan-fold or sheets, subject to being in RSGB format (and preferably Near-Letter-Quality or better).

27. Each log must also include a list of multipliers/bonuses for each band (where applicable). Entrants should also include a Dupe Sheet for each band. This comprises a list of all callsigns worked, sorted into alphabetical order (or alphabetical order of suffix) together with the serial number sent to that station, or the time of the QSO.

28. A Summary Sheet (RSGB form HFC2 or equivalent) must be included, showing: Contest, Date, Final Score, Station Callsign & address, Name of Club or Group (if applicable), Exchange (eg County Code) sent, Entrant's Name, Address & Callsign and, for each band, Equipment and Antennas used (using the Equipment Coding System set out below) plus power output. If the entry is multi-operator, a list of the Names & Callsigns of all operators must appear on the summary.

29. Logs submitted on computer disk are welcomed. A Summary Sheet on paper is still required, but paper logs, multiplier lists and dupe sheets are not. Full details of the RSGB data format are printed in the *RSGB Call Book*, or are available on request from the address below.

30. Sample forms for use in RSGB contests are available from HQ. Examples are printed in the *RSGB Call Book* and may be copied as needed.

31. Logs must be postmarked no more than 15 days after the end of the contest. Acknowledgement will be sent if a stamped, addressed postcard or IRC is enclosed.

32. Logs must be sent to: RSGB-G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, ENGLAND. Logs become the property of the RSGB.

33. Awards are made at the discretion of the RSGB. Trophies (except for certain miniatures) remain the property of the RSGB.

34. Receiving Contests. The above rules apply, but also:

(a) Only SWLs or holders of licences to transmit ONLY ABOVE 30MHz may enter.
(b) Entrants should use RSGB SWL Contest forms if possible. The Callsigns of both the "station heard" (for which points are to be claimed) and the "station being worked" must be logged.
(c) The same callsign may appear only once in any group of 3 consecutive entries in the "Station being worked" column.
(d) The Summary Sheet declaration to include: "I do not hold a licence to transmit on frequencies below 30MHz."

Equipment Coding System.

First character - power:

0 0 - 1 Watt
1 1.1 - 5 Watts
2 6 - 20 Watts
3 21 - 100 Watts
4 101 - 400 Watts

Second character - antenna:

C Centre-fed (dipole, doublet, G5RV etc)
G Ground Plane or Vertical
Y Yagi
Q Quad or Loop
W Wire (any other type)

Third character - number of antenna elements.

Fourth character - max height of antenna above ground

0 0 - 9 feet
1 10 - 19 feet
2 20 - 29 feet

8 80 - 89 feet
9 90 or more feet.

UK COUNTY CODES FOR HF AND VHF CONTESTS

County	Code
Alderney	ALD
Co Antrim	ATM
Co Armagh	ARM
Avon	AVN
Bedfordshire	BFD
Berkshire	BRK
Borders	BDS
Buckinghamshire	BUX
Cambridgeshire	CBE
Central	CTR
Cheshire	CHS
Cleveland	CVE
Clwyd	CLD
Cornwall	CNL
Cumbria	CBA
Derbyshire	DYS
Devon	DVN
Dorset	DOR
Co Down	DWN
Dumfries & Galloway	DGL
Co Durham	DHM
Dyfed	DFD
Essex	ESX
Co Fermanagh	FMH
Fife	FFE
Mid Glamorgan	GNM
South Glamorgan	GNS
West Glamorgan	GNW
Gloucester	GLR
Grampian	GRN
Guernsey	GUR
Gwent	GWT
Gwynedd	GDD
Hampshire	HPH
Hereford & Worcester	HWR
Hertfordshire	HFD
Highlands	HLD
Humberside	HBS
Isle of Man	IOM
Isle of Wight	IOW
Jersey	JER
Kent	KNT
Lancashire	LNH
Leicestershire	LEC
Lincolnshire	LCN
Greater London	LDN
Co Londonderry	LDR
Lothian	LTH
Greater Manchester	MCH
Merseyside	MSY
Norfolk	NOR
Northamptonshire	NHM
Northumberland	NLD
Nottinghamshire	NOT
Orkney	ORK
Oxfordshire	OFE
Powys	PWS
Shropshire	SPE
Sark	SRK
Shetland	SLD
Somerset	SOM
Staffordshire	SFD
Strathclyde	SCD
Suffolk	SFK
Surrey	SRY
East Sussex	SXE
West Sussex	SXW
Tayside	TYS
Tyne & Wear	TWR
Co Tyrone	TYR
Warwickshire	WKS
Western Isles	WIL
West Midlands	WMD
Wiltshire	WLT
North Yorkshire	YSN
South Yorkshire	YSS
West Yorkshire	YSW

VHF/UHF GENERAL RULES

VHFCC GENERAL CONTEST RULES 1994

The rules governing all RSGB VHF/UHF/SHF Contests held in 1994 (and thereafter unless changed) will include the following general rules. Queries on VHF contests may be made to Bryn Llewellyn, G4DEZ, 110 South Avenue Southend-on-Sea Essex. SS2 4HU. Tel: 0702 460747.

The individual contest rules contain most of the detailed information on the sections, scoring systems and methods of tabulation. Please note that all points claimed for a contact could be lost by both stations if either station logs callsigns incorrectly, including any suffix. The receiving station will also lose all claimed points for a contact where other information is logged incorrectly. Ten times the claimed points will be lost for unmarked duplicate contacts. The committee reserves the right to inspect as per Rule 22 as and when felt neccessary.

1. Entries: All entries must be sent to the contest adjudicator at the address shown in the individual contest rules. Entries sent to other addresses will be treated as check logs only. Please check *Radcom* and or RSGB News for any late changes to adjudicator, it is YOUR responsibility to get your entry to the correct adjudicator, if in any doubt you may telephone the VHFCC Chairman. All entries become the property of the RSGB and cannot be returned. Recorded delivery or registered post shall not be used, and such entries may be disqualified, at the adjudicators discretion.

The VHFCC will now accept entries on disc (IBM compatible 3 1/2"), using the format as shown in the *RSGB Call Book*. For the first year would entrants using this method please supply a hard copy of the log as well. The normal entry sheets will still be required. If the disc that is sent is unreadable or not of the requisite format then it will be treated in the same way that an unreadable printed copy would.

2. Last posting date: All entries must be postmarked not later than 16 days after the end of the contest or last cumulative activity period, or as specified in the rules for individual contests or as modified by VHFCC. (See VHF/UHF Contest Rules published in *Radcom*).

3. Cover sheets: All entries must be accompanied by a correctly completed current RSGB VHF/UHF contest cover sheet (Form 427-86 or later) for each band used, including full details of antennas and final amplifier devices. In multiband events entrants must also complete a multiband sheet (Form 4422). In contests using a county/countryor QTH Locator multiplier scheme, multiplier check lists must also be included (see rule 14).

4. Operators: All operators must be RSGB members,(unless AFS contest, see individual contest rules to see if this applies).

5. Single-Operator fixed stations: Single operator fixed stations are those operated by the licensee in person from his/her normal place of residence or past residence, with no assistance with operating or log keeping during the contest.

6. Fixed stations: To be eligible to enter a fixed station section the station must be located at the main station address as shown on the license validation document. Addresses such as farm fields, open or common land, Government owned land, will be treated as /P, unless operated from a bonafide permanent building. The spirit of the contest will be paramount.

7. Locations: In multiband events all stations forming one entry must operate from one site, defined as a circle of 1km radius. Entrants may not change the location of their stations during the contest.

For VHF Field Day only, no operation (except the normal tests undertaken immediately prior to start of contest), allowed in the 24 hours prior to contest start time. Equipment must only be set up within the 24h period prior to the contest start time. This includes tents, caravans on site, masts, towers, antennas, or anything else that is to be used in the contest.

8. Valid contacts: No points will be lost if a non-competing station contacted by an entrant is unable to supply an IARU Locator, serial number or any other letter code group that may be required, but the receiving operator must obtain and record enough information to be able to calculate the claimed distance score. Contacts with stations whose callsigns appear on the cover sheet will not count for points, or multipliers. Only one scoring contact may be made with a given station on each band in use during the contest, ie any callsign regardless of suffix or prefix may only be worked for points once. Any non-scoring contacts must be clearly marked in the log. Unmarked duplicate contacts will be penalised at the rate of ten times the claimed score for that contact. In cumulative contests one contact may be made with a given station (as defined above) during each activity period.

9. Radial ring scoring: Contacts made between stations separated by the distances shown in the table will score as indicated.

km	Points
0-50	1
51-100	3
101-150	5
151-200	7
201-250	9
251-300	11

and pro rata.

For computer scoring purposes a conversion factor of 111.2km/degree must be used. In 50MHz contests the maximum number of points per contact is now unlimited.

10. Final Tabulation of multiband and cumulative contests: The final tabula-

tion showing the overall results will be formed by taking the sum of the normalised scores on each band or from the three best sessions in cumulative contest, or as decided in in the rules for the individual contest as published in Radcom. The normalised scores will be calculated by dividing each station's points score by that of the band/session leader and multiplying by 1000.

ie Normalised score for each band/session = Score achieved x 1,000 divided by Band/session leader score

11. Awards: There will be an award to the highest scoring station in each section. An award will also be made to the runner-up in each section. Certificates of merit may be awarded at the adjudicators discretion. Placement certificates will be awarded if the cover sheet of the contest entered is annotated 'Placement Certificate Required' and a large SASE (A5 minimum) is enclosed.

A Certificate will also be awarded to the highest placed Single Operator (fixed and portable), running 25W or less to a single yagi. This applies to all contests where the power limit is above 25 watts output.

12. Crossband contacts: Crossband contacts do not count for points, except where separately notified in the rules of individual contests.

13. Log keeping: The logs for contest entries must be made out on current RSGB VHF/UHF log sheets or, if computer listings are to be submitted, these must be cut to A4 size, RSGB log format, line spaced to contain 25 contacts per sheet, and be correctly collated (not Z fold). Each sheet must be headed with the entrant's callsign, IARU locator, contest title and sheet number,(the top of any computer generated log sheet must duplicate a standard RSGB VHF log sheet). Logs must be tabulated as follows.

(i) Date/time (UTC)

(ii) Callsign of station worked

(iii) My report on his/her signal and serial number

(iv) His/her report on my signal and serial number

(v) IARU Locator received

(vi) QTH or county received (when required) or comments

(vii) Points claimed Radial Ring, Kilometres or both.The contest exchange must consist of both callsigns, RS or RST report followed by serial number, and IARU locator. Any complaints received or made about signals must be recorded in the comments column. Gross errors in logging can lead to disqualification.

14. County/country and QTH Locator multipliers

1) In contests using a county/country multiplier scheme the contest exchange will include the full county name or the code letters shown in the operating guide. Your county must be shown on each log sheet.

2) Each new county or country worked is a multiplier and must be clearly identified on the log, note this includes your own county and country, and that a contact with a station in another G prefix area can count for both a county and a country multiplier (eg GD Isle of Man). Where more than one station is worked in a particular Scottish region additional multipliers can be claimed for each contact, up to a maximum of three multiplers for each region.

3) In contests using QTH Locators as multipliers, each new QTH locator worked, ie JO01, IO91, JN99, KO23 is classed as a multiplier. A check list of QTH multipliers must be provided (similar to that used for Country/County multiplier comntests), in any contest using this form of multiplier.

4) The score obtained under rule 9 is multiplied by the total number of multipliers worked to provide the claimed score.

5) A separate list of claimed multipliers must be included showing as a minimum the counties, countries, and/or QTH Locator squares worked in alphabetical order together with the callsign and serial number of the first claimed contact for each multiplier. If other contacts are to be considered as alternative multipliers, should the first contact be disallowed for any reason, then please include callsigns and serial numbers for subsequent contacts with each county, country, or QTH Locator.

6) Rule designation.

14a County/Country multiplier Contest

14b QTH Locator multiplier Contest.

14c Combined County/Country/QTH multiplier Contest.

15. Serial numbers: Serial numbers start from 001 on each band and advance by one for each contact. In cumulative contests serial numbers increment from 001 for each activity period.

16. Power Limits: The DTI licence limits must be strictly adhered to. In an RSGB contest (sponsored or controlled by VHFCC) where the contest power limit is lower than the DTI licence limit then this limit, (as described in the rules for the contest in question) must also be strictly adhered to. If upon inspection a station is found to be running ILLEGAL power, or above the contest power limit, the station will be DISQUALIFIED. ALL operators of that station will be liable to a BAN on entering ALL VHFCC sponsored or controlled contest for a period of up to TWO years.

17. Antennas: The same antenna system must be used on transmit and receive, at all times, except at frequencies on or above 2.3GHz.

18. Sub bands: Stations using telephony in the recognised CW sub-bands are liable to DISQUALIFICATION. Entrants must observe the provisions of the IARU/RSGB band plans. Bands other than those included in the contest cannot be used simultaneously by a separate station for setting up contacts or talkback.

19. Poor signals: Stations which persistently radiate poor-quality signals, or otherwise contravene the code of practice for VHF/UHF/SHF contest operation are liable to DISQUALIFICATION or loss of points.

20. Repeaters, Satellites or moonbounce. Contacts made using these modes will not count for points.

21. Proof of contact: Proof of contact may be required.

22. Inspection: Entrants must permit inspection of their stations by members of VHFCC or its representatives, and give site access information if requested to do so. The inspector must be permitted to remain for as long as desired (the full length of the contest if necessary), and to return to the site for subsequent inspections at any time during the contest. Contestants must demonstrate to the inspector's satisfaction that they are obeying the rules of the contest.

