Radio Communication

The Journal of the Radio Society of Great Britain

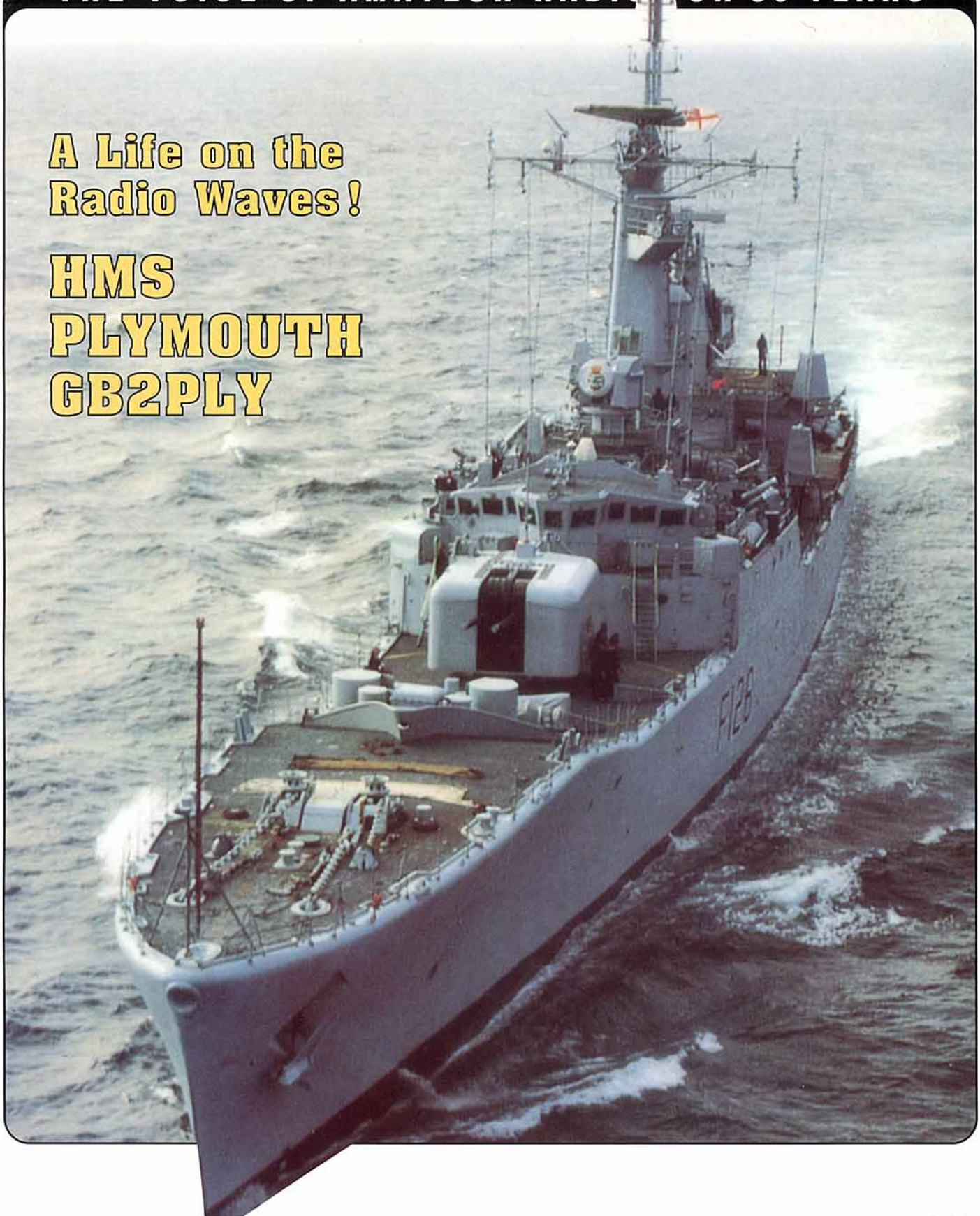
January 1993

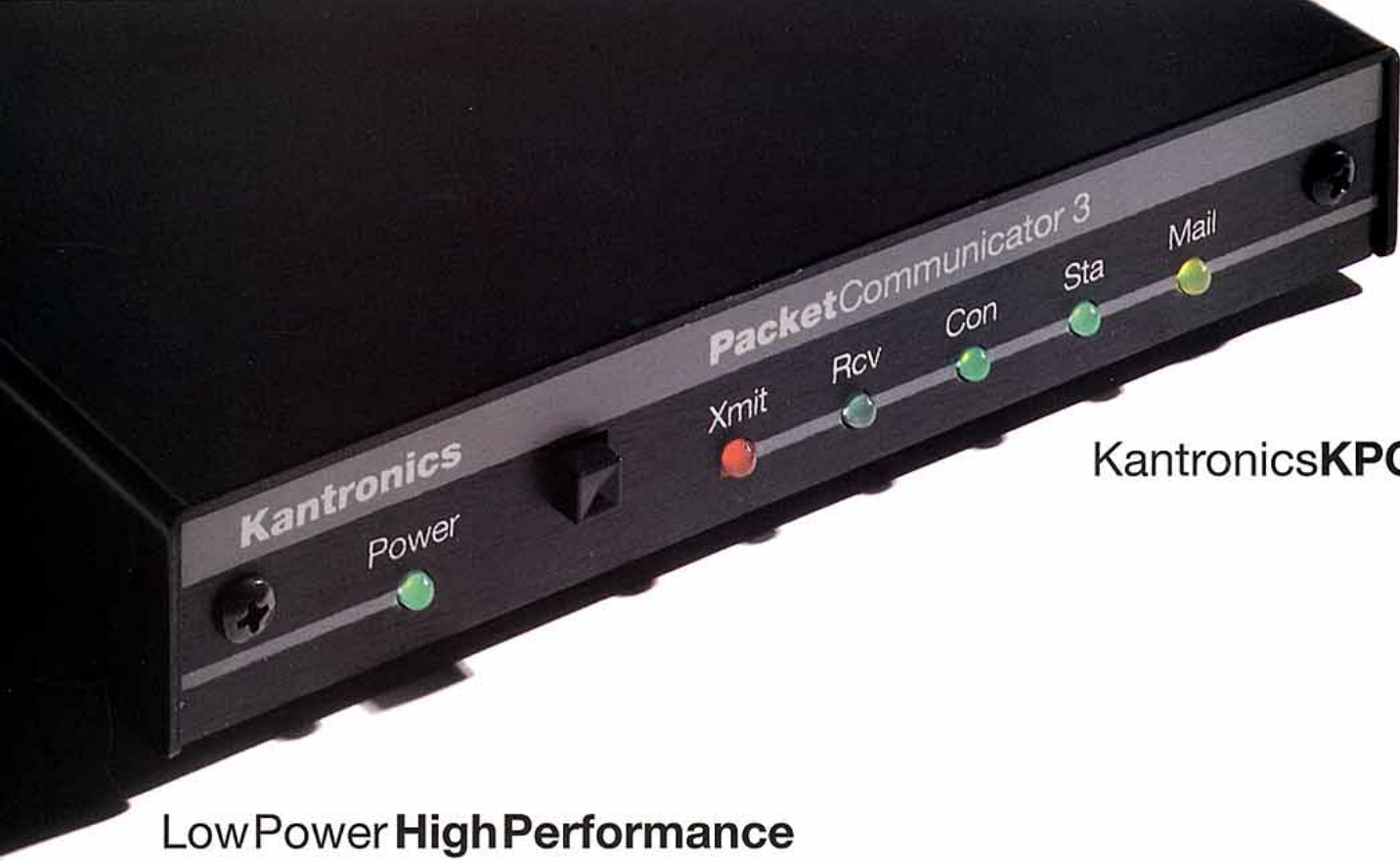
Volume 69 No 1

THE VOICE OF AMATEUR RADIO FOR 80 YEARS

A Life on the Radio Waves!

HMS PLYMOUTH GB2PLY





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Radio Communication

An even better *RadCom*: 1

To celebrate the RSGB's 80th Anniversary year, we have made your magazine even better:

- **New Column - Novice Notebook by Ian Keyser, G3ROO**
- **New Column - Book of the Month**
- **More Colour - By popular demand, the Propagation Predictions have been coloured up for ease of use.**

And there's many more goodies to come later in the year!

NEWS AND REPORTS

TECHNICAL FEATURES

COVER PICTURE:
Floating Museum, HMS Plymouth has an active amateur radio station, GB2PLY, at its Birkenhead berth. Full story: page 6.
PHOTOGRAPH: Maritime Books, Liskeard.

We forgot to credit last month's cover photos. They were by courtesy of British Telecom (main picture) and John Fogg of the Scouting Association (inset). Apologies to both.

REGULAR ARTICLES

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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Trophies manager: Bob Harrison, G4UJS
VHF manager: Dave Butler, G4ASR
Society historian: G R Jessop, G6JP
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Morse practice co-ordinator: Mike Thayne, G3GMS
Audio visual library co-ordinator: David Simmonds, G3JKB
QSL Bureau Liaison Officer: John Hall, G3KVA

Correspondence to honorary officers should be passed directly to them (QTHR), not to RSGB HQ.

ANNUAL SUBSCRIPTION RATES
Corporate Members: UK and Overseas (*Radio Communication* sent by surface post): **£30.00.** Airmail rates on request.
UK associate member under 18: £15.00. Family member: £12.00
Corporate (Concessionary): £25.00 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): £15.00 (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

Members Hotline and Book Orders:
0707-49855

The RadCom Leader

Optimistic for '93

THE FIRST RADCOM LEADER of 1993 comes hot on the heels of a very successful AGM. I was pleased to meet a number of members for the first time and it was rewarding for me to hear the kind comments regarding the efficiency and helpfulness of the HQ staff. These comments are supported by an increasing number of letters I am receiving along the same lines.

Compliments like these are always passed on to the staff and it's encouraging for us to know that we are seen through the eyes of the membership in such a positive manner.

It was announced at the meeting that subscriptions will be held at current levels for the rest of the financial year. It was also announced that for the first time the Society will be introducing Direct Debit. This method of paying your subscription has been talked about for a number of years; at last it has arrived. From March you will be able to spread your subscription payments over four quarterly instalments. Full details will be sent out with the January reminder letters.

What else is planned for 1993? *RadCom* will be continually improved. The Editorial team is working hard to provide you with more features and articles which will be introduced during the year. We expect to introduce new titles in our book range as well as providing you with the opportunity to purchase more marketable and attractive RSGB merchandise.

We are planning to attend more rallies and events up and down the country to give you the opportunity to meet us and get a fuller insight into the work of the Society. There will be another open day at Lambda House to enable members to come and see the large number of improvements we have made to the facilities over the last 12 months. And we will continue to strive to improve the administrative services provided by HQ.

These are positive statements for the New Year. I and my staff are full of optimism for the future of the Society, I hope you are too!

Peter Kirby
General Manager

RSGB Credit Card Update

THE INSERT IN OUR DECEMBER ISSUE attracted a flood of applications - and also queries from existing card holders.

For your information the card now carries an annual fee of £10, but it is available free for the first six months.

Those members who took out their cards before the fee was introduced will continue to benefit from their existing arrangements and can rest assured that changes in terms and conditions will be notified by Bank of Scotland at least one month in advance.

Prize Winners

- Club raising the most money:

Strumech Versatower

Stratford Upon Avon & District Radio Society, £357.40.

Datong Morse Tutor:

Flight Refuelling ARS & local RAIBC, £100.

- Individual raising the most money:

50MHz Transceiver - AKD

Hilary Claytonsmith, G4JKS, £360.

Microreader MKII - Enterprise Radio Applications

Mr A L Sammon, GI4PCY, £109.30.

- Club's most unusual effort:

2m Handheld - Waters & Stanton

Civil Service Amateur Radio Society for donating £1 for each ZA QSO made from the CSARS HQ station.

- Under 18 raising the most money:

70cm Kenpro Handheld - Nevada

David Dennison, (9) sponsored run (sole entrant).

- Individual most unusual effort:

2m/marine Yupiteru scanner - Martin Lynch

Amanda Baird, G0RZX - parachute jump raised £222.

HF ATU - Bredhurst Electronics

Mike Costello, G3YPP - London Marathon.

- Largest donation from outside the UK:

'Mini-pack' packet radio system - Siskin Electronics

Mr D J Walsh, EI5CD, £205.

Pump action Morse key - G4ZPY Paddle Keys

Mr DA Jelly, A45IJ (G4UQB), £60.

- Holiday Competition:

Weekend break - Victor Brand Associates

Mr C R Blackmore, G8FHN.

Rugby Time Clock - AMDAT

Mr J Russell, G0LVR.

Runners up:

In addition, prizes were awarded to the folowing for their efforts:

Mr BC Dupree, G4INB - *Dipole of Delight (Hately Antennas Limited).*

White Rose Rally - *2m Indoor Preamplifier (RN Electronics)*

Mr R Rylatt, G3VXJ - *Digital Thermometer (ICS Electronics).*

Keighley ARS - Choke Balun (Ferromagnetics).

How You Raised Over £4,500 for MENCAP

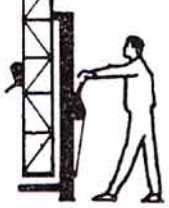
THE RSGB MENCAP Albania Appeal, launched last April, has raised more than £4,500 to help mentally handicapped people in Albania. The appeal generated some very generous responses: There was the housebound cancer sufferer who sent in a donation apologising that he was unable to arrange a sponsored event, the amateur who had given up smoking and donated the money saved, and the rally organisers who chose this appeal to benefit from their fund raising activities.

Several people lost pounds (lbs) to raise pounds (£) and look a lot better for it, and there were sponsored runs, sponsored ZA QSOs, sponsored contests and even a parachute jump! Headquarters staff raised over £850 through various activities (sponsored slims, swims, raffles, car boot sales, etc). Our advertisers were most generous in donating many prizes to attract funds for this worthy cause, and the prize winners are shown on this page. The major prizes will be presented at a ceremony early in 1993 at which the RSGB's cheque will be handed over to MENCAP.

A very big thank you to everyone who contributed towards this appeal - we know the money will be put to excellent use by MENCAP to help alleviate the misery of those unfortunate people in Albania. Thank you all, well done!

Hilary Claytonsmith, G4JKS, wins the AKD 50MHz transceiver by raising £360 for MENCAP.

Donating £1 for every ZA QSO wins the Civil Service ARS a 2m hand-held from Waters & Stanton.



The Strumech Versatower goes to the Stratford Upon Avon & District RS which raised nearly £360.

Council Election Result

THE VOTES cast in the election for the 1993-5 Council were as follows:

ORDINARY MEMBERS

G R Morris, GW1ATZ	695
T I Lundegard, G3GJW	*1352
J Bazley, G3HCT	*1355
F S G Rose, G2DRT	734
J Greenwell, G3AEZ	*1322

ZONAL MEMBER

P W Mayer, G0KKL	66
J N Gannaway, G3YGF	*215
Invalid votes	193

* Elected. A full list of the 1993 Council appears opposite.

RLO Correction

THE ADDRESS for the new RLO for South Yorkshire Alan Whitehead, G4JKW, is: Laburnum Cottage, 3 Darley Yard, Worsbrough Dale, Barnsley S70 4SB, and not as published last month. His telephone number was shown correctly: 0226 299031.

Licensing News

AT A meeting between the RSGB and the Radiocommunications Agency (RA) on 22 October, the following were discussed:

● Repeaters: Various aspects discussed including off-air remote close-down and the RSGB proposal for the frequency coordination and technical planning of the UK network. Strong concern was expressed at the large amount of time taken by the RA to process Site Clearance Forms for repeaters and beacons.

● Extending the Greetings Message facility.

● Microwave band-planning: As recommended by IARU Region I, the RA was notified of the UK microwave band-plans. The RA agreed to refer to band-plans on their Information Sheets but not in the Licence.

● Enhanced facilities for packet radio.

● Reciprocal licensing: The RA announced that TR61-01 had been amended to allow non-CEPT countries to participate in the 'instant reciprocal licence' scheme. It is important to note that this facility extends *only* to those countries listed on your Licence Validation Document.

● Single band 28MHz equipment: Deep concern was expressed at the RA's continuing restriction on this type of equipment.

● 432MHz band: The RSGB vigorously opposed the proposed use of a CEPT allocation to low power (10mW) remote control systems between 433.05 and 434.79MHz. The RA gave a positive assurance that they would defend the Amateur Service in the event of problems arising.

● The next regular meeting between the Society and the RA was scheduled for early 1993.

Changes at the RA

STEPHEN SPIVEY, who for two and a half years headed the department of the Radiocommunications Agency which deals with amateur radio, is moving to the DTI's Atomic Energy Division. His successor is Roger Louth.

SSL

THE SOCIETY has received many letters concerning Subscription Services Ltd who issue Amateur Radio and Amateur Radio (Novice) Licences. The contents have been passed to the RA.

Spectrum Review

THE RSGB submission to the RA's Third Radio Spectrum Review (concerning 28 to 470MHz; see *News and Reports*, Sep and Oct 92) was sent on 29 October. The submission involved considerable work by the VHF Committee and members of the HF and Licensing Advisory Committees. Members are thanked for their valuable input to these committees.

The presentation of a carefully constructed case in defence of amateur radio against pressures from other spectrum users is just the sort of job for which the RSGB was created, and for which members pay their subscription. Members can obtain a copy of the RSGB's formal submission by sending an A5 SASE to: RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Please mark the envelope 'Spectrum Review'. We will report on the outcome of the review just as soon as it is available.

Emergency Communications Officer

FOLLOWING THE disbanding of the RSGB Raynet Committee, the RSGB's emergency work was coordinated on a temporary basis by Membership Liaison Committee Chairman Clive Trotman, GW4YKL.

A permanent successor has now been appointed by RSGB Council.

He is John Irving, G4XJT, whose address is 5 The Thicket, Fareham, Hants PO16 8PX; tel/fax 0329 827051.

● STOLEN from Basingstoke in November, FT-209RH S/N 052972; FT-709R S/N 070909; FT-709R S/N 021491; Sony ICF2001D S/N 101907 and a Sony ICF-SW1 S/N 105702. Information to WDC Payne of Basingstoke Police on 0256 473111 x 157.

● STOLEN from a car in Cardiff last October, FT-270RH with voice synthesis (S/N 5D051186). Information to GW4SRO or to Fairwater Police Station, Cardiff.

● STOLEN from a car in Coventry in November, FT-470 (S/N 9G091005). Information to Coventry Police on 0203 539010.

Taizo Arakawa, JA3AER, visited RSGB HQ in July 92 with his wife JG3FAR. Taizo is General Manager of Sharp's Quality Control Centre at Wrexham. He obtained the call GW0RTA by passing the UK exam since there is no reciprocal licensing agreement between the UK and Japan. An enthusiastic supporter of the RSGB, Taizo writes for the Japanese *CQ Magazine* about amateur radio in Wales.

HMS Plymouth - GB2PLY

A PERMANENT special event callsign has been granted to the Royal Naval Amateur Radio Society for their station on *HMS Plymouth*. The ship (see this month's cover) is a 2,800 ton Rothsay Class Frigate built at Devonport in 1958. It is 113m long and has an armament of two 4.5in guns, a Seacat missile launcher, a Mk10 Mortar and a Wasp helicopter. The ship's company is 250 and its speed is 28 knots.

In May 1982, the *Plymouth* took the surrender of the Argentinian forces on South Georgia and led the Falklands fleet into San Carlos Water. It currently resides at East Float, Birkenhead, Merseyside and is open to the public as a floating museum run by the Warship Preservation Trust.

The RNARS station, GB2PLY, has both HF and VHF equipment and is on the air on phone and CW at least one day a week. Any RNARS member may join the Merseyside (HMS Plymouth) Group which also has the call G0SJW (seven jolly wrens!) for events off the ship. Further details can be obtained from Bill Cross, G0ELZ, QTHR.

Can You Help Relief Team?

IN MARCH 1991, a group of UK radio amateurs joined a team of volunteers providing relief work in Romania. Their help in providing communications between hospitals, orphanages and stores, and from the town of Turnu Severin to the UK, greatly contributed to the efficiency of the project. This was followed up by a return trip by some of the group in 1992.

As a result, more requests for help began to come through so a group 'Radio Amateur Relief Expeditions' was set up to coordinate things properly. The group is led by Dave Davies, GW0KWY and Don Sunderland, G6FHM, assisted by a retired Lt Colonel.

Current projects involve finding items requested by Turno Severin hospital and requests for radios to be used in hostels for the homeless in Bucareste. By the time you read this, the group will be travelling to Yugoslavia where they will be assisting with communications for relief convoys.

Radio amateurs are required with skills in the medical, engineering, teaching and construction fields, as well as HGV drivers. If you feel you can help, please send brief details of your experience and skills to Don Sunderland, G6FHM, QTHR.

● The Southend and District Radio Society has loaned an AR88 to the Essex Bosnian Refugee Group to enable them to listen to news from home.

At the AGM, Phil Mayer, G0KKL, complimented HQ Staff on their efficiency. More details next month.

South Pole Update

THE PENTLAND South Pole Expedition is progressing well despite 100 knot winds. In the first 23 days of the attempt to walk further than anyone else in the region, Sir Ranulph Fiennes and Dr Mike Stroud have travelled 242 miles towards the Pole, well ahead of schedule. Difficult conditions have been experienced, resulting in the loss of one day's walking due to winds at over 100 knots. The sleds are, of course, at their heaviest (420lb) during the early part of the walk.

Rescue

ONLY A WEEK into the trek, Ran had to come to the rescue when Mike fell down a deep crevasse on the Filchner Ice Shelf. Although Mike was safe, his sled was damaged and running repairs to the harness were necessary.

A spokesman for the expedition, which aims to raise £2 million for Multiple Sclerosis research, said "The going is particularly tough at this stage as the two men struggle to keep their footing on the upward trek through the ice channel. But they are in excellent spirits."

Radio

MORAG, VP8/GM0MUV, is now operational on the HF bands from her Antarctic base camp. Her husband, Lawrence, GM4DMA, has been in touch with the expedition direct from his Aberdeen QTH using a rhombic.

The Saltash and District ARC put on a 'history of radio' stand at the 'Getting the Message' exhibition in Saltash Guild Hall. Bert Lee, G7FTF (committee member), John Miller, G8SNP (Treasurer) and Geoff Marskey (Chairman) were on hand to answer visitors' questions.

RAE Course in Nottingham

A SHORT course will be run at the Arnold and Carlton College, Digby Ave, Nottingham, from 7 January, comprising 16 meetings on Thursdays, 1830 - 2115. The aim is passing the RAE in May. The course is intended for those with some basic knowledge of radio, such as Novices wishing to upgrade, or those requiring some revision. Details from Alan Lake, G4DVW, on 0602 382509.

Attention RAE Instructors

HAREC STANDS for Harmonised Amateur Radio Examination Certificate. It is a mechanism which enables a radio amateur to obtain a permanent licence in the countries which have implemented the CEPT agreement (see 1993 *RSGB Call Book*, p 71). At the moment the CEPT TR61-01 recommendation allows the issue of temporary reciprocal licences; a HAREC would take this a stage further and permit the issue of permanent licences.

It is necessary to make sure that all amateurs in Europe have passed an examination which covers the same basic areas of study. To ensure that this happens all syllabi have to be harmonised. To this end there has been an Addendum to the City and Guilds RAE (7650) syllabus as follows:

SECTION 5 TRANSMITTERS

5 TRANSMITTERS

Examination objectives.

5 The use of a valve as a power amplifier.

Syllabus.

5.5 Valves. Their application as RF power amplifiers, advantages and disadvantages.

Please note that the assessment specification remains the same (Section 5 Transmitters = 8 questions).

Novice Licence Review Meeting

THE LONG-awaited tripartite review meeting between the Radiocommunications Agency (RA), City and Guilds of London Institute (CGLI) and the RSGB took place on 3 November 1992. The subject was the Novice Licence scheme.

Preparations

A PREPARATORY meeting between the RSGB and the RA dealt with the following points:

2m allocation for Novices

The RA felt that denying Novices access to the 2m band provided the best incentive for them to upgrade to a full B licence.

Power levels

It was agreed that the levels would remain the same because it was too early in the scheme to review existing power levels.

Correspondence

Prior to the tripartite meeting the RSGB Training & Education Committee submitted a paper to the RA for their consideration. It contained recommendations, observations and a synopsis of comments submitted by RSGB Committees and Instructors. At the same time photocopies of all pertinent letters received by the RSGB were sent to the RA for information. In turn the RA provided a summary of their input received from interested parties. The C&G comments centred on fine tuning of the syllabus.

The meeting

THE RA FELT that, in general, the scheme had been a success with only minor modifications required. Mention was made of the high operating standards of Novices which shows the effectiveness of the practical element in the Novice Training Scheme.

Syllabus changes

Some minor modifications to the NRAE syllabus were agreed. These changes would be made effective from 1 April 1993. As the syllabus is not due for reprint until 1994 an addendum sheet would be produced to go out with the existing CGLI NRAE syllabus booklet. Instructors have been informed of the changes which mainly involve the tidying up of loose ends. A copy of the addendum sheet is available from City and Guilds, 46 Britannia Street, London WC1X 9RG; tel: 071 278 2468. The changes will also be incorporated into the RSGB Instructors Training Manual.

The Schedule

The RSGB proposed that the Novice frequencies be extended on 432MHz and 50MHz and that the QRP calling frequencies be included on some HF bands. At the time of going to press (early December) the changes to the Schedule were still to be confirmed. Novice RAE (773)

Novice RAE (773)

Several areas of concern were discussed including centre fees to candidates. The CGLI stressed that they have no jurisdiction over centres. The high cost of centre approvals meant that some radio clubs may have difficulties setting up as examination centres. The RSGB asked if some concession could be made for radio clubs and the CGLI agreed to look into this.

EXAMINATION	CANDIDATES	PASSES	PASS %
June 1991	185	153	82.7
September 1991	188	151	80.3
December 1991	256	196	76.6
March 1992	236	191	80.9
June 1992	369	271	73.4
September 1992	223	183	82.1(provisional)

NOVICE LICENCES (at 30/8/92)	Over 21 yrs	Under 21 yrs	Total
Class A	36	42	78
Class B	301	331	632

● THE RA HAS just informed us of two prosecutions of (un-named) radio amateurs at Sale Magistrates Court on 29 May 1992. They pleaded guilty to charges of using radio apparatus other than in accordance with a licence, and were conditionally discharged and ordered to pay costs of £1.12 each. All equipment was forfeited.

EMC and Your Licence

Licence Amendment

THE CONDITIONS of the Amateur Radio Licence (A) and (B) and the Amateur Radio (Novice) Licence (A) and (B) have been amended by the addition of a new paragraph. This paragraph, which has been introduced because of the European Commission EMC Directive, has been added to Note (l) of the Notes to Terms, Provisions and Limitations Booklets BR68 and BR68a/N. The version originally proposed by the RA was as follows:

"If an interference problem arises, this may indicate that the affected equipment has inadequate immunity. On the other hand, amateur transmissions are relatively high power and it may be appropriate for the amateur to modify his transmission practice to minimise a problem to neighbours. In considering whether affected equipment has a reasonable standard of immunity, regard will be had to the immunity standards imposed under Council Directive 89/336/EEC on electromagnetic compatibility. If the field strength of the transmissions at the affected equipment exceeds the level set out in the applicable harmonised standard, restrictions may be imposed on the licensee to reduce the field strength to that level."

This was studied by the RSGB EMC Committee which identified two main areas of concern. The first was that there was no mention of the fact that although 'CE' marked equipment will comply with the new European immunity standards, it may still suffer breakthrough due to inadequate installation or incorrect servicing. The second concerned field strength. Although the EMC Committee acknowledges that circumstances may arise when it is necessary for an amateur to reduce the field strength generated by his or her station, it was not considered acceptable that any such reduction should be down to the levels set out in the relevant European immunity standards. Although these new immunity standards mean that 'CE' marked equipment should have a moderate level of immunity, the level specified is relatively low compared to the field strengths which an amateur station may generate. The original paragraph did not mention the possibility of fitting filters or taking other steps to further improve the immunity of 'CE' marked equipment.

The EMC Committee produced an amended paragraph which was submitted to the RA together with several pages of technical commentary to support the proposed amendments. As a result of this submission, the RA put forward a revised version which accommodates the spirit of the EMC Committee suggestions. The final version is as follows:

"If an interference problem arises, this may indicate either that the affected equipment has inadequate immunity or has not been properly installed or maintained or that excessive field strengths are being generated. Each case needs to be considered on its merits, but regard will be had to the harmonised standards introduced for the purposes of Council Directive 89/336/EEC on Electromagnetic Compatibility. In order to solve the problem, it may be necessary, depending on the circumstances, to take reasonable steps to improve the immunity of the affected receiving installation, to modify transmission practice or to impose restrictions on the licensee."

New RA EMC Leaflet

IN SEPTEMBER 1992 the RA sent the RSGB a draft of an Information Sheet they proposed to issue on the subject of EMC and the Radio Amateur. This was studied by the EMC Committee. The changes the Committee suggested were in the main intended to give the leaflet a more pro-amateur tone, but in the final version it appears these were not adopted.