23. Appeal: The ruling of the Council of the RSGB shall be final in all cases of dispute, but must be decided in conjunction with the rules and spirit of the contest.

24. Required exchange information: Where QTH information must be exchanged it shall be given as a point identifiable on an Ordnance Survey route planning map or equivalent (scale 1:625,000) or as a distance and direction not greater than 25 km from such a point. Where rule 24 is invoked it should be taken to mean that QRA (locator) and QTH (address) information is required, eg. JO01IL 2k South of Southend on Sea! If rule 24 NOT invoked then read individual contest rules.

25. Foreign entries: Foreign amateurs are allowed to enter RSGB contests but will be placed in a separate section, thus allowing them to compare their entries with those of UK entrants. Winners and runners up certificates will be issued as appropriate. SWL's are also encouraged to enter and a certificate will be issued to the leading foreign SWL and to the runner-up if appropriate.

26. Special calls: Entries from stations using special event calls such as GB GX GS or any other special club prefix will not be allowed. Normal club callsigns can of course be used eg G4ZDA is ok GX4ZDA is not.

CODE OF PRACTICE FOR VHF/UHF/SHF CONTESTS

1. Obtain permission from the landowner or agent before using the site, and check that this permission includes right of access. Portable stations should observe the Country Code.

2. Take all possible steps to ensure that a site is not going to be used by some other group or club. Check with the club and last year's results table to see if any group used the site last year. If it is going to be used by another group, come to an amicable agreement before the event. Groups are advised to select possible alternative sites.

3. All transmitters generate unwanted signals; it is the level of these signals that matters. In operation from a good site, levels of spurious radiation which may be acceptable from a home station may well be found to be excessive by nearby stations (25 miles away or more).

4. Similarly, all receivers are prone to have spurious responses or to generate spurious signals in the presence of one or more strong signals, even if the incoming signals are of good quality. Such spurious responses may mislead an operator into believing that the incoming signal is at fault, when in fact the fault lies in his own receiver.

5. If at all possible, critically test both receiver and transmitter for these undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all in-amateur-band spurious radiation, including noise modulation, to a level of -100db relative to the wanted signal. Similarly, every effort should be made to ensure that the receiver has an adequate dynamic range.

6. Above all, be gentlemanly at all times. Be helpful and inform stations apparently radiating unwanted signals at troublesome levels - having first checked your own reciever! Try the effect of turning the antenna or inserting attenuators in the feedline; if the level of spurious signal changes relative to the wanted signal, then non-linear effects are occurring at the receiver. Some recent synthesised equipment has excessive local oscillator phase noise, which will manifest itself as an apparent splatter on strong signals, even if there is no overloading of the receiver front end. Pre-amplifiers should always be switched out to avoid overload problems when checking transmissions. If you receive a complaint, perform tests to check for receiver overload, and try reducing drive levels and switching out linear amplifiers to determine a cure. Monitor your own signal off-air if possible. Remember that many linears may not be linear at high power levels under field conditions with poorly regulated power supplies. The effects of overdriving will be more severe if speech processing is used, so pay particular attention to drive level adjustment. If asked to close down by a Government Official or the site owner, do so at once without objectionable behaviour.

SWL VHF/UHF/SHF CONTESTS

1. The 1994 general rules for SWL sections of the Society's contests have been revised in an effort to try to attract a greater number of SWL entries. Any contest organised or adjudicated by the Society will carry a listener section. The VHFCC has sought the views of some of the country's leading contesting SWLs in framing these new rules.

2. The 1994 general rules for VHF/UHF/SHF contests will apply except where they are modified below.

3. Listener contests are open to any non-licenced member of the RSGB. Only the entrant may operate the receiving station.

4. Logs must show the following information.

1) Date and Time (UTC).

2) Callsign of station heard.

3) SWL report of station heard.

4) Report, Serial Number, and QTH Locator/information (if applicable) sent by station heard.

5) Callsign of station being worked.

6) Points claimed.

5. Stations may only be claimed for points if they are in QSO with another station.

6. On 144MHz, the callsign in the 'station worked' column must only appear once in every THREE contacts logged. In 'multiplier' contests, this rule shall be read "must only appear once in every THREE contacts logged unless the station being worked is a new multiplier for the listener".

7. If both sides of a QSO can be heard, both may be claimed for points provided that rule 6 is not contravened.

8. There are no restrictions on logging any station heard on any of the VHF UHF or SHF bands. However, it should be noted that the VHFCC expect that no more than five consecutive contacts made by any one station should appear in any listener log on any VHF UHF or SHF band.

9. The Hansen Trophy will be awarded to the SWL with the highest aggregate score in all the SWL sections of RSGB contests between 21 January and 2 December 1994. The aggregate score will be calculated in accordance with general Rule 10.

FOREIGN ENTRANTS TO RSGB VHF CONTESTS.

I have been asked to look at the possibility of allowing foreign amateurs to enter RSGB VHF contests. The following rules have been agreed with members of the VHF Contest Committee.

1. A foreign amateur is allowed to enter any RSGB VHF contest (even though this may not be specifically stated in the individual contest rules) as long as the station entered is located within the boudaries of the United Kingdom. G,GD,GI,GJ,GM,GU,GW. There will be a separate section for continental entries.

2. The foreign amateur must be a member of his own country's national society, and must be able to prove this when entering his/her logs. A photocopy of any relevant document is acceptable.

3. If there is no national society in the entrants country of origin then this must be stated on the entry form 427-86. The committee's decision on the validity of the entry must be accepted. Any query regarding validity can be checked by writing to G4DEZ QTHR prior to the contest. Foreign amateurs will be listed separately, and if sufficient numbers enter a contest, then a certificate will be issued to the highest placed entrant. Foreign amateurs will not be entitled to take "Trophy awards". The issue of certificates will be at the VHF Contest Committee's discretion.

4. Foreign amateurs who are also members of the RSGB must also abide by the above rules, but there would be no need to show that they are members of any other society. RSGB membership must be noted on form 427-86 so that membership can be proven.

Bryn Llewellyn G4DEZ
VHFContest Committee Chairman.

VHF RULES

A NEW SERIES OF CONTESTS FOR 1994

David Johnson, G4DHF, of the VHFCC has come up with a new idea for a series of short contests during 1994. David as some of you may well know, is a keen contester and expeditionary activating some very rare QTH Locator squares over the years. His idea is to encourage low power contesting with minimal equipment that can be 'back-packed' to the final destination. The following are David's words taken verbatim and form the aims and rules of the contest.

Aims:

a) To promote the fun of contesting and to develop skills in contesting and operating.

b) To encourage low power portable operation with operators working fellow low power enthusiasts from a variety of hill-top sites within the UK.

c) To introduce the art of contesting to those who, for various reasons are unable/unwilling to form/join contest groups or those who simply do not have the time for 'full-blown' contests.

d) To promote home construction and an awareness of how equipment actually works, particularly in the development of receivers, transmitters, antennas, pre-amplifiers and feeder systems.

It is in the spirit of the contests that the equipment should be capable of being carried to the operating site by the operator(s) or being transported/erected outside of a car.

Times: 'Socially acceptable' FOUR hour periods on Sunday afternoons. Timing of the contests should allow participants time to (walk) reach their destination, set-up, operate, clear away and return home with a good margin of daylight. Times will be staggered to coordinate with existing contests.

Modes: SSB or CW

Sections: a) 10 Watts Single Operator Portable or Multi-Operator Portable. b) 3 Watts Single Operator Portable or Multi-Operator Portable.

Participants will be expected to demonstrate how the power level was determined, particularly where the basic commercial equipment is rated at a higher output power.

Restrictions:

1. All operators must be RSGB members.

2. The contest is open to all stations, but only portable stations may submit a contest entry.

3. Although any number of antennas or groups are permitted, no fixed or mobile towers, cranes or any other 'significant structure' (in excess of 2" outside diameter) is to be used as support. Antenna height will be limited to 28' above ground level.

4. ALL EQUIPMENT MUST BE BATTERY POWERED. If mains rotator is envisaged, they must also be powered from a single source battery (with suitable converter circuitry) supply not exceeding 28V.

5. Petrol/Gas/Diesel generators for charging are not permitted, This includes a motor vehicle engine. If operating from vehicle supply, the engine must be switched OFF. Wind and Solar power is permitted.

General rule 14c applies (Country/County/QTH Locator multipliers) 1994 **General Rules.**

Radial ring scoring system.

Rule 10 Normalisation will aplly.

Dates: 22 May; 12 June; 4 July; 4 Sept

Contest: 2m Open; No RSGB contest; VHF Field Day; 2M Open

Times: 1100-1500GMT (Note 'Back Packers' contests run for an hour later than normal RSGB contests).

Award: Trophy - The Back Packers Shield will be awarded to the leading station in either category, the best three placings out of maximum four sessions. A certificate will be awarded to the leading station running one watt or less into a single antenna, for each session.

Adjudicator: D Johnson, G4DHF, 65 West Street, Bourne, Lincs PE10 9PA.

Note: An information pack will be made available shortly - covering, paperwork, site selection, how to work out locator, safety (weather/power cables), how to get the best from your equipment, types of antennas and pre-amplifiers, how to measure power. Hints on how to operate in a contest, logging, exchanges, scoring. Sample log sheets, cover sheets, multiplier sheets summary sheets and declaration, and a reprint of a QRA map of the UK and Northern Europe to facilitate scoring. If you re-

quire one please send 36p in stamps and a large (A4) SAE to G4DHF. Please allow plenty of time for return as we are still writing some of them!

Bryn Llewellyn G4DEZ

144/432MHZ

Date: 5/6 March

Time: 1400-1400UTC

General Rules apply.

Sections: F Single operator fixed; M Multi operator (fixed or portable); L Listeners; SS Single Operator Fixed, Six Hours duration; SS Operation for any contiguous 6 hour period (no breaks, a continuous 6 hours), starting at any complete hour ie 1400-2000 or 0000-0600 not 0823-1423!)

Only one entry per station. Entry to both the full 24h and 6h sections is not allowed, choose one or the other NOT both.

Serial numbers start at 001 on each band. Single band entries will be accepted as long as the 4422 cover sheet is marked 0 points on the band not used.

Adjudicator: S Thompson, GW8GSQ, 8 Nantlais, Corntown, Bridgend, Mid Glamorgan CF35 5SA

NOTES FOR CONTESTERS:

All entries must be postmarked at the latest by the 16th day after the end of the contest, ie if contest ends on a Sunday (say the 1 Octember) then the entry must be postmarked on or before the third Tuesday after that Sunday (17 Octember). For VHF Field Day an extra week is allowed, ie the fourth Tuesday. Any late entries can only be accepted at the discretion of the adjudicator.

No recorded delivery or registered post. Entrants can obtain a proof of posting certificate from the Post Office which we will honour if an entry has been delayed in the post.

QTH information to be exchanged on 70MHz only, however not all 70MHz contests require this information, see individual rules and General Rule 24 (1994).

General rules: 1 through to 9, 11,12,13,15 to 23,25,26, apply to all contests any changes will be noted in individual contest rules.

Adjudicators will not normally enter contests which they are adjudicating, however if the adjudicator does wish to enter then his entry will be vetted by a subcommittee before final adjudicated list is published.

Every contest is open to foreign entrants who will be listed separately from UK stations, certificates will be issued to section winners (and runners-up, if enough entries).

RSGB 1993 VHF/UHF CONTESTS CALENDAR

26,27,28	
29 Dec	70/144/432MHz Fixed (Apr 93)
16 Jan	144MHz CW Single Op Fixed/All Other (Dec 93)
23/30 Jan	70MHz Cums (Dec 93)
6 Feb	432MHz Fixed/AFS/SWL (Dec 93)
13/27 Feb	70MHz Cums
5/6 Mar	144/432MHz
13 Mar	70MHz Cums
27 Mar	70MHz Fixed/SWL
10 Apr	1st 23cm & 13cm Fixed/SWL
7 May	70cm Trophy
7/8 May	432MHz to 24GHz
21/22 May	144MHz/SWL/Single/All Others
22 May	1st Back Packers 144MHz
4 Jun	50MHz Trophy
4/5 Jun	IARU 50MHz
12 Jun	70MHz CW
12 Jun	2nd Back Packers 144MHz
18 Jun	432MHz FM Fixed & Open
3/4 Jul	VHF Field Day
4 Jul	3rd Back Packers 144MHz
23 Jul	144MHz Low Power/SWL
24 Jul	432MHz Low Power/SWL
21 Aug	432MHz Fixed/SWL
30 Aug	144MHz CW Cums
3/4 Sep	144MHz Trophy/SWL
4 Sep	4th Back Packers 144MHz
14/29 Sep	144MHz CW Cums
25 Sep	70MHz Trophy/SWL
1?2 Oct	RSGB 432MHz-24Ghz

For details of rules for European contests, contact G4PIQ, QTHR.

VHF RESULTS

50MHZ TROPHY 1993

The majority of entrants experienced good Es openings through out the contest. The changed date of the contest (April in 1992, June in 1993) was generally liked. The maximum points for any one QSO on 50MHz is now 61 (see March *RadCom* page 17) not 25. Most entrants did not spot this change - 80% of the logs had to be re-scored to take account of this change. Several stations lost multipliers as a result of not supplying a multiplier check list in accordance with rule 14(d). Please read the rules before you enter the contest.

Congratulations to 'The Flowerpot Men' (GW0RDI/P) for winning the Open section, to BRS25429 for winning the SWL section, to PE1EWR for his solitary entry in the Overseas section and to GD0TEP/P for not only winning the Single Operator section (and hence the Six Metre Cup) but also for winning the Telford Trophy for the highest scoring entrant.

Ian Pawson, G0FCT

SECTION M - MULTI-OP, FIXED OR PORTABLE

Pos	Callsign	LOC	QSO	Multi	Points	Best DX	km
1	GW0RDI/P	IO82JJ	320	80	322880	9H5EE	2305
2	GD7HEJ/P	IO74QD	233	64	308928	IT9IPQ	2341
3	G4UJS/P	IO94RU	168	59	253700	IT9DQM	2094
4	G4DSP/P	JO03CE	207	60	188580	IT9IPQ	2040
5	G8LNC/P	IO90OW	232	64	169408	9H5EE	2077
6	G3TSW	IO80FV	152	54	87480	CT3GT	2251
7	G4SRS/P	IO81UP	151	54	80514	9H5EE	2225
8	G3NAT/P	IO91XG	121	49	59143	IK8MKK	1573
9	G4BRA/P	IO91PK	115	46	42182	OM3TPG	1380
10	G4DDL/P	IO91MP	82	45	31950	OK2PZW	1265
11	G6ZTT	IO83QE	42	28	18480	OK2SBL	1517

SECTION S - SINGLE OPERATOR, FIXED OR PORTABLE

Pos	Callsign	LOC	QSO	Multi	Points	Best DX	km
1	GD0TEP/P	IO74SF	264	73	402814	IT9IPQ	2339
2	G4KUX	IO94BP	160	61	194834	YU7AU	1934
3	G3ZYY/P	IO80AQ	117	50	129650	9H5EE	2210
4	G0NYL	IO93QN	103	50	78600	YU1ABA	1848
5	GM3POI	IO88OW	85	15	67455	IK0FTA	2229
6	G6HKM	JO01FT	132	54	62532	YO4BZC	2132
7	G0AEV	IO81WL	86	47	58938	IK7UXY	2014
8	G8ZQB	IO92JN	90	45	47925	IK8MKK	1647
9	G7FDC	IO80FI	69	35	43680	9H5DV	2161
10	G1FYC	IO81VU	66	34	34442	IK7UXY	2040
11	G3OIL	IO91CB	64	35	31990	9H5EE	2131
12	G0RRC	JO02MB	59	32	29792	I8US	1840
13	G0OVA/P	IO91GI	70	36	23018	9H5EE	2136
14	G1OGY	JO01GR	66	34	17000	OM3TPG	1295
15	G7GAB	IO92IJ	48	32	11520	OM3TPG	1280
16	G0HVQ	IO81VV	35	26	11466	OM31D	1430
17	G8ORG/P	IO83PC	48	30	9900	S59AM	1425
18	G0LJD	JO01FJ	16	14	3263	OK2SBL	1294
19	G7JHZ	IO91UM	20	17	3105	I4VOS	1130

SECTION L - SWL

Pos	Callsign	LOC	QSO	Multi	Points	Best DX	km
1	BRS25429	IO93FX	89	47	165656	IT9IPG	2183
2	BRS52543	IO83LT	20	16	3904	OE6VCG	1544
3	BRS32525	JO01AL	70	1	800	OM3TPG	1328

OVERSEAS SECTION

Pos	Callsign	LOC	QSO	Multi	Points	Best DX	km
1	PE1EWR	JO11SL	23	17	7565	EH6IF	1274

DIRECTION FINDING

RESULTS OF CHELMSFORD/ COLCHESTER HF QUALIFYING EVENT

The last top band qualifying round of the year was held on Sunday 5 September using the Bury St Edmunds and Sudbury map, with the start at Great Green, near Cockfield. Good signals were heard from both stations at the start.

Station 'A', G3WMM/P, was located on the banks of the River Gipping two miles south of Needham Market whilst Station 'B', G4KQE/P, was located in woodland on Tiger Hill about four miles south of Sudbury. Both stations were 19.5km from the start.

Competitors split equally with seven choosing 'A' and seven choosing 'B' as their first transmitter. Early arrivals at station 'A' found plenty of head-high nettles to contend with and much bush beating took place before the first competitor, Phil Cunningham, arrived at 1445. A steady stream followed at regular intervals with an excited Colin Boyce hot-foot from station 'B' arriving at 1535. All 14 teams successfully located station 'A' before closedown at 1630.

At station 'B' a lot of effort had been put into erecting an aerial with an earth spike at the remote end hopefully to lead competitors onto the wrong end of the aerial. Most competitors however came in from an unexpected direction from which the signal took them into the Tx much to the dismay of the operator. Colin Boyce was the first in at 1426, with 13 teams successfully locating the transmitter by closedown.

After the event the teams and organisers had tea at Cornard United Football Club. The winner, Colin Boyce, and second placed Dick Brocks both qualify (subject to confirmation) to take part in the 1993 National Final.

RESULTS

Pos	Name	Club	Time of Arrival at Transmitters A	B
1	C Boyce	Mid Thames	1535	1426
2	R Brocks	Colchester	1540	1441
3	G Whenham	Coventry	1540.30	1438
4	P Cunningham	Colchester	14.45	1551
5	P Clark	Torbay	1507	1612
6	Brian Bristow	Mid Thames	1521	1612.30
7	P Tyler	Mid Thames	1613	1440
8	C Plummer	South Manchester	1522	1617
9	C Merry	Dartford Heath	1618	1453
10	T Gage	Mid Thames	1518	1619
11	G Nicholls	Banbury	1626	1453
12	C Wells	Mid Thames	1539	1626.30
13	R Goodeart	Mid Thames	1520	1628
14	P Graves	Colchester	1540	-

HF RULES

1ST SLOW CW CUMULATIVE

1. General: The aim of this event is to provide training and encouragement for those less experienced in CW and contesting. It is intended primarily for Novices and those newly licensed or just getting their feet wet in the world of CW contesting.

2. The General Rules for HF Contests, as published in the January 1994 issue of *Radio Communication*, will apply.

3. Sections: (a) Transmitting
(b) Receiving

Single- or Multi-operator entries will be accepted in section (a). There is no limit to the number of operators in a team, nor need they be the same for each session.

Section (b) is Single-operator only.

4. Eligible Entrants: Section (a) All operators must be members of the RSGB. Section (b) Individual RSGB Members who do not hold a Class A Full or Novice licence. This contest is open only to stations in the British Isles (excluding Eire). Stations outside this area may not be contacted or logged for points.

5. Dates/Times: five sessions, each from 1900 to 2030UTC on: Tuesday 5 April, Wednesday 13 April, Thursday 21 April, Friday 29 April, Monday 9 May 1994.

6. Frequency/Mode: CW only between 3.540MHz and 3.580MHz

7. Exchange: RST and First Name (in full, with correct spelling). Multi-op stations must send only one name during any particular session, regardless of who is operating, although different names may be used during different sessions.

8. Maximum Power: 3 Watts RF output for Novices, 10 Watts RF output for holders of Full licences. There is no restriction on the method of generation.

9. Speed Limit: No faster than 12WPM, and never faster than the other station is sending. Please join in with the spirit of the contest . . . . don't use a keyer; don't use a computer - get out that straight key and keep your log on paper (at least during the event!)

10. Scoring: Section (a) Any UK station may be worked once for points during each session. Any contact with a Novice callsign at either or both ends scores 20 points. Contacts between two Full licence-holders score 5 points. The overall score is the total of the best three sessions. Section (b) Listeners may log for points only stations actively participating in the contest. Each Novice logged scores 20 points, each Full callsign counts 5 points.

11. Logs: Entrants are requested to submit logs for all sessions during which they are active, in order to assist with the adjudication. Full details of the correct format, and the address to which logs must be sent are given in the General Rules. The name of the operator worked/heard should be recorded in column 5. Logs must be postmarked no later than Monday 30 May 1994.

12. Awards:

Section (a) Certificates of Merit to the leading Novice and Full licence-holder, and also to the highest placed station entering any RSGB HF CW Contest for the first time (please note on your Cover Sheet if you qualify for this last award). Section (b) Certificate of Merit to the leading listener. At the discretion of the HF Contests Committee, additional certificates may be awarded if there is sufficient support.

HF CONTESTS CALENDAR

1 Jan	LF Cums 7MHz (Dec 93)
2 Jan	LF Cums 3.5MHz (Dec 93)
3 Jan	LF Cums 1.8MHz (Dec 93)
8 Jan	LF Cums 3.5MHz
8/9 Jan	*HA DX CW* (Dec 93, p16)
9 Jan	AFS (CW) (Nov 93)
11 Jan	LF Cums 1.8MHz
15 Jan	LF Cums 7MHz
15 Jan	AFS (SSB) (Nov 93)
15/16 Jan	*AGCW-DL QRP* (Jan 94, p19)
16 Jan	LF Cums 3.5MHz
19 Jan	LF Cums 1.8MHz
22 Jan	LF Cums 3.5MHz
23 Jan	LF Cums 7MHz
27 Jan	LF Cums 1.8MHz
29 Jan	LF Cums 7MHz
29/30 Jan	*CQ WW 160m* (Jan 94, p21)
29/30 Jan	*UBA SSB*
29/30 Jan	*REF CW*
30 Jan	LF Cums 3.5MHz
4 Feb	LF Cums 1.8MHz
6 Feb	LF Cums 7MHz
12/13 Feb	*PACC*
19/20 Feb	*ARRL DX CW*
26/27 Feb	7MHz CW
5/6 Mar	*ARRL DX SSB*
12/13 Mar	BERU

HF RESULTS

ROPOCO 2 1993

As in ROPOCO 1 held earlier in the year, there was a high level of interest with a 17% increase in logs received over last year's contest. During adjudication, memories of former HFCC member Edwin, G3XTJ, were recalled and his keeness on accuracy of copying CW and presentation of logs. With this in mind, congratulations are due to Terry Green, G3GLL, whose entry contained just one dot error.

The event is a good test of operator skill and not an easy contest in terms of exchange of information since a Post Code is received and forwarded on to the next station contacted. It is tempting to correct what is perceived as an error but this would only result in loss of points. There were some anomalies noticed with certain hand-written logs where transcription from the original real-time sheets to a neater final log produced possible errors. Two stations appear to have sent the same Post Code for each contact despite the name of the event being Rotating Post Codes!

One comment occurred in a lot of logs and reflected most entrants' feelings- "a most enjoyable event". GM4SID was critical of the start time being against GM stations, this will be considered when looking at the rules for the next event.

G3SJJ

Posn		Callsign	Score
1	*	G5LP	718
2	*	G4BJM	701
3	*+	G3GLL	667
4		G3JKS	654
5	=	G0JQN	647
5	=	G3WGV	647
7		G4ARI	644
8		G0IVZ	634
9		G3KHZ	631
10		G3TBK	624
11		G4ZFE	607
12		G4RCG	598
13		G3GC	588
14	=	G3UJZ	580
14	=	G4EBK	580
14	=	G3HEJ	580
17	=	G4KGG	577
17	=	G2HLU	577
19	=	G3JJG	570
19	=	G4GIR	570
21		G4OGB	567
22		G0JNZ	560
23	=	G4OFR	557
23	=	G4TLS	557
25		G3JTG	550
26		GW3WWN	544
27	=	G3KNU	537
27	=	G4WYG	537
29		G0OGN	527
30		G0LZL	510
31		G4XRV	507
32		G3HJF	500
33	=	G3BPM	480
33	=	G3NKS	480
35		G4XPE	470
36		G3IGU	464
37		G4UXG	451
38		G5MY	441
39		G3MA	435
40	=	GM4SID	427
40	=	GW3SB	427
42		GM0MYV	410
43		G3LIK	400
44		G3CQR	370
45	=	G4IZB	350
45	=	GM3UM	350
45	=	G3KDL	350
48		G4PTE	347
49		G4PDQ	327
50		GW4KVJ	300
51		GW0KZW	285
52		G4BUO	187

Thanks to GW3JI for the Checklog
+ = G3XTJ Memorial Trophy Winner
* = Certificate Winner

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DRAKE T4XC/R4C/MS4 c/w WARC bands. Rx fitted with Sherwood Filters, some spare valves, manuals: £550, may consider splitting. Datong D75 RF Speech Processor: £55. G3MBM, QTHR.(Cambridge) 0223 860178.

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G3TPW COBWEBB Antenna, new, unsuitable this location: £120. Bill, GM3GJB. (Falkirk) 0324 23608.

G3TSO 80M Mini trsvr in H/B case, 10W RF out: £80. Prefer buyer inspects, collects. G4HMC. (Bucks) 0494 866925.

G4MH MINIBEAM, gd condx, tuned, spare spokes. Hirschmann RO250 Rotator and SL100 Support Bearing. Offers? Would Exchange for VFO230 or cheap HF Rx, FRG7 etc. FREE to good home, AVO Valve Characteristic Meter Type VCM163. Prefer buyer collects. Telephone after 6pm. (Guisborough) 0287 642596.

HOMEBREW RULES OK! Clearing out the Black Boxes. TenTec Argonaut 2: £795. Kenwood TS50, + CW filter: £895. Mizuho MX 3.5: £175. IC32E +BC35, CTCSS, batteries: £295. IC229E: £250. IC202E: £120. IC900 144/432/28MHz: £425. Trio YG455C Filter: £80. All plus carr. Chris, G3TUX. (Surrey) 0428 661501.