The draft information sheet did not mention amateurs taking steps to improve the immunity of an affected installation. However, at the same time the new proposed paragraph to be added to Note (l) of the Terms, Provisions and Limitations booklets, BR68 and BR68a/N, acknowledged that it may be necessary "to improve the immunity of the affected receiving installation". The RSGB felt that the information sheet should on this point be aligned with the new additional paragraph (see above). In the final leaflet, RA234, this suggested addition has been incorporated.

On the subject of field strength, the final version of the leaflet says . . . ."if poor immunity is not to blame and other steps to reduce interference have failed, the amateur may be required to take steps to stop the field strength exceeding the level that the relevant European standard requires the affected installation to be able to withstand". This is far more specific than the additional BR68 paragraph of the original draft of RA234.

If a case arose where this were to be applied, it could mean that, for example, an amateur would only be permitted to generate a field strength of, for example, 1.78V at a neighbour's TV installation. Assuming far field and free space conditions (something which doesn't exist in practice due to reflections and absorption) it can be calculated that at a distance of 10 metres this field strength can be generated by an effective radiated power of approximately 6.5W. This underlines the importance of amateurs being able to solve breakthrough problems by measures such as fitting filters and ferrites, etc.

All amateurs should make sure they can cope with any problem of interference which may arise. Perhaps buying and inwardly digesting the new "Radio Amateur's Guide to EMC" by Robin Page-Jones could be a start. Forewarned is forearmed.

Members may like to obtain a copy of RA 234, *EMC and the Radio Amateur*, free of charge by ringing 071 215 2072. Once you have read it, please write to the EMC Committee via RSGB HQ with any comments.

RSGB VHF/UHF Awards News

WIM, PE1AED, was one of two amateurs to reach the 100 confirmed squares level on 50MHz, the other being Andy, GD7JQI. Going one level better at 125 squares was G1SDO while Paul GW6VZW was the sixth to reach 200 squares confirmed on 50MHz. Applications for the 50MHz standard and senior transmitting awards are already coming in with Ela Martyr, G6HKM, claiming the first certificate for each category.

Another noteworthy achievement was the first ever RSGB VHF/UHF/Microwave award to a UK novice licensee, 11-year-old Alice Blackwell, 2E1AIZ, when she claimed the 1.3GHz distance award for her contact with LA8OJ. This contact, Alice's first non-G QSO, was over a distance of 720km which is particularly remarkable as she used just 1W to a single 23-element Tonna.

Three Supreme Awards have been issued: to Martin Hall, G8IEM; John Ridd, G8BQX and David Hilton-Jones, G4YTL. Listeners were represented by F11ATZ Michel Monteil who was issued the 50MHz 10 countries certificate.

Congratulations to all RSGB VHF/UHF award recipients who include:

50MHz: Standard Transmitting - G0FIG, G8BQX. Senior Transmitting - G8BQX, G8BFL. 10 countries (2-way) - G1MZD, G7ICV, G7EWG. 20c (2-w) - GD7JQI. 30c (2-w) - G8BQX, G3KPT. 40c (2-w) - G1SDO. 50c (2-w) - G0LCS, G5JJ. 60c (2-w) - GW6VZW. 80c (2-w) - G3VYF. DX 25c - G7GMD, GD7JQI. 25 squares - G1MZD, G6LAU.

70MHz: 30 squares/8 countries - G0EHV.

144MHz: 60 squares/15 countries - G0HZK. 100s/20c - G0FIG. 275s/35c - G4RGK. Std Transmitting - G0FIG, G7HCC, G0DLR, G4NPH, Snr Transmitting - G0FIG, GI4OWA, G0DLR.

432MHz: Snr Transmitting - G8IEM, G4YTL.

1296MHz: Std Transmitting - G8IEM.

Ian L Cornes, G4OUT, HF/UHF Awards Manager

Raynet Trade Mark

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The Professionals in Amateur Radio

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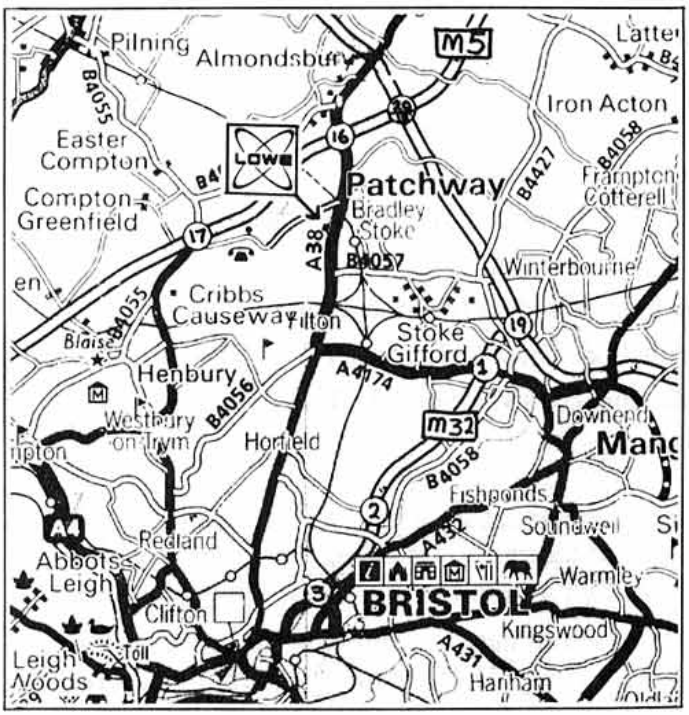
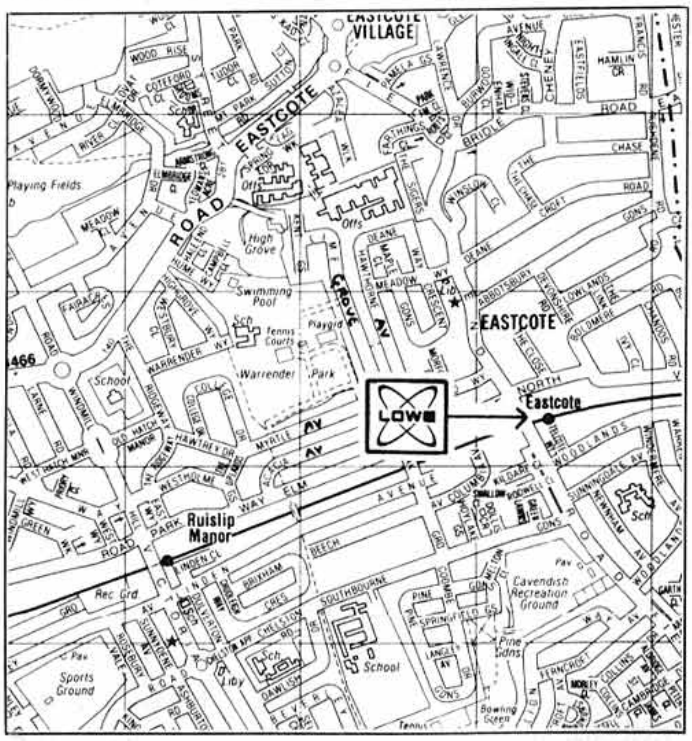


amateur radio equipment, shortwave receivers and scanners. More room for books, antennas, power meters, cable and connectors. More room for Icom, Yaesu, Alinco and anything else you feel we should be supplying.

We've made it very easy to find, just 600 yards from junction 16 of the M5, on the A38 towards Bristol, before Filton Airfield. We're on the right hand side and there is plenty of free parking behind the shop, with a private alleyway to the front. The close link to the M4 will also make life easier for Tony's visitors from South Wales and Wiltshire.

Our Eastcote branch takes on a new look this month to become our first One Stop Hobby Electronics and Communications Superstore !

This is in response to the terrific volume of requests we've received from customers wishing to buy electronic components and hardware, together with small tools like soldering irons, screwdrivers and cutters. Perhaps we can put the "amateur" back into amateur radio !! We'll also have a large variety of other domestic electrical items so it's the ideal place to take the whole family as they'll also have something to look at whilst you ponder over the latest HF rigs, VHF handies, or try out the new PACTOR mode on the KAM.



We're sure there is something for everyone in our new look London showroom and it's very conveniently located at Eascote Underground station, ideal if you use public transport to get around London or with plenty of free parking just outside if you don't !

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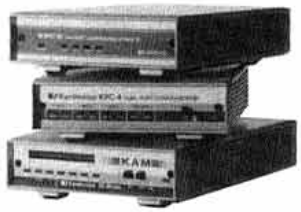

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Operate CW, RTTY, ASCII, FEC, ARQ, packet or copy NAVTEX on HF and packet on VHF (or UHF!) simultaneously. Toggle back and forth between any HF mode and packet for sending, while viewing monitored and connected packets and HF data at the same time.

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Hostmaster adds a new dimension to operating a true multimode TNC, providing split screen operation for RX & TX, menu display line, packet monitor window, separate packet connect window per channel, status display lines, transmit buffer per channel and is compatible with all Kantronics 5.0 firmware: KAM, KPCs and DataEngine 2.0

(*The KAM is ideal for swl's too. Your RX and computer is all you need and we have FAX software and alternative terminal programmes if you don't need Hostmaster's features.)

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When you buy any Kenwood transceiver from any Lowe shop you know your are buying the total peace of mind that can only come from Lowe's unique Kenwood experience and our exclusive two year warranty.

As a special introduction to our new warranty policy, we are offering a free Kenwood PS33 with every TS450 purchased from us during the month of January. This would normally cost £192.95 and represents fabulous value for money - another of our promises from last month - and our Happy New Year to you !

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Northbourne,
Bournemouth
BH10 6BW
Tel: 0202 577760

Dave G4KFN at
NEWCASTLE
Newcastle Airport,
Woolsington,
Newcastle Upon Tyne
NE20 9DF
Tel: 0661 860418

Tony G4CYE at
BRISTOL
79 /81 Gloucester Rd
Patchway
Bristol
BS12 5JQ
Tel: 0272 771770
NEW

Fred G4RJS at
LONDON
223/225 Field End
Road,
Eastcote,
Middlesex
HA5 1QZ
Tel: 081 429 3256

Tony G4NBS at
CAMBRIDGE
162 High Street,
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Cambridge
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Tom G4LAR at
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- Three power levels

ALINCO FROM LOWES

We've wanted to sell Alinco for a long time. We've watched the company grow over the last few years to become well established for innovation, quality and value for money. The two new handhelds we have featured this month are winners. The DJ580E has everything you would expect of a dualband handie and is complete with nicad and charger. A wide range of cases, speaker mics and batteries will increase its operational flexibility. The only thing it lacks is a high price tag !

The DJ180E is the newest 2m handie. I was really impressed with the elegant simplicity and ease of operation of this set but it still has scanning and memory functions for those who need them. At the price of this unit, why buy second hand ? By the way, if this looks too simple for you, it's possible to upgrade to full CTCSS, add a keypad with full DTMF, and upgrade to 200 memories. There's also extra batteries, cases, mobile bracket, speaker mics and wait 'till you see the drop-in charger that comes with it.

All this now with Lowe warranty and complete customer care.

BUTTERNUT FROM LOWE

Cushcraft make a super aerial called the R7. It covers 7, 10, 14, 18, 21, 24, & 28 MHzand it costs around £369.00. Butternut also make super aerials and they make a comparable model called the HF 9V. But here's the difference - The HF9V covers 3.5, 7, 10, 14, 18, 21, 24, 28 AND 50MHz ! What's more it will save you over £100 compared to the R7 ! We're not saying the R7 is a bad aerial (after all we also sell them !), we just thought you'd like a choice. More for less ??.....It could only happen at Lowes !!

AERIAL FARMING THE BUTTERNUT WAY

Part of the folklore of amateur radio handed down by the oldtimers is to start your antenna system small and then let it "grow" as the neighbours get used to it. Sound advice, but now its a possibility with Butternut's HF6V. It starts life as a six bander (80, 40, 30, 20, 15, & 10m - all the important ones !) You can then add a kit for 17 and 12m or maybe the 6m kit or combine both those with the topband add-on to give you a full ten bands. Start your antenna farm today. The HF6V is only £199.95 - a lot less than you thought !!

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Still our best selling dualband handheld ! With its unique message paging system and a host of other features it cannot be beaten. Now with Lowe's **TWO YEAR WARRANTY** and **FREE** Secret Function Manual.

HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham B17 8QB

THIS MONTH I have to record the sad news that top HF DXer and contester Al Slater, G3FXB, died suddenly on 11 November. He achieved top listing in the DXCC Honor Roll in 1975 and in 1988 was only the third amateur to be elected to the *CQ* Contest Hall of Fame. There was no major contest in which he had not achieved top honours and he specialised in the Society's Commonwealth Contest, winning the Thomas Trophy as leading UK station from 1973 onwards for 18 years. He also enjoyed great success in the *CQ* WW DX Contests. At the time of his death Al was Chairman of the First Class Operator's Club (FOC) and had been it's President and Treasurer. His on the air activity was legendary and he will be sadly missed.

Please note that the final 1992 WARC Band table will appear in February and a 1993 table will start in the March issue.

TOP BAND

HOW ABOUT making new friends to start 1993? Two correspondents who take a keen interest in DXing on 1.8MHz have written with a plea. They point out that the allocation in Japan only extends from 1.907.5 to 1.912MHz and they beg others to leave this minute segment clear whenever possible at the times when JA is workable. I must say that I find this band fascinating because some incredible DX is there for those who listen carefully and have patience - see some of the entries in *Band Reports*! G4DBN says "anyone can join the clique; all you need is a high resistance to sleep deprivation, no neighbours, no relatives, and a huge jar of coffee . . . ."

ISLANDS ON THE AIR AWARD

FOR THE *1993 Honour Roll and Annual Listing* please note that the last date for *mailing* updates or applications to the appropriate check points is 1 February 1993. The check point for UK stations is G4WFZ (QTHR).

CONTESTS

JAPAN INTERNATIONAL DX CW CONTEST

2200 8 January - 2200 10 January

1.8, 3.5, and 7MHz only. Only 30h operation allowed and off periods must be at least one hour and marked in log. Single operator single and multi-band and multi-operator multi-band and QRP (less than 5W) classes. Send RST plus *CQ* zone (UK is 14). QSOs count four points on 1.8MHz, two on 3.5MHz and one on 7MHz. The multiplier is the number of prefectures contacted (plus Minami Torishima, Ogasawara, and Okino-Torishima) - a maximum of 50 per band.

MIDWINTER CONTEST

0700 - 1900 9 January (CW)

0700 - 1900 10 January (Phone)

Single operator class only. YLs may contact anybody, OMs only YLs! Exchanges consist of RS or RST, country, and QSO number (starting at 001 for men and 2001 for ladies).

HUNGARIAN DX CW CONTEST

0000 - 2400 17 January

1.8 to 28MHz following IARU band plans. Exchange RST and serial QSO number. HAs will give a two letter code after the report indicating their county. HADXC members will give their club number and not the two letters.

AGCW STRAIGHT KEY PARTY

1600 - 1900 6 February

3.510-3.560MHz CW using straight keys only. Logs have to be sent before 28 February.

I can supply photocopies of the rules of any of the contests listed above (SASE please).

CQ WW 160 METRE DX CONTEST

2200 29 January - 1600 31 January (CW)

2200 26 February - 1600 28 February (SSB)

Single and multi-operator. Exchange RS/T and "prefix or country abbreviation". US and Canadian stations give state/province. QSOs with own country count two points, with own continent five, and elsewhere 10. Multipliers are *continental* US states (48), VE provinces (13) DXCC and WAE countries and each /MM station worked. *It is suggested that 1.830-1.835MHz is left clear for intercontinental contacts.* Computer logs may be submitted together with a clear printout. Those with more than 200 QSOs must send a 'dupe' list.

Mailing deadlines for logs are 28 February (CW) and 31 March 1993 (SSB). They go to David L.Thompson, K4JRB, 4166 Mill

BAND REPORTS

I have omitted 3.5, 7, and 18MHz from this month's tables because of the increased volume of reports on 1.8 and 28MHz - both of which seem to have produced a lot of interesting items. Thanks go to G2HKU, G3s GVV, KKJ, G4DJC, GJ4GG, GW4KGR, G4MUW, G4NXG/M, G4OBK, G0KDS, and the UK DX Packet Cluster courtesy of G4PDQ. Callsigns printed in italics are of stations using CW:

1.8MHz

0300	*FG5BG, NP4Z, 7Q7XX.*
0400	*PY0FF, 3DA/G3SXW.*
0600	*HF0POL, K0JGH, N8CC, PZ1EL, W9CMB.*
0700	*FK8KA, V47KP, ZL2JR.*
1700	*OH1AF/OJ0*, ZL2JR, 4J1FM.
2000	*VKs 3IO, 5KL, 4S7RO.*
2100	*JA4LXY, JH1RES, RV0AL, 4K2MAL, 5U7M, 6W6JX.*
2200	*FR5DX, JA3AAW, JA5CPI, TJ1GG, UA0YGI, VK6HD, VQ9QM, YB6AVE.*
2300	*RL0L, TF3AB, VY2SS, ZS6NW.*

10MHz

0000	*FG/OH2BGD, J68ZA, P4/K4PI, PY0/PP1CZ, ZD8LII, 7P6CW.*
0800	*FK8GJ, ZL3GQ.*
1600	*JW0E, RY0U, VR2/WX3N.*
1800	*TJ1GG, ZA1J, 3DA0/G3TXF, 7X2AB.*
2000	*FM/OH1MA, VK9WW, DK9FN/VR2, VQ9AC, VQ9AM, YB6AVE.*
2200	*TZ6VV, 3B8CF, 8R1RPN.*

14MHz

0700	FK8s CP, FB, *FS, GJ*, SV2ASP/A.
0800	KD7P/NH2, KH8/WB7RFA, ZK1HJ, 4J1FM.
0900	A35KB, KL7CMQ, P30ES, VP8VN.
1500	KC6WW, VK9WW, XU2UN, XU3UN.
1700	FR5AI/G, HS1HSJ, S21A, TZ6VV, V51GB.
1800	V73DO, VU7CVP, 5R8DF, 9ER1TA.
1900	A61AD, FK8CP, PY0F/PP1CZ, T30JH, ZL3ARK.
2000	ET3YL, *FS4PL*, HF0POL.
2100	CE0Y, FS/AI7B, VP8CLR.

21MHz

0700	BZ4RCQ, 3X0HNU.
0800	BV2CR, BY5RT, D2EL, JT1CS, V73DO, 4J1FW.
0900	A35KB, BY3AB, CE4LFO, VP8ON.
1000	BY5VZ, JU830C/6, KL7Y, XU2UN.
1200	HC0E, P40A, VQ9WM, VU7CVP.
1400	NH6U, S79KMB, VS6CT, ZS9A.
1600	HC8A, *HF0POL*, V31PW, 5X5MB.
1700	FR5ZN, TI9JJP, TL8NG, ZF8AA, 5R8GW.
1800	FS/AI7B, KL7RA, ZF2MD/8, *7Q7XX.*
2000	CE0Y.

24MHz

1000	*KL7Y, VR2/WX3N*, XX9MD, 9M2HB.
1300	*J5UAI, P4/K4PI.*
1400	C53GB, FY5FJ, TI9JJP, *VQ9RB*, 9Q5PL.
1500	XE1VIC, *3DA/G3SXW.*

28MHz

0800	A22MN, ET3BC, VS6GA.
0900	AA71CH, BY3CC, FK8FU, HS1BV, JU83OC, KD7P/KH6, VK, VQ9IO, XX9GD, 9V1ZE.
1000	BV2BT, KH0AS, VU7CVP, XX9AS, 6W6/WB2P, 9M8R.
1100	A71CH, EL1LL, HS1BV, VU2VMI, S79J, VK6.
1200	FG5FC, PY0TSN, XX9BG, 8Q7AA.
1300	D2EL, FR5AI/G, FR5ZN, 3B8FU, 6D2X.
1400	C9RJJ, HC1RJ, JY40CH, TZ6VV, 3DA0BP.
1600	HH2PK, PY0F/PP1CZ, VP5/KB2PDC, 9ER1TA.
1700	CE0Y, V29X, VP5S, VP8VN, W6-W7, 6D2X, 8R1PN.

QTH CORNER

FT4WD	via F6AXX, 72 Chemin de Bellevue, F-83500 La Seyne sur Mer, France.
KP5 expedition	QSL to N0TG, Box 891, DeSoto, TX 75123, USA.
P29DX	(new) PO Box 7416, Boroko, National Capital District, Papua New Guinea.
VP8GAY	via GM0LVI, Law Vista, High St, Errol, Perth, PH2 7QQ.
9ER1TA	via N4NX, 355 Westerhall Ct, Atlanta, GA 30328, USA.
9ER1TB	via K4PHE, 1510 Pine Creek Drive, Lawrenceville, GA 30243, USA.

WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G3WGV	**136**	162	119	417
G3KKJ	109	**165**	138	412
G4OBK	93	147	139	379
G2VJ	79	109	111	299
G3IAR	69	97	59	227
G3ING	62	89	42	193
G2AFV	69	72	42	183
G4MUW	-	63	42	105
G4NXG/M	-	68	29	97
G4XRV	92	-	-	92
GJ4GG	19	34	20	73
GM0KMJ	-	-	62	62
GW4RGT	13	21	16	50

Al Slater, G3FXB, (now, sadly, a silent key) receiving the Col Thomas Rose Bowl for being the leading UK station in the 1991 RSGB Commonwealth Contest.

Stone Court, Norcross, GA 30092, USA, indicating 'CW' or 'SSB' on the envelope. Sample log and summary sheets are available from *CQ Magazine*, 76 North Broadway, Hicksville, NY 11801, USA, in exchange for a large SAE and IRCs.

EA RTTY CONTEST 1993

1600 13 February - 1600 14 February

3.5 to 28MHz following IARU bandplans. Exchange RST and *CQ* zone. EAs will send their 'Prefijo Provincial' (there are 52 of these). One point for contacts on 14, 21, or 28MHz within own continent and two outside. Three and six points respectively on 3.5 and 7MHz. DXCC countries and Spanish provinces are the multipliers and count on each band. Total points times total multipliers is final score. Logs go to EA RTTY Contest Manager, Antonio Alcolado (EA1MV), PO Box 240, 09400 Aranda de Duero (Burgos), Spain, by 10 April.

DX NEWS

DX'PRESS reports that FR5AI/G on **Glorioso Is** operated near 28.020MHz around 1300 daily and that he also frequented 28.545MHz at 1200 and 14.256MHz at 1700 when he joined a net. By now he will have moved to **Tromelin Is** and should be FR5AI/T - possibly following the same operating pattern. FD1NOG is with the crew which arrived on **Crozet Is** in November. He will be FT4WD and operate CW and SSB. DF3ZJ is now 9X5AB in **Rwanda**. His call is a reissued one and he uses CW, SSB, and AMTOR on 14-28MHz. In late October 5X5WR/A - in **Uganda** became 5X5MB but QSOs with 5X5WR/A were not accepted for DXCC credit and perhaps the same will apply. However, contacts with 5X5WR in 1986 were accepted. The DXCC status of the recent activity by Carl and Martha Henderson from **Eritrea** as 9ER1TB and 9ER1TA is also unknown.

VE3BW will be in **Antigua** for most of January as V2/VE3BW. He will primarily use CW and will be in the *CQ*WW 160 Metre Contest. According to *The Long Island DX Bulletin* HH2PK will arrange schedules on 1.825MHz between 0100 and 0300.

W6REC is reported to be on the air from KC4AAF at McMurdo Base until the end of this month. Suggested places to look for him are 3.505, 7.005, 14.025, 14.180-14.190, 21.025, and 28.025MHz. VP8CGK, on **S Georgia** can be found near 14.050MHz on Saturdays between 1800 and 1900. VP8GAY, in **Antarctica**, can sometimes be found in the lower 15kHz of 28MHz from 1700, 21MHz from 1800, 14MHz from 0100, 7MHz from 0200-0400, 3.5MHz from 0400-0900. According to *The Long Island DX Bulletin* VP8CFM has said that the team which has just arrived at **S Orkney** contains a licensed YL radio operator.

JA4IDX/JD1 and JK1APB/JD1 should continue to be heard from **Minami Torishima** until the middle of the month. They have been found on 10.106 and 28.464MHz. YI1MH frequents 28.515MHz around 1430. Operator Majid was one of the original operators of YI1BGD.

VK6LA should by now have returned to **Cocos Keeling Is** and be on again as VK9CB for a short period.

JW5NM should continue to be on the air from **Svalbard** until next year.

A Bulletin from ARRL dated 20 October 1992 said that the ARRL DX Advisory Committee has voted *not* to pursue the following items: (1) changing the DXCC status of the former USSR republics, (2) consideration of a rule to permit operation from stations located on docked ships, (3) a study of an advanced DXCC award, and (4) changing the DXCC status of 4U1VIC.

EXPEDITIONS

DL1VU WAS scheduled to start his most recent Pacific trip in late November. He hopes to visit T32VU (E Kiribati), KH5/DL1VU (Palmyra), T31AF (Canton Is), T30CT (Tarawa), T33VU (Banaba), C21NI (Nauru), V63VU, KC6/DL1VU, and DU1/DL1VU, and finally V85 before returning to Europe. He will probably stay several weeks at each stop (depending on local transportation availability) and will mostly use CW on 1.825 - 1.835, 3.5 - 3.510, 7 - 7.100, 10.105, 14.027, 18.073, 21.027, 24.895, and 28.027MHz. He will usually listen one to five kHz *down*.

RSGB DX News Sheet reports that K9AJ has confirmed that a multinational team of ten (most probably including G4LJF) will be on the air with three stations on all bands/modes for seven days from **Baker & Howland Is** (KH1), starting around 25 January. The team is due to meet in Honolulu on 11 January and leave for E Kiribati on 19 January. It is possible that a two day operation from **Baker Is** might also take place. The team will return to Honolulu on 8 February via Tarawa.

The same source says that a frequent visitor to **Equatorial Guinea** is organising a multi-operator expedition there sometime during this month. I4ALU was expected to be on the **Maldive Is** from 28 December until 8 January using the callsign 8Q7BX in an all CW operation.

The expedition to **Desecheo Is** should take place between 28 December and 4 January. The operators will be AA4VK, KW2P, N0TG, WA4DAN, and W0RJU. They will be on all bands 1.8 to 28MHz using CW and SSB. Callsigns will possibly be individual calls/KP5.

AWARDS

PRINCIPALITY OF MONACO AWARD

This is offered by the Association des Radio Amateurs de Monaco to those who have confirmed working (or hearing) three stations in Monaco since 1 January 1980. Send list of QSLs - certified by two amateurs or a national society awards manager - plus 10 IRCs or US $6.00 to C Passet, 3A2LF, 7 rue de la Turbie, MC 98000 Monaco.

WORKED ALL SMALL EUROPEAN COUNTRIES

Also from ARAM this time for working/hearing (Class 1) all eight countries, and (Class 2) three plus Monaco. The countries are C3, HB0, LX, 9H, 1A0, 3A, T7, and HV. Apply as for the previous award.

VASTERAS RADIOKLUBB 50 YEAR AWARD

Celebrates the 50th anniversary of the Vasteras Radioklubb which was formed on 2 March 1943. fifty points are required and are acquired by contacting VRK members between 1 January and 30 April. Five points per day and band for each station - QSOs on 2 March count double and with SK5AA, SK5BB, and (during March) 7S5AA also double. Listeners may apply and the same points system operates. The award is free but contributions towards the postage would be appreciated. Send verified log extract no later than 31 May 1993 to VRK Award Manager, Box 213, S-721 06, Vasteras, Sweden. The club members are all SM5s and I can supply a list.

THIRD INTERNATIONAL RADIOSPORT GAMES

The Friendship Amateur Radio Society of Victoria, BC, says that it is organising these Games in Victoria from 24 to 27 June 1993. The first Games were held in Khabarovsk in 1989 and the second in Portland and Seaside Oregon in 1991. There will be CW sending and receiving competitions and a hidden transmitter hunt. A large commercial display area is being arranged and there will also be a flea market.

A special event station using the XO7 prefix will be on the air for four days and all visiting amateurs will be allowed to operate and receive a certificate. There will also be a Field Day station on on 26 and 27 June which visitors may operate. Participants are ex-

continued on page 19 ▶

NEVADA EVERYT

YAESU RADIO

Yaesu FT747GX – Still an unbelievable performer across the H.F. bands and one of the top 5 in budget H.F. Transceivers. Top Band to Ten, you won't be disappointed...**£P/X Special**

Yaesu FT-890 – Recent reviews answer all your questions. Based on a winning combination, available with or without auto A.T.U...**£Call**

Yaesu FT-530 – A Twin Band Handheld and a host of features including Dual In-Band RX, CTCSS DTMF all fitted. Wideband coverage plus optional speaker mic with LCD display. Guaranteed to be the next No. 1...**£Call now**

Yaesu FT-1000 – You will never want another H.F. Transceiver! The FT-1000 does it all. This has to be the ultimate word in H.F. communications. Full brochure available...**£Call**

FULL YAESU RANGE NOW IN – CALL FOR DETAILS

DRAKE

Drake R8E – Number one in the U.S. since 1943. Drake is known right across the globe for its technology and above all, reliability – remember the "B" line separates (mine are still going!). Wide frequency coverage, excellent dynamic range Superb filtering In fact it's simply the best shortwave clarity you'll find. Outperforming many other receivers costing much more. Whatever your interests – Drakes' R8E can handle it!!!