IC22 Ideal for Packet 10W, 2 Metre. Crystalled 145.650 & 145.675MHz and some Repeater, etc. Old but works fine: £55. G0ANX. (Wantage) 0235 868498.

IC251E: £250. NAG 144XL: £250. Eddystone 750: £50. RA17 + case: £125. FT101E: £100. Nevada ATU TM1000: £95. DEC LA50 serial printer: £40. All working, selling for shack reorganisation. Prefer buyer inspects, tests and collects. G8MTV QTHR (Darlington) 0325 721545.

ICOM 71E Receiver including user and workshop Manuals, boxed: £550. KW107 Supermatch: £100. Carr extra. Prefer buyer collects. (Seaford) 0323 897145.

ICOM 725, AM/FM, narrow CW filter: £500. AH3 Auto ATU interfaces directly with 725, tunes longwires all bands: £200. Revox 20A PS: £50. All Three: £700. Prefer buyer collects. Can demonstrate. G3AAH, QTHR. (Birmingham) 021 451 3369.

ICOM Automatic antenna tuner AT-500, Icom checked recently: £225. Heathkit station monitor Model SB-614: £85. Needs attention. Carr or collect. (Nr Hereford) 0544 318875.

ICOM IC735 as new, boxed, manual: £650 ono. GM4WJA, QTHR. (Elgin) 0343 541806.

ICOM IC735 fitted 500Hz filter, IC PS15 PSU: £700. AEA L30 Linear: £630. Heathkit Scope SB610E: £80. Backstar Frequency Meter "Meteor 100": £100. Jaybeam TB3 Mk3, Daiwa Rotator DR7600R, Daiwa Controller DC7011: £225. H/b Rollercoaster beautiful 1KW Antenna Tuner: £80. Heathkit Cantenna Dummy Load: £10. Ferromagnetics choke Balun, brand new: £35. AVO Model 8 in leather case: £30. ALL ONO. Collect or carr extra. (Barrhead, Glasgow) 041 881 4440.

ICOM IC735 HF tcvr, CW, filter, manual, as new: £700. Miniature 80M tcvr built from kit RadCom Jun 91: £125. G3TSO (Cirencester) 0285 750532.

ICS FAX-1 Fax, Navtex, RTTY Decoder, ex condx and performance, with manual and cables: £190, carr extra. G3KZU, QTHR. (Oxford) 0865 63000.

KAYPRO 2 Computer with Wordstar, SuperCalc & MBasic: £50. Ferrograph Tape Recorder 5A: £50. G4DXO, QTHR. (Hove) 0273 561616.

KENWOOD SW2100 SWR/Power Meter, 200 & 2KW Power range, matches TS950SDX, Twin Meters with orig pkg: £80. (Bristol) 0272 642867.

KENWOOD TH48E 430MHz Tcvr, Nicads, charger and case. Excellent condx, still under warranty, c/w manual. (Felixstowe) 0394 275820.

KENWOOD TM742E bought in July 93, excellent rig, 2m & 70cm with possibility of 3rd Band. Cost £829, will accept: £650 ono. (Carnforth, Lancs) 0524 733212.

KENWOOD TS440S with ATU, pristine, boxed: £825. Cushcraft R7 Vertical as new: £295. Kenwood TM401E D/band Mobile, boxed, excel condx: £295. (Wilmslow) 0625 531154.

KENWOOD/TRIO TS530S 160-10M inc WARC, 100W Tcvr, narrow SSB/CW filters, exc cond: £500. VFO120 suit TS530, TS120-130, etc: £55. Yaesu FT101B 160-10M inc 12M, well used, but works f/b and reliable: £180. Evenings, w/ends only. G3TCO, QTHR. (Bristol) 0272 681068.

KW2000A, PSU and Remote VFO, fully working: £150. Datong Morse Tutor, ex condx: £30. Robot 800, RTTY, Morse, ASCII and SSTV modes, c/w mono Monitor: £150. Lee, G0PVO. (Oldham, Lancs) 0706 842355.

LINEAR (HF) Home Brew 1KW+ o/p, 160 - 10 metres, 3.5KV PSU. Try with Valves (3/500Z). Sell without: £200 or Swap WHY? (Scarborough) 370532.

LOWE HF-225, AM/FM detector, factory fitted Nicads, active whip ant, key pad, case, cost new £675 will accept £450. Global AT-1000: £55. SEM Hi Q Matcher: £40. DeeComm long wire: £10. Discone: £15. All vg condx. Tony, G7NZR (Ilkley) 0943 607506.

LOWE HF225 Receiver with FM module, Whip Aerial/preamp: £290. Black Jaguar Scanning Rx BJ200 Mk3, 26-510MHz, battery charger: £120. Both units as new. (Larkhall) 0698 887176.

MYFORD ML7 Lathe, 0.5HP Motor, 3/4 Jaw chucks, face plate, set change wheel, long topside, clutch steel cabinet, rear tool post, 2 Steadies Driving plate tools etc. Also NU-Tool 12 Speed Drilling Machine. Both in very gd condx. Offers? G4EGB, QTHR. (Scarborough) 0723 362537.

NATIONAL HRO Communications Receiver inc 11 plug-in Coil sets; 50KHz to 30MHz, with spare valves, gd condx: £45. Yaesu FT202 FM H/held 2m Tcvr, 3 simplex, 3 repeater channels, 6 inch Helical Antenna, Nicad batteries, instrs, gd condx: £25. G4HUM. (Portsmouth) 0705 833314.

OFFERS WANTED. Ham Radio, Dec 72 - Sep 85. Practical Wireless, Nov 68 - May 73. Practical Electronics, Nov 68 - Aug 74. Short Wave Mag, Jan 68 - Apr 81. QST, Jan 81 - Dec 81. Film User (Cine), Jan 64 - Feb 70. Amateur Movie Maker, Aug 61 - Apr 63. Amateur Tape Recording, Aug 61 - Apr 63. Wireless World, Oct 21 - Mar 22, (June 1923), (Jan 1924), Feb 44 - Jul 44, (April 45), Aug 67 - Jan 89. Boys Own Paper, Feb 1919 - Oct 1921. RadCom,

Dec 1967 to Present. GM3ZVF. (Kirkcaldy, Fife).

PACKET TNC-DL: £75. Royal 1300 Discone: £25. Farnell DTC12 Scope - Component Tester: £80. Farnell 12/4DA Scope: £80. ME30 Eprom Eraser: £40. 50V 5/10 Amp PSUs: £30 each. Weller GC2000 Soldering Station: £25. Farnell Variable PSU: £25. Alpha Repeater L1000 and L500, 1KW 500W variable DC-Load: £250. Ring (Stroud) 0453 828011.

PSION 3 computer 256KB, c/w manuals, box etc, as new condx, 6 mnths old: £125ono. GM8RXZ (Inverness) 0463 243457.

PYE/PHILIPS PF85 as new, low band, ideal 4 metres c/w large battery, helical working on PMR channel at present: £95. (Kettering) 0536 522441 9am-5pm only.

SATELLITE Equipment. Discus Elipse Sat Rx/ Dish Positioner, 184 channels, 2GHz triple band tuner, VCR timer, stereo sound, remote control. Would suit serious satellite enthusiast. Brand new and bxd, list price £450, selling for: £190. D2Mac Satellite Receiver: £35, with Antenna: £55. Sommerkamp TS380DX 28MHz M/mode Tcvr, slight fault on Tx, hence: £90 ono. Carr Extra. G4EFE, QTHR. (Reading) 0734 418586.

SILENT KEY Disposal. TS500 HF rig 200W, matching PSU/Spkr, orig boxes, h/books: £225. Eddystone 740/3 Rx, h/book: £65. BC221 Wavemeter, charts, h/book, H/phones: £45. Items stored ten years. Working when QRT. Gd clean appearance, offers considered. Carr at cost. John, G3OAZ, QTHR. (Basingstoke) 0256 465126.

SOMMERKAMP 277ZD fully working order, mod to 10 metres. Must sell so: £250. Phone evenings & W/ends (Surrey) 0428 683189.

TEN TEC Centuary 22. Six Band CW Tcvr: £220. Call after 7pm. G3VZM, QTHR. (South Wirral) 051 339 5317.

TINY 2 Mk 2 TNC, as new, bxd, leads etc: £95. Kent straight key, never used, bxd: £25. Mutek 2M receive preamp for shack use, bxd: £25. Daiwa RS40X PSU rated at 32 Amp continuous 40 Amp max, bxd: £110. Nick, G7IYG (Uxbridge) 0895 236297.

TRIO TS-830S with CW filter: £575. AT230: £130. SP230: £65. MC50 mic, brand new: £30. Hd/phones HS-5: £25. ERA microreader II: £100. Datong FL3: £85. Morse Tutor D70: £45. HiMound key, new :£20. Morse tapes: £20. Daiwa CN620A SWR: £40. SEM Ezitune: £40. SEM QRM Eliminator: £60. Global AT-1000: £55. All very gd condx. Tony, G7NZR (Ilkley) 0943 607506

TRIO TS830S, Kenwood Spkr SP230, Daiwa Electronic Keyer DK210, All clean, GWO: £445, bargain. JRC NRD515 HF Gen/cov Rx: £300. Scanner Amplifier AB15 GaAs FET, low noise, wide band 25-2100MHz: £20. Datong UC2 Up-Converter (Makes a 144/145MHz or HF Amateur Band Tcvr into Gen/cov Rx): £35. Datong Audio Filter FL1: £30. Gordon. (Nr Tamworth) 0543 481202.

TRIO TS930S with ATU, Filters, SP930, MC60. All boxed, manuals, mint condx: £950. Contact paul. (Abingdon) 0235 530940.

TS440S Fitted auto ATU, ex condx, C/W MC42S mic, bxd: £725. Dave, G4MCL (Manchester) 0942 886594 or 0860 547775.

TS530SP, CW filter: £450. KW1000C 1KW 80-10m Linear Amp plus pair new 572B valves: £260. Both as new. G3OCA. (Derby) 0332 662818.

TS830S, ex condx: £525. SPC3000 ATU, C/W twin meters: £125. Both for £600. Altron SM30 telescopic mast C/W winch: £125. Extension tube: £10. Daiwa DC7011 rotator & controller + cable: £60. Altron AQ6-20 2-ele beam, vgc: £40. Balun 1:1: £10. Maplin YN48C dipmeter, as new: £30. Datong D70 Morse Tutor: £30. Items bxd, with manuals. Prefer buyer test and collect. (Ashington) 0670 812028.

TS830S, S35 Mic: £525. SM220 Station Monitor BS-8 Pan Display: £190. All as new. Carr Extra. GM4HKW, QTHR. (Kirriemuir) 0575 73455.

TS850SAT HF Tcvr looking for a good home, with matching PS52, SP31 and MC80. All in mint condx, boxed as new. Offers in region of £1750 ono. (Carnforth) 0524 733212.

VALVES VT104, VT105 at: £10 each. Car Radio 12V type 1522AM ADU4749: £10. Ekco TV model TMB272: £35. (Staines) 0784 454757.

WESTERN ALUMAST Hinged base and winch. Ex condx. Breaks into 3ft X 10ft lengths: £140. Buyer collects. Ring after 6pm. (Christchurch) 0202 471294.

WESTON Tiltover Unimast for Sale. C/w winding gear. Base cemented in. Price new £350. Take £40, buyer removes and collects at his convenience. (Market Neighton, Nr York) 0430 872547.

WOOD & DOUGLAS 2M linear 1W/30W: £40. Lodestar sig gen 100KHz - 150MHz SG-4160B: £90. Specrum tnsvtr boards 28/50MHz: £15. 28/144MHz: £15. (Tewkesbury) 0684 299420.

WORLD WAR TWO No 19 Set with vibrator PSU, unmodified, VGC but no connecting cables: £100 ono. Phone Ray. (Billericay) 0277 625649.

YAESU FC757AT, VGC: £150. FT690R2, case, Nicads, charger, VGC: £250. Standard C828 2m FM: £55. Manuals for all items. SEM Tranzmatch: £55 VGC. Postage paid by buyer. Ring after 5pm. (Londonderry) 0504 352804.

YAESU FT101B Tcvr, CW Filter, Holdings RF Clipper, spare Valves: £200. (Wantage, Oxon) 0235 764943.

YAESU FT209R h/held + chrgr: £140ono. Clarke mast, heavy duty: £225. AVO Mk 7: £8. G3WDK QTHR (Drewsteignton, Devon) 0647 21631.

YAESU FT230R 3/25 watts: £115. Alinco DR-110 5/25W: £155. Both FM Mobile with Mic and leads, recently professionally serviced. Definitely NO Offers. (Leominster) 0568 616608.

YAESU FT757GX Tcvr, FC757AT auto ATU, FP757GX Sw-mode PSU, MHI-B8 Hand Mic, all boxed with manuals: £750 ono. Comm Pakratt Packet ROMpack for C64 plus RS232 Module and manual: £20. (Germany) 010 49 2163 82644.

YAESU FT790R, case, u/d Mic, handbook, M/ Modules 70cm 30 Watt Linear: £280. Electroniques Hamband HB166 Tuner, 1.8-30MHz, 1.6MHz IF, data: £5. WW2 collectors item, L/R Twin pointer Meter, AM Ref 10Q/2, best offer. Carr extra all Items. Eric, G3RXJ, QTHR. (Newick, E Sussex) 0825 723353.