- Fully filtered with AMS as standard
- 99 programmable memories with Scan
- Computer control option
- I.F. Pass-band offset facility

£995

Options

R8E Matching Speaker	**£49.95**
VHF Conv. (35-54 & 108-174MHz)	**£195.00**
P.C Computer Drive Software	**£59.95**
Full Technical W/Shop Manual	**£29.95**

SCANNING RECEIVERS

YUPITERU MVT 7000 HANDHELD

- Receives 8 to 1300 MHz 100kHz-1300MHz (at reduced sensitivity)
- 200 Memory channels
- Rotary or keypad freq. control
- AM/FM/NFM
- Large display with strength meter

Each set is supplied complete with:-
Full set of high power NiCads, AC charger. DC power lead and carry strap **£319**

AR1500 HANDHELD
Covers 500kHz-1300MHz receiving NFM/WFM/AM and SSB.

Supplied with a large selection of accessories including:-

- Charger
- Dry Cell Battery Case
- Long Wire Antenna
- Ear Piece
- Soft Case..... **£299**

MVT-8000 – Mobile version of the 7000 c/w mains adaptor. Especially sensitive @ UHF. Recommended..... **£349.00**

VT225 – Worlds 1st Civil/Military Airband Handheld 108-142MHz Civil – 222-391MHz Military. 100 memories. AM/FM on VHF **£249.00**

VT125 UK – 30 memories with programmable steps of 25, 50 & 100kHz. 108-142MHz coverage. Each unit has a UK charger & NiCads..... **£169.00**

VT150 Marine – Covers 142-170MHz. 30 memories. Steps 10, 12.5, 5, 25kHz. Ideal marine band monitor c/w NiCads & charger **£169.00**

Fairmate HP2000 – Still one of the most popular handhelds on the market today. Continuous coverage from 500Kcs-1300MHz. AM/FM/WFM modes. 1000 memories **£279.00**

AR2800 – Desk top, all mode scanning receiver. 500kHz-600MHz and 800MHz-1300MHz. Fitted BFO for SSB reception, excellent results. Come and try one!!! **£P/X Special**

AR3000A – The latest in multimode scanners, offering continuous coverage from 100kHz-2036MHz. Modes:- USB/LSB/CW/AM/FM/WFM. Computer control available via ACEPAC-3 Software (for PC/Clones)..... **£865.00**

KENWOOD RADIO

Kenwood R-5000 – Tried and tested in all corners of the world. This receiver keeps going and going. 150kHz-30MHz. All mode with many options - what more could you want...**£P/X Special**

Kenwood TS450/690S – Two superb H.F Transceivers capable of delivering the "punch" when necessary. 100W O/P, optional Auto A.T.U. plus general coverage receive...**£P/X Special**

TH28/48/78E's – The family of 3 "designer-type" handhelds that feel comfortable in the hand whether Two Meters, 70 Cms (ideal novice band) or 2/70 Twin Bander is what you're after - take a serious look at the "TH" range...**£Call**

Kenwood TS850S – Another sure winner from Kenwood! Designed with the serious operator in mind and built to last ..... why not consider upgrading or part-exchanging your old TS830???...**£P/X Special**

NEW

SCANMASTER®

10 METRE RETRACTABLE MAST

Suitable for: Dipoles, Long Wires, VHF/UHF Beams, G5RV and many other antennas.

A new and inexpensive aluminium 10 metre retractable mast that may be used at home or for portable use. Easy to erect in minutes - your antennas can now be independant of trees, buildings and other make shift fixing points! The steel guying rings are corrosion protected to provide years of useful life. Because individual requirements vary guy wires are *not* included. A base fixing plate is available as an extra.

Introductory Price £69 Plus £8 Carriage

NEW FROM YAESU THIS WINTER

FRG-100 H.F. RECEIVER

Call now and be one of the first to own this brand new general coverage receiver. Don't forget our generous part-exchange schemes. Call the Hotline for immediate response..... **£475**

SCANNING ANTENNAS

Nevada Scanmaster – (500kHz - 1500MHz). New high quality wideband receiving antenna uses fibre glass/stainless steel with 4 small radials. "N" type connector. Length 1.1 metres..... **£39.95**

THIS MONTH'S SPECIAL OFFER

NEVADA
MS1000 BASE/MOBILE SCANNER

MOBILE VERSION OF THE HP2000 HANDHELD BUT WITH SEVERAL ADDITIONS:-

- ★Switchable audio squelch
- ★Tape recorder output socket
- ★Automatic - signal operated tape recorder switching
- ★All metal case for improved EMC compatibility
- ★Receives:- 500kHz - 600MHz, 805 - 1300MHz. Supplied with mains power supply.

SAVE £50

£229

SEND IN £2 FOR OUR NEW 72 PAGE COLOUR CATALOGUE (INCLUDES A £2 VOUCHER)

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USE YOUR CREDIT CARDS FOR SAME DAY DESPATCH

HING FOR THE RADIO ENTHUSIAST

HUGE STOCKS - FAST DELIVERY - PERSONAL SERVICE

NEVADA COMMUNICATIONS, 189 LONDON ROAD, PORTSMOUTH PO2 9AE
TELEPHONE HOTLINE: (0705) 662145 FAX: (0705) 690626

ICOM

Icom IC-728 – If you like Icom, you'll like the 728 HF Transceiver. As expected, built to a high standard. Full coverage, 100W o/p, many accessories ..... **£Under 1000**

Icom IC-735 – This is more than just another transceiver - well designed & stylish in looks with an enviable performance. All the usual features and still ..... **£Under 1100**

Icom W2E – Twin Band handie - with all the necessary features we have all come to expect. So neat & compact it leaves you wondering "how do they get it all in"! ..... **£Mid 400's**

Icom R-100 – The mobile monitoring station. 500kHz to 1.8GHz. What more is out there? 100 mems, AM, FM & WFM modes ..... **£Call**

Icom R-7100 – An affordable - professional grade receiver. Hosting 25-2000MHz coverage & a whole 900 memories to play with! Full colour brochure available ..... **£Try our P/X scheme**

Icom R-72 – Lets not forget all the S.W.L's - Icom haven't with this general coverage H.F receiver 100kHz-30MHz. All mode (FM optional) with 99 mems for favourite frequencies ..... **£Call**

Icom R-1 – Icom's most popular pocket sized wideband receiver. 150kHz- 1300MHz. AM/FM/WFM modes. 100 programmable memories ..... **£P/X Special.**

EARTALKER

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 handheld (Call for details on your particular model). Separate volume, PTT switch and control box **£39**

MICRO-READER

ERA Microreader – Data Communications decoder - decodes RTTY, CW, AMTOR (A) & SITOR (B). 16 character LCD display needing only connection to receiver extension speaker socket. Shortly to become available will be the large 4-line LCD display with built-in parallel printer driver port. Variable in-built morse tutor. (Call and reserve your optional display now) **£169.00**

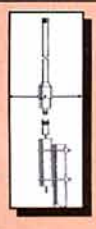
SCANNING ACCESSORIES

JIM PSU101 MK IV – A combined desk stand and power supply/charger for handheld scanners. Suitable for most popular models. Special versions now available. Please call now for details **£29.50**

JIM BHA3 – Desktop stand for handheld scanners **£9.95**

JIM CHA4 – Mobile holder for handheld scanners in the car **£6.95**

WB1300 Discone – (25-1300MHz) Stainless steel top of the range "N" type connector. Complete with short mounting pole and clamps. 8 elements with vertical whip. This months' special ... **£49.95**



Micro-Scan – (180-1300MHz). New low cost budget ground plane antenna **£12**

Skyband – (25-1300MHz). Our most popular stainless steel economy wideband discone. Recommended. Bargain Price ONLY **£24**

SONY ACTIVE ANTENNAS

AN1 – An external active antenna with built-in pre-amp, covers 150kHz-30MHz. Fully portable with easy to mount fixing brackets .. **£57.95**

AN3 – Active antenna for Aircraft and VHF reception, suitable for Sony Air 7 plus many others **£54.00**

ALINCO & STANDARD

Alinco DJ-580 – Fast becoming the top selling Twin Band handheld here in the U.K. Complete with all "mod-cons" including AM Airband RX. Comes ready to go just plug-in and charge - the perfect way to operate 2M & 70 Cms **£389**

Alinco DJ-F1E – Don't take my word for it but my customers agree that this is the perfect companion when considering a 2M handheld. Full coverage and again offered with Airband receive **£259**

Alinco DR-599E – Replacing the 590E - This little unit has an impressive 50W on each band, automatic remote repeater function (ideal raynet exercises) and a host of extra facilities including ext.RX. Full colour brochure available - call us now! **£589**

Standard C528 – This Twinband handheld is the model the others were based on! Still a popular choice with many features including remote cloning and repeater talk-thru! **£365**

Standard C588 – The very latest from the "Standard sets" in twin band handhelds. DTMF, CTCSS, Crossband Rep, Paging, AM RX and even a 200 channel memory option. A handheld & scanner rolled into one. ..... **£Call**

LOW LOSS CABLE

Japanese FB (Fine business) Cable! Superb low loss cable - essential for optimum performance with wideband UHF Transceivers and Receivers. Tough weather resistant yet still remaining flexible. This range of cable is good for frequencies up to 3GHz.

Model 5D (8.1mm) ..... **£0.56 p/mtr**
Model 8D (11.1mm) ..... **£1.40 p/mtr**
Model 10D (13.1mm) ..... **£1.99 p/mtr**

"N" type connectors for the above cable **£3.36**
(10D "N" type ..... **£4.45**)

Shortly available BNC's and PL259's to fit the FB Cable.

KENPRO RADIO

KT-44 – 70 cms handheld. Thumb wheel frequency control. Full 10MHz! Ideal novice or repeater user. c/w NiCad, beltclip & charger **£159.00**

KT-22 – Popular 2M version of the KT-44 with simple NO FUSS operation. Ideal standby handheld or for use on Packet **£149.00**

KT-220 – A 2M handheld with direct keypad entry and LCD display. 10 memories & CTCSS fitted. Ext 12V DC socket. Up to 5 watts output SPECIAL **£169.95**

NEW HAND-HELDS

ALAN CT-145 – Fully featured 2M handheld with options for DTMF & CTCSS Paging. 5 watts output is available when powered from external 12V DC supply. Now with extended receive - 130-169MHz. Excellent reliability & performance **£165.00**

ALAN CT-450 – 70 cms version of the CT-145. This model will be a proven winner amongst the new novices and seasoned users alike. Full 10MHz coverage, 430-440MHz. 5 watts available when powered via 12V DC. This model comes highly recommended! **£175**

SONY SHORTWAVE

As a Sony Shortwave centre, we stock a complete range of Sony Shortwave product. Here is a selection of our best sellers:-

SW77 – One of the best new editions to the Sony range. The SW77 covers 150kHz-30MHz plus an additional 76-108MHz. With a rotary tuning dial, 125 scan memories, the reception of AM/FM/USB/LSB and CW modes is a breeze. Fitted tape record facility finishes this superb all round receiver. ..... **£Call**

SW1E – Pocket Shortwave plus VHF Commercial radio. Each unit is supplied with headphones, case and shortwave guide. This model will not hurt your pocket **£149**

SW7600 – One of Sony's most popular VHF and Shortwave medium sized receivers. Frequency coverage:- 76-108MHz FM, 150kHz-30MHz Shortwave, on AM/FM/SSB. Well rated ..... **£Call**

NEW PORTABLE SONY SW55 – Technically the best that Sony have come up with yet! Stable enough for fax reception, yet easy enough to tune on SSB. A dual conversion receiver produces excellent results on all the bands - the SW55 is a real winner.

- 150kHz - 30MHz, 76-108MHz, all mode inc. SSB.
- 125 multi-function memories inc. world time clock/alarm.
- 4 way digital inc. scan/manual/direct access ..... **£P/X Special**

NEW VECTRONICS AMP

Vector 500. "Canadian Punch!" A full 1000 Watts PEP on SSB enables you to beat the pile-ups. Now available here in the U.K. Top band to 10 from only 60-80 Watts input. Call now for your brochure!

- 4x811A Low Cost Tubes
- 600W C.W. 1000W PEP
- Compact 24lb weight

£865

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.

Marc II Hipster receiver 150kHz-520MHz. All boxed. v.g.c. .. **£175**
Yaesu FRG7 Good old faithful receiver. Now sought after model **£175**
Realistic Pro-37 300 Ch Handheld Scanner. As new **£175**
Regency 7000 Base/Mobile Scanner. Very sensitive receive **£195**
Yupiteru VT125Mk II Excellant Airband RX. 30mems + search **£95**
AOR 3000A Simply the best money can buy! V.V.G.C **£725**
Icom R71E SW RX. c/w remote control option. Boxed **£650**
Revex Station Monitor **£199**
Trio TR2200G 2 metre rock bound portable TX/RX **£75**
Trio AT230 Matching Kenwood/Trio ATU **£155**
Yaesu FT200 Good old faithful TX/RX. Immaculate condition **£285**
Yaesu FRG7700 Complete with active antenna and ATU **£425**
Yaesu CPU2500 2 metre FM Mobile TX/RX c/w matching PSU **£245**
JRC 135 Superb H.F. TX/RX. Gen coverage Receive. V.G.C **£675**
M/M 2 metre transverter **£150**
Drae Slow Scan TV unit with manuals **£195**
Nevada TM1000 ATU. Very Good Condition.. Bargain! **£99**
Kenwood TS930S Considered by some the best H.F. TX/RX **£1095**
Kenwood TL922 2kW PEP H.F. Amplifier. Good condition **£995**

THIS MONTH'S SPECIAL P/X DEAL
Get the very latest in H.F. transceivers by part-exchanging any of the following:- TS830S, TS430S, TS440S, FT707, FT107, FT7, FT7B, FT77, TS130S or any other models from that era!

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

VECTRONICS

Vectronics – Canadian based - producing High Quality affordable Amateur accessories including:-

ANTENNA TUNING UNITS
VC300 – Good basic workhorse – X-Point metering (300W) **£129.00**
VC300DLP – As above but with in-built 300W D. Load **£149.00**
VC300D – New model - now has digital peak reading pwr display (300W) **£169.00**
HFT1500 – Impressive 3kW A.T.U. balance/unbalanced inputs will match just about anything. X-point metering **£399.00**

ACCESSORIES
PM30 – Power/SWR bridge with X-Point meter 1.8-60MHz 3kW **£89.00**
LP30 – High power L/pass filter. Rated 1.5kW. Every station should have one **£39.00**

Build Your Own A.T.U.'s and Loops
TC150 – 13-150pF Variable 7.8Kv Capacitor **£19.95**
TC170 – 13-170pF Variable 7.8Kv Capacitor **£19.95**
TC250 – 13-250pF Variable 7.8Kv Capacitor **£19.95**
TC500 – 13-500pF Variable (2 x 250pF ganged) Capacitor **£28.00**
TC48 – 48 Turn Mech Counter. 1 count for Rev **£15.95**
Large graduated control knobs (1-9 indicator) **£3.57**

VHF/UHF NEWS

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

A VERY Happy New Year to all readers of *VHF/UHF News* and especially to both regular and occasional contributors. Let's all make a New Year Resolution to be more active on the bands in 1993, irrespective of any openings.

THE TABLES

THE ANNUAL table starts afresh on 1 January and the first listings will be in the May issue. The rules are quite simple. The figures are the claimed totals of counties and countries worked on the 50-1240MHz bands, excluding repeater and packet radio QSOs. The counties are the 77 recognized for RSGB VHF contest purposes and you may include three different stations in each of the twelve Scottish regions, making a total of 101. Irish Republic (EI) counties should *not* be included.

The countries are the DXCC ones, including your own, plus Sicily, IT9. A comprehensive list starts on page 58 of the 1993 edition RSGB *Call Book* [see *BookCase* pp78/79 to order a copy - Ed]. Since publication, some new countries have been been allocated callsign blocks by the ITU. These include Croatia (9A), Slovenia (S5) and Bosnia-Hercegovina (4N4), which have been accorded DXCC status by the ARRL. Send me an SASE if you want a copy of our table rules.

ACTIVITY

AN AGENDA item at the VHF Committee meeting on 14 November concerned activity on the VHF/UHF bands. Based on a detailed analysis of recent contest logs and of callsigns recorded on packet nodes, we found that there are thousands of stations using the bands, after all. Compared with a decade ago, we all now have access to another 2MHz at 50MHz and the packet network has attracted thousands of operators, so activity is spread over more bands and modes.

There may be many operators who would be interested to try VHF but who cannot justify spending hundreds of pounds on new equipment. Chairman Peter Burden, G3UBX, wondered what has happened to all those rigs of 10-20 years ago; the TR7010, TR9130, FT480, IC211, IC260, FDK M750X, TS700, to mention just a few? We imagine the majority are probably still in working order but are just gathering dust in cupboards or under benches.

Perhaps we should start a campaign to resurrect these more vintage products and either give or loan them to friends so they can sample what the VHF/UHF bands have to offer? Some would probably require a little servicing - cleaning dirty switches and relays, replacing duff capacitors, checking alignment - but that is all part of the hobby, anyway. This could be an ideal club project to catalogue what old rigs members have in their shacks. Come to think of it, it would be a good way to attract new members by offering them the loan of some gear.

CONTESTS

THE DERBY and District ARS (DADARS) 1992 Annual 2m SSB Contest, held on 22 March only attracted 14 entries, the overall winner being G1NUS/P, a QRP Multi-op station which accumulated 9,728 points. QRP Single-op station G0GAG was second with 5,580pts while QRO Single-op G4TZM came third with 5,568pts. The provisional date for this year's event is 21 March.

Last January I mentioned an annual 144MHz Activity DX Contest sponsored by a German group. The information came from DL8EBW in Wuppertal, but nobody ever mentioned it thereafter. The VHF Committee wondered if more contests would encourage extra activity, envisaging a rolling or cumulative type? When I wrote a VHF column for another magazine some years ago, I introduced the Annual CW Contest based solely on the number of different stations worked. It proved popular so could be the basis for an all-mode version. Let me have your comments, please.

WHERE IS IT?

THE VHF committee has still not traced the 1962 VHF Committee Cup. This was originally intended to be awarded annually for the best piece of home constructed equipment. Because nobody ever submits an entry nowadays, the Committee decided to award it for the best VHF-related material published in the amateur radio press. Can any reader help us locate this cup?

METEOR SCATTER

THE QUADRANTIDS stream is active 1-5 January and the IMO's *1993 Meteor Shower Calendar* suggests the visual maximum should be at 1000GMT on the 3rd at solar longitude (LS) 283.13°. The radio maximum could be up to 14 hours earlier, around 2000 on the 2nd but, due to a paucity of information, these predictions could be incorrect by as much as +/-5 hours. This is a short shower, the maximum rarely lasting more than a few hours, so it is easy to miss it altogether. Times when the reflection efficiency exceeds 50% are: NE/SW 1100-1800; E/W 1500-0300; NW/SE 2300-0600 and N/S 0100-0700 and 1030-1630 - all GMT.

NEW CALLSIGNS

THE SLOVENIJE Radio Amateur Society (ZRS) has circulated a list of over 150 stations showing their new calls. The YT3, YU3 and 4N3 prefixes were changed to the series S51-S59 on 24 October. Some stations have retained their old suffix, eg YU3AW is now S53AW, but many have not, eg YU3ES is now S53VV. If anyone needs a copy send me an SASE and I'll run one off.

BEACONS

THE GERMAN beacon DK0WCY (JO44VQ) on 10.144MHz is located 20km south of the Danish border. It sends its call, then carrier, continuously repeated. If there is an aurora it will add "Aurora" or "Strong aurora." Every ten minutes it sends a date/time message, the previous day's relative sunspot number, 10cm solar flux at Penticon, Canada and the Ak index at Boulder, USA. This is followed by Sun activity comments, the state of the magnetic field, probability of a short wave fadeout (SWF) and the state of HF conditions.

DK0WCY has been QRV since 1983 and is a club station of the German national society the DARC. It runs 30W output from a crystal controlled Tx to a horizontal triangular loop antenna at 6m

ANNUAL VHF/UHF TABLE
JANUARY TO DECEMBER 1992

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Points
G6HKM	67	64	-	-	66	23	32	17	21	9	299
G4FCD	40	26	-	-	86	23	52	19	37	12	295
G8ESB	10	11	32	6	83	18	35	9	19	5	228
G0NFH	18	29	28	4	56	15	32	13	7	5	208
G0JBA	-	-	37	4	52	19	33	12	18	5	180
G4LDR	14	19	27	5	49	16	34	10	-	-	174
GW6VZW	77	65	-	-	-	-	-	-	-	-	142
G6MXL	1	17	9	1	38	19	26	11	9	7	138
G0EHV	-	-	29	5	55	15	20	10	-	-	134
G1SWH	8	20	17	5	38	10	21	9	2	1	131
G7EWL	26	24	3	1	54	18	-	-	-	-	126
G8LHT	-	17	20	4	42	18	12	3	4	1	121
G3FIJ	-	-	14	2	51	9	29	5	3	1	114
G7CLY	15	28	-	-	47	12	2	1	-	-	105
G4OUT	-	-	36	6	43	10	-	-	-	-	95
GW0PZT	-	-	-	-	67	25	-	-	-	-	92
G7LIJ	-	-	-	-	62	26	-	-	-	-	88
G6ZWP	-	-	-	-	73	15	-	-	-	-	88
GI4OWA	11	24	-	-	27	20	-	-	-	-	82
G0EVT	29	7	2	2	22	10	5	2	1	1	81
G6ODT	-	-	-	-	41	15	11	5	-	-	72
G7JAF	-	-	-	-	52	11	7	1	-	-	71
G3FPK	-	-	-	-	52	15	-	-	-	-	67
GU4HUY	-	-	-	-	43	13	-	-	-	-	56
G0HDZ	2	6	-	-	15	6	-	-	-	-	29
G6AJE	-	-	-	-	8	2	-	-	3	2	15

British counties are those listed on page 65 of the January 1992 *RadCom*; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI counties. Countries are the usual DXCC ones plus IT9. Deadline for the final appearance is **28 January.**

AGL. Data are input in the morning over the telephone lines by a limited number of amateurs. Comments and reports on the service may be sent to DK4VW at Kreutzacker 13, D-3550 Marburg, Germany or via BBS DB0SIF.

Ted Collins, G4UPS (DVN), reports that a new 6m beacon, OZ6VHF (JO57EI), is QRV on 50.054MHz, allegedly running 25W to a turnstile antenna. The OZ7IGY beacon is back again on 50.021MHz. A new African beacon is TU2VHF (EJ76AM) on 50.094MHz; that is the same locator as TU2OJ. In Slovenia, S55ZRS (JN76HD) is the new callsign of 4N3SIX on 50.014MHz. On 2m, the Wrotham beacon GB3VHF (JO01DH) on 144.925MHz was switched off on 28 October and was still missing a month later.

MOONBOUNCE

SOFTWARE

The WA1JXN High Performance Moon Tracking Program, MOON.BAS, has been around for many years and is available in both CP/M and DOS versions. A much more comprehensive program for IBM compatibles is the EME Planner by Doug MacArthur, VK3UM. I have the 1990 version and the main .EXE file is 313k which, with the accompanying .DAT ones, occupies most of a 360k floppy. The program is menu driven and now incorporates the previously separate Help file.

When using the program for the first time, choose the General Setup option. This enables entry of callsign, calculation interval, band, antenna beam width, transmit period and sequence, etc. The DX Locations option gives access to an extensive database of DX QTHs which you can edit to your own requirements. It includes locator and distance calculators. The Calculations option offers a choice of real time track, Moon position, common EME windows, Sun position, noise source position and an EME power budget calculator. All data can be printed out on either 11in or A4 paper.

In common with all other amateur Moon programs I have examined, this one does not take into account the fact that the Moon's orbit plane is inclined at 5.15° to the ecliptic. The ramifications of this were explained in an article by Peter Gerber, HB9BNI, in the Winter/1989 edition of *VHF Communications*. Bearing in mind the beamwidth of practical amateur antennas up to 1.3GHz, this is of little significance. This is a beautifully structured piece of software which makes full use of a colour monitor.

A copy of the 1987 version 2.05 is included in a three-disk set, Reference 1004ABC, from the Public Domain and Shareware Library, Winscombe House, Beacon Road, Crowborough, E Sussex, TN6 1UL. This collection contains scores of useful programs under the general category of Propagation, including W6EL's MINIPROP. Thanks to Rod Smith, G4DQY, of the PDSL for loaning review copies.

ACTIVITY

The second leg of the ARRL EME contest on the 14/15 November weekend created lots of activity on 144MHz. John Regnault, G4SWX (JO02PB), wrote: "During peak times battle was joined every 300Hz all the way up to 144.032MHz." The .020 - .030 part ". . . . was crammed with activity." He completed 63 QSOs with 31 multipliers (DXCC countries and W/VE call areas), during the two legs, his best ever effort. It included 14 more initials, the best being KH6FOO on random at 1102 on the 15th. At 1735 on 12 November he completed with ZL1BVU at long last. The next favourable low-noise weekend is 9/10 January, just after full Moon.

REPEATERS

THE MID-SUSSEX Repeater Group sent comprehensive details of its 70cm repeater GB3HY (IO90WX) on RB5. It is located on the eastern outskirts of Haywards Heath (SXW). Brought into service in June 1989, it now comprises two independent Motorola MICOR units - one operational, one as backup - and the ERP is 25W from a four-stack, folded-dipole antenna system. CTCSS is fully operational, the encoder/decoder using the industry standard CML FX365 circuits.

GB3HY is operated on a very informal basis by enthusiasts. Donations from users for its upkeep and running costs are always welcome. Cheques should be made out to The Mid-Sussex Repeater Group and sent to Mr C L Stiller, G0AUI, who is QTHR.

70cm voice repeater GB3ER (JO01GR) near Chelmsford (ESX), which used to be on RB10, is now on RB3. For further details contact G1FOA (QTHR).

The Winter 92 edition of *FM News*, the publication of the Central Scotland FM Group, includes a list of the 312 members and a balanced selection of articles and adverts. The editor is Dennis Cram, GM3NIG. Chairman Tom Hughes, GM3EDZ, seeks comments from members on the subject of freeloaders - those non-members who regularly use the group's six repeaters. For details of the CSFMG contact secretary Alistair Fraser, GM3AXX (QTHR).

50MHZ

NEWS

Please add EH3BTZ to the Spanish list published in November. Georges, F8OP, told GJ4ICD that many French operators have regional permits and were not in the original, official list. Geoff is passing lists of these to awards managers. G4UPS reported that JX3EX and JX7DFA are active from Jan Mayen Island, the first QSOs being made on 13 October. QSL to '3EX via LA5NM and to '7DFA via his home call, LA7DFA. The latter runs beacon mode, JX7DFA, on 50.079MHz. 5R8AB in Madagascar is reportedly building a transverter to use with his TS930S HF transceiver. 9Y4VU in Trinidad now has an IC-551D so will be able to make SSB QSOs; his QSL route is via W3EVW.

ACTIVITY

The general decline in solar activity continues, so much less DX has been worked compared with this time last year. In late October there were a few Es openings: to EH7 and 9 on the 25th: S5 on the 26/27th: CT1, EH7 and ZB0 on the 28th: EH3, 5 and 7; F, I0, 2, 4, 5 and 8; OE, S5, YU2 and 9H on the 29th: DL, EH3, F, I1/2, OE, OZ and S5 on the 30th, as noted from the logs of Terry Chaplin, G1UGH (SFK), G4UPS, and Paul Baker, GW6VZW (GWT).

Ela Martyr's, G6HKM (ESX), sole November QSO was on the 2nd with EH7UH and she now has all legal countries worked on 6m confirmed by QSLs. In late October the band sustained some propagation to ZS6 on the 26th, 7Q7 on the 29th and V5 and ZS9 on the 30th. On 1 November, ZS6WB and V51E were briefly audible in SW England in the afternoon/evening period. Otherwise, November, up to the 21st, seems to have been pretty dead.

144MHZ

AURORAS

Auroral propagation was reported on days when the Ap index was over the mid-20s. On 27 October, 1615-1640, Arlen Pardoe, GM0HUO (FFE), copied beacons GB3LER, OY6VHF and SK4MPI when beaming due north. Chris Williams, G6ZWP (SPE), copied GB3LER, 1629-1737, but CQ calls on 144.300MHz brought no replies. On the 29th, Arlen worked LA2PHA (JO38) at 1740, QTE 40°, the event ending by 1900. Again Chris had no luck but copied a GM on CW at 12°.

On 9 November GM0HUO didn't hear any beacons but worked LA2RZ (JP20) at 1645 at 5°, the event finishing by 1730. Another far north aurora occurred on the 15th when GB3LER, OY6VHF and SK4MPI were just above the noise at 1510. Arlen now has a 0.6dB masthead preamp with low loss feeder. He is on packet radio but complains: ". . . . no luxury of DX warnings up here!"

TROPO

There was a good tropo opening on 5/6 November in which Phil Boorman, G0JBA (KNT), worked F1JRX (JN25) for the farthest south contact, OE3EFS/3 (JN78) and OK1MAC/P (JN79). Jon Acton's, G0NFH (AVN), successes included OK1FZA/P (JO60) and EI4DQ (IO51) to the west. G1UGH managed QSOs with LX1CT (JN29), EI4CI and EI2GK (IO63), DG9RCI (JN59) and OK1FZA/P on the 5th and next day, DL9NDA/P (JO50) and OK1MAC/P.

On the 5th, G6HKM worked OK1VMS/P (JO60) who was S9 plus 40dB. Other DX included OK1UBR (JN69), HB9RCJ (JN37) and stations in JN27, 39, 48, 49 and 59. Early afternoon activity next day brought contacts with OK1VEI (JO70), DG9NBT (JN49), OE5VHL and DK0OG (JN68). Ela has received her VU2000 award from the JARL for 2,000 confirmed SSB QSOs on 144MHz; it is certificate number 2, so congratulations.

Karl Lamford, G6ODT (NHM), worked F6IPR/P (JN27) on 5

continued on page 19 ▶

QSL

RSGB QSL Bureau,
PO Box 1773, Potters Bar,
Herts, EN6 3EP

● Mr D Hollingworth, G0AMH, used to be the QSL Sub Manager for G4P but had to give up the job some three years ago because of failing eyesight. He is, however, still receiving envelopes from G4P call holders - and he doesn't want them! Please note that the G4P QSL Sub Manager is R Colvin, G0BXQ. A full list of current QSL Sub Mangers appears in the new RSGB *Call Book*.

● The QSL Bureau in Taiwan has moved and its address is now: CTARL QSL Bureau, PO Box 93, Taipei, Taiwan. The QSL Bureau in India has also moved and its new address is: ARSI QSL Bureau, PO Box 6143, Madras 600017, India.

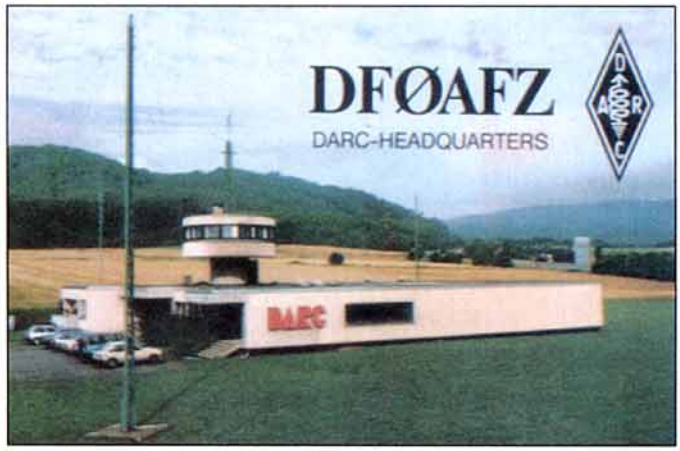
● The address for the G3LAA to G3NZZ series QSL Sub-Manager is incorrect in the 1993 RSGB *Call Book*. He is Andrew Giles, G4OJH, whose correct address is: 209 New Bristol Road, Weston-Super-Mare, Avon BS22 0BJ.

● I recently received a request for a copy of an up to date prefix list because of the number of confusing new prefixes being heard on the band. Geoff Watts BRS3129, 62 Belmore Road, Norwich NR7 0PU, produces, at a very modest cost, what I consider to be the best prefix list available and I strongly recommend it.

● Will members who send self-addressed stamped envelopes to their Sub Managers please remember to include their callsigns on them.

● There has been much correspondence lately about QSL success rates. As a matter of interest my own figures show a return rate of 45%. It would be of interest to know if that is above or below the rate achieved by other card collectors.

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



The headquarters of the German National Amateur Radio Society, DARC.

● I have recently sent out some written guidelines for newly appointed QSL Sub Managers and hope that you will find these of assistance to you. I will, of course, send every current Sub Manager a copy for information and I hope that if they have any comments they will drop me a line so that I can update the information from time to time. I am sure many newly appointed Sub Managers will already know most of what I have set out to assist them but it is quite wrong, in my opinion, to ask anyone to assume responsibility for a task without issuing any standard guidance.

● My query about the use of QSLL produced a large number of interesting and helpful letters for which I am most grateful. Can I show my ignorance again and ask if anyone knows why VE is often sent as a prelude to the start of transmission in code.

John Hall, G3KVA

HF NEWS

continued from page 13

pected from Russia, Canada, Japan, and the USA. A contingent of 14 Russians from Khabarovsk will be present. Invitations are extended to *all* and for more information please write to FARS Victoria, c/o Camosun College, Box 128, 3100 Foul Bay Rd, Victoria, BC, Canada V8P 5J2 - or contact VE7KPV @ VE7DIE.#ISLAND.BC.CANADA.NOAM via packet.

PROPAGATION

SMITHY'S OFFERING this month is moderately encouraging. It says: "Last month's report ended with the hope that the second half of October would see a recovery in HF band conditions and the sun duly obliged! Daily solar flux values passed through a trough at the middle of the month and then climbed rapidly to a peak of 175sfu on 28 October. During this period there was quite a lot of flare activity, most of it benign, and MUFs rose to the sort of values to be expected at this stage of the cycle - and just in time for the CQ WW Phone Contest. Frequently such sudden surges in activity are followed by deep troughs but in this case the decline during the first half of November was only slow, with daily values remaining above 125sfu. The overall trend in this recovery is best illustrated by the movement of the 27-day average solar flux which rose steadily from 116 to 143sfu over the 30 day period. It will be interesting to see what happens in the second half of November - history, however, by the time this is read."

THANKS

. . . . AND A Happy New Year to all contributors and to the authors of the following for information extracted: the *Lynx DX Bulletin*(EA2KL), *DX'press* (PA3DZN), the *Long Island DX Bulletin* (W2IYX), and *RSGB DX News Sheet* (G4DYO).

The closing date for **March** issue is **20 January**.

● THE ARRL Awards Committee has added Croatia (9A - formerly YU2) and Slovenia (S5 - formerly YU3) to its DXCC Countries list for contacts after 26 May 1991. Bosnia-Hercegovina (4N4,YU4) is also added for contacts after 15 Oct 1991. These apply to QSL cards received at ARRL HQ from 1 Jan 1993. Cards received earlier will be returned.

VHF NEWS

continued from page 17

November and OK1FZA/P next day. Brian Underdown, G7LIJ (KNT), has reached his target of 150 squares in just eight months. His QSOs on the 5th included DL6NAA (JO50), OK1UBR (JN69), OK1FZA/P and OK1VMS/P, while the 6th saw DL, F, HB9, OK stations and OE5XUA (JN77) and OE5XJM (JN68) in the log.

From Gwynedd, father and son duo Pat, GW3KJW, and Edward Allely, GW0PZT, found the band open right across Europe on the 5th with several contacts over 1,000km. The next day brought only two QSOs with F and ON stations. Ian Cornes, G4OUT (SFD), operated in the Marconi Memorial CW contest on 7/8 November making 96 QSOs worth 28,288 points. Those over 700km were FF1MOF (JN28), DK0BN/P (JN39), DK8ZB/P and DL0FM/P (JO40), DL5GBG/P (JN48) and DL4VAI (JN39).

430MHZ UP

PLEASE NOTE that 435.725 and 435.750MHz are allocated by the Primary user to the RAF Volunteer Reserve (Training) and are mainly used from various RAF and other airfields by the ATC at weekends. If you hear non-amateur traffic on those frequencies, that it what it is likely to be, so please QSY as they are prime users.

The 5/6 November tropo brought good conditions on UHF, too with similar countries worked to 144MHz, but fewer QSOs. G0JBA's best DX on 70cm was around 700km but Phil couldn't quite complete with DG5NEX (JN49) on 23cm. G6HKM heard nothing on 70cm on the 5th but did contact OE5VHL at 1321 next day. Ela took part in the Cumulatives but was critical of the dates. In the 23cm Cumulatives she made four QSOs on 21 October and 17 on 6 November.

DEADLINES

THAT'S IT for another month. The next deadlines are **28 January** for **March**, and don't forget to send in your final Annual Table scores, and 26 February for April. The comms routes are:

Fax 081-668 5582, CompuServe 70630,603, telex 9312111074(CN) and BT Gold 76:MSX021 - and Her Majesty's mail.

HF F-LAYER PROPAGATION PREDICTIONS FOR JANUARY 1993

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	....38871...	....59983...	....89996...	....99998...	...2877894..	431665567843	886532235888	++42....25++
MALTA	....47653...	....69875...	....899982..	....988995..	...18778984.	562764457996	998632235899	+++4....25++
GIBRALTAR	.....5543...	....17765...	....499882..	....799895..	....8877893.	342.76557895	898653224799	++++2....4++
ICELAND	.....1452...	.....2674...	.....6997...	.....89993..	....288897..	121.76668951	787164345787	++++3...24++
** ASIA								
OSAKA	....1.......	....3.......	....62......	....84......	...1751..1..	1..153223513	....2..13663	.........35.
HONGKONG	....662.....	....884.....	....8861....	...17873....	....465521..	2...1323563.	1......13674	353
BANGKOK	....7986....	....89982...	...168885...	...147787...	....155682..	3....2236745	2......13677	355
SINGAPORE	....68771...	....79882...	...158896...	...137788...	.....55683..	2....2235744	1.......3686	353
NEW DELHI	....8872....	...18884....	...26787....	...346772...	...113566...	52....235455	73......3678	5........355
TEHERAN	....89871...	...188983...	...476886...	...655788...	1..522568411	7422..235866	873.....3677	54.......344
COLOMBO	....88982...	...178994...	...246887...	...1247881..	1568511	42....235866	51......3678	2........345
BAHRAIN	....88871...	...287883...	...455886...	...5336882..	2..4..368731	8521..135887	872.....3677	54.......344
CYPRUS	....99984...	....99997...	...3988992..	...58788951.	32.765678952	885532346898	8863...14788	++3......4+5
ADEN	....88884...	...2778971..	...4446883..	...52248962.	41.3..157974	863....25888	872.....2677	54.......344
** OCEANIA								
SUVA/S	.....143....	.....2651...	.....5873...	.....7786...	....365673..	....532354..	...131.132..	.....
SUVA/L	....321...2.	....5431.241	1...87542552	87655751	...17545772.	...3521244..	...12...22..	.....
WELLINGTON/S	.....453....	.....675....	....28882...	....48785...	....76567l..	....532353..	....31.131..	.....
WELLINGTON/L	.....	....1.....	....32...111	64211321	....7533452.	...1521243..	....2...21..	.....
SYDNEY/S	....6445....	....86671...	....88884...	...187786...	...1655681..	....3323661.	.......1351.	.........2..
SYDNEY/L	.....1.....	.....21...1.	....1531..3.	36521251	56444651	....3312463.	....1...24..	.....
PERTH	....66432...	...177664...	...258887...	...1377881..	....1556851.	1....2235863	3662	.........33.
HONOLULU	.....	.....	.........2..	.........4..	.11...1.161.	.14.312143..	..3531.121..	...4........
** AFRICA								
SEYCHELLES	....33653...	...1447751..	...3346883..	...21248862.	42....157974	861....25888	84......2677	5........345
MAURITIUS	....47765...	...1468871..	...23468951.	1..211489741	53....157985	85.....25899	72......2688	4........355
NAIROBI	....757861..	...1767883..	...34458963.	21.421269862	65.3...47997	983....15898	872.....2687	54.......354
HARARE	....345662..	....4567852.	1..133469852	32.321148984	8712...16998	983.....4899	862.....1688	54.......355
CAPETOWN	....3367741.	44678631	11..43458873	43.121137996	8813....4899	9841....1589	862......378	+4........4+
LAGOS	....8+87852.	87778741	21..85458974	54..73237997	88234...4899	89851...1699	7883.....388	455.......55
ASCENSION Is	....4854651.	67557741	11..86445874	43..83123897	884.61...599	99953....279	7885......58	55+2......2+
DAKAR	....3987851.	....5977873.	1...87547863	32..86325886	774.73..2699	98944....389	77862....158	44+4......2+
LAS PALMAS	....298884..	....4999961.	....7988984.	98888962	443.86556897	988474324699	889741..1479	+++5......4+
** S. AMERICA								
Sth SHETLAND	....1333441.	....3555653.	1...67655553	22..77543455	564.7531.135	455242.....2	12331.....	.....
FALKLAND Is	....1346751.	....2666662.	57643442	21..77421244	664.751...25	688252.....3	36652.....	.332.....
R DE JANEIRO	.....442351.	.....653462.	27433552	11..56211365	654.74....57	989351....26	87862......3	55+4.....
BUENOS AIRES	.....233551.	....1454552.	46533341	1...77411144	544.751...15	788252.....3	57863......1	25+4.....
LIMA	......9885..	......97761.	......85443.	12731122	223.544....4	6782531....2	47863.....	.554.....
BOGOTA	......8875..	......98761.	......86443.	1742232	213..351..15	7781432....3	67763......1	3544.....
** N. AMERICA								
BARBADOS	.....19876..	.....297762.	.....585454.	7732352	223..64...46	8782331...16	87663......4	5444.....
JAMAICA	......6985..	......88761.	......87543.	752231	212.1252..14	6671432....4	677631.....1	3544.....
BERMUDA	......7985..	......88871.	.....287663.	4754551	212..5521255	7671332...26	877631.....4	5544.....
NEW YORK	......3985..	......5986..	......78772.	776651	112..3553354	77713322..36	777631.....3	4444.....
MEXICO	.......784..	.......885..	.......8641.	......18521.	112.11352..2	46814222...1	278631.....	.454.....
MONTREAL	......3884..	......5996..	......78882.	.....178774.	112..3554564	777133231236	777631....14	4444.....
DENVER	........73..	.......185..	.......4861.	.......6762.	122....55322	477131132..2	378631.....	.454.....
LOS ANGELES	........42..	........64..	........85..	........851.	122..1.36211	367132.33...	158631..1...	.254.....
VANCOUVER	.....	.........12..	.........45..	........671.	121..1.17631	467132.25322	257531..21..	.254.....
FAIRBANKS	.....	.....	.........1..	........13..	121..322571.	465.43235643	245531.12432	..24.....

The provisional mean sunspot number for November 1992 issued by the Sunspot Data Centre, Brussels was 92.0. The maximum daily sunspot number was 125 on 25 November and the minimum was 59 on 13 November. The predicted smoothed sunspot numbers for January, February and March, are respectively: (classical method) 84, 82, 80; (SIDC adjusted values) 96, 92, 88.

SWL NEWS

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

NOW THAT we are turning the corner into 1993 and another year in this sunspot cycle, we can expect HF conditions to deteriorate, LF conditions to improve and Sporadic E on the VHF bands to be a little more favourable. Only time will tell if these predictions are accurate.

At the time of writing, HF conditions were remarkably good with the solar flux for 30 October given as 229 - certainly the highest for some considerable time. The period was dominated by the *CQ* Worldwide SSB contest, and so far 17 logs had been received. The results, however, will be available in a few months.

DX NETS

A FEW MONTHS ago I published a list of times and frequencies of some of the major DX nets in the hope that some SWLs could catch some of the choice DX which appears from time to time. I was pleased to hear from my licensed colleagues who found the information helpful. For those who have reached the magic 200, or those who just like listening to DX nets, here are some more plus some corrections:

7043kHz - The Night DX Net meets 1900 Fri.

14155kHz - The Mercury Net meets 0500 Sat.

14,243kHz - The European DX Net meets 1500 Mon-Fri, 0630 Sat.

14,253kHz - The JY3ZH Net meets 0500 daily.

14.256kHz - The DL2BCH Net meets 1700 Mon, Wed and Fri.
14,256kHz - The African Net meets 2000 daily.

14,236kHz - The '236' Net meets 0130 daily.

14,184kHz - The Lazy Net meets 1600 Sat and Sun.

21,200kHz - The EC DX Net meets 1700 Sat.

21,263kHz - The 9J2 Net. No information about time.

If anyone has further information about Nets, please pass it on.

From memory, there used to be a Caribbean Net. Does anyone have the current information on that, and what about the /MM Net?

NEWS FROM THE CIS

OLEG, UA3.20408, provides much news this month from the CIS.

There is a free SWL club in the CIS called 'Forward'. It was formed in the USSR in 1964 and currently has 250 active SWL members and all you need to join is an SWL callsign. For further details you should write to Sergey Savin, Moscowskaya oblast, 140214 Russia. You should enclose your name, SWL callsign, date of birth and details of your confirmed countries, ITU Zones, prefixes, awards. Updates must be sent at least once every two years. Oleg asks that an IRC should be enclosed for a reply.

Turning to SWLing generally in the CIS, newcomers get their first knowledge of amateur radio by operating club stations. They obtain their SWL callsigns there. Some club stations have club SWL callsigns, for example, UZ3TXA (ex UK3TAC) has the club SWL callsign UK3-122-1. SWLing is usually the first stage of becoming an amateur. Oleg knows of a few amateurs who still use their SWL callsigns, eg UY5XE is UB5-068-3.

One of the most well known receivers in the CIS is the R-250, or R-250M or R-250M2. It is a superheterodyne valve receiver built in the '70s. However, it is large and cumbersome.

Reading about amateur radio is difficult as magazines and books are not easy to come by. Information about forthcoming DX-peditions, etc is extremely rare. I hope that I may hear more from Oleg at a later date to be able to provide you all with more information about SWLing in the CIS.

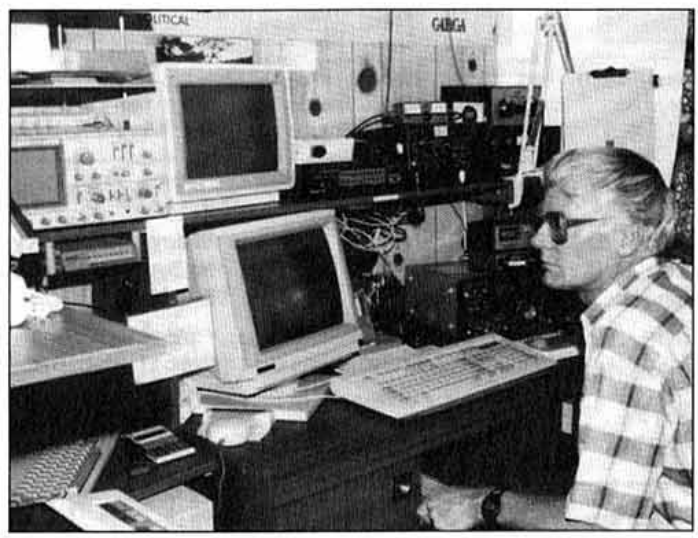
WHITE ROSE SWL CONTEST

NOW ENTERING its 12th year, the White Rose Society is again trying the new formula of LF bands plus the WARC bands for their 1993 contest. It runs from 1400 on 16 January to 1000 on 17 January. On SSB, the bands in use will be 1.8, 3.5, 7, 18 and 24MHz. On CW it's 3.5, 7, 10, 18 and 24MHz. A contest with a difference. Please try to support it. The full rules are available from PO Box 73, Leeds LS1 5AR.

WHERE ARE THEY NOW?

THIS MONTH I shall feature Jim, G4RGA ex-BRS30694. Jim was licenced in November 1982, shortly after the final 1982 Countries table was published and held the callsign GW4RGA until he moved to Somerset. For the first year he was on HF at every spare moment, and on 144MHz when the HF bands closed. After that activity waned and skeds on 3.5MHz and the occasional contest were the major activity.

After acquiring an interest in computers Jim's activity switched to RTTY and then to VHF packet - which is still his main interest today. However, he is still to be heard on HF using an FT101Z but is still, primarily, a listener, tuning the HF bands for that choice piece of DX and doing lots of 'utility' listening. This month's photo shows Jim at his station.



Jim Dunnett, G4RGA, was BRS30694 prior to November 1982. His main interest involves using computers for RTTY and packet.

UBA 93 CONTEST

LAST YEAR, 36 SWLs entered this contest - not one from the British Isles. I hope that someone will represent us this year. The SSB leg takes place from 1300 on 30 January to 1300 on 31 January. The full rules can be obtained by sending me an SASE.

HF NEWS

AS I HAVE said, the month in review was dominated by the *CQ* Worldwide SSB contest, and the special DX-peditions which were active. I had details of over 30 different expeditions, not all to the favoured contest winning location of the Caribbean. Some of the more unusual were - S79J, V7MHZ, ZD8Z and 6V6U There was a great deal of activity from the Caribbean, perhaps the most noticeable being KP2A, J37L, V31DX, VP2EC and VP5S.

Looking at the month outside of the contest, my reporters mention a good deal of activity on 18MHz with NL7ZH mentioned by several listeners, and an usual one in the shape of ZS7ANT. On 24MHz, PJ8AD and 7X2BK seemed to be active constantly.

Elsewhere, these were perhaps the best loggings:

28MHz: BV2FR, VS6GA, XX9GD, 3X0HNU, 9ER1TA (counts as ET for the present) and 9V1YC.

21MHz: A71BV, HL9XX, VR2GC (new prefix for VS6), VU7CVP (Laccadives Is), XX9AS and 9V1UV.

14MHz: EP2HZ, ET3BC, TJ1GG and VP8CGK (South Georgia).

7MHz: CE0/SM0AGD, CO8OH, FM5DN, HF0POL, OD5/SP1MHV, TR8NSY, VK9WW, VU2NTA and 9M8PV.

3.5MHz: A45ZZ, A92BE, PJ4/WA3LRO, S79ELY, TI4CF and VP8ML.

Before tying the ribbons on HF, I would mention that Albert Tideswell, BRS48462, has just heard his 300th country on 3.5MHz. He also has over 290 confirmed of which the most recent have been 7Q7XX, Z21HS, FK8CP and A22MN. Also, a quick word about 9A (Croatia) and S5 (Slovenia). They will not officially become new countries until the DXAC officially adds them to the DXCC list. [Added 25 Nov - *Ed*].

FINALE

COPY FOR the **February** issue should reach me by **13 January**. Have a good year.

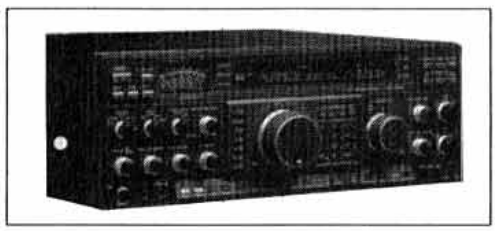
MARTIN

TOMORROW'S RADIO TODAY....

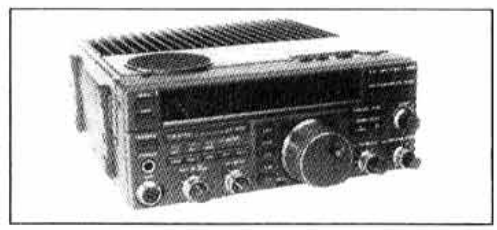
New prices have finally arrived - the increase is high due to the devaluation of the pound, but I'm offering you a deal to INSTANTLY EASE YOUR POCKET. You'll still get top trade-in prices for all your existing equipment, which can be used as a deposit and then pay the balance over nine whole months, WITHOUT ANY INTEREST!

Interest Free - ZERO % APR !!

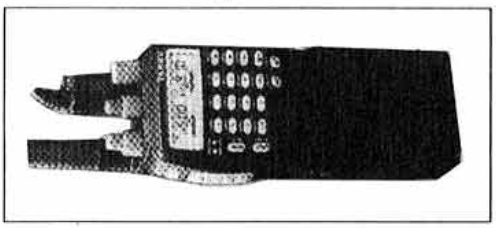
FT 990 100W H.F. multimode Gen. cov. rx plus ATU. DC version also available.
DEPOSIT £902 plus 9 x £133



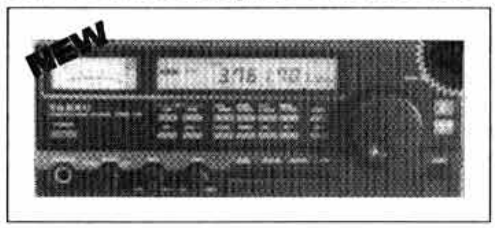
FT 1000 Is it the world's no.1 TCVR. Should be. 200w multimode. Rx-100k -30MHz
DEPOSIT £1499 plus 9 x £199.99



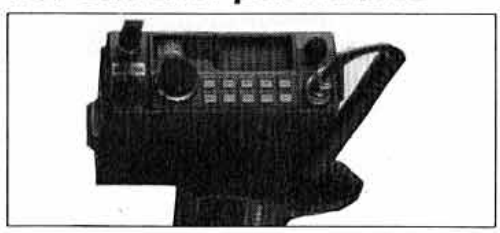
FT 890 Selling like hot cakes. The HF minute, mobile, multimode, multibander.
DEPOSIT £299 plus 9 x £100



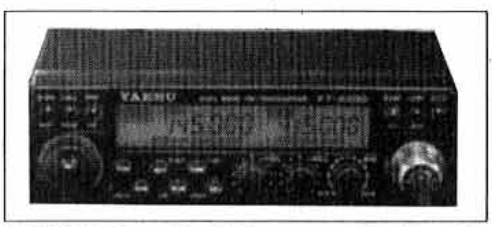
FT 530 Latest all band handy. 5w 2m and 70cms. Dual rx on 1 band. Spectacular!
DEPOSIT £149 plus 3 x £100



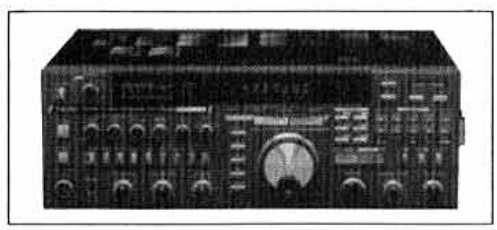
FRG 100 New arrival high performer rx 50k-30MHz. Ultra stable. Ideal decoder!
DEPOSIT £199.99 plus 3 x £100



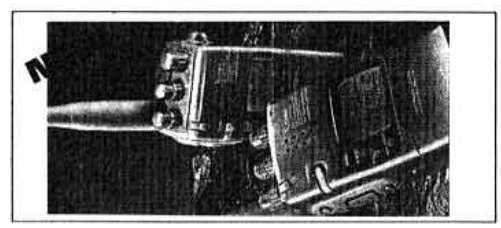
FT 290R Mk2 New concept in portable base rigs. Add an optional linear!
DEPOSIT £199.99 plus 3 x £100



FT 5200 Super 'mobile pagers? So hi-tech. Ask Martin for mind blowing details!
DEPOSIT £ 235 plus 9 X £55.55



FT 736 R VHF/UHF base with 25w on 2m and 70cms. Special price just for you!
DEPOSIT £569 plus 9 x £111.11



ICW21E Super handy TCVR's . Receives both 2m and 70cms simultaneously.
DEPOSIT £131 plus 3 x £98

Guide to SHOPPING for AMATEUR RADIO in the U.K....

Remember! Buying Amateur Radio Equipment is expensive and can be a risky business, especially when using Mail-Order. You may well see better prices advertised elsewhere, but when you next get a quotation, before parting with your hard earned cash, ASK THE SUPPLIER THESE QUESTIONS:-

1/ Is the equipment to full U.K. spec with appropriate serial no.?

2/ Is the equipment 'factory prepared' to match U.K. spec?

3/ If imported, is your potential supplier authorised by the official U.K. distributor to market that model?

4/ Can they guarantee your personal after-sales support, technical advice and upgrades, plus immediate availability of all spares and the full range of accessories?

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G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

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CALL, WRITE, OR FAX FOR YOUR 4 PAGE COLOUR MARTIN LYNCH NEWSLETTER PACKED WITH GOODIES, BARGAINS AND INTERESTING NEWS. WOULD YOU LIKE TO CONTRIBUTE?

LYNCH

WITH 9 MONTHS TO PAY!!!

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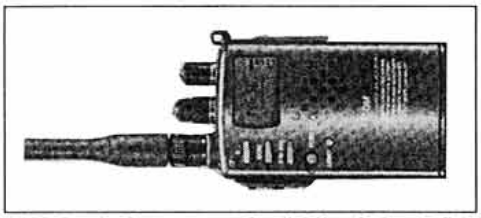
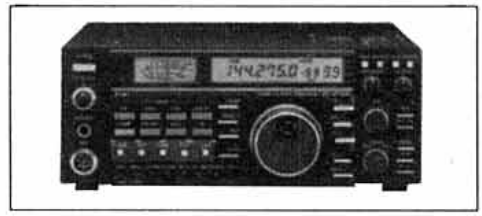
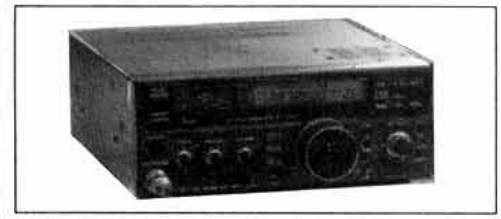
Interest Free - ZERO % APR !!