YAESU MD-IC8 Desk Mic, brand new and bxd, never used: £80. Vacuum variable Capacitor 600pf 5KV: £65. 4CX350: £30. 4CX250B: £15. All items new. Welz CH20A 900MHz 1KW Coaxial Switch: £25. All items carr extra. G3WZT, QTHR. (Horsham) 0403 864222.

YAESU station comprising FT101ZD Mk3, FM board, fan, FC902 SP901 FV101Z, ext VFO, spare valves, vgc, non-smoker: £750ovno. G3OPL QTHR (Ramsgate) 0843 597916.

WANTED

wa**25AMP PSU** or FP707. G4UTH QTHR (Ashford) 0233 733591.

A ROCKWELL COLLINS KWM380 required. Other Collins equipment may also be of interest. Ivan Morris, GD3CKO QTHR. (Douglas) 0624 629742.

ADVANCE Mains Transformer for Advance Oscilloscope OS 2100 serial No 687. Please contact Tony, G4JYH, QTHR. Phone day 081 886 0126. (London) 081 886 1983.

ANY RACAL Aluminium enclosed Modules for RA1217, RA217 Receivers, ie:- 1st VFO, 2nd VFO, 1MHz Unit, 40MHz Filter, 37.5MHz Filter, RF Unit, IF Unit. Also 1.6MHz IF Xtal Filters for these Rx's. Made by SEI Ltd type BD38733. Also circuit diagram for Eddystone 770R Mk2. (March) 0354 741168.

ART13. Wanted in any condx. Bendix TA12, likewise Please. Ring evenings. (Northants) 0603 860452.

GENUINE IBM Keyboard for PC/XT; 83-Key version preferred, others considered. GM5NU. (Edinburgh) 031 332 7092.

HEATKIT VFO type HG-10 as used with DX60. Any condx considered. G4JQT QTHR (Reading) 0734 596806.

HELIOGRAPH TRIPOD with mahogany legs and screw threaded brass top, Mayre marked stands, Camp or Helio "A" Mk3. Phone Jon anytime. (Taunton) 0823 321187.

HRO RECEIVER Wanted for Spares. Complete or part complete, any condx. G4LBY, QTHR. (Mansfield) 0623 29473.

KENWOOD TS130V plus AT130 or similar 10W Tcvr. Required for QRP/P use, must be VGC. Details to G4VZF, QTHR please. (Brentwood) 0277 354822.

KENWOOD TS930S in gd condx. Call Jan, G0IVZ. (Cornwall) 0579 62652.

KW "ONE SIXTY" Transmitter 1.8-2.1MHz KW Lowpass Filter. Evenings. (Mansfield, Notts) 0623 26154.

MK119 Rx, any condx. B2 Tx, any condx. Have Mk328 Rx, Hallicrafters Sky Champion. BC312 swop any of above for Mk119 Rx or B2 Tx. Any Mk119 or B2 bits welcome. G3JQL QTHR (Durham) 091 3861116.

MODULE FOR 1.6MHz repeater shift for FT780R. Produced by Amateur Electronics, Birmingham. G3ZJY, QTHR. (Milford on Sea) 0590 645872.

TRSVR, Gen/Cov, preferably simple to operate for Ham returning to hobby after a very long time. G3BSK. (Birmingham) 021 744 4671.

WANTED 12 VOLT HF Tcvr, must be in very gd condx. Prefer Trio, Kenwood TS140 or similar but WHY. Contact David, G0IBW, QTHR. (Guisborough) 0287 633816.

WANTED 30/35FT Tower, post mounted, pref 2 ele Jaybeam or similar H/D Rotator. Phone anytime Pete. (Lutterworth) 0455 557263.

EXCHANGE

INFORMATION by telephone bulletin board systems. No charges! Extensive choice of files for downloading. 'The Wizard BBS V42 BIS' (0704) 821420 (24 hrs). 'The Amateur Advert BBS' 051-524-3407 (10pm-8am). Both BBSs are located in the North West. G7EVY.

SOFTWARE for Atari STE4MB (Designer program, 4 million sprite catalogue, useful for PCB design, modern spriticated art etc. Also RTTY & Morse). Swap for Hi-gain colinear for 2M or 70cm, or FL7025 25W 790 Amp or phasing harness for 2M or 70cm aerials, or 2M/70cm preamps. Valued at about £100. Any split. Write Mr V McClure, 43 Roman Way, Seaton, Devon. 0297 23421.

DOBSONIAN 8inch Reflector Telescope, c/w two eyepieces. Exchange for HF equipment. G7PIR. (Birmingham) 021 628 9011.

EXCHANGE FT726R 2, 6, 70 plus Satellite Units fitted, excl condx. Plus Cash for TS790 Kenwood. Telephone evenings (Glos) 0594 544689.

TS430S, PS430, BW VS300A ATU, orig boxes. Want IC475E/H or IC575E/H, must be GWO, Prepared to negotiate. Mick, G1RMN, QTHR. (Eastbourne) 0323 504194.

CLUB NEWS

DEADLINE - Items for inclusion in the March 1994 issue must be sent to HQ marked "Club News - DIARY", to be received by 21 January 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

RSGB CITY OF BRISTOL GROUP - 31, Talk on Portishead Radio by Larry Bennet. Details 0272 672124.

SOUTH BRISTOL ARC - 5, CW night Activity; 12, Table Sale, bring & sell, % to Club funds; 19, Show off your QSL cards; 26, Computer shareware - how about sharing!. Details 0272 834282.

BEDFORDSHIRE

SHEFFORD & DARS - 6, Welcome back; 13, G8EMJ, Constructors Contest; 20, Activity night; 27, Charter Lea Motorcycles. Details 0462 700618.

BERKSHIRE

BRACKNELL ARC - 12, Annual General Meeting. Details 0344 420577.

NEWBURY & DARS - 26, VHF/UHF Contests by Ian, G3SEK. Details 0635 863310.

READING & DARC - 13, Planning the Year ahead; 27, The 1992 Mellish Reef Dxpedition, by John, G3WGV. Details 0734 476873.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 19, Annual Dinner; Feb 2, Foreign QSOs by Liz, G0ETU. Details 0296 81097.

CHESHAM & DARS - 5, 1994 Club Programme meeting; 12, Tech topic "PSU Repairs" with G8KBV; 19, HF Night on Air; 26, Hancock's Half hour!. Details 0494 676391.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 7, Video evening; 14, Shacklog Software Demo by Alan, G3PMR; 21, Operating & Morse Practice evening; 28, "Q" a talk by Tony, G0OEG. Details 0763 243570.

CLWYD

RHYL & DARC - Club meets every 1st and 3rd Monday of each month, WRVS Centre, 116 Vale Road, Rhyl at 8pm. Details 0745 351362.

CO DOWN

BANGOR & DARS - 7, Quiz night, Winston Hotel,Queens Parade; Feb 4, Constructional evening with Crawford, GI0EZD. Details 0247 883315.

CORNWALL

POLDHU ARC - Regular meetings, Tuesdays & Fridays 7.30pm. Visitors welcome. HF Net Wednesday 7.30pm, 3.75MHZ - GB2GM and GX0PZE. Details 0326 290638.

CUMBRIA

EDEN VALLEY RS - 27, Demo of Packet Radio. Bring and buy sale. Morse practice and construction evening. Club meets, odd months at BBC Club, Penrith. Details 07683 52106.

DERBYSHIRE

BUXTON RA - 11, Live Morse night; 25, Video night; Feb 8, Shack design. Details 0298 25506.

DERBY & DARS - 5, Surplus Sale. Details 0773 856904.

DEVON

APPLEDORE & DARC - 17, Talk on EMC by Les, G5HD. Details 0237 477301.

AXE VALE ARC - 7, Talk "Radio in Shanghai" by Graham, G0GTR. Details 0297 33756.

EXETER ARS - 10, Talk "Welding techniques" by Basil Bolt. Details 0392 214204.

EXMOUTH ARC - 5, Junk Sale; 19, Talk on Propagation by Stan, G3IEW. Details 0395 279574.

TORBAY ARS - 21, Construction night. Details Walt, G3HTX on 0803 526762.

DORSET

SOUTH DORSET RS - 4, Meeting. Club meets 1st Tuesday of every month. New members and visitors welcome. Details 0305 773860.

ESSEX

BRAINTREE & DARS - 3, Widgets 2. Details 0376 327431.

COLCHESTER RA - 13, Talk on UFOs and UFOlogy by G7OWC. Details 0206 764034.

LOUGHTON & DARS - 7, Word Processing by John, G1DJI; 21, Talk "WW2 Lancaster Bomber (Pt2)" by Tom Langley, G4PSY, provisional; Feb 4, Using Oscilloscopes by Jack, G3OPA. Details 081 508 3434.

VANGE ARS - 6, Junk Sale; 13, Guns by Bob, G3IUC; 20, Film "The catch nobody wants" by Roy, G3ASH. Details 0268 552606.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK RC - 18, Annual General Meeting. Details 081 749 9972.

BROMLEY & DARS - 18, Annual General Meeting. Details 081 777 0420.

CLIFTON ARS - 14, Computer evening; 28, How to Tune up Linears. Club meets at "Earl of Derby" Public House, Dennetts Road, Newcross, London every Friday. Details 081 859 7630.

COULSDON ATS - 10, Competitive Construction Evening. Details 081 684 0610.

CRYSTAL PALACE & DRC - 15, QRP (Low Power) Homebuilt Radio Equipment by Wayne, G0JJQ; Feb 19, AGM. Details 081 699 5732.

EDGWARE & DARS - 13, Annual General Meeting. Details 081 204 1868.

HOME COUNTIES ATV G - 25, Annual General Meeting, followed by the grand Junk Sale. Talk-in on 144.750MHz. Details 081 979 4432.

SURREY RCC - 3, "Oscillosocopes for Amateurs" by Phil, G0OHI and Peter, G3ZPB. Details 081 660 7517.

SUTTON & CHEAM RS - 20, Talk "Antenna Modelling" by Derek, G3GRO. Details 081 644 9945.

WIMBLEDON & DARS - 28, Backyard Antennas. Meets 2nd & last Friday of each month. Details 081 540 2180.

GREATER MANCHESTER

ECCLES & DARS - 4, Lecture "History of the Eccles Club" by G8VF; Feb 1, Discussion "Club stand at the Norbreck Rally". Details 061 773 7899.

SOUTH MANCHESTER RC - 7, Mini Lecture Contest; 14, Baluns by G0HAL; 21, Club BBS System explained; 28, tba. Details 061 969 1964.

TRAFFORD ARC - 6, Talk "HMS Bronnington G0TON" by Peter, G3XGE.: Feb 3, Introduction to TCP/IP by Terry, G0CRF. Details G0BHP, QTHR.

GWENT

PONTYPOOL & DARS - Hold monthly Novice Nights. Details GW0FJH 0495 762604.

GWYNEDD

DRAGON ARC - 3, Together to greet 1994; 17, Talk "Underwater exploration in the Menai Straits" by Cecil Jones; Feb 7, Talk "Noise Bridges and their Uses" by Stewart, GW0ETF. Details 0248 600963.

HAMPSHIRE

HORNDEAN & DARC - 6, A talk by Keith Ridley, Deputy Editor of the Portsmouth area local newspaper "The News"; Feb 3, Junk Sale. Details 0705 472846.

ITCHEN VALLEY ARC - 14, Talk "Radio Scout-

ing & Gilwell Park GB2GP" by Frank, G6OLK. Scouts welcome; 28, Talk "What Packet can do for You + DX Cluster system" by Chris, G4HCL. Details 0703 732997.

HEREFORD AND WORCESTER

BROMSGROVE & DARC - 14, A talk & slide show "St Kilda, Outer Hebrides, IOTA EU59".Visitors + XYL/YL invited. Details 0562 710010.

HEREFORD ARS - Club meets on first and third Friday of each month. Details G4MET, QTHR.

VALE OF EVESHAM RAC - 13, Annual General Meeting. New members welcome. Details 0386 41508.

HERTFORDSHIRE

CHESHUNT & DARC - 5, Natter Nite & Members Forum; 12, Amateur TV night by Adrian, G0OJY and John, G3WFM; 19, Natter nite; 26, Quiz Night with Alvin, G1VXD. Details 0992 464795.

DACORUM ATS - 18, Demonstration on Packet Radio by Ken, G3MSW. Details 0582 766973.

HODDESDON RC - 20, Talk "Have Fun with QRP" by Wayne, G0JJO. All visitors most welcome. Details 0992 633036.

STEVENAGE & DARS - 4, Welcome back, HF/VHF on Air, CW Practice with Frank, G4ISO; 11, Converting DB27 CB Ant to HF Mobile(10 through 20m) by Rob, G2BKZX; 18, Microphones - Mobile & Base by Simon, G0EVZ; 25, Video evening - N Texas Contest Club video "Big Beams, Big station to Win Contests, Texas Style. Details 0438 350882/724509.

HUMBERSIDE

BRIDLINGTON & DARS - ***New Venue*** The Ship Inn, Flamborough. Details 0262 671268.

GOOLE R & ES - 3, G0OLE "On Air" evening; 7, A Repeater report, hosted by Steve, G8VHL; 17, Video -Microwaves; 24, Talk by Andy, G8ZCS; 31, social evening. Details 0405 769130.