IC2I So do I...never mind! Liked the IC2S range of 2m handies? You'll love this.
DEPOSIT £44 plus 3 x £75

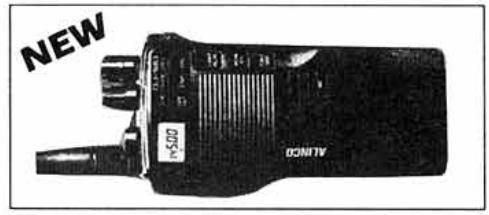


IC275H -'H' for hi-power. 100w on 2m.It's so good I actually use one myself!
DEPOSIT £275 plus 9 x £100

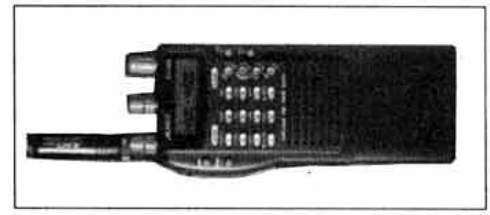


IC 729 100w on HF and 10w on 6m plus PBT and speech processor. Lovely Jubbly!
DEPOSIT £285 plus 9 x £100

IC 3230H 2m/70 rx 2 bands simultaneously. Built in duplexer. Guaranteed divorce!
DEPOSIT £175 plus 9 x £55.55



DJ 180E State of the art 2m econ. tcvr. So small you'll lose it, and buy another from me!
DEPOSIT £169 TOO CHEAP FOR INT.FREE!



DJ 580E Dual band. W & S can still retire on this one. Smooth talking bar stewards!
DEPOSIT £89 plus 3 x £100

TS 850S 100w HF for purists. So many chips with this one you'll need vinegar.
DEPOSIT £499.95 plus 9 x £122.21

TS 450S 100w hf multimode. Gen. cov rx and all the trimmings of high performance.
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TS 690S As 450 but separate ant connector + 50w on 50 Mhz. Real leading edge stuff!
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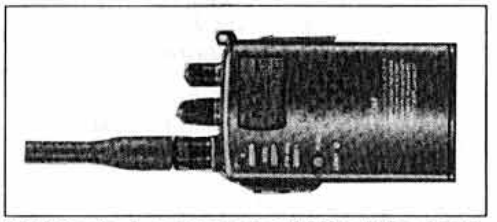

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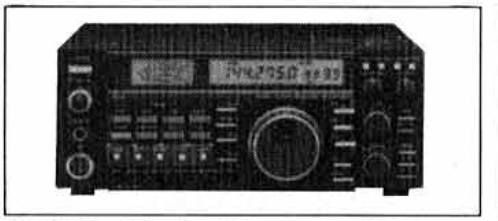

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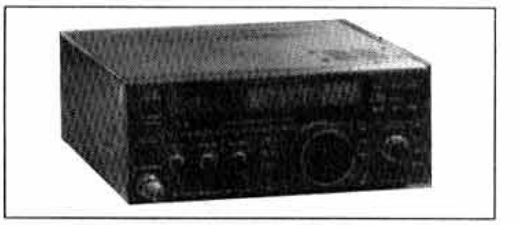

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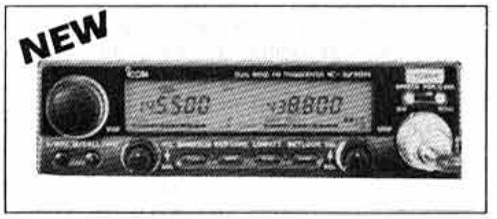

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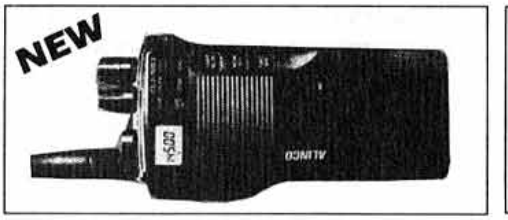

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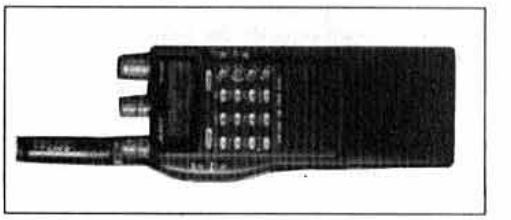

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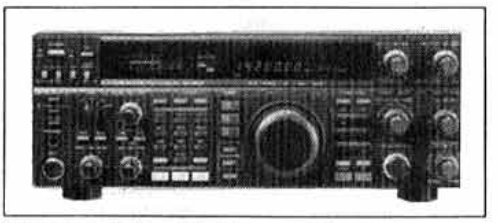

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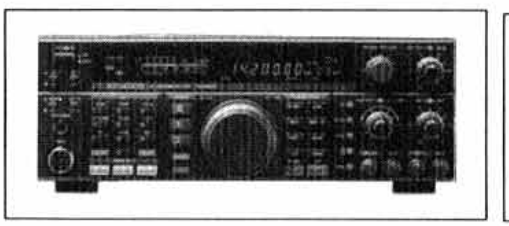

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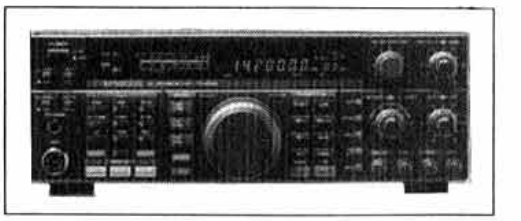

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RADCOM NEWS FEATURE

On the Air From the Mongolian Gobi Desert

by Ray Gerrard, G3NOM/HS0

A DXPEDITION to the Mongolian Gobi Desert was successfully completed on 7 July 1992. The team - led by JA1UT - consisted of ten operators - JT1BX, JT1CS, JT1CD, JA1UT, JA1CMS, JA1UPA, JT/JI2MED, JR0CGJ, JH0DDI, and G3NOM. The purpose of the visit was to help the Mongolian Radio Sports Federation in the development of amateur radio and to join MRSF in the celebration of the 830th Anniversary of Chingez Khan, as well as to activate a remote region with the prefix JT4.

During a four day period 5180 QSOs were made on all bands from 3.5 to 50MHz on CW, SSB, FM, and RTTY. The special call JU830C/4 was used to mark the anniversary, and operation also took place under individual callsigns with the Mongolians signing JT1/4 and the visitors JT4/ own callsigns. A special QSL is being issued for JU830C/4 contacts for which cards should be sent to JT1KAA or JR0COJ. For individual operators QSL via their own calls except in the case of JT4/G3NOM - which go via G0CMM - this was the first Mongolian licence issued to a British amateur.

Equipment Used

The equipment and operators were accommodated in five traditional tents known as *ghers*. Three stations were established using FT901, FT747GX, and FT655 equipment. Ameritrom 811 and FT2100 linears were used and antennas were an HB9CV (for 14, 21, and 28MHz), a 50MHz beam, a multiband WARC loaded dipole, and inverted-vee parallel dipoles for 3.5-14MHz. For RTTY a Commodore 64 computer and Microlog terminal unit with television set monitor were used. Power at the site came from a shaky 60kW diesel generator whose power variations caused the power supply of the FT747GX to cease to function. All this miraculously survived a 500km flight from Ulan Bator which involved a bumpy non-airstrip landing followed by an even bumpier bus journey.

The multi-national team arrives in the Mongolian desert.

The Chairman of the MRSG for the South Gobi Region welcomed the group shortly after their arrival. He was thanked for his help and co-operation in making arrangements for the visit.

Pile-up and Sand Storm

At the start of RTTY activities a pile-up developed. At the same time a sudden sand storm occurred and blew down the mast supporting the inverted-vees, unfortunately damaging the 50MHz beam. After the mast was re-erected and RTTY operation was resumed a series of power failures occurred, interrupting operation and causing frustration to everyone involved.

The local inhabitants of this sparsely populated area were extremely friendly and interested in the unusual behaviour or radio amateurs. Each evening off duty operators were invited to join in the local social activities which included singing, dancing, drinking Mongolian vodka, and eating goat's cheese under the desert stars. The expedition leader Yoshi-san broke a front tooth sampling some of the desert's delicacies!

Operation took place whenever the power was available, which averaged about 18 hours a day. The power generator seemed to take a 'siesta' each afternoon in compensation for being asked to work all night so that the DX could be worked! Such was the enthusiasm of some operators, that after the last all-night session, the dismantling of the masts, antennas, and equipment, was left to the very last minute when the homebound aircraft arrived.

On returning to Ulan Bator the expedition equipment was donated to the JT1KAA club, and members of the MRSF were thanked for their warm hospitality.

Up goes the 6m beam. The *ghers* (tents) can be seen in the background.

● NEW ZEALANDERS are breaking distance records on their 181kHz band (yes, kilohertz!). ZL1WB at Whangerie on the north island has been heard as far south as Dunedin whilst running 40W to a 450m antenna. The Lowfers net, chaired by ZL4MB, meets at 2030 (local) on 3850.

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EDGWARE
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LEEDS
Lowe Electronics, 34 New Briggate, Leeds. Tel: 0532 452657

MAIDSTONE
Lowe Electronics, Chatham Road, Sandling, Maidstone. Tel: 0622 692773

MATLOCK
Lowe Electronics, Chesterfield Road, Matlock, Derbyshire. Tel: 0629 580800

NEWCASTLE
Lowe Electronics, Newcastle Airport, Woolsington, Newcastle. Tel: 0661 860418

NEWPORT PAGNELL
Photo Acoustics Ltd, 58 High Street, Newport Pagnell, Bucks. Tel: 0908 610625

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NORFOLK
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NORTH HUMBERSIDE
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Novice NOTEBOOK

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

NOW THAT there are nearly 1000 licensed Novices, the Novice section of *RadCom* will in future include this column which is all about construction. Of course there is a limit to the number of ideas that one person can come up with in a year so it is essential that I receive ideas or designs from yourselves that I can build upon and come up with working designs.

PROBLEMS AND SOLUTIONS

THIS MONTH'S offering is a unit that I recently built for my outside workshop. This workshop is really for metal bashing and heavy work, but on a Thursday evening the local constructors get together there to build and chat, and it becomes a constructors club! The problem was that normal construction was mainly heavy work and when a PCB needed to be built it meant clearing a worktop area of bits and pieces prior to working on the board.

What we needed was a work station that could be lifted off the shelf and dumped on a dirty table to enable the PCB to be built. This having been completed, it could then he put away again quickly. It has proved its worth but now we almost fight over who gets the station!

Often, the Novice constructor has the same problem. The kitchen table is pressed into service on Sunday afternoon and suddenly the family demands their table back for its 'proper' purpose! This station can be lifted off in seconds and the parts cleared away with it onto the hall floor.

It is a very simple unit and all the bits and pieces were picked up at a boot fair for less than £3, less the soldering iron or course. That was bought at another boot fair for £5 . . . . I love my boot fairs! The base was the door of a kitchen unit for 50 pence, the socket 30 pence, the mat cut from a rubber car mat and the picture lamp, including tube, I got for £1.20 (I could not beat him down to a pound). Finally, the four rubber feet were salvaged from an old TV.

BOARD AND FITTINGS

I FIRST CUT the board to size, in this case 38 x 46cm (15 x 18 inches) so this could fit on one of the shelves, but the exact size is not really important. It is best to make it as large as possible to give sufficient room to work, but not so enormous that it's difficult to move from room to room and store. Next mark the centre line and mount the power socket box a little in from the edge of the board - about half an inch is sufficient so that it is easy to insert the mains plug without hitting the lamp support rod.

Now for the mat, I thought long and hard in selecting the best type and finally came to the conclusion that one with a deep squared pattern in it would be best. This was because the bits of solder, wire, etc would be trapped in the mat which could then be lifted off and the bits discarded with ease. I am please to say that my idea proved correct and the bits are easily disposed of without making a lot of mess. The mat is placed on the board, trimmed to fit around the socket box, and the edges cut away to make a tidy fit. It is best to do the trimming at this early stage because to leave it until the station is completed would mean the lamp getting in the way.

A LITTLE LIGHT WORK

THERE ARE several styles of lamp, but the one shown in the photograph is easy to fit on the underside of the board. Before fitting, a hole is drilled so that the cable can pass into the socket box.

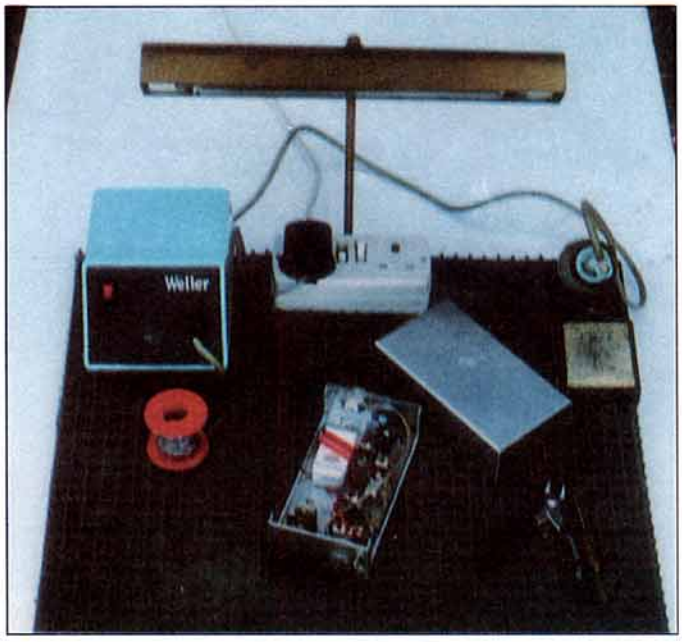
For safety, it is *essential* that the lamp unit is fitted with three cored cable and the metal frame of the lamp is earthed. The mains input cable to the unit is passed through the hole in the back edge of the base board and from here it goes into the base of the socket box.

You will now have a solid fixing for the cable so that it can't be accidentally pulled out. This cable should be three core 2.5mm flex and the plug on the end can then be fitted with a 5 amp fuse. If lighter cable is used it will not stand accidental excessive pulls and eventually become dangerous, so do make sure you use the correct type and clamp it securely where necessary.

The two earth wires (from the lamp and the mains input cable) should be inserted into the earth terminal of the socket, the two line wires (brown) into the line terminal, and the two neutral wires (blue) into the neutral terminal. When the unit is plugged in and switched on at the wall socket, the light will come on immediately to indicate that the station is ready for you to use.

Next month we'll look at some useful tools for constructing electronic equipment, and in future months some simple, cheap, accesories that you can make rather than buy.

RadCom's newest columnist Ian Keyser, G3ROO, avid home constructor. He regularly writes for the G QRP Club magazine *Sprat*.



This portable electronic work bench can be packed away when not in use.

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

AMATEUR RADIO is a hobby that has no physical limitations. It can be enjoyed by all, whether able-bodied or handicapped. Obviously, entry into the hobby may be more difficult for the latter, but then the sense of achievement is all the greater.

The Highfields Disabled Amateur Radio Club consists of able bodied members as well as members with various disabilities. The able bodied members are needed to help the others, and they gain in many ways from the experience.

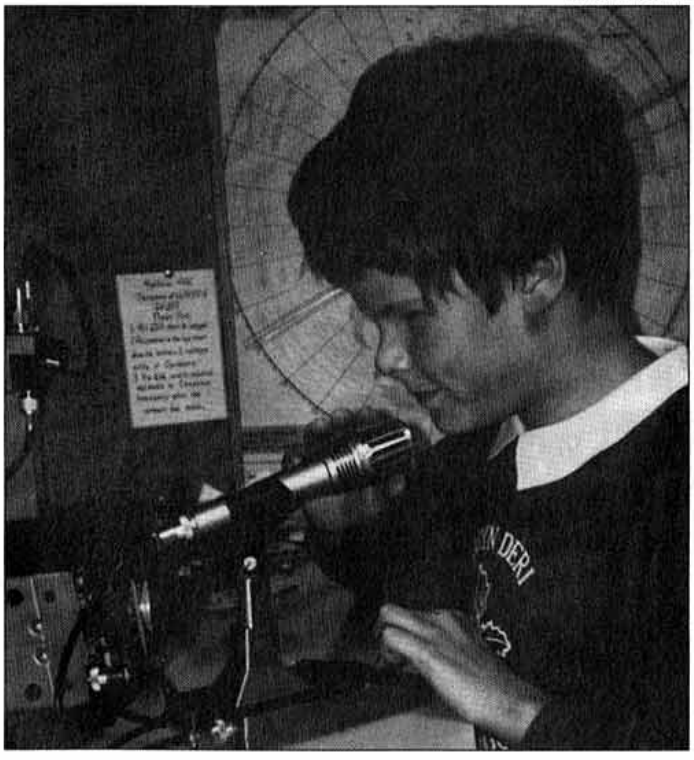
Mark Mathews (see photograph) has been blind from birth and at twelve years old has embarked on a Novice training course. As you know, this is a practical course so obviously there were certain elements of the course which Mark could not complete. He was able to build a receiver which didn't involve soldering - and it worked! He also assisted one of the helpers in the construction of the test sets and the audio amplifier - not to mention the assembly of the PL259 and BNC plugs. For the rest, being unable to read the instructions, he listened, learned and worked very hard.

Then came the exam in September. The questions were read to Mark along with the choice of answers. Questions involving diagrams were more difficult, but with the diagram described, he could answer. As the exam progressed, his answers were faithfully recorded as given . . . . and the exam result eagerly awaited. His callsign proves his success - he is now 2W1BDD. Congratulations, Mark!

Council Member Clive Trotman, GW4YKL, gave me this information. He was involved with Mark's training throughout and conducted the exam. He also tells me that the RAIBC is supplying Mark with a 70cm rig, which I am sure will be put to good use - he has been practising on the Club equipment!

I believe that Mark is the first blind Novice - unless you know different?

PHOTOGRAPH: GW4YKL



Twelve-year-old Mark, 2W1BDD, the UK's first blind Novice.

AGE IS NO BARRIER

THREE STUDENTS from Pontypool received their results at the end of October and all were successful.

Stephan and David are both sixteen. Further proof (if it were needed) that amateur radio opens other educational doors, comes from Con, GW0FJH, who gave me the news. He added a comment made by the Head of Science at the school attended by the boys. This was that amateur radio may well have helped towards the Grade 'A' which each received in GCSE Science and electronics. And the fact that the constructional project undertaken by David was the "best ever seen" must surely be due in some part, to the emphasis placed on construction in the Novice course.

The third successful candidate was Charlton - a mere stripling at 79 years old! After many years in the Navy, and a spell as a short-wave listener, he decided to give the Novice licence a try. Next step? Well, he already has his sights set on the next target - the 'A' licence. We all wish you well, Charlton. Let us know when you get it, won't you?

New Novices expected after the next exam include Rebecca, who is blazing the trail as the first young lady to take the course in Pontypool. More are expected to follow so keep us informed Con!

ALL THINGS ARE POSSIBLE

IT HAS ALREADY been mentioned that our hobby is open to all, regardless of disability, and here is further proof. Jamie and James are at present working very hard and will be taking the NRAE in December. Most people have thought with dread of a dark world, but spend a moment thinking of a silent one. Both of these boys are deaf.

The Mary Hare Grammar School, a unique Secondary School for deaf children runs a Novice training course with teacher Merton, G4JAL, the Instructor. The school callsign is G7MHS. Jamie and James are pupils there. Two girls, Beth and Tina, have also had practice using the radio equipment and may well follow their example in the new year.

Facilities available include a radio shack, workshop, library and equipment including packet capabilities. The shack also contains an overhead projector, and this has enabled the training to break new ground. In future, more aspects of amateur radio will be covered including Morse training and construction of QRP (low power) equipment using school-made PCBs.

Another Novice training course is to follow next year and there will also be an RAE course for some of the teachers who have become interested through the initial Novice venture. £500 has been donated to the school by the BP Forties Field towards equipment for which they are very grateful.

We wish the students and staff at the Mary Hare Grammar School every success, and hope to hear more from them in the future.

The final comment must come from their newsletter, *Chatterbox*. "If you are interested, please come and see our station". Those in the Newbury area of Berks, with a little time to spare, might like to take up the invitation? Perhaps you could give them a call on 0635 248303 to arrange this, so that it fits in with other activities they may have planned.

NRAE RESULTS

I HAVE JUST spent a useful hour or two reading the City and Guilds report on the NRAE. 223 candidates took the September exam, and there were 183 passes giving a pass-rate of 82.1%

Since the first exam in June last year, there have been 1475 candidates. Of these 1145 were successful giving an overall pass-rate of 78.59% These figures appear to show that there were 312 unsuccessful candidates, but I hope that many of them tried again and were successful at the second attempt.

The general comments state that most candidates were well prepared - which gives a pat on the back to Instructors. There was however, a comment on the answering of questions on safety which must give cause for concern:

"The two questions on safety attracted good scores. Although only 71% of candidates answered the question correctly, it is encouraging to note that candidates are improving gradually in their knowledge of the wire colours for a three-pin mains plug"

This rather implies that up to 29% of budding Novices might wire a plug wrongly! Perhaps on other household appliances too. It also means almost *one third* could put themselves - and others - in great danger. A vital point that must be addressed.

On a different note but again in the general comments following the June exam. Results should be sent to centres within four weeks of each examination, but marking takes place after all papers are received by the Institute. If there is a delay in receiving them from some centres, then results will be delayed for all. Those who have any influence at all with centres could perhaps help in ensuring that papers are dispatched quickly - for the benefit of all candidates.

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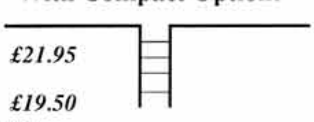

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This is a truly amazing kit for all those who want to get into packet radio without committing themselves to a large outlay. The complete kit of parts is provided with circuit, board layout and comprehensive manual. It can be put together in an evening. All you need is an RS-232 lead to your computer and cable connection to your transceiver mic socket. You'll be receiving and sending Packet signals in no time at all. If you haven't tried Packet radio, here's your chance to do so with minimum outlay and guaranteed results.

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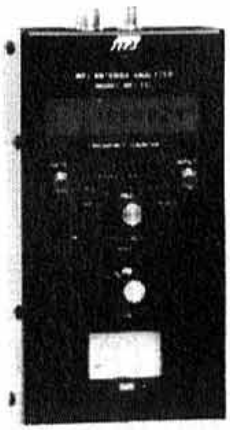

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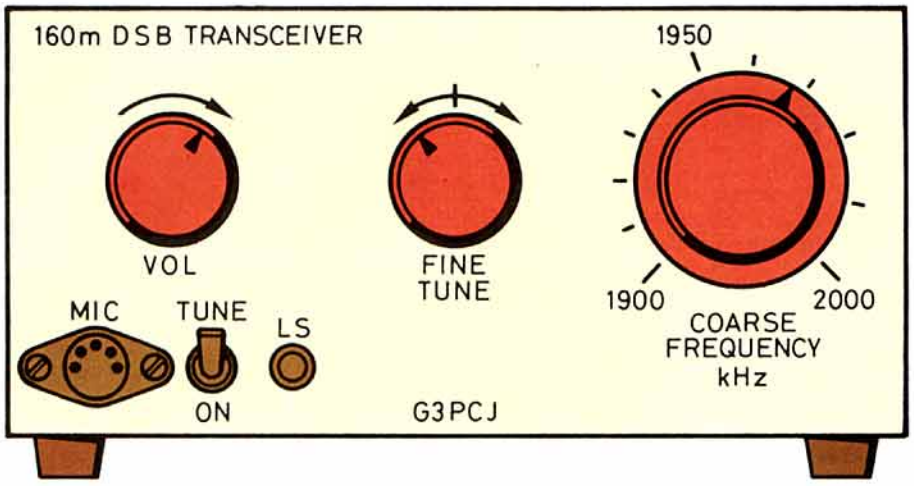
RADCOM TECHNICAL FEATURE

Simple 160m Phone Transceiver

The first of a two part article by Tim Walford, G3PCJ

MY DESIGN OBJECTIVE was a rig for construction by Novices interested in phone operation. The new Novice A licence only allows phone operation on Top Band (1.8MHz) or from 28.3MHz upwards, but the latter isn't so easy for home construction. This rig covers Top Band and has an output of 3W PEP DSB (the Novice licence limit) from a 12V supply. It is simple, easy to build and set up (both mechanically and electrically), and performs well considering its low cost. It should appeal to QRP operators and those who used to use valves but have so far been reluctant to experiment with solid state gear! The band is lovely and quiet by day - ideal for ragchewers! Don't be put off by a lack of garden for antennas - practically any length of wire can produce surprising results if properly matched. The rig should cost about £50, and could form the basis of an effective but low-cost amateur station!



MAIN FEATURES

THE RIG HAS A DIRECT conversion receiver (Rx) for SSB, AM, DSB (or CW). The transmitter (Tx) is double sideband suppressed carrier, with a VFO covering 1.9 to 2.0MHz. Simple mechanical construction is used, and the PCB has a minimum of parts (all readily available). Setting up is also easy and the set features a robust FET RF output stage. A wide range of mic types are suitable and, lastly, the transceiver operates from a non-critical 12v 1A supply. See **Fig 1**.

Apart from the rig, a power supply, loudspeaker (LS), antenna and matching unit will be needed for receiver operation only. For building the transmitter a microphone with Push to Talk (PTT) switch, antenna matching indicator, and a 50Ω dummy load are also required. For setting up the receiver, the minimum test equipment is a frequency counter or second radio which covers Top Band. The transmitter will need a 1A DC meter and an antenna matching unit. An SWR (standing wave ratio) meter to indicate both power output (or forward voltage) and reflected power (or voltage) will give optimum antenna matching. Full class A licensees should note that 'QRO' operation at about 10W PEP is possible with a 25V power supply.

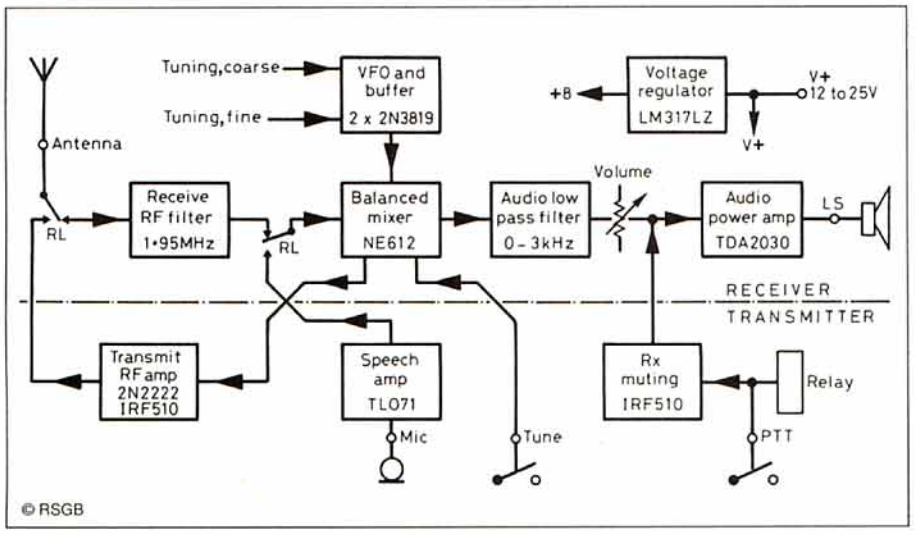


Fig 1: A block diagram of the simple 160m phone transceiver illustrates how the dual-input / dual-output double balanced mixer is used for both transmit and receive signals.

CONSTRUCTION HINTS AND TIPS

THIS PROJECT IS FOR THOSE who already have some electronic construction experience - the board is moderately dense and it requires tidy soldering. Hence it is not suitable as a first construction project. Readers who are not very experienced in construction are advised to read the whole of the article (including part two, next month) before they start. If in doubt, don't hesitate to consult someone with more experience. Novice course instructors should certainly know someone who can help. It is possible to build the receiver on its own initially (two chips, two transistors and a voltage regulator) then add the transmitter later. The whole rig only uses three chips and five transistors, plus the voltage regulator. You can't get much simpler than that for a complete phone rig!

MECHANICAL DESIGN

THE MECHANICAL CONSTRUCTION is the simplest complete solution I could devise! Since all three controls are pots, a simple front panel and printed circuit board (PCB) is adequate. Provided it is copper plated on one side the front panel can be soldered to the main PCB. Solder joints should be placed every 35mm between the front panel rear copper side and the top or ground plane side of the main PCB. They are both initially 100 x 160mm and the single sided unetched board is cut to 75 x 160mm with a hacksaw for the front panel. All three controls, sockets for microphone and LS, and tune switch can be suitably positioned, and the offcut strip used to form two 25 x 50mm corner bracing pieces

placed at the ends of the joint between the main PCB and the front panel.