GRIMSBY ARS - 6, Organisation & team selection for AFS CW contest; 14, Christmas Dinner; 20, The designing and construction of an ATU, by G3RSD. Details 0472 825899.

NORTH FERRIBY ARS - 7, Night on Air; 14, Discussion by Ken, G4VKK; 21, Night on Air; 28, Aerial Forum, by Frank, G3YCC. Details 0482 650410.

KENT

EAST KENT RS - 6, Talk "Packet Radio" by G3EMU. Details 0227 364606.

HILDERSTONE RS - 14, Talk "The Novice Examination" by Martin, G0LGE; 28, Extras for 2m Station by Paul, G3DNR. Details 0843 869812.

MAIDSTONE YMCA ARS - 7, RAE class and CW; 11, Dummy Morse test; 14, Computer Usage (Packet/Satellites) instructional evening and CW as necessary; 28, Video "American Holiday", Nick, G4ZXI; 29, Club Dinner, details Alan, G0NCW. Details 0622 670936.

MEDWAY AR & TS - 7, The VIP Quiz by John, G6IVP; 21, Icom Amateur Radio. Details 0634 710023.

DOVER RC - 5, Novice evening; 12, Kanga Kits presentation, G0BPS; 19, Operating evening; 26, Tales from the repair department, G1HHU. Details 0304 852030.

LANCASHIRE

BURY RS - 11, Introduction to Packet Radio, by G3RTU; 18, RagChew & Operating; 25, RSGB Video. Details 0204 883212.

FYLDE ARS - 11, Annual General Meeting; 25, Informal. Details G7CUL, QTHR.

PRESTON ARS - 20, Annual General Meeting. Details 0772 686708.

LEICESTERSHIRE

CHARNWOOD ARCC - 2, New Year Club meeting; 16, Discussion "The Year to Come"; Feb 6, Antennas for 160m. Details 0509 232927.

LOUGHBOROUGH & DARC - 4, Open forum "Ideas" for 94; 11, Talk by G8AYG; 18, NOA + construction; 25, Video "Domestic scene". Details 0509 218259.

LINCOLNSHIRE

GRANTHAM RC - 4, Talk "Intruder Watch" by Dave, G4MQM; 18, Talk "Relief Missions in Africa" by Pat, G7KFW; Feb 1, Talk 'Sine waves, Decibels and falling off "logs"' by Mike, G3PJR. Details 0476 65743.

LOUTH & DARS - meet on 3rd Tuesday in month at The Wellington, Louth.. Details G1XWD, QTHR.

SPALDING & DARS - 14, Annual General Meeting. Details 0775 750382.

MERSEYSIDE

LIVERPOOL & DARS - 4, Quiz; 11, GX3AHD on the Air; 18, Experiences of a wartime Sparks by G3AVJ; 25, Surplus Sale; Feb 1, Discussion "Licencing interpretation. Details Ian, G4WWX, QTHR.

WIRRAL DARC - 12, Annual General Meeting; 26, Surplus Equipment & Junk Sale. Details 051 648 5892.

NORFOLK

ARC of FAKENHAM - 4, Talk "Microwaves" by John, G4BYV. Details 0485 528633.

KINGS LYNN ARC - Meets every Thursday, 7.30pm The Scout HQ, Chequers Lane, North Runcton. Details 0553 765614/841189.

NORFOLK ARC - 5, Quiz, chaired by Sheila, G0KWP; 12, Real radio evening; 19, Talk Operating Packet by Roger, G3LDI & Paul, G4VLS; 26, NOA. Details 0603 618810.

YARMOUTH RC- 6, informal; 13, Contest Plans for 1994. Details 0493 721173.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - 6, NoA; 13, Bring your gear night; 20, Talk "Waterproofing and terminating Coaxial cables"; 27, Construction night. Details 0602 501733.

MANSFIELD ARS - 10, Talk by Rob Mannion, G3XFD. Details 0623 755288.

SOUTH NOTTS ARC - 7, Annual General Meeting; 14, Construction (FC); 21, Amateur Fast Scan TV link Demonstration, with Nunsfield House ARC. (FC); 28, Construction(FC) (FC:- Fairham College). Details 0602 211069.

NORTH YORKSHIRE

HAMBLETON ARS - 13, Practical/Ops night; 20, RAE course; 27, Annual General Meeting. Details 0609 776608.

POWYS

POWYS ARC - 20, Annual General Meeting; 29/30, SES in aid of the County Air Ambulance. Details 0686 640611.

SHETLAND

LERWICK RC - 13, Film evening with Videos of DXpeditions and other Radio related topics. 7.30pm at Islesburgh Community Centre, Lerwick. Details Bob, GM4CAQ, QTHR.

SHROPSHIRE

SALOP ARS - 13, Emergency General Meeting; 27, Talk "RAF Airfields of Shropshire" by Flt Lt I M Pride, MBE(tbc). Details 0743 361935.

TELFORD & DARS - 5, Committee. Equipment availability; 12, Tuning Linears, by G8PAW; 19, VHF/UHF Contesting by G4UJS; 26, GB0AA Preparations. Details 0952 588878.

SOMERSET

WINCANTON ARC - 10, Talk 'Packet Radio' by G3CQE; 24, General Discussion, activation of club Stations. Details 0963 34360 or 0747 51381.

YEOVIL ARC - 6, Deviation Checks on H/helds by G3AIK; 13, Junk Sale & Bring and Buy; 20, 40m Converter for the Yeovil Rig by G3PCJ; 27, Club station on Air. Details 0258 473845.

SOUTH GLAMORGAN

CARDIFF RSGB G - 10, Talk "AR300" by Dave, GW3RWX. Details 0222 810368. (0446 773212.)

STAFFORDSHIRE

CANNOCK CHASE ARS - 6, Lecture "Heraldry" by JM Sanders, MBE; Feb 3, Lecture "Radio control of Model Aircraft" by John Duller. Details 0543 262495.

STRATHCLYDE

MILTON OF CAMPSIE ARS - Meets every 2nd Wednesday at Milton of Campsie Cummunity Hall, 7.30pm. New members and visitors invited. Details Alan, GM7PGT 041 799 1444.

SUFFOLK

SUDBURY & DRA - 4, Talk & demo "Computers" by Nigel, G0ORI; Feb 1, Talk "Measurements in the Shack" by Frank, G3FIJ. Club meets on 1st Tuesday at Wells Hall Old School, Gt Cornard and 3rd Tuesday at Five Bells Public House, Gt Cornard of the month. Details 0787 313212.

SURREY

DORKING & DRS - 25, Annual General Meeting, 7.30pm sharp. Details 0306 631236.

TAYSIDE

DUNDEE ARC - 4, Holiday; 11, Construction night; 18, Members Mini Lectures; 25, Construction night. Details from GM4FSB, QTHR.

TYNE & WEAR

TYNESIDE ARS - Wednesdays, 7.30pm at St Teresa's Club, 200 b Heaton Road. A new Morse Tuition Class will commence at the first meeting in January. Details from Stuart, G0BEV 091 281 0999.

WARWICKSHIRE

STRATFORD U AVON & DARS - 10, New Year Social; Tony Potter, G3ESK - "European Space Agency". Details 0608 682495.

WEST MIDLANDS

SOUTH BIRMINGHAM RS - 12, Talk/slides "Holes in the Ground" by Dudley Canal Trust. Visitors are welcome to attend most meetings. Details 021 474 3784.

SOLIHULL ARS - ***New Secretary*** Paul Gaskin, G8AYY, QTHR. Details 021 783 2996.(Nov 10th notified)

STOURBRIDGE & DARS - 3, On Air; 17, University of Wolverhampton, learning development unit by Mark, G7EDZ. Details 0384 374354.

WEST SUSSEX

HORSHAM ARC - 6, Talk 'Story of Wireless' by John, G0GNA. Details 0737 842150.

WORTHING & DARC - 5, "Surveying in Malta"; 12, "Reminiscing" by G5CO. Details 0903 753893.

WEST YORKSHIRE

DENBY DALE ARS - 5, Talk "Why you should make a Will & how to do it". by Ian, G6TSW; 19, Talk "The Novice Licence" by Paul, G0LVV; Feb 2, A Day in the life of the Wakefield Coroner, by David Hinchliff. Details 0484 429238.

HALIFAX & DARS - 18, Talk "H/B Test Equipment" by John, G3BBD. Details 0422 202306.

KEIGHLEY ARS - 6, Discussion night; 13, G0KRS & G7KRC Night on Air; 20, Discussion night; 27 Annual General Meeting. Details 0274 496222.

NORTH WAKEFIELD RC - **NEW VENUE** East Ardsley Cricket Club, East Ardsley, Nr Wakefield. 6, Natter night; 13, Annual General Meeting; 20, Talk "White Rose Rx" by John, G3TDZ; 25, Visit to Police Air Support Unit; 28, On Air night. Details 0924 362144.

WILTSHIRE

TROWBRIDGE & DARC - 5, First meeting 1994; 19, Annual General Meeting, 8pm Southwick V H. 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'.

23 JANUARY 1994

OLDHAM ARC Radio Rally - Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open 11am, 10.30 for disabled. Features many trader with a good variety of items for sale and a bring & buy. Refreshments available from 11.30am in the Failsworth Suite, on the balcony over looking the main hall. Morse Test available on application, bring two passport photos. Talk-in on S22 via GB4ORC starting at 7.30am. This year will features a Mobile Contact prize for operators on the way to the rally. Details from Kathy, G4ZEP, QTHR or Tel: 061 652 8617 home or 061 633 0550 work.

30 JANUARY

THE 4th LANCASTRIAN Rally - University of Lancaster, Lancaster. Doors open 11am, 10.30am for disabled visitors. Trade stands, bring & buy. Ample car parking and a car wash service is available, provided by the Scouts. Admission £1, children under 14 accompanied by an adult admitted free. Details from G1OHH on 0524 64239.

6 FEBRUARY

SOUTH ESSEX ARS Radio Rally - The Paddocks, Long Road, Canvey Island, Essex. (The Paddocks is located at the end of the A130.) Doors open 10am. Features trade stands, bring and buy and home made refreshments. Free parking with space outside main doors for disabled visitors. Talk-in on S22. Admission 75p. Details from Ken, G0BBN, 0268 755350.

13 FEBRUARY

BARRY MOBILE Rally - Barry Leisure Centre. Same venue as last year. Doors open 10am, 9.30 for disabled visitors. All usual facilities available. Details from Mike, GW8CMU, phone/FAX 0446 711426 or Mobile 0860 840647.

CAMBRIDGE & DARC Radio and Computer Rally - Addenbrookes Hospital Ambulance Station, Cambridge. (Easy access from M11 & A604 via ring road.) Doors open 10.30am, entry £1. Trade stands, bring & buy. Talk-in on S22. Bookings and details from George, G0OEL on 0954 719273.

NORTHERN CROSS RALLY - Rodillian School, on the A61 between Leeds and Wakefield, near junction M1/M62. Doors open 11am, 10.30 disabled and bring & buy. Usual trade stands, bring & buy. Morse Tests on demand, bring two passport-type photographs. Bar and refreshments, ample parking. Talk-in S22. Details Dave on 0532 827883.

20 FEBRUARY

RSGB VHF Convention - Sandown Park Exhibition Centre, Esher, Surrey. Comprehensive trade exhibition, specialist groups and a full lecture programme. Presentation of Trophies. Details from Geoff Stone, G3FZL, 081 699 6940. Stand bookings from Les Hawkyard, G5HD, 0409 281342.

TRAFFORD Rally - G-MEX Manchester. All usual traders and attractions. bring & buy and new traders. Refreshments and hot & cold food. Doors open at 10.30am for all classes, with a disabled persons priority queue. Talk-in on S22 via GB1GMX. Trade enquiries and details G1IJK on 061 748 9804.

26 FEBRUARY

9th RAINHAM Radio Rally - ***NEW VENUE*** Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent. (From M2, jun 4 take A278 or A2 from Rainham, well signposted, follow the RRR arrows). New venue more space, more traders, ample parking, bring & buy, refreshments and snack area with tables & chairs. All on one level, easy access for disabled. Admission £1, children under 16 free. Talk-in on S22 via GB4RRR. Further information from G7JBO 0634 365980 any reasonable time.

TYNESIDE ARS 8th Annual Rally - The Temple Park Centre, John Reid Road, South Shields. Accessable from the A1, A19 both north and south and A69 from west. Doors open 11am, 10.30 disabled visitors. Features the usual trade stands, bring & buy stall. Comprehensive catering and leisure facilities at the centre. Ample car parking. Talk in on S22. Details from Jack, G0DZG on 091 265 1718.

27 FEBRUARY

7th TAW & TORRIDGE Rally - Bideford Halls on the Quay, Bideford, North Devon. Doors open 10.30am. Features trade exhibitors, bring & buy stall. Refreshments available all day. Plenty of parking space. Details from Mike, G3PGA, QTHR.

12/13 MARCH

RSGB LONDON AR & Computer Show - Lee Valley Leisure Centre (Same venue - new name), Picketts Lock Lane, Edmonton, London, N9. Doors open 10am on both days. Disabled facilities. Large trade presence. Lectures, Special Interest Group sections. Plus a bring & buy stall. Talk-in on 2m and 70cm. Details 0923 893929.