All holes in the front panel should be drilled to size before soldering to the main PCB. If an electric drill is not available then use a small hand drill to make, say, 2mm holes and enlarge them as required with a round file, remembering to remove any burrs. Four rubber stick-on feet are placed in the underside corners of the main PCB. Alternatively the main PCB can be mounted in a metal box using stand-off insulators, but this is much more expensive and not really necessary!

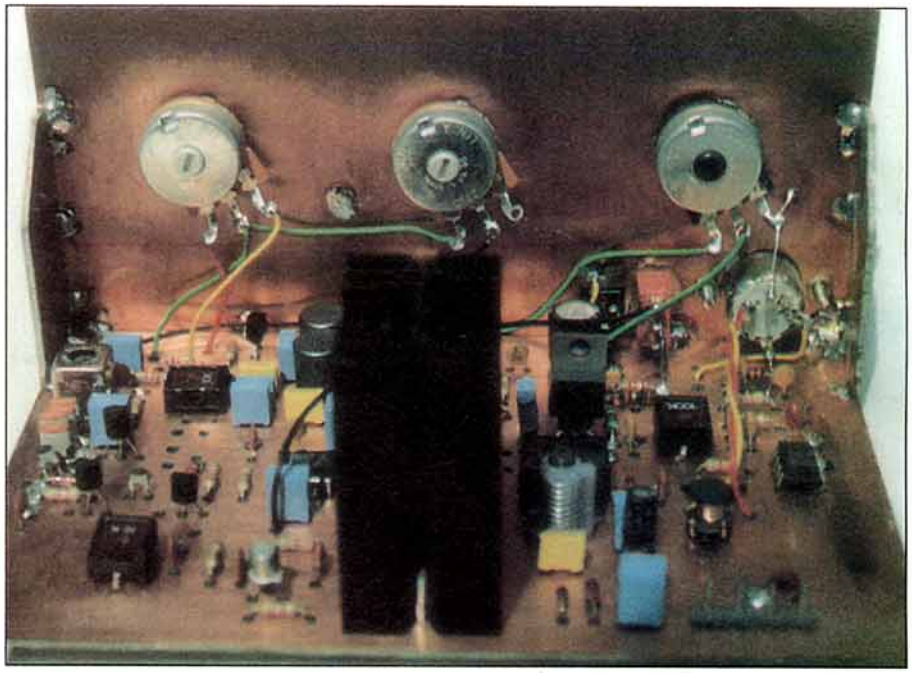
MIXER AND OSCILLATOR

FOR ELECTRICAL SIMPLICITY and the avoidance of awkward or difficult to obtain parts, the rig uses a balanced mixer chip type NE612 [the near equivalent NE602 would also be suitable - *Ed*] for reception of SSB (either sideband) DSB, CW, or AM. The same chip on transmit generates double sideband suppressed carrier signals. Hence the rig should be compatible with all amateur users of Top Band. Remember that the band is shared with other (non-amateur) users and it is important to avoid interference to others. Listening carefully before transmitting should ensure there is no problem.

Fig 2 shows the circuit diagram. The most critical part of the transceiver is the variable frequency oscillator (VFO) used to drive the mixer chip for both reception and transmission. Many simple rigs use crystal control but this is unsuitable for tuning SSB signals. To avoid the mechanical complexity of variable capacitors and slow motion drives, variable capacitance diode tuning is employed with two pots for coarse and fine tuning respectively. A +8V regulated supply from a LM317LZ feeds the VFO which is fitted with temperature compensating capacitors to give good stability. Although the NE612 has its own oscillator facilities, they can't be used in this case since better buffering is required on transmit to avoid frequency modulation. The VFO uses two 2N3819 JFETs in a Hartley oscillator and buffer arrangement.

RECEIVE FILTERS

ON RECEIVE, SIGNALS FROM the antenna pass through the receive RF filter. This removes out-of-band broadcast signals which might otherwise overload the mixer. The various windings and tappings on the coil match a 50Ω antenna impedance to the 1.5kΩ input of the NE612 mixer. A relay is used to disconnect this filter on transmit, but two wire links can replace the relay if the transmitter is not being built. The received signals are amplified and converted down to audio in the mixer. Unwanted signals beyond the desired maximum of 3kHz are removed by the LC filter on one output of the NE612. This filter has a very sharp roll-off such that signals more than about 6kHz away from the desired one are unlikely to be audible. The principal gain control (manual in this case) should always follow the main filter and the combination of 2k2 resistor and the 4k7 log control provide the correct filter termination. The use of 47nF and 220nF in series provides a solution to finding non-standard 40nF capacitors for the filter! All the audio amplification and power



driving for a loud speaker is done in the TDA2030 chip- this is a useful device which can accept wide supply voltages and have its gain/bandwidth adjusted in the same way as an operational amplifier (op-amp). In this case its voltage gain is set to 2,200 over the band 300Hz to 3kHz.

TRANSMITTER OPERATION

THE TRANSMITTER DEPENDS on the same NE612 chip acting as a balanced modulator. The VFO input to the mixer is unchanged but the other input receives signals from the speech amplifier via a relay.

The speech amplifier has a preset potentiometer to adjust the gain over a wide range. This allows different types of microphone to be used, with outputs in the range 1mV to 500mV and impedances up to 47kΩ. Crystal, dynamic, amplified and electret types are all suitable.

Space is allowed on the board for an input resistor which may be needed for a low impedance or amplified mic. The modulated RF signal is taken from the output of the NE612 to a buffer which presents a low impedance drive to the IRF510 transmit power amplifier (note that a carrier balance control is not needed since the inherent balance in the NE612 is adequate for this rig).

The IRF510 power FET is pretty robust and should tolerate moderate unintentional abuse! It's also very cheap which is why another is used to mute the receiver on transmit. Both power FETs are turned on by a preset DC voltage on their gates which is reduced on receive to turn them off.

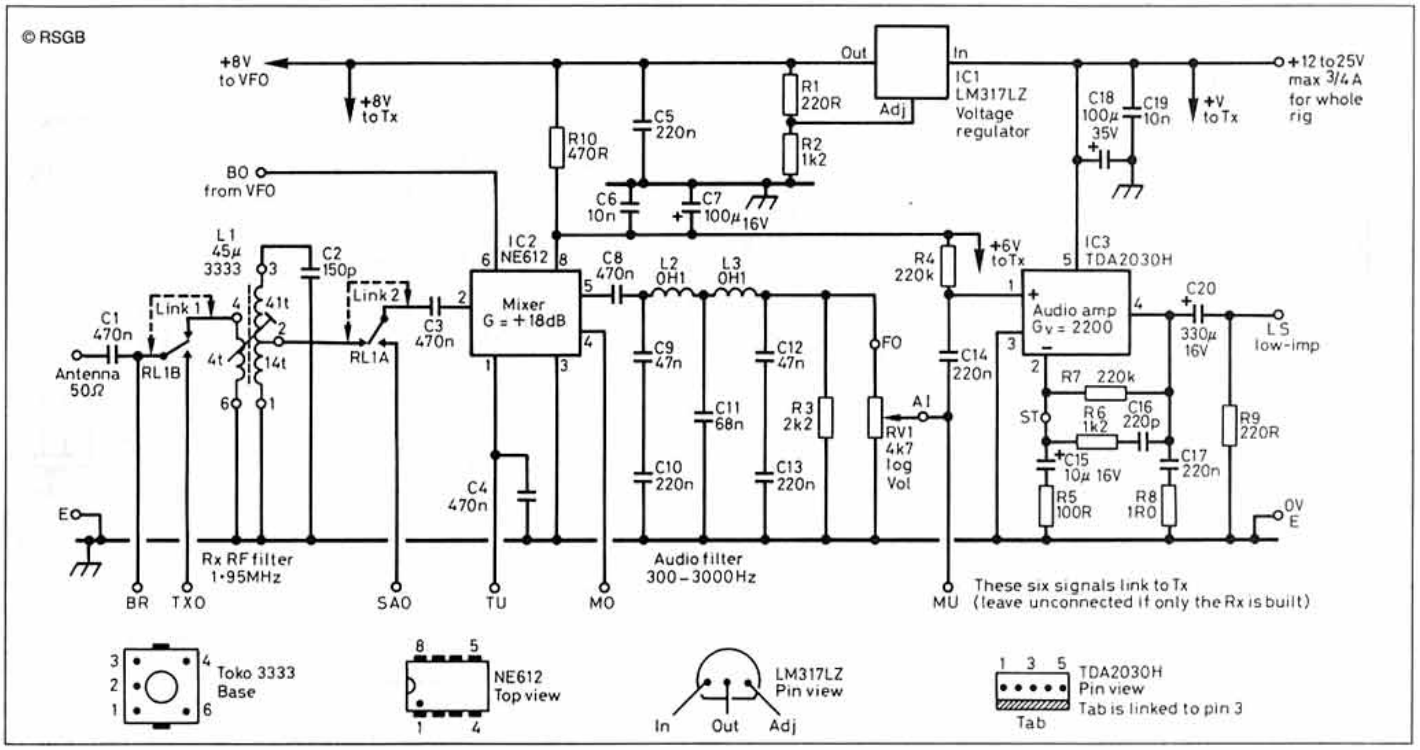
The drain circuit of the output FET is a very high C - low L tank circuit resonating at 1.95MHz to achieve a loaded Q of 12. This provides some reduction of harmonics. A single relay provides the changeover to transmit and the board allows for a single pole, normally open, PTT switch in either the supply to the relay or in its ground connection, to suit the type available. Another switch unbalances the modulator, which in turn produces a carrier for tuning the antenna matching unit (ATU).

ASSEMBLY DETAILS

GOOD SOLDERING TECHNIQUES are needed with any project (beginners might like to refer to First Steps in Home Construction, *RadCom*, May 91). A 15 to 20W soldering iron with a clean 1 to 2mm tip gives best results for the PCB mounted components. Most components will solder easily but sometimes the Toko coil screening can lugs are reluctant to take solder so it is advisable to tin them before insertion into the board.

The general mechanical layout is left to the individual constructor, but the layout shown in the photograph has proved most effective. The two tuning controls can be positioned anywhere but the volume control must be connected by short leads to the PCB. The wiring to the two sockets should also be reasonably short and not close to each other. Most readers will purchase a kit with all parts included (see part two) and the rest of the article assumes construction from a kit. However there is nothing to prevent the more adventurous etching their own boards or using 'dead bug' style construction with components mounted by their leads on a single sided copper board. The layout shown in part two is recommended, however!

Mark out carefully and then drill the front panel, check that sockets and pots will not foul parts on the board, (remember to allow an extra 2-3mm for the thickness of the concealed front edge of the main PCB). Fit the two sockets and 'Tune' switch. Next, solder the front panel temporarily on its rear side to the top/ground-plane side of the main PCB front edge (made from offcuts of the original 100 x 160 front panel PCB) ensuring that the front panel conceals the main PCB edge. Solder lightly each end only at first, about 3mm from the ends of the joint. Check that the two panels are at right angles by fitting the two corner braces. If correct, solder the braces into place at each end of their straight sides, then finish soldering the main PCB to the front



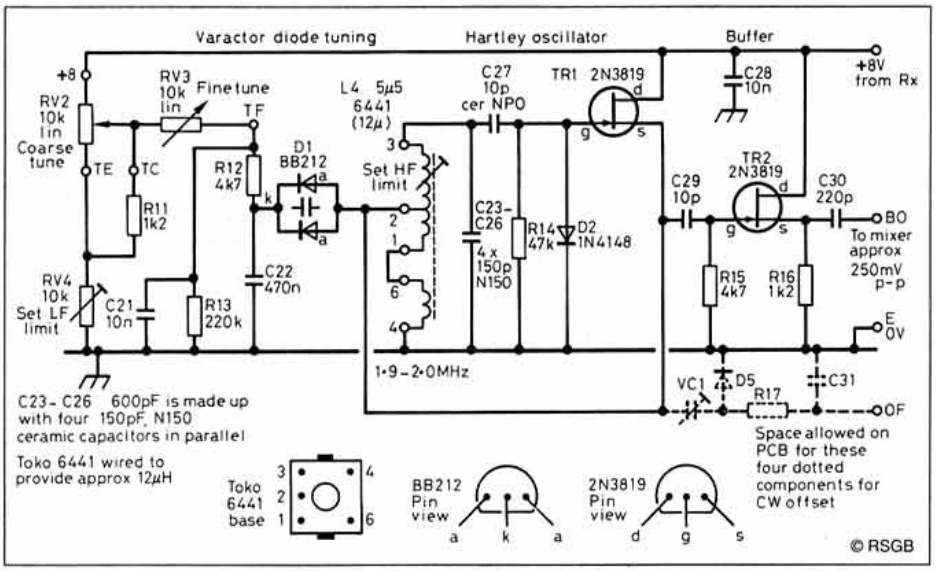
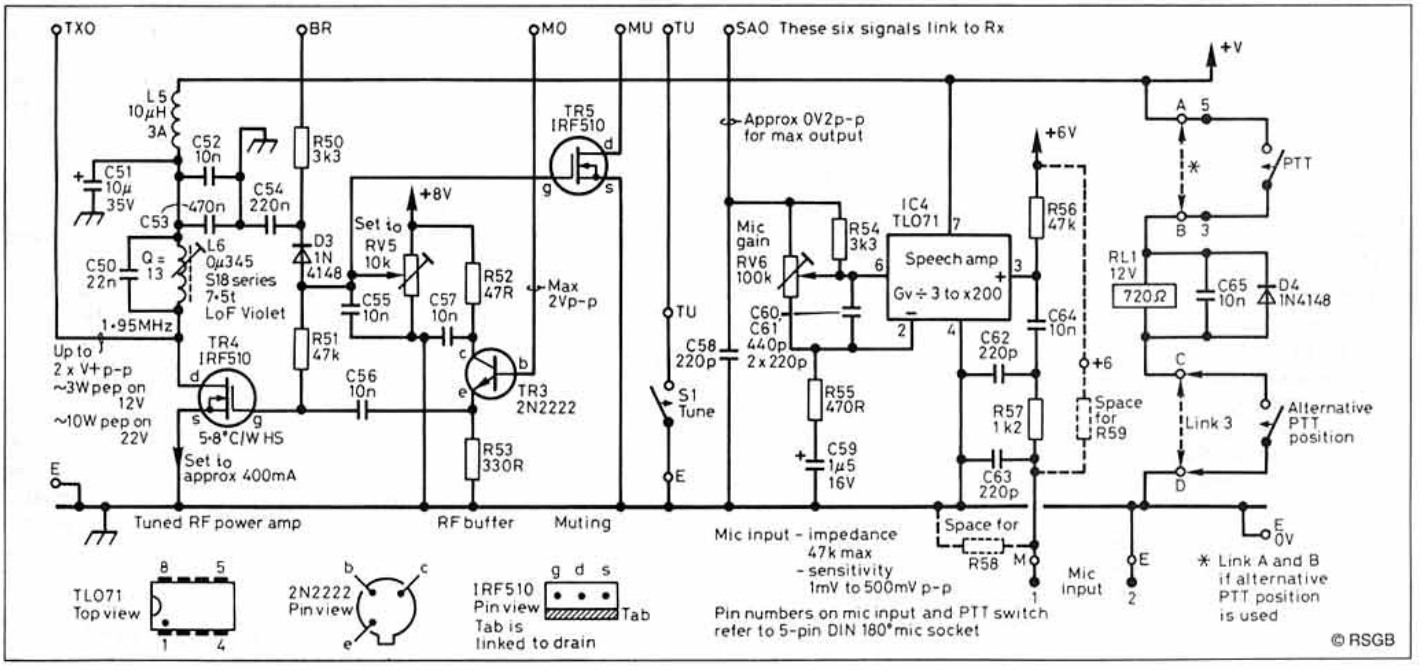


Fig 2: The 160m DSB transceiver combines good performance with a relatively simple design using easily available components.

A direct converson receiver (top) using just two integrated circuits is combined with the varicap-tuned FET VFO (centre). The receiver will operate satisfactorily on its own provided that links 1 and 2 are inserted in place of the relay contacts.

The transmitter (bottom) is suitable for use with a variety of different microphones, and produces an output of up to 10W PEP when used with a 22V supply. For Novice use, a 12V supply will give an output of 3W PEP.

Note that R18 – R49 and C32 – C49 do not exist.



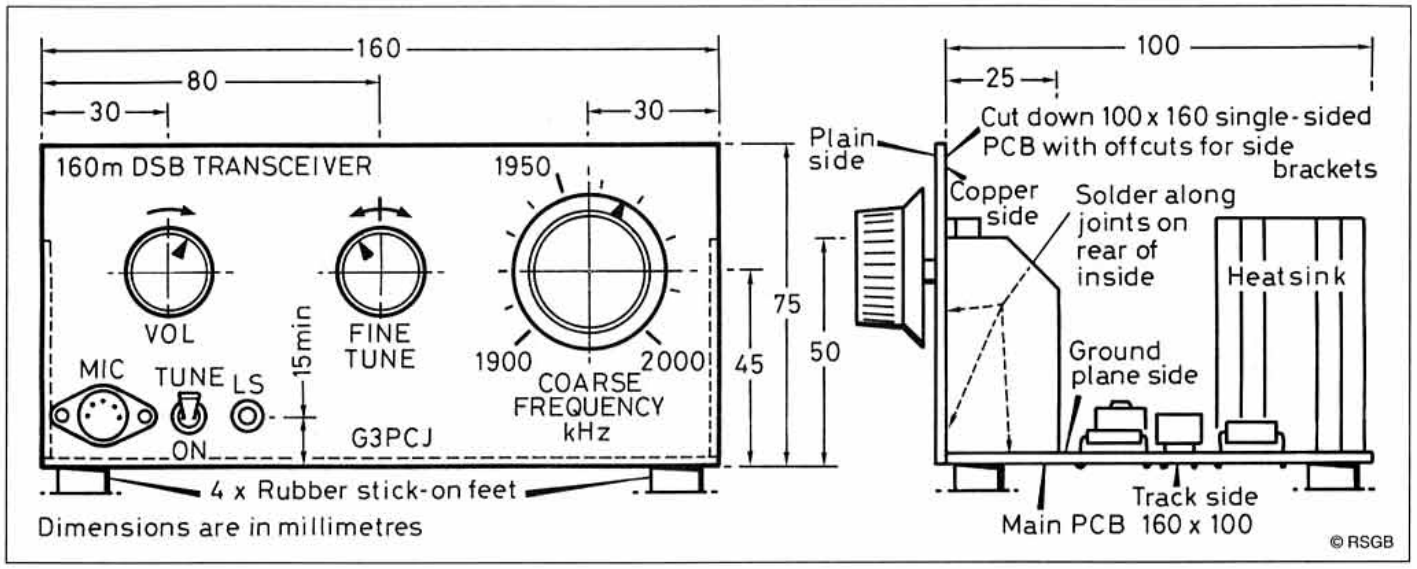


Fig 3: The G3PCJ 160m DSB transceiver covers a frequency range of 1900-2000kHz on 160m, although it can also be modified for the CW sector of the band.

panel by extra joints every 35mm or so. Sticking the four rubber feet to the corners of the main PCB should result in a rigid, self contained structure!

Note: The main PCB should be assembled prior to attaching the front panel.

CONNECTIONS TO THE PCB

THE MAIN PCB IS DOUBLE SIDED with an unetched copper ground-plane on the top or component side - and tracks etched on the bottom. Where non-earthy leads emerge through the top of the main PCB there should be an etched insulating area or countersinking to avoid contact between the lead and ground plane. Earthy lead holes will not be etched or countersunk on the top.

Usually connections to the ground plane (0 volt) are soldered on both sides of the board but there are some components, such as polyester and electrolytic capacitors, where it is impractical to solder their earthy lead to the PCB without it sticking too far off the board. All these points are linked by tracks to earth points where it is possible to solder both sides- these tracks have a chassis symbol on them at some point on the PCB. Thus the earth points must be soldered to the ground plane wherever possible - ie at all earthy leads of resistors, disc ceramic capacitors, transistors, ICs and coil screening cans.

Make certain that the correct end of these earthy components is soldered to the ground plane because it is practically impossible to remove (and re-use) a part that has been soldered on both sides. If IC sockets are used it is wise to double check their orientation.

The circuit diagram (Fig 2) and parts layout (next month) should be used to check that components are inserted correctly. It's a good idea to photocopy the circuit and cross off parts as they are fitted. Leads should be short but not so tight that they touch the top ground plane when they shouldn't - particularly integrated circuits.

After inserting a component, double check the connections before going onto the next. Always turn the rig off before inserting a new part, soldering or attaching test equipment leads.

AUDIO AMPLIFIER AND VFO

I ADVOCATE CONSTRUCTION in stages, testing each on completion where possible. Remember to check the polarity of the 12V power supply before switching on. If incorrect it is easy to destroy some components! I suggest starting with the +8V regulator IC1 followed by R1, R2, R10, C5, C6, C7, C18, C19. This can be tested with a voltmeter. Next assemble the audio stage IC3. This is bolted directly to the board without an insulating washer. Install R4, R5, R6, R7, R8, R9, C14, C15, C16, C17, C20. Connect short wires from the board to the LS socket, fit the 4k7 volume control and connect the earth lead directly to the front panel ground-plane.

Connect the slider to the TDA2030's input with a short wire AI (see circuit diagram). Connect another short lead for the input to the pot from the LC filter but do no fit the filter Ls and Cs yet. Connect a loudspeaker (LS) to a 3.5mm plug, plug in and switch on. A finger on the input lead to the volume control (turned clockwise) should produce a loud hum if all is well. Switch off and install L2 and 3, R3, C8, C9, C10, C11, C12, C13, repeat the finger test but this time at the junction of C8 and C9.

Begin construction of the VFO by soldering TR1 and TR2 carefully. Next come resistors R11, R12, R13, R14, R15, R16, RV4 followed by capacitors C21 to C30, then L4 and diodes D1 and D2. Although the circuit shows two varactor diodes they are both within a single BB212 package. The coil shield of L4 should have both of its lugs soldered. Install the two tuning pots and wire them up to +8V, TE, TC and TF. When fitting the preset RV4 adjust its slider fully anti-clockwise (which gives the largest VFO frequency range). If another receiver covering Top Band is available (or a frequency counter) the VFO can now be tested, otherwise proceed with construction of the rest of the receiver. Connect a lead from the output of C30 to the other receiver's antenna terminal. Tune around 1.9MHz and listen for the rig's VFO while turning the coarse tuning control from one end to the other. It should appear somewhere as a loud heterodyne (oscillation). Precise frequency calibration is done after all construction is complete and power has been applied for at least 15 minutes.

RECEIVER TESTING AND CALIBRATION

THE REMAINDER OF THE RECEIVER can now be completed and IC2, L1, C1, C2, C3, and C4 connected. If the transmitter is also being built, then relay RL1 should be installed. Otherwise put in two short wire links (links 1 and 2), as shown, to simulate the normally closed contacts. Now try out the whole receiver with an antenna such as a few metres of wire or even a central heating pipe! Of course, a properly tuned and matched antenna system is even better. Certainly at night there should be stations audible which will help in adjusting the set, and by day a slight increase in background noise should be present when the antenna is plugged in. If the 'hum test' was satisfactory but the receiver still doesn't work, then it's likely that the VFO isn't working - check all connections carefully. When all is well the receiver power supply current should be between 40 and 70mA.

To set the VFO frequency calibration turn the fine tuning control to mid position, then the coarse control fully clockwise for the 2.0MHz mark. Next adjust the core of L4 to bring the VFO to 2.0MHz using either another receiver or a frequency counter. Either a plastic trimming tool or a suitably filed down plastic knitting needle should be used. Then turn the coarse tuning control fully anti-clockwise for 1.9MHz. Tune the VFO to 1.9MHz by adjusting the preset RV4. During final calibration, each 10kHz of the dial can be marked off with the aid of a counter or crystal marker generator.

Finally peak the RF filter with a steady signal on about 1.95MHz. To do this, adjust the core of L1 for maximum heterodyne loudness (reduce the input signal as necessary). That completes the receiver adjustments and now it's ready for use. If broadcast station breakthrough causes problems then an extra RF tuned circuit could be provided. However, in most cases the antenna matching circuit, to be described next month, will eliminate this problem.

. . . to be concluded

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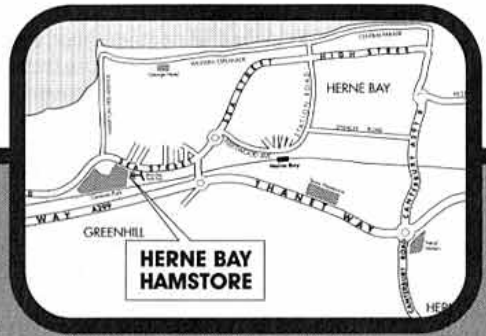

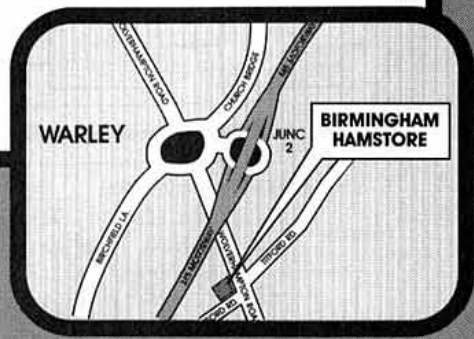

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IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

Michel Vonlanthen, HB9AFO, assembled an ultra-sensitive **10GHz FM ATV receiver**. He recently took it to the top of the Puy de Dome in central France, 1465m ASL, where F/HB9AFO/P received perfect pictures from FC9JSR/P (20W from a TWT) atop Mont Blanc, 3842m ASL, a record distance of 303km. A simple companion **transmitter** has only four components! The descriptions appeared in the Swiss *Old Man* of 9/92.

THE SENSITIVITY OF MY 10GHz ATV receiver outstrips anything achievable with amateur means; this is made possible by the use of a satellite TV component called an LNB (Low Noise Block), which is satellite TV parlance for a down converter with a low-noise pre-amplifier. **Fig 1**.

THE RECEIVER

THOUGH NOT DESIGNED FOR amateur frequencies, my Sharp model BSCH86ZOO 10GHz LNB still has useful gain in the 10.3 - 10.5GHz part of our band; it drops off rapidly below that.

With the LNB's local oscillator at 10.0GHz, a 10.5GHz signal is converted to 500MHz. As a very sensitive receiver for that frequency I use an AOR AR-3000 multimode scanner.

Its 45MHz IF was brought out and fed to an FM TV decoder which is a 45MHz adaptation (originally 65MHz) of one described by DF4PN in *cq-DL* 11/89. Its output, 1V p-p of composite video, and sound, are then applied to the SCART connector of the TV receiver.

The coax carrying the signal down from the LNB to the scanner carries DC up: 15V to power the LNB and 18V to activate the antenna polarization switch contained in the LNB. DC is blocked from the scanner by a 10pF ceramic capacitor and fed into the coax through a choke of 6 turns, 4mm diameter of 0.4mm enamelled wire.

RESULTS

ON FM WIDE-BAND PHONE, the first results surpassed our fondest hopes. The combination of a 60cm off-set dish, LNB and scanner outperformed our conventional Schottky diode system by several tens of decibels.

On ATV, I have made a QSO with Serge, FC1JSR, a distance of 135km. Perfect colour pictures. At 50km, I could even receive without an antenna! For comparison, the best AM ATV QSO was with HB9SLV over a distance of 74km, but that was P2 and barely decodable.

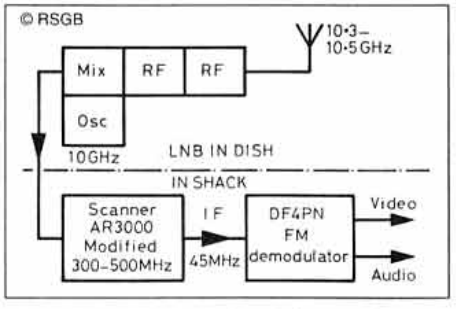

Fig 1: The 10GHz FM ATV receiving system

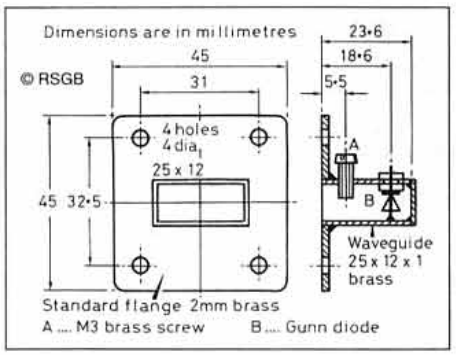

Fig 2: The Gunn diode 10GHz oscillator

The stability of the 10GHz YIG oscillator in the LNB is good enough for NBFM reception. I have not tried SSB or CW, but a pure carrier does produce a beat note.