13 MARCH

9th WYTHALL Radio Club Rally - Wythall Park, Silver Street, Wythall, (Near Birmingham, on the A435, just 2 miles from Jn 3 on the M42). Event occupies three hall and a marquee. Doors open 10.30am. Features the usual traders, bring and buy stall, run by the club. Refreshments available. Talk-in on S22. Admission £1. Details Chris, G0EYO on 021 430 7267.

20 MARCH

NORBRECK AR Electronics & Computing Exhibition - Norbreck Castle Exhibition Centre, Blackpool. Details G6CGF on 051 630 5790.

TIVERTON SOUTHWEST ARS Rally - Tiverton Pannier Market in the middle of Tiverton. Doors open 10am. Many trade stalls and a bring & buy stall. Talk-in S22 by G4TSW. Trader details from G6SMG 0884 257009.

27 MARCH

BOURNEMOUTH RS 7th Annual Sale - Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open 10am. Amateur radio and computer traders, Club and specialized groups. Refreshment available. Admission £1, including free raffle ticket. Talk-in on S22 via G1BRS. Details Ian, G2BDV, QTHR or 0202 886887.

MAGNUM Rally - Magnum Leisure Centre, Irvine, organised by Cunninghame & DARC. Details GM0DEQ 0563 40048.

PONTEFRACT & DISTRICT ARS Spring Rally and Components Fair - The Carleton Community Centre, Carleton, nr Pontefract. Details Colin, G0NQE 0977 677006

3 APRIL

LAUNCESTON 8th AR Rally - Details 0409 221624 or 0566 775167.

28th WHITE ROSE ARS Rally - Details G7ELS on 0850 690189.

4 APRIL

CENTRE OF ENGLAND Rally - Details 0952 598173.

10 APRIL

SWANSEA ARS Rally - Details 0792 404422.

16 APRIL

SPRING ALL MICRO Show - Details 0473 272002.

17 APRIL

BURY RS Radio Rally - Details 061 762 9308.

MARSKE-BY-THE-SEA Radio Rally - Details 0642 475671.

EVENTS DIARY

23/24 APRIL

IRISH R & T Society Dinner/AGM - Details Ken, EI4DW, QTHR or Tel: 074 31109.(UK 010 353 74 31109)

1 MAY

11th ANGLO-SCOTTISH Rally - Tait Hall, Kelso. Details GM4UFP, 0750 200006 after 6pm.

BRITISH AMATEUR TELEVISION CLUB (BATC) Rally. ***NEW VENUE*** The Sports Connextion, Leamington Road, Ryton-on-Dunsmore, Coventry. Details Tel: 0788 890365 or Fax 0788 891883.

2 MAY(MONDAY)

DARTMOOR Radio Rally - Yelverton, Devon. Details 0822 852586.

MID-CHESHIRE ARS Rally - Details G4XUV on 0606 77787.

8 MAY

MARS/DRAYTON Mobile Radio Rally - Details G6DRN on 021 443 1189.

10th YEOVIL QRP Convention - Details G3CQR, QTHR. Tel: 0935 813054.

29 MAY

EAST ANGLIAN Radio & Computer Rally (ESWR) - The Maidenhall Sports Centre, Ipswich, Suffolk. Details 0394 271257.

12 JUNE

The 25th ELVASTON CASTLE National Radio Rally - Elvaston Castle Country Park, nr Derby. Details Ken, G3OCA, 0332 662818. Trader enquiries to Keith, G1ZLQ, 0332 662896.

ROYAL NAVAL ARS Annual Mobile Rally - HMS Collingwood, Fareham. Details Clive, G3YTQ 0705 3327621(daytime) 0329 234143(eve).

19 JUNE

DENBY DALE & DARS Annual Mobile Rally - Details 0484 644827.

NEWBURY Boot Sale - Details on 0635 863310

26 JUNE

37th LONGLEAT Amateur Radio Rally - Prices to both visitors & trade will be frozen at 1993 levels.
Details Shaun, G8VPG on 0272 860422 (office hours), 0225 873098 (eve & weekends), FAX 0272 869387.

2/3 JULY

HAMFEST-UK - The County Showground, Weston Road, Stafford. Details 0923 893929.

9 JULY

CORNISH Rally - Details G0OOP on 0872 222605.

10 JULY

SUSSEX AR and Computer Fair - Details G8VEH, QTHR Tel: 0903 763978 or 0273 415654 office hours.

24 JULY

COLCHESTER Radio & Computer Rally - Details Frank, G3FIJ, QTHR 0206 851189.

28/31 JULY(THURSDAY-SUNDAY)

AMSAT-UK Colloquium - The University of Surrey, Guildford. Details from Ron, G3AAJ 081 989 6741.

7 AUGUST

RSGB WOBURN Rally - Details from Norman Miller, G3MVV, 0277 225563.

29 AUGUST(MONDAY)

SCARBOROUGH AR Electronics and Computer Fair - Details Ross, G4ZNZ, QTHR.

4 SEPTEMBER

BRISTOL Radio Rally (Incorporting Bristol Computer & Electronics Market) - Details G4YZR 0275 834282.

PRESTON Amateur Radio Society 26th Annual Rally - Details George 0772 718175 or Godfrey on 0772 253810.

TELFORD Radio Rally - Details 0743 249943.

VANGE Amateur Radio Society Rally - Details Doris 0268 552606.

11 SEPTEMBER

BARTG Rally - Details Peter, G8VXY 021 453 2676.

25 SEPTEMBER

THE THREE COUNTIES Rally - Details G4PQZ 0905 773181.

GB CALLS

The list below shows all special event stations licensed for operation during this month and up to 30 November. It was taken from the HQ computer on 28 September. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

5 DECEMBER

GB2NCL	North Carr Lightship
GB8NCL	North Carr Lightship

13 DECEMBER

GB5PGS	Paisley Grammar School

1 JANUARY

GB0CLI	Colne Lion International

3 JANUARY

GB2NCL	North Carr Lightship
GB8NCL	North Carr Lightship

27 JANUARY

GB5AA	Air Ambulance

28 JANUARY

GB0AAS	Air Ambulance Service
GB0CAA	County Air Ambulance
GB0FFL	Flight for Life
GB2CAA	County Air Ambulance
GB2FFL	Flight for Life
GB4CAA	County Air Ambulance

29 JANUARY

GB0AA	Air Ambulance
GB2AAS	Air Ambulance Service
GB4AA	Air Ambulance
GB4AAS	Air Ambulance Service
GB4FFL	Flight for Life
GB8AA	Air Ambulance

SILENT KEYS

WE HAVE BEEN advised of the deaths of the following radio amateurs:

F8TH	Mr M E J Halphern	19.10.93
G0DHF	Mr L Brewster	13.09.93
G0EBC	Mr C Rolls	25.10.93
G1HMH	Mr B Robshaw	17.05.93
G3ATU	Mr S A Herbert	29.09.93
G3BGK	Mr S E Sumner	09.08.93
G3CPP	Mr J Smith	26.03.93
G3FKP	Mr F Fell	11.10.93
G3IMP	Mr S Poole	30.09.93
G3MJF	Mr L Fielding	23.10.93
G3SQG	Mr A Deeley	22.10.93
G3UTF	Mr R Clarke	
G4EBJ	Mr J Hunter	12.09.93
G5ZH	Mr C W Plimmer	01.10.93
G6KD	Sqn Ldr K M Dunsford	13.04.93
G7GSA	Mr J Brown	20.10.93
G7MTN	Mr A H Hymas	28.09.93
G8OD	Mr D P Taylor	05.05.93
GM3CSM	Mr I Hamilton	11.10.93
W1TVN	Mr T Paterson	Sept 92

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	6EL2	(10dBd/boom 2.25m)
	3EL2	(7dBd/boom 0.8m)
	ACTIVE2	(5.5dBd/boom 0.4m)
	VDIP2	(*vert. fold. dipole*)
430-440MHz:	*19EL70*	(14.5dBd/boom 4m)
	13EL70	(13dBd/boom 2.5m)
	6EL70	(10dBd/boom 1m)
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RSGB – at Your Service

SOME OF THE RSGB'S TEAM OF VOLUNTEER EXPERTS — AVAILABLE TO HELP YOU

RSGB Policy Matters (Zonal Council member):

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, 4 The Serpentine, Kidderminster, Worcs DY11 6NX. Tel: 0562 862374.

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.

Zone G (Scotland):

Frank Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR. Tel: 0307 67565.

For general advice and details on local clubs, or if you don't know who to contact:-

Your RSGB Liaison Officer

AVON (Zone D) – D Collins, G4ZYF, 63 Church Road, Hanham, Bristol BS31 6TU.

BEDFORDSHIRE (Zone B) – Post vacant – refer to Zonal Council Member.

BERKSHIRE (Zone D) – Dave Chislett, G4XDU, Hilltops, 2a St Marks Road, Maidenhead, Berks SL6 6DA. Tel Home: 0628 25720; Work: 081 540 0600 ext 2086.

BORDERS (Zone G) – Ian Wilson, GM4UPX, 30 Howdenburn Court, Jedburgh, Roxburgh TD8 6JP. Tel 0835 62656.

BUCKINGHAMSHIRE (Zone D) – Ron Ray, G3NCL, Flat 4 Victoria Villas, Gladstone Road, Chesham, Bucks HP5 3AD. Tel 0494 776420.

CAMBRIDGESHIRE (Zone B) – Mr Michael Brooke, G8HXR, 70 Wooton Avenue, Old Fletton, Peterborough PE2 9EG. Tel 0733 340485.

CENTRAL (Zone G) – Brian Waddell, GM4XQJ, 'Carsemount', 3a Polmont Road, Laurieston, Falkirk FK2 9QQ.

CHESHIRE (Zone A) – Dave Glover, G1VJP, 216 Alder Street, Newton-le-Willows, Merseyside WA12 8HS. Tel 0925 225445.

RSGB Liaison Officers (A-N) and Honorary Officers

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*.

CLEVELAND (Zone A) – Chris Flanagan, G7NRO, 21 Pentland Ave, Billingham, Cleveland TS23 2PG. Tel: 0642 553345.

CLWYD (Zone E) – Peter Higgs, GW4IGF, Oulton, Parkside, Rossett, Wrexham, Clwyd LL12 0BP. Tel 0244 570212.

CORNWALL & ISLES OF SCILLY (Zone D) – Bert Hammett, G3VWK, 'Rosehill', Ladock, Truro TR2 4PQ. Tel 0726 882758.

CO ANTRIM (Zone F) – Belfast: Gordon Curry, GI6ATZ, 4 Rocklands, Annhilt, Hillsborough, Co Down BT26 6NU. Tel 0846 638896. Co antrim: Albert Henry, GI4CRL, 23 Long Common, Ballymena, Co Antrim BT42 2NU. Tel 026641068.

CO ARMAGH (Zone F) – Raymond Ashe, GI8RLE, 49 Deans Walk, Sleepy Valley, Richhill, Co Armagh BT61 9LD. Tel 0762 870423.

CO DOWN (Zone F) – North: see under Co Antrim, Belfast. South: see under Co Armagh.

CO DURHAM (Zone A) – Post vacant – refer to Zonal Council Member.

CO FERMANAGH (Zone F) – see under Co Armagh.

CO LONDONDERRY (Zone F) – Victor Mitchell, GI4ONL, 1 Myrtlefield Road, Londonderry, Northern Ireland BT47 1PG. Tel 0504 311019.

CO TYRONE (Zone F) – see under Co Londonderry.

CUMBRIA (Zone A) – Mike Gibbings, G3FDW, 5 Meadowbank Lane, Grange over Sands, Cumbria LA11 7AT. Tel 0539 532433.

DERBYSHIRE (Zone B) – refer to Zonal Council Member.

DEVON (Zone D) – Mr D Hinds, G3VNG, Greengates, 4 Thornyville Villas, Oreston, Plymstock, Plymouth PL9 7LA. Home Tel 0752 401511.

DORSET (Zone D) – Ken Powell, G1NCG, 27 Bingham Road, Verwood, Dorset BH31 6TU. Tel: 0202 820718. Can be sent packet messages via GB7BNM.

DUMFRIES & GALLOWAY (Zone G) – refer to Zonal Council Member.

DYFED (Zone E) – Martin Goodall, GW8ZMU, 91 Uzmaston Road, Haverfordwest, Dyfed SA61 1UA. Tel 0437 764009.

EAST SUSSEX (Zone C) – Post vacant – refer to Zonal Council Member.

ESSEX (Zone C) – Malcolm Salmon, G3XVV, 54 Church Road, Rivenhall, Witham, Essex CM8 3PH. Tel 0376 514377.

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GRAMPIAN (Zone G) – Mr Stewart Cooper, GM4AFF, Grytviken, South Cookney, Stonehaven, Kincardineshire AB3 2RX. Tel 0569 31182.

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GREATER MANCHESTER (Zone A) – See under Cheshire.

GUERNSEY & DEPENDENCIES (Zone D) – Brian Ayres, GU1HTY, Rousey, Bailiffs Cross Road, St Andrews, Guernsey, CI. Tel 0481 36104.

GWENT (Zone E) – Peter Dombrowski, GW1NYO, 30 Hillary Road, Newbridge, Newport, Gwent NP1 5DD. Tel 0495 246359.

GWYNEDD (Zone E) – North: Dewi Roberts, GW0ABL, 23 Lon Hedydd, Siglan Farm Estate, Llanfairpwll, Anglesey, Gwynedd LL61 5JY. Tel 0248 713647. South: Mr T P Vernalls, GW6IMS, 5 Min-y-Traeth, Minffordd, Penrhyndeudraeth, Gwynedd LL48 6EG. Tel 0766 770546.