A satellite TV receiver, minus the LNB, can be used for 1.2GHz ATV as it covers 0.95 - 1.95GHz. As these receivers are intended to work off an LNB, their noise performance is not the best and a low-noise pre-amp is indicated. The picture quality is perfect, however. [According to G4AYT the 300-500MHz FM output of an LNB receiving a 10GHz ATV signal can be fed directly into a domestic (AM) TV set; slope detection provides recognizable pictures, or sound, though not both at the same tuning - *G4LQI*]

Numerous 1255MHz experiments have convinced me of the superiority of FM over AM ATV. Once the FM demodulation threshold has been surpassed, the picture is unconditionally stable, even in the presence of noise. Also, the span between nothing and a perfect picture is but a few dB, while on AM this is at least 40dB. This was borne out by my experience on Puy de Dome. On the top, reception varied P0 - P5, the latter for extended periods. Only 50m lower, there was no reception at all. The only disadvantage of FM is bandwidth, 20 - 30MHz of it, [half as much is used in the UK - *G4LQI*] but in the 23cm or 3cm band there is room to spare. We use the same FM standard as satellite TV.

THE SIMPLEST ATV TRANSMITTER

TO BE QRV ON 10GHz QUICKLY, I use an oscillator, **Fig 2**, which I had built a few years ago. The first modulator was identical to the one I use on 23cm, but I was not satisfied with it and after several simplifications I arrived at the 'minimum' version of **Fig 3**.

Being an experimental arrangement, the modulator is directly connected to the oscillator, ie without a buffer. This makes the connecting cable part of the oscillator circuit: change its length and the transmitter frequency changes. My tests show that it works perfectly, though. Using a horn antenna with an aperture of 7cm (15dB gain) a P5 colour picture was received 5km away.

The 10GHz transmitter is a Gunn diode oscillator. The iris, a standard flange with a central 7.8mm dia round hole instead of a rectangular opening, controls the loading of the oscillator by the horn antenna: **Fig 4**. The diode was bought at Birkett's in England for less than £3. With my Gunn diode a 6.5V supply gives the best result. I have not measured the output but estimate it between 5 and 10mW.

The trick of modulating the diode is to directly connect the video signal to the voltage divider which controls the output voltage of the LM309K regulator. The 82Ω resistor provides proper loading for the camera and setting the regulator to 6.5V is the only adjustment required.

With only four components, this must be the world's simplest FM TV transmitter: a case for the *Guinness Book of Records?*

The modules are bolted together by means of standard flanges. They make a 10GHz Meccano from which many other combinations can be assembled.

Four of us are QRV on 10GHz FM ATV: FC1JSR, HB9SLV, HB9RKR and HB9AFO. We can go to mountain tops at short notice. Ask us for a sked.

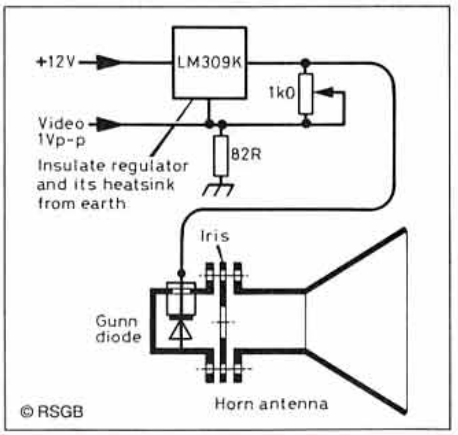

Fig 3: Frequency modulating the 10GHz ATV transmitter

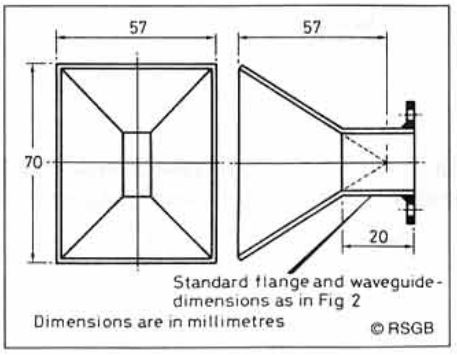

Fig 4: This simple horn antenna has 15dB gain

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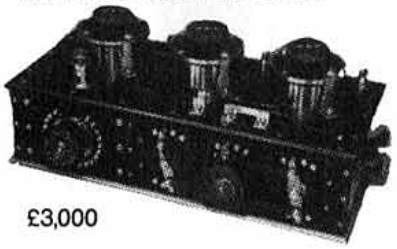

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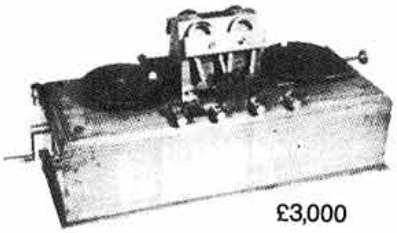

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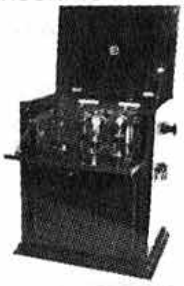

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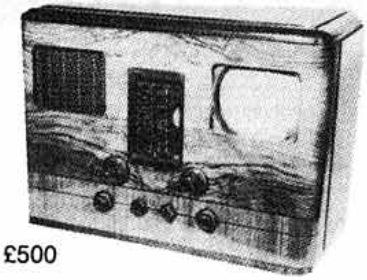

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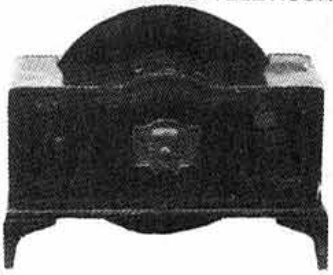

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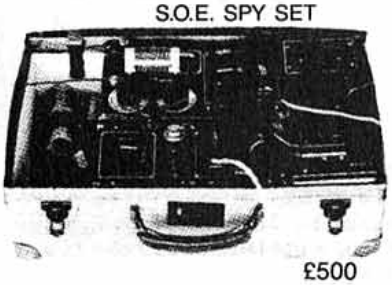

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Pat Hawker's Technical Topics

VALE - WILLIAM HALLIGAN, W9AC (HALLICRAFTERS)

WHILE THE TOP HF communication receivers of the 1930s were undoubtedly the HRO and Super Pro models noted in the September *TT*, the more widely known and most famous name in amateur radio receivers for many years was indisputably 'Hallicrafters', the firm founded by William J Halligan, W9AC, in 1933 and which he ran until he retired to Miami, Florida in 1975. From ARRL comes the sad news that the founder of Hallicrafters died on 14 July, 1992, aged 93, after a life which spanned the whole history of radio.

He was first licensed as 1AEH in 1914, served as a ship's radio operator when still a teenager and as a US Navy operator at NAE on Cape Cod during WW1. He then worked for a time as a journalist before opening a radio store in Boston during the 1920s. In 1928 he moved to Chicago forming a partnership Chambers-Halligan selling retail radio components.

When, during the American depression, the firm failed, he formed his own company Hallicrafters, and was soon making and selling communications receivers ranging from the low-cost Sky Buddy (which sold in the UK for around £9), the Sky Champion with a stage of tuned RF amplification (UK around £15), to a series of higher performance Skyriders, Super Skyriders and Ultra Skyriders (coverage up to 79.5MHz) and Sky Challengers. From 1937, there was also a series of Hallicrafters AM/CW transmitters, starting with the 50 watt (100W CW) HT1 and from 1938 the HT4 (325W phone/400W CW) that became the basis of the US services' excellent BC610 transmitter used in the signals vehicles SCR299/SCR399 mentioned in connection with the Super Pro.

The British Y-services made good use of Hallicrafters S-27 VHF receivers tuning 27.8 to 143MHz (S-27B 36 to 165MHz) introduced in 1940, and also a high-performance HF receiver in the Super Skyrider series (SX-28 and military version SX-28B) dating from 1941. Post-war, in 1946, the low-cost S-38 was in effect a replacement for the Sky Buddy, with the S-40 replacing the Sky Champion, but import restrictions meant that few came to the UK.

With all the surplus receivers on the market in the late 1940s and 1950s, communication receiver firms found in tough going and, for example, Hallicrafters began making television receivers. Nevertheless, they still catered for the amateur market with a succession of models and some kits, pioneering a number of technical firsts and in 1962 becoming the first firm to market an amateur transceiver with a fully-transistorised receiver section (FPM-200). One of the best known post-war models was the SX71 double-conversion receiver introduced in 1950.

The following month, August, saw the passing at the age of 80 of (Colonel) Jerry Parker, G1SML, who played an important role in the wartime SOE Signals Directorate, organising clandestine radio links from Cairo and from the UK. In *TT* (June 1987, p409) I told how in Cairo in the early 1940s, dissatisfied with the equipment provided by British Intelligence, he bought from special funds a number of the Collins 18M-5 transmitter-receivers which had been developed originally for one of Admiral Byrd's Antartic expeditions. These were supply to General Mihailovic's Chetniks in the days before British support swung behind the partisans of Marshal Tito (Josef Broz). Jerry Parker was later involved with the links with Denmark that used the 'Telephone Directory' set designed by Lorens Duus Hansen, OZ7DU and built secretly in Copenhagen. Jerry once described how the first time Hansen came secretly to London to meet him, he was brought out of Denmark in a high-speed launch which picked him up from the pier that jutted out from and was used by the Gestapo headquarters in Copenhagen.

IMPEDANCE/POWER METER

C W FARRELL, G8GS, having used a thermo-couple ammeter and 75Ω dummy load to measure transmitter output to a matched antenna, decided to make another instrument. This incorporated a peak voltmeter to enable measurement of circuit impedance (Vpk x 0.7/Irms) in addition to RMS power (I x I x R) and sinewave PEP power (2 x I x I x R) using simple arithmetic. **Fig 1** shows his circuit - the meter is calibrated in peak and RMS volts with the aid of another test meter. The peak voltmeter uses three 1N914 diodes in series to cope with the peak inverse voltage, and capacitors of 0.01µF, 350V working for his transmitter output of about 45W RMS.

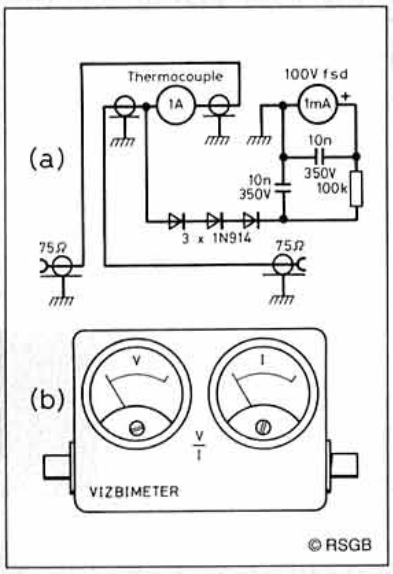

Fig 1: G8GS's 'Vizbimeter' has a peak voltmeter added to a power-meter using a thermo-couple ammeter and 75Ω load.

IONOSPHERIC PROPAGATION ON VHF

WHEN, IN MID-1985, the DTI accepted the recommendation of the Merriman Committee that the band 50-50.5MHz should be allocated to British amateurs, this was hailed in *TT* as "a valuable acquisition" (*TT*, September 1985 pp706-8). It was stressed that "50MHz is uniquely suitable for all those interested in the exploitation of an unparalleled number of different propagation modes. For 50MHz, rather than 30MHz, stands at the critical junction between HF and VHF and is a frequency more responsive to the ionosphere than the lower troposphere that dominates propagation on 70 and 144MHz. It combines many of the features of HF and VHF, external noise levels are significantly below those on 28MHz, antenna arrays are more compact, yet it is suitable for less critical and demanding equipment than the VHF and UHF bands."

"Just consider", I wrote, "the possibilities offered by the following basic propagation modes: (1) Worldwide F2 ionospheric propagation in daylight at periods of very high sunspot activity, with occasional, though possibly rare, openings towards the south in most phases of the cycle. (2) Transequatorial and field-aligned F2 propagation (TEP) in the evenings, even though the UK is often considered too far north for this to be at all common. (3) Ionospheric scatter modes (with very high power) can provide reliable 24hr communication over distances of from 500 to 2000km. (4) Almost the optimum frequency for sporadic-E and meteor burst communications. (5) Reasonable for auroral propagation. (6) Some degrees of tropospheric bending, ducting and tropospheric scatter modes, though less pronounced than at 144MHz and above. (7) Significantly better propagation over hills and down into valleys than at 144MHz."

It was also then noted that HF operators could expect to be reliably warned of sporadic-E and/or high MUF on 50MHz by the presence of short-skip signals on 14, 21 and 28MHz. Perhaps the one disadvantage of 50MHz, not mentioned in the 1985 item, is its susceptibility to local man-made electrical interference, including the all-too-common RFI from computer-based IT equipment.

Seven years later, there seems no reason to revise or amend this list of possible 50MHz propagation modes. Indeed the work by amateurs worldwide on this part of the radio spectrum is beginning to influence the professional radio physicists and the classic texts on HF/VHF propagation. A contribution by three Australian engineers - Peter Dyson and Juan Chen (Latrobe University, Bundoora, Victoria) and John Bennett (Monash University, Clayton, Victoria) in *IEEE Transactions on Antennas and Propagation*, July 1992, pp841-3 'Single-Hop F2 propagation above 30MHz and over distances greater than 4000km' clearly draws on the experiences of Australian amateurs (who have for years exploited the Australia/Japan path on 50MHz).

The abstract notes that "During recent years of increased solar activity there has been an increase in the number of reports of communications at 50MHz over distances exceeding 4000km. This has led to discussion of the

propagation modes and to suggestions that the 'standard textbook explanation' fails to explain that such propagation can occur via single-hop F2 modes. We point out that in fact, the 'standard textbook explanation' based on parabolic layers does predict such modes."

The authors write: "Long-distance propagation occurs mostly at HF, so textbooks usually couch their discussions in terms of these frequencies. However, descriptions of propagation via ionosphere make clear that the range of frequencies that can propagate in any mode depends on the properties of the ionosphere. Thus it is apparent that frequencies in the VHF band can propagate if appropriate conditions occur. Even so, other mechanisms involving scatter are more frequent causes of VHF propagation via the ionosphere and this has probably led to the mistaken impression that the 'standard textbook explanation' does not explain that VHF F2 propagation is sometimes possible."

The Australian writers show how 'Bougere's Law' can be used to determine the maximum frequency reflected from a specific height in the ionosphere and the relationship between the critical (plasma) frequency (the maximum frequency that will be reflected directly downwards) and the maximum usable frequency (MUF). They show that 30MHz signals can be propagated if the plasma frequency is 10MHz at a height of 386km so that propagation at 30MHz will almost invariably occur if foF2 is at least 10MHz: "Much higher plasma frequencies are required to reflect 50MHz. For example, the plasma frequency must be at least 13.6MHz at a height of 250km. Since the peak height of the F2 layer is often greater than this, foF2 will often need to be as much as 15MHz or greater for single hop F2 propagation to occur at 50MHz."

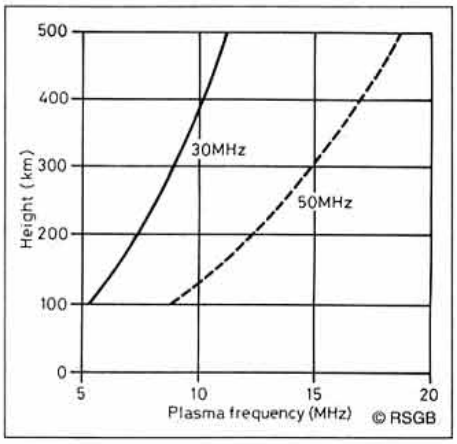

Fig 2: Diagram shows plasma frequency required to reflect 30 and 50MHz signals at various heights of the layer.

They note that data recorded by K Davies and published in the 1966 book *Ionospheric Radio Propagation* show that at mid-latitudes, the noon value of foF2 is about 10-11.5MHz when the sunspot number is high - thus propagation in the lower VHF band around 30MHz can be expected at these times at mid-latitudes. Davies also presents some data from the high latitude station of Adak, Alaska, showing values of foF2 as high as 15MHz. Perhaps surprisingly this indicates that 50MHz propagation is more likely at higher latitudes: "Relatively high values of foF2 also occur at the equatorial anomalies, increasing the likelihood of VHF propagation near the equator. Of course, other ionospheric features, such as ionospheric tilts or horizontal gradients, may lead to VHF propagation via the F2. This is particularly true near the equator where transequatorial propagation can occur due to gradients associated with the equatorial anomaly and with equatorial bubble irregularities. VHF propagation can also result from reflection from sporadic E layers."

Fig 2, from the paper, shows the plasma frequency required to reflect 30 and 50MHz signals at a given F2 layer height.

The paper notes that the calculation of the range of single-hop propagation is more complex. Davies showed that propagation over ranges of 4000-6000km can occur for single-hop F2 modes with the greatest range occurring when the M factor (the factor by which MUF is greater than foF2) approaches 3, giving as an example an oblique ionogram in which propagation between Ottawa and Slough, a path of over 5000km, occurred at frequencies up to 48MHz.

Fig 3 shows power contours for propagation via a quasi-parabolic layer at a height of 375km and with Ym representing the divergence of the layer from a true parabola. The M factor for this layer is 3.05 so that FoF2 must be at least 16.4MHz for (conventional) single-hop propagation to occur. **Fig 4** shows how the power contour can be affected by underlying E and F1 layers. The formulae on which these contours are based are given in the paper.

The paper is summarized as follows: "The main requirement for VHF single hop propagation via the F2 layer of the ionosphere is that foF2 must be sufficiently high, as occurs at times during years of high sunspot number. For a spherically stratified ionosphere, the highest frequency propagated depends on the combination of foF2, peak layer height and layer shape. Other factors, such as horizontal gradients, can also affect the highest frequency propagated via the ionosphere.

"The distances over which single hop F2 modes propagate can be significantly increased by underlying E and F1 layers. It has been shown that the presence of E and F1 layers can extend single hop F2 propagation well beyond 4000km for a wide foF2 is sufficiently high for them to be reflected from the ionosphere.

"Since VHF can propagate by other modes, (eg via sporadic E, transequatorial and scatter modes), careful consideration of prevailing ionospheric conditions is needed to positively identify VHF single-hop F2 modes over long distances."

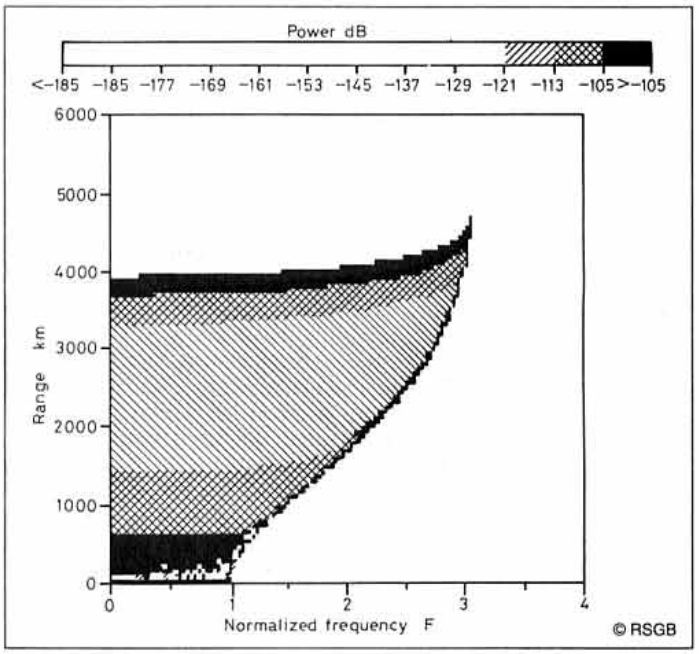

Fig 3: Power contours for single hop propagation via a single quasi-parabolic layer at a height of 375km. For such a layer the plasma frequency (F) for 50MHz propagation would need to be over 16MHz. However layer heights may be significantly lower than this making 50MHz propagation possible at lower plasma frequencies.

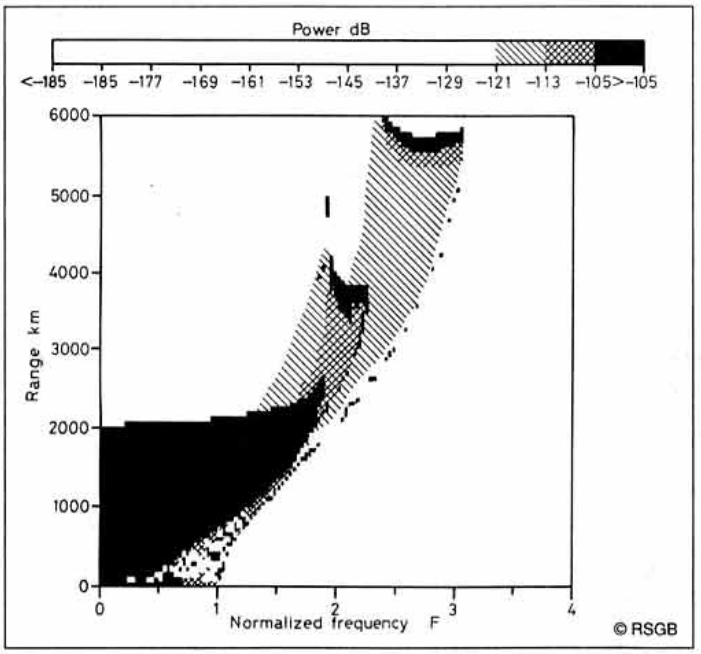

Fig 4: Power contours for single hop propagation via an ionosphere consisting of E, F1 and F2 layers based on layer parameters at Darwin, Australia at 1500 hours local time during March with a sunspot number of 150. The data comes from a paper 'Single Hop F2 Propagation above 30MHz and over Distances Greater than 4000km'.

MORE ON SLEEVE BALUNS

THE 1:1 CHOKE CURRENT-BALUN may be formed either by coiling a few turns in the coaxial feeder at the element end. Alternatively it can be constructed in the form of a ferrite-bead sleeve section as shown in *TT*, Sept 1992. A basically similar device but designed to fit to the base of the 300Ω section of a G5RV type antenna is regularly advertised in *RadCom* by Ferromagnetics of Mold. These are finding increasing popularity as a means of reducing common-mode RF current on the outer braid of coaxial cable feeders.

Most sleeve baluns comprise some 40-50 small ferrite beads slipped over a short section of thin diameter cable such as RG303/U or RG141 cable as shown in the September *TT*. However an alternative approach for use where such cable is not readily available is described by Bill Orr, W6SAI, in his 'Radio FUNdamentals' column in *CQ*, October 1992. He writes:

"The current balun can consist of a number of turns of coax wrapped into an air coil, or wrapped around a ferrite core. The air coil is bulky (about six turns of coax, 8 inches in diameter for RG8/U or RG58/U serves on the 14-30MHz range). This is an inexpensive choke coil, and it can be a portion of the feedline, held together with cable ties. For best results it should be placed at the antenna (element) terminals.

"Wrapping coax around a ferrite core is difficult, as anyone who has tried this can affirm. The bulky air coil is better.

"Taking an idea from the VHF solid-state world, Doug DeMaw, W1FB, proposed in 1980 that ferrite 'sleeves' passed over a coax line could serve as an RF choke, or current balun, to decouple the line. Shortly thereafter, Walt Maxwell, W2DU, built and measured such a decoupling sleeve made up of a number of ferrite beads on a length of the coax. The W2DU HF balun consisted of 50 type-73 beads on a foot-long length of 50Ω Teflon dielectric cable. The only fly in the ointment with this design is that the specified RG303/U cable is not available from most amateur radio distributors. The suggested alternative cable, RG141/U, is also not a household word!

"A practical and inexpensive balun can be either of readily available RG58/U or RG8/U (or similar European cables). Luckily, toroid beads (sleeves) having inner diameters of 0.5in and 0.25in that will pass the coax lines are available in either 43 or 77 ferrite material. The original W2DU design used 73 material which is similar to 77, but large cores that slip over coax lines are presently available only in 43 and 77 material **(Table 1)**.

"Test baluns were constructed using the two available types of ferrite and the baluns were tested using a General Radio RF impedance bridge. Each balun was made of a short length of RG58/U and tested using the set-up recommended by W2DU.

"It was arbitrarily decided that the impedance presented by the choke balun should be about ten times the coax line impedance over the operating range of the balun, 500Ω for a 50Ω cable.

"My conclusion was that the balun using 77 material performed best below 10MHz and that using 43 material was better above 10MHz. In both cases excellent current balance was obtained in the load, even when the load itself was purposely unbalanced.

"A ferrite sleeve balun can be built by sliding six (sleeve) beads of the proper size over the coax at the antenna end of the transmission line. The beads can be held in position against each other by application of heat-shrink tubing. Use the 77 beads below 10MHz and the 43 beads above 10MHz. If you don't mind a slightly poorer balance at the low frequency end, the 43 beads can be used down to 3.5MHz." I feel that to rely solely on heat-shrink tubing protection might result in UV problems for antennas in sunlight. Zack Lau, KH6CP/1 has pointed out in *QST* that it is difficult but not impossible to differentiate the various ferrite materials by colour and texture: "For example, type 43 material has a pronounced metallic sheen compared to type 72. Type 75 material usually appears to be dull and dark."

It is perhaps worth emphasising that, at least for dipole-type antennas, a balun may not be necessary, and may make very little difference to performance. Before going to the trouble of making or buying a sleeve balun it is worth checking that, without it, there really is significant RF current flowing back down the outer side of the braid on all or some bands and causing unwanted effects such as RFI or high levels of RF in the shack.

Amidon Part No	Outer dia (in)	Inner dia (in)	Length (in)	Fits cable
FB-77-1024	1.0	0.5	0.825	RG8/U
FB-43-1020	1.0	0.5	1.112	RG8/U
FB-77-5621	0.562	0.250	1.125	RG58/U
FB-43-5621	0.562	0.250	1.125	RG58/U

Nomenclature	Permeability	Material
Type 77	2000	Manganese-Zinc
Type 43	850	Nickel-Zinc
Type 73	2500	Manganese-Zinc

Table 1: Characteristics of Amidon toroid sleeve-type beads as given by W6SAI.

HERE AND THERE

IN *QST* (AUGUST 1992), Zack Lau, KH6CP/1, offers the following answer to the question whether 6146B RF power valves can be substituted for the earlier 6146 valves: "In most cases you can, although the B suffix version has slightly higher grid-to-plate capacitance which may cause problems if the range of the neutralization circuit is marginal. In addition, while the anode dissipation of the new tubes may be greater, do not try to squeeze more power out of the circuit. Your power supply may not survive the additional stress! For tube type amplifiers it is often the power supply that limits the amplifier, not plate dissipation." KH6CP offers many other useful hints on "Substituting parts" in building or repairing amateur equipment.

Mitchell Lee, KB6FPW, in offering advice (*QST*, August 1992) on handling and storing lengths of coax-cable suggests these should not be longer than 100ft since longer pieces are hard to manage in terms of both weight and length. Lengths should be tagged with a note of their length. He adds: "When rolling up the coax, start the roll by making one loop and secure it with electrical tape. Then continue the roll by turning the loop while walking towards the other end of the coax. Do not feed the coax on by coiling it onto the roll - this is guaranteed to make kinks: see **Fig 5**. After rolling up the coax, finish off with more electrical tape to secure the loose end. Selflocking nylon cable ties are also useful for this purpose, and can be used to secure the roll in several places. If the coax has been used in a wet or dusty environment, it is a good idea to hose it off and lay it out in the sun to dry. Blow moisture and dirt out of the connectors with compressed air. If the coax is really dirty, you may want to unroll it and wipe it down with a wet rag. To store the roll, either lay it out flat or hang it up. Always store it in a cool, dry location, away from direct sunlight. If you choose to hang the coax, use a large radius hanger such as a garden hose hanger but make sure that it will not subject the coax to abrasion from sharp edges. When it is to be used, unroll it in the same way as it was rolled up - like a wagon wheel instead of pulling it off the coil sideways, so as to prevent kinking and frustrating tangles.

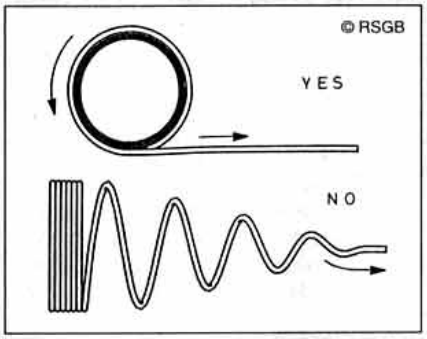

Fig 5: The right and wrong way to coil and uncoil lengths of coaxial cable. Always wind and unwind the cable tangentially in order to avoid kinking.

MORE ON THE ZS6BKW/ GOGSF MULTIBAND DIPOLE

JUST OVER A DECADE AGO, *TT*, May 1982, pp412-3, presented an item 'Potential of the G5RV antenna' which brought to the notice of amateurs the computer-aided work of Dr Brian Austin (ZS6BKW and more recently G0GSF). He showed how the dimensions of the multiband dipole antenna popularised by Louis Varney, G5RV, some forty years ago could be modified to extend its performance to the 18 and 24MHz bands. A few years later, Dr Austin provided a full-length description (*RadCom*, Aug 1985, pp614-617, 624) of this antenna. Computer aided work showed how such an antenna could be dimensioned so that, even without an ATU, an effective match could be obtained on most bands from 7 to 28MHz. With the aid of an ASMU (ATU), operation on 3.5, 10 and 21MHz was possible.