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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, 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.

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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.

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MID GLAMORGAN (Zone E) – David Jones, GW1SQT, 'Beridale', 41 Penrhys Road, Ystrad, Rhondda, Mid Glamorgan CF41 7SJ. Tel 0443 435309.

NORFOLK (Zone C) – Post vacant – refer to Zonal Council Member.

NORTHAMPTONSHIRE (Zone B) – Mr D J Linnell, G0MJK, 19 Beech Avenue, Northampton NN3 2HE. Tel 0604 711647.

NORTHUMBERLAND (Zone A) – Post vacant – refer to Zonal Council Member.

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.

RSGB Liaison Officers (O-Z) will appear in next month's At Your Service.

Honorary Officers

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The LAST WORD

A REASONABLE JOB

Whilst I sympathise with J M Robson, GM3CFS (*The Last Word*, December 93) in that conditions do seem to be worse further north and that the propagation forecasts (along with most other facilities in this country) appear to be focused on the south, I personally feel that the forecasts are perfectly readable and understandable in their current format, particularly since the introduction of colour, and that they do a pretty reasonable job of a nigh impossible task.

All forecasts must, I suppose, be taken with a pinch (or skip-full) of salt, particularly when they are prepared so far in advance to meet publication deadlines. Perhaps those of us in Northern England should subtract 2 from each probability number published, and the GMs should subtract 4!

Dave White G0OIL

THE DX WAS THERE

Despite the electronic calculator, most of us can still count from one to ten. And insofar as we can tell left from right, high from low, etc, we have little difficulty in understanding the *RadCom* HF propagation predictions. To attempt to present such a vast amount of detail in 'plain English' would be a futile exercise. So please, no change!

HF prediction in low sunspot periods is a difficult task, but my log book for October doesn't seem to be at odds with the table. The DX openings were there, though the 'window of opportunity' for us QRP guys is often short.

David Evans G4YND

FROM THE CHAIRMAN

GM3CFS (*The Last Word*, December) is correct in saying that *to him* conditions on 10m have not been good during September and October and that the predictions published in *RadCom* do not reflect a true state of affairs. If he carefully checked the predictions against what he could work over any period throughout a solar cycle, they would invariably be optimistic, for the simple reason that he is in Thurso and the predictions are based on London.

As you go north the ionosphere is not ionised as much because the sun's rays are at a lower angle and have to cover a larger area. Thurso is generally colder than London for the same reason. There is also the problem of the magnetic field, the further north one goes, the nearer to the source of magnetic disturbance one gets. There is much more aurora and magnetic disturbance in the north of Scotland than in London, and every disturbance, even the weak ones, causes a deterioration particularly of the higher HF bands, lasting sometimes for many days.

These basic propagation principles apply regardless of what forecast system is used. If you look at solar cycles in enough detail you will notice that during the spot minimum period, which we are approaching now, there are more solar coronal holes than at other times, and each one causes an increase in magnetic disturbance in the higher latitudes. I can assure GM3CFS there is not much wrong with the forecasts as published if he learns how to use them *for his location*.

As for the forecasts predicting openings to the USA which he could not take part in, the 6/10 Club report for October shows that the 10m beacons were received from W1-4 and W8-9 with signal strengths up to S6. Agreed, the reliability is low, W1-4 being about 30% of the time from around midday to near midnight, but remember that many of these beacons run on low power. W8-9 beacons, being further north, have about the same signal strengths when heard but are not so reliable at only about 10% of the time.

As to having a forecast in English I presume you mean that words should be used instead of numbers for all 47 circuits and 8 bands, catering for all variations in equipment and regions. The present predictions style and layout has been arrived at by much painstaking experiment which was backed up by user surveys and is about the best that can be devised, *provided that people understand and use them correctly.*

All propagation predictions require the operator to have some basic knowledge of how to use them, and to get the best from them it requires some basic knowledge of propagation for the bands that are used. If I can persuade the editor to let us have some space to explain the matter in much greater detail and how to get the best out of the forecasts then that I feel would solve these problems. Meanwhile it would help if you could study the explanation of solar and propagation information in the *RSGB Call Book*, and the basic propagation chapter in the *Radio Communication Handbook*.

Charlie Newton G2FKZ
Chairman Propagation Studies Committee

THIRTIES THRILL

You can imagine my astonishment when I slipped the November *RadCom* out of its cover and saw the faces of two well-remembered friends of the 'thirties looking at me. Even more astonishing was the very clear picture of the receiver that I made in about 1936! I was thrilled to bits to see it occupying pride of place on the front cover. However, I felt at once that the date of that NFD was 1938 and not 1933 as stated in *RadCom*.

I was a member of that NFD expedition and I remember it well. We set up the station not far from New Mill quite high up on the side of the Holme Valley and we made use of an old derelict mill building for shelter. I still have a few of the old bits and pieces that went into that receiver including the Raymart BFO coil that can clearly be seen at the back of the receiver. However, we did not score very well and this was partly blamed on the shortcomings of my Rx but nobody took it very seriously.

I believe that Arnold Moss, G8VF, whose callsign I had temporarily forgotten, made the transmitter. As far as I have been able to find out he may be the only other member of that NFD expedition who is still alive and I have written to him to re-establish contact.

The phones, too, were mine and I still have them. Those worn by G2CP were made by BTH and those worn by G8GU were by Sterling. They both still work and I still use the BTH ones occasionally when I want some high-Z 'phones! I also have some receivers of the 'twenties and they work fine.

I am still home brewing and am active on all the HF bands using home-made QRP rigs. They are mostly solid-state but I find that I can still get better performance from valve PAs than from transistors. Old instincts die hard!

Ronald C Kaye G6RO

[One of the nicest things about using pictures from our archives is receiving this sort of letter. Thanks for correcting us on the year and for the useful background information – Ed]

CONGRATS AND THANKS

My sincere congratulations to David Evans, G3OUF, on his election to RSGB Council; I wish him every success during the course of his term in office.

I also wish to thank the 163 of my fellow amateurs who voted for me in this election and assure them, and all communications volunteers, that I shall continue to work for the promotion of amateur radio emergency communications whenever possible.

Derek Young G8ZQJ

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.

POST WAR *BULL*

Whilst reading some 1949 *RSGB Bulletins*, I found 'Month on the Air' very interesting. Both 5m and 6m were allocated in those days, but not 15m. Two metres AM was considered useful for G to Europe (compare present day FM usage). VK5KO, at 1920GMT, was being received in the UK on 80 Metres CW at signal strength S7-8 (almost incredible).

There was a recommendation that G stations should cease swopping QSL cards between themselves (unless they were absolute newcomers). Amateur radio licences had still not been restored in post-war Germany, other than to occupation forces.

There was anticipation of the clipping of 150kHz from the top end of the 7MHz band, effectively halving its width; but new freedom to use a certain previously forbidden segment in the middle of the 3.5 to 3.8MHz band. The introduction of 21MHz took place at the same time. But 300kHz was being clipped from the top of the so-called 30MHz band, or rather 30Mc/s, the former unit of measurement.

The Atlantic City Convention was the instigator of all these alterations which were, if the slaughter of Forty be ignored, beneficial on average.

L D Strange G3NYA

JOTA CONVERT

On 10 September 1993 my first Validation Document arrived from the RA, with my callsign, G7RBQ.

I was first introduced to amateur radio on a very cold, wet Friday evening in October a few years back. I had volunteered to help these people (who I didn't know) put an aerial on top of our Scout hut for something called Jamboree On The Air. I am pleased to say things have improved a lot since then; the hut has had new windows, heaters, roof and floor and we now operate at least twice a year for JOTA and Thinking Day On The Air from three stations with five antennas on most of the common bands.

This year will be my first year operating and I owe it all to these amateurs. Thank you John, G4OJS; Barrie, G4AHK; Phil, G1ZAD; Howard, G3NOY; Melanie; Alan; Daniel; Richard, G8ALO and The Scout National Communications Team, G7NCT.

I wish anyone who is currently studying for the RAE or NRAE the best of luck in their exam.

Peter Dodman G7RBQ

SLOW DOWN FOR LEARNERS

What a struggle it has been to learn my Morse Code, though I must admit I've had encouragement and help, and I've also done a lot of listening on the HF bands. But I finally did it on my fourth attempt at the Morse test, and I was so proud of myself and so thankful to all my friends who have stuck in there with me.

Well now you think it's time to sit back! But oh no! It's only just started! Now it's getting down to the CW seriously, listening as much as possible and getting the Q code and all those abbreviations weighed off!

It's to this end that I want to ask radio amateurs on the HF bands to spare a small thought for those people who are listening to CW in order to learn the Q codes and abbreviations, and trying to write it all down. And if possible please slow down a bit on your callsigns.

Yes, we do pick the slow Morse where we can, but even this can be a bit awkward, especially when no space is left in between the words or after punctuation. All this will make CW more enjoyable and you will find more joining you.

Len Willford G7KIJ

RADIO FUN

May I, through the columns of your magazine and on behalf of the children at Bridekirk Dovenby School, thank all those radio operators who took time to talk to our Special Event Radio Station, GB4BDS, organised in our school by Dennis Martin during the last week of November.

The children were delighted with the success of their project and really enjoyed talking with people all around the country. We put up a map of the British Isles in the classroom marking off all the places with which we made contact and then attaching QSL cards when they arrived. The children learnt a lot and had fun too. Many thanks

Mrs W K Dempster, Head Teacher, Bridekirk Dovenby School, Cumbria

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ADVERTISERS INDEX

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The display advertisement copy date for our March 1994 issue will be 10th January, 1994

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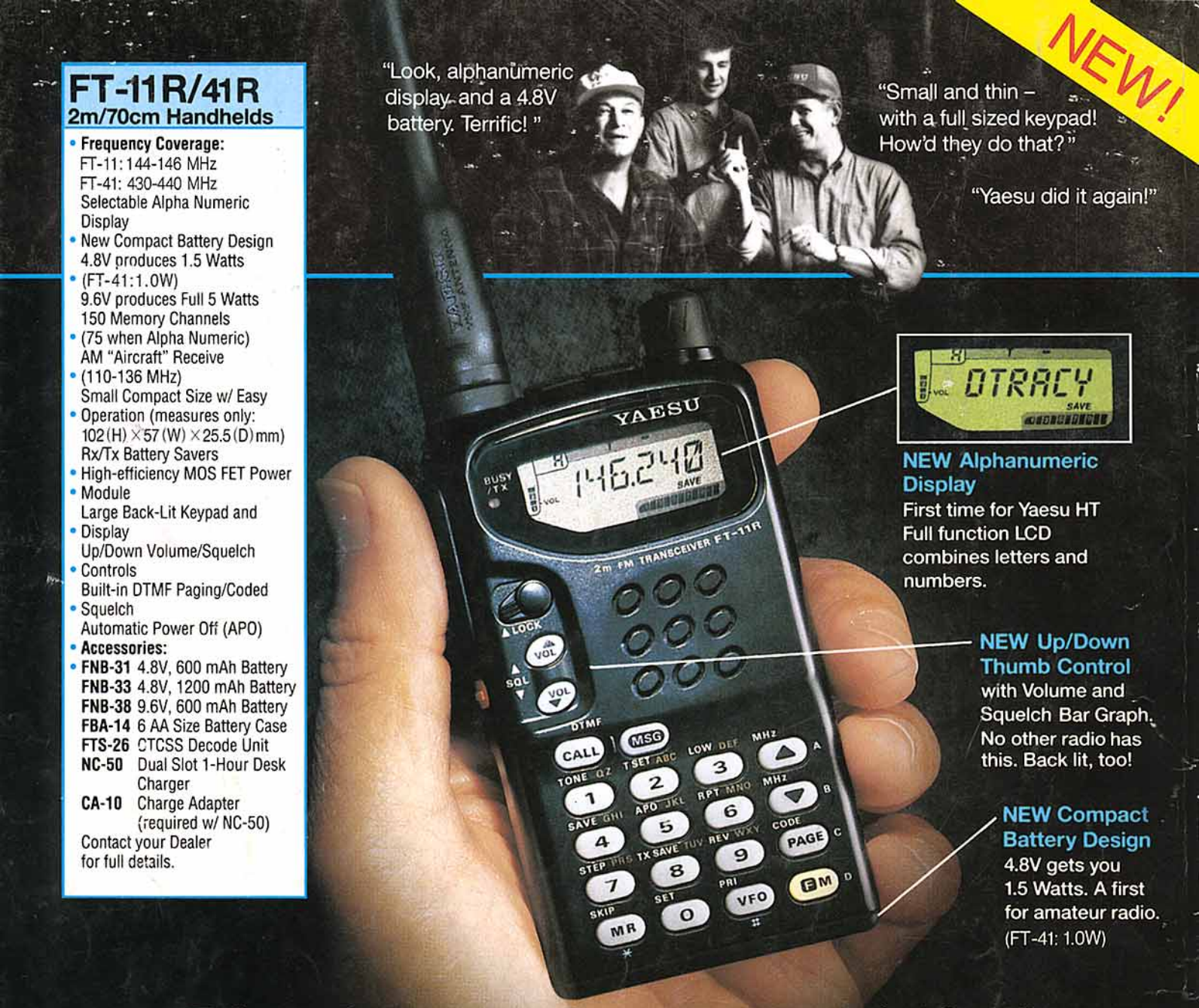

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NEW Up/Down Thumb Control
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