Surprisingly, relatively few UK amateurs seem to have taken advantage of this modified design which eliminates the disadvantages of traps, multiple wire elements etc, yet still provides a coaxial feed into the shack. Also, it can be used as a readily transportable wire antenna for field events, expeditions etc. It has, however, been attracting increasing attention overseas, and also for non-amateur communications.

Fig 6 as given in the Danish journal *OZ* (10/92) and initially in Rothammel's *Antennabuch*, shows **(a)** the standard 'G5RV' antenna together with two modified versions, **(b)** as proposed by W5ANB in *QST*, Nov 1981, for 7, 14 and 28MHz, and **(c)** the ZS6BKW/G0GSF arrangement discussed below. **Fig 6(d)** shows one form of ATU that can be used with any of these antennas on bands where the VSWR without a tuner is more than about 2:1. The Danish article by Rick Meilstrup, OZ5RM, gives results of measurements made on the original G5RV antenna now being marketed by DeeComm, although normally a wire antenna can be constructed at lower cost than a packaged product.

In the New Zealand journal *Break-in*, May 1992, Rick Hill, ZL1OK presents some SWR measurements made on what he describes as "a very useful cheap antenna that thrashes the pants off a G5RV .... The main disadvantages are the lack of 15m band coverage, the 10m resonance is rather high in the band and the antenna is de-tuned somewhat by heavy rain."

ZL1OK writes that his antenna has a feedpoint impedance close to 50Ω on five bands - "operation on all or part of the 40, 20, 17, 12 and 10 metre bands is quite practical using a solid-state rig with no tuner. I have built several versions of this antenna. Results have been good with the antenna in the inverted vee configuration with the apex 12m above the ground. He gives measurements made on a lightweight version using slotted low-loss TV ribbon (300Ω) for the matching section and 0.55mm² hookup wire for the 'top'. It is possible to optimize SWR for your favourite portion of your favourite band by adjusting the dipole length, but this may result in the 'loss' (without an ATU) of one of the other bands."

A recent IEE colloquium on 'Multi-band Antennas' was concerned primarily with antennas for the microwave and millimetre wave bands, but provided also a forum for Brian Austin, G0GSF, to describe his version of the G5RV type antenna as a solution to the problems of tactical HF one-hop communications. He emphasised that ionospheric propagation mechanisms used at HF involve diurnal, seasonal and sunspot cycle variations that make multi-frequency operation obligatory if 24-hour contact is required over any given path.

"This requirement places quite considerable constraints on the antenna systems used and would suggest that either a multiplicity of antennas or a single broadband configuration is required .... If operational requirements (eg tactical situation or non-permanent installations) preclude the use of large broadband antennas then a viable alternative is the multiband antenna.

"A configuration which achieves multiband performance, at high radiation efficiency, was

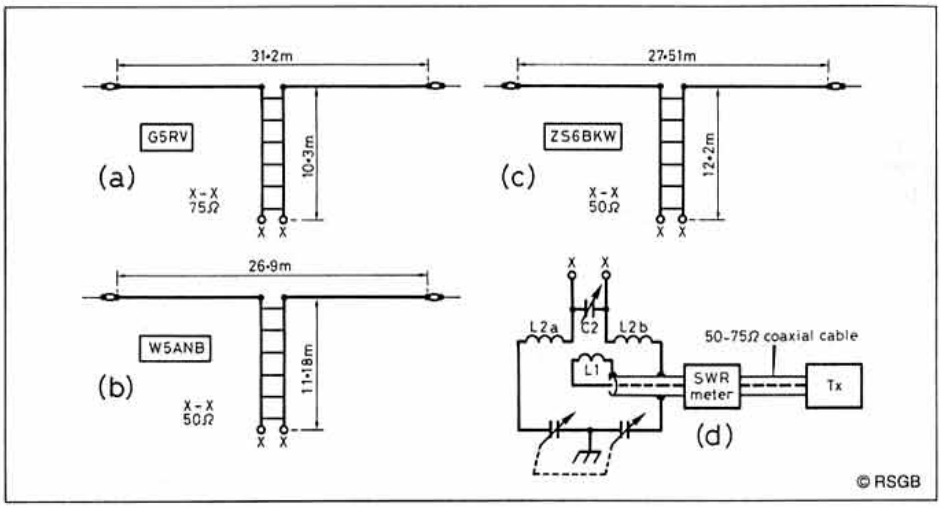

Fig 6: Three versions of multiband dipoles providing low SWR on the coaxial cable feeder on a number of HF bands. (a) The original 'G5RV'; (b) version proposed by W5ANB; (c) the ZS6BKW/G0GSF antenna discussed in the text and (d) a suitable ATU for all versions for use on bands not providing low SWR.

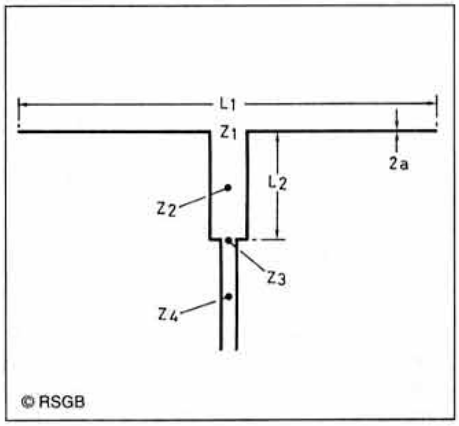

Fig 7: Basics of the multiband wire antenna.

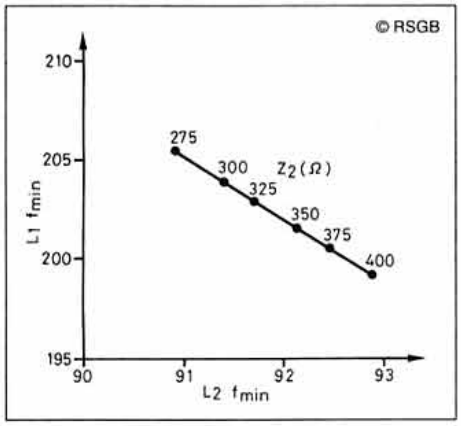

Fig 8: 'Design line' for the multiband antenna.

first used in the 1930s, then popularised for radio amateurs by Louis Varney, G5RV, (*RSGB Bulletin*, Vol 34, No 7, 1958, pp19-20) and more recently optimized in terms of its VSWR performance (B A Austin, 'An HF multiband wire antenna for single-hop point-to-point applications', *J.IERE*, Vol 57, No 4, 1987, pp167-173).

"The antenna is shown in **Fig 7**. The transmission line section L2 acts as a series-section impedance transformer whose function is to transform Z1, the driving-point impedance of L1, into a suitable value Z3 which will match the characteristic impedance Z4 of the system transmission line to the terminal equipment. The performance criterion used is the VSWR on that cable (usually coaxial with Z4 equal to 50Ω). An acceptable match exists when VSWR is equal to or less than 2:1 .... In general, the relationship between L1, L2 and Z2 when the VSWR with respect to Z4 is shown in **Fig 8**."

In the IEE colloquium digest No 1992/181, Dr Austin presents two relatively simple manual methods to analyse the performance of this antenna (see also the *J.IERE* reference given above). He shows that where Z2 is greater than 275Ω and less than 450Ω an acceptable impedance match will occur at a number of frequencies in the HF range. The optimum value of Z2 lies between 325-400Ω. Within this range the matching performance of the antenna is basically independent of Z2, and a simple design equation for the antenna is L1 (f_{min}) = 473.44 - 2.95 L2 (f_{min}) where f_{min}

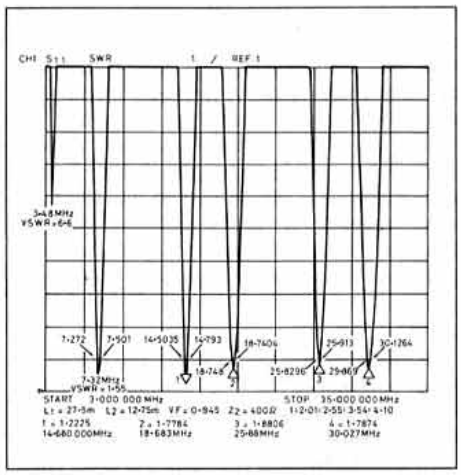

Fig 9: VSWR vs frequency for multiband antenna.

is the lowest frequency at which the antenna is to operate, constrained by the requirement that π L1/λ is greater than 1.

For any given values of f_{min} and Z2, there are specific lengths L1 and L2 which will satisfy the matching criterion. The frequencies at which this match occurs are related by the following series which varies slightly for different values of Z2: f/f_{min} = 1: 1.99: 2.53: 3.49: 4.07: 5.62: 7.18.

Dr Austin has designed and tested a number of these antennas in various practical situations. **Fig 9** shows the VSWR for an antenna providing resonant frequencies just outside amateur bands with L1 27.5m, L2 12.75m, Z2

400Ω (velocity factor 0.95) and Z4 50Ω. With these dimensions five bands of frequencies in the HF band, between 3 and 30MHz, yielded VSWRs less than 2:1 with f_{min} equal to 7.32MHz and the matching series 1: 2.01: 2.55: 3,54: 4.10. A ferrite sleeve balun, consisting of 40 ferrite beads (type 73 material, permeability 2500) was used at the intersection between the balanced line L2 and the coaxial cable Z4. Its effect on the measured impedance Z3 and hence on the VSWR was minimal. He concludes: "It would appear, therefore, that the use of a balun is not justified in this application."

A KISSLESS FUTURE WITH VSLI/DSP?

WHEN FRANK WELLS, G3ATJ, enquired as to the meaning of the abbreviation KISS (Keep it simple, stupid) in 'The last word' (*RadCom*, Nov 1992, p77) the Editor, in supplying the meaning, added "It is generally used in connection with home construction" - a comment that conceals a disturbing, if understandable, trend in the development of new technology for professional communications and broadcasting. For KISS was originally coined by professional engineers but increasingly is being disregarded in commercial practice. The trend is towards complex very-large-scale-integration (VLSI), with tiny application-specific chips containing thousands of active devices. A far cry from the days when even professionals hesitated to use more than about 20 thermionic valves and preferably fewer in a receiver or transmitter.

The latest move towards vastly more complex systems, based on the wonders of digital signal processing, can be seen in the current effort being put into digital audio broadcasting (DAB) and digital transmission of high-definition or 625-line television within terrestrial UHF channels. Several such systems have already reached the stage of field trials in Europe including the UK. Similarly, work is at an advanced stage for digital mobile radio systems. In all these systems, a key factor is the lower bit rates that are possible using digital compression - with the enormous redundancy of video signals making it possible to transmit coded digital video signals in bandwidths much narrower than is possible for analogue video signals. Digital speech combined with error correction can, for communication purposes, be transmitted with a total bit-rate of around 5-9kbit/s in bandwidths determined by the modulation mode.

Digital signals can be regenerated many times without introducing any additional quantisation noise and DAB, for example, can provide multiple channels from one transmitter of CD quality stereo music. In the European-developed system this can use a single channel allocation for a country-wide terrestrial complex, representing much greater spectrum efficiency than a comparable VHF/FM network. But the susceptibility of high-speed digits to multipath effects has required the adoption of a complex modulation system called COFDM (coded orthogonal frequency division multiplex). This is related to multi-tone telegraphy with similarities to the Piccolo HF system of the 1960s. This was used for many years by the Foreign Office but has now been largely abandoned in favour of satellite systems for FCO diplomatic communications.

But where will digital speech systems leave amateur radio? Packet radio has shown the advantages and disadvantages of digital systems on the amateur bands, particularly on HF. Will it be long before we see bandwidth-compressed digital speech and digital video? Technically and economically this seems likely once the necessary chip sets are available at consumer electronics prices. But whether digital transmission systems such as OFDM with its large numbers of closely spaced carriers individually modulated will be feasible (or even desirable in amateur radio) remains to be seen. One thing is certain, they would break the rules of KISS! Equally important, they would make the hobby even more of a 'black box' activity than it is at present.

Will we soon need to understand such concepts as 'Codebook excitation linear prediction coding (CELP)' or for video 'Motion compensated hybrid discrete cosine transform coding (MC-DCT)' not to mention the Reed-Solomon systems of forward error correction?

Terrestrial DAB as demonstrated on several occasions by the BBC (most recently during Open Days at the BBC Research Centre, Kingswood Warren) clearly offers significant advantages over VHF/FM for mobile reception of multiplexed broadcast channels. But there remains the problem of acquiring 'parking spectrum' (possibly in the old Band III around 200MHz) for use until such time as it is politically possible for DAB to replace VHF/FM in Band II. And this at a time when the BBC is still encouraging listeners to equip themselves with three band LW/MW/FM receivers and have promised to complete their FM network before taking Radio 4 off the AM bands! But there can be little doubt that the future of personal and mobile cellular radio-telephones lies in digital rather than the current analogue systems.

So far, for amateur radio, DSP has been thought of primarily in terms of high-performance selectivity filters working at audio frequency although this is just one of the many potential applications. The cover of the September 1992 issue of *QST* proclaims: "DSP: The Future is Here" to mark an article 'Low-cost digital signal processing for the radio amateur' by Dave Hershberger, W9GR. He describes a multipurpose digital signal processor based around the TMS320CI0 DSP CPU (see **Fig 10**). It functions as linear-phase super-sharp CW filter, an adaptive noise filter and an advance multiple automatic notch filter, all under software control. But even in this form it is hardly KISS technology.

RE-CYCLING COMPONENTS

MY ACCOUNT IN THE September *TT* of how one of my old mains transformers came to a dangerously smoky end that might have been avoided if it had been fitted with a temperature fuse of the type described and illustrated in the 1950s *Radio & Television Engineers Reference Book* (in a section by L Driscoll who was at the time in charge of the Murphy Radio Receiver Design Laboratory) attracted more comment than I had expected. A subsequent search through circuit diagrams of British-made broadcast receivers of the early 1950s revealed temperature fuses fitted to only a few top-grade Murphy receivers such as their 'baffle-cabinet' Model A188c with push-pull audio output. Possibly other British firms fitted them, but if so I cannot trace any.

Bob Currell, G4EIK, suspects that the transformer may have been sealed with shellac as widely used for sealing coils etc. He points out that it is widely known in the antique restoration trade that shellac is not a stable material. It has a limited shelf life when in an alcoholic solution of about two years and only lasts about 80 years without care when applied to a surface as French polish. After about this time interval, which is variable with storage conditions, it tends to flake off, crack and become hard and brittle causing it to scratch very easily and deeply. G4EIK adds: "Inside a piece of electrical equipment the warm dry conditions coupled with the thermal shock from the heating and cooling cycles would exacerbate any tendency to crack and cause breakdown of the insulation - this could be a possible explanation of the failure of the transformer."

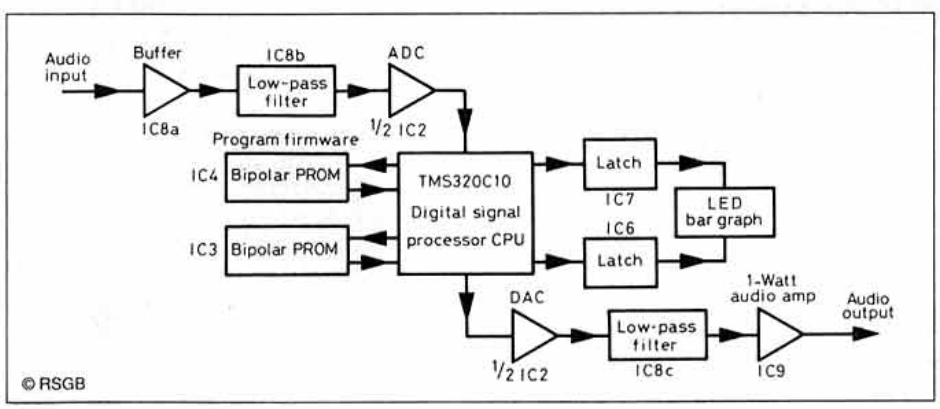

Fig 10: W9GR digital signal processor - block diagram.

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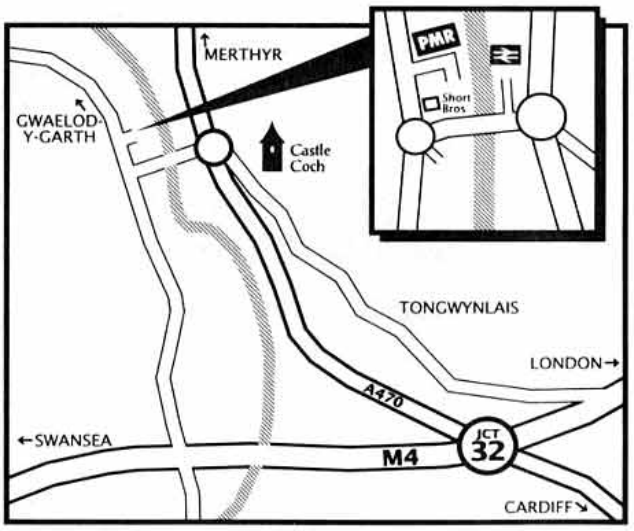

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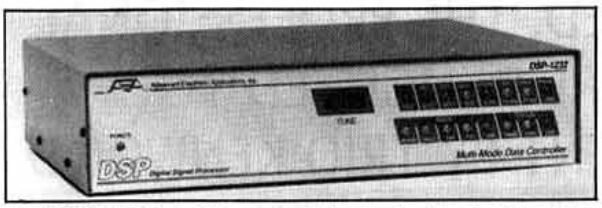

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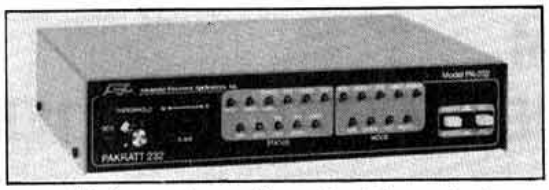

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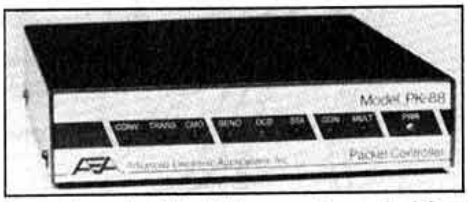

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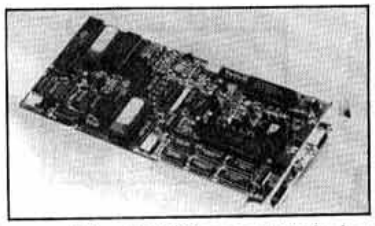

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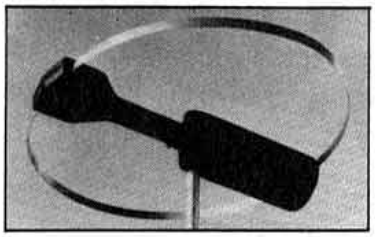

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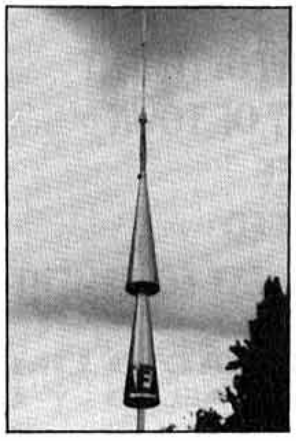

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RADCOM EQUIPMENT REVIEW

The ICS AMT-3 AMTOR Terminal Unit

by Janet and Ron Stone, GW3YDX

ICS ELECTRONICS LTD has a long history of being associated with AMTOR and I was pleased when asked to review one of their own products - in fact this was the company which produced the first complete AMTOR terminal unit.

There is a variety of AMTOR and RTTY equipment on the market, most of it being of the multimode terminal variety such as the KAM, MFJ1278 and PK232. The multimodes necessarily require switching between modes, and some of them compromise on filter bandwidths to cover all modes at less cost.

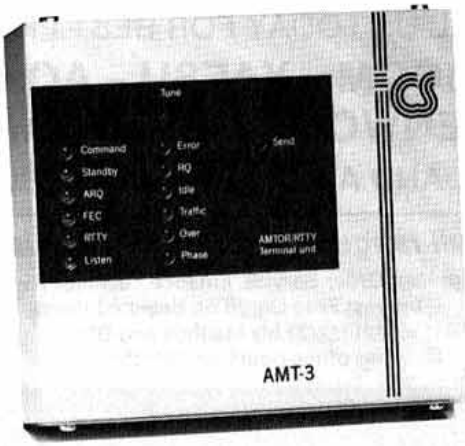
The AMT-3, however, has been specially tailored to RTTY and AMTOR and requires very little switching between modes. It comes supplied with special driver software optimised for those modes, but it is not necessary to have an IBM-PC for the AMT-3, as it *can* work with a dumb terminal. However the PC software makes the system a delight to use.

The unit consists of a neatly presented box 25 x 135 x 160mm with side mounted connectors for 11-16 VDC at 500mA, RS232 serial port and a 9-way 'D' connector for the radio. Output can be either direct FSK or AFSK 'American' high tones. The unit may be free standing - a stand is supplied - or wall-mounted using rear keyhole slots. It comes very well packed, with a comprehensive 40-page manual.

Compared with my station MFJ-1278, which requires much button pressing to go from ARQ back into FEC, it is very easy to use. Driver software for the IBM-PC is menu-driven, the main menu giving a clear choice of FEC, RTTY, ARQ, command mode etc. Tabbing down to ARQ a carriage return invites manual entry of a SELCALL or a choice of up to 40 user-programmed stations that can be held in the ARQ memory (battery back-up provided). For the ZF1GC AMTOR mailbox on Grand Cayman Is in the West Indies, which I use a lot, the display would show:

Prepare to call station ZF1GC
Selcall : ZFGC
Frequency : 14.073.63
Press RETURN when ready. ESC to abort

Dialling up the frequency on the transceiver and pressing 'Enter' results in the mailbox invariably being 'up' in less than 15 seconds. Transmission and copy is totally in ARQ. If the path is poor, there are more 'RQs' (repeat requests) and the data rate slows as a result, but perfect copy is printed. Solid copy from the mailbox has often resulted with powers as low as one Watt at GW3YDX, AMTOR being an excellent QRP mode.



On the AMT-3, CQ messages for both RTTY and AMTOR can be preset and called up by pressing F6 on the keyboard. For fledgling typists who cannot type very fast the driver software contains options for up to four preset messages and, in addition, full type-ahead into a 4000 character transmit buffer whilst receiving text. As text is sent out it is echoed to the screen at the same rate, thus showing the quality of the link. The buffer, incidentally, is loaded in word mode, meaning that there is a chance to put typing errors right until the space bar or carriage return key is pressed. Logging of QSOs for later review can be to either disk or printer.

Tuning in a signal is very easy. There is a string of 16 large LEDs which flicker when an incoming signal is received. Centering the lit segments gives correct tuning. Centering a spread of illuminated segments was found to be much easier than a single small LED (as in the case of some terminal units). There is also a bank of status lamps to indicate both the status of the terminal and the quality of the link. Watching the traffic status LEDs flicker off and on gives complete information about the traffic flow during a contact as the quality of the link varies, and repeats are requested.

To assist with the future re-alignment of the unit there is a special 'Test' mode to align the tones and to ensure that the received centre frequency is correctly aligned with reference to the transmit tones.

THE AMT-3 IN OPERATION

DURING THE REVIEW PERIOD the AMT-3 performed flawlessly in HF conditions varying from reasonable to awful. Compared with most other multimodes it was much easier to use. Replies to FEC transmissions required the SELCALL of the other station to be entered followed by a carriage return - the transition into an ARQ contact being totally automatic. The ARQ memories and big transmit and receive buffers were also of particular benefit. FEC transmissions that did not print using the MFJ-1278 were copied more consistently on the AMT-3 and many contacts resulted that would otherwise not have taken place. Most of the contacts made during the review period were made on AMTOR but the terminal was tested on RTTY and it also performed well.

CONCLUSIONS

AT £179.95 INC VAT (plus £6.00 p&p) the unit is not cheap, but has to be compared with other products around. The multimodes are in the £250-£300 class and they will find it difficult to beat the AMT-3 for AMTOR and RTTY, particularly where ease of operation is concerned. I believe that the AMT-3 offers good value for money and in terms of the best way of deploying one's hard earned cash probably the best course of action would be an AMT-3 for the HF digital modes and a multimode TNC for VHF packet. Only projected expenditure on a bed-settee prevented purchase of the review unit, which was returned to ICS with regret. Such is life!

Acknowledgments are due to ICS (Unit V, Rudford Industrial Estate, Arundel, W Sussex BN18 0BD.) for the loan of the unit and to the SysOp at ZF1GC for helping with tests.

AMTOR - Why Use It?

AMATEUR RTTY HAS BEEN AROUND for a long time and was essentially derived from landline teletype where the problems of channel congestion and fading are absent. Anybody who has copied amateur RTTY will know that weak signals with QRM can end up as total gibberish on the printer or screen.

In both AMTOR and conventional RTTY, letters and numbers are sent by digital means, ie each letter and number has a digital code. In RTTY each character has five digits, eg G is 01011, ie

51

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TRADE ENQUIRIES INVITED

The ICS AMT-3 AMTOR Terminal Unit

continued from page 49

Space-Mark-Space-Mark-Mark which the distant receiver decodes as a G if the receiver is synchronised and no other signals corrupt the sequence. However, noise and QRM can cause decode errors and incorrect characters.

MODES AND CHARACTERS

THE AMTOR SYSTEM HAS seven digits instead of five, eg G is 1010110. In every AMTOR character, three data bits are logic state 0, and 4 are logic state 1. This gives a consistent 3:4 ratio for each character, unlike RTTY. The AMTOR character set was chosen to avoid close look-alikes and the AMTOR terminal detects all characters without a 3:4 ratio and interpret them as errors. Therefore the possibility of printed errors is much reduced.

There are two main AMTOR modes - FEC (Forward Error Correction) and ARQ (Automatic Request). A transition normally occurs between the two when moving from CQ to a QSO.

In FEC the 7-bit characters are transmitted twice. The receiving terminal decides which of the two to print (or not, if the input does not pass the 3:4 bit ratio test!) It is important to note that the transmitting station should send 'idle' signals so that the receiver may synchronise to them. Unfortunately, the practice of sending plenty of idling signals in FEC is not too widespread.

With ARQ the transmitting 'master' station connects to a specific remote station and sends data to it in three 7-bit character groups. The distant terminal examines each character for a 3:4 ratio. If all's well the remote station returns control characters which say, in effect, "All OK, carry on", or "Not copied correctly, please retransmit" (ie the repeat request 'RQ'). At the end of an 'over' the transmission is terminated with a '+?'- AMTOR equivalent of a voice "over" and the transmit/receive roles are then reversed.

ERRORS AND REQUESTS

ALTHOUGH BETTER THAN RTTY, FEC cannot include retransmission requests, so is potentially less accurate than ARQ unless the link is good. But ARQ cannot be used in CQ or broadcast mode, as the identity of the other station needs to be known in order to establish the link. Monitoring an ARQ contact by means of the 'LISTEN' command does not always reveal station callsigns, as much ARQ has short transmissions followed by the +? 'over' characters - contacts are by 'quick break-in'.

So in practice, CQs tend to be made in FEC, with stations announcing their SELCALL. Callers use this SELCALL to set up the ARQ link and continue in ARQ.

So what is this 'SELCALL'? It's simple: a four letter code derived usually, but not always, from your callsign, and programmed into your AMTOR terminal. The SELCALL for GW3YDX is GYDX, but USA stations use 'FRED' instead! A station hearing GW3YDX on FEC will hear 'CQ FROM GW3YDX SELCALL GYDX . . . . PSE K'.

To contact me, the other station will put its terminal into ARQ mode and send the command 'ARQ GYDX'. After a few bursts of 'GYDX GYDX GYDX ...' from the other station, my terminal will recognise the call and either automatically go to ARQ mode (as in the AMT-3) or be locally switched by a command sequence.

After a successful CQ and transition into ARQ, the identity of the remote station is still unknown. It's operator must supply this. The QSO is on because the terminal LED says so, and part of the fun is finding out who's there! ARQ sounds complicated, but soon becomes easy. For real time HF band communications, it is second only to CW for reliable weak signal contacts.

As well as QSOs - mostly around 14075kHz - there are also AMTOR mailboxes, some with links to the Packet Network. Mailing and receiving messages through AMTOR mailboxes is much more reliable than using the HF Packet system. This is often unusable due to packet collisions caused by QRM and multipath propagation. [See this month's *DataComms* on page 60 for an explanation of the PACTOR alternative - *Ed*].

RADCOM CONSTRUCTION FEATURE

HF All-band Antenna for Mobile or Home

Concluding the article by John Robinson, G3MPO

BLUE-COLOURED polythene tubing comes in a range of concentric sizes, and is held by all plumbing suppliers. One size is a tight fit over 22mm copper central heating tubing. Two 1.5in (38mm) lengths of this plastic tubing fitted inside two similar lengths of the next size up make excellent base insulators and can be fitted over a 5.5in (140mm) length of copper 22mm central heating tubing, with a two-inch pigtail of wire soldered to the mid-point (**Fig 4** see part one).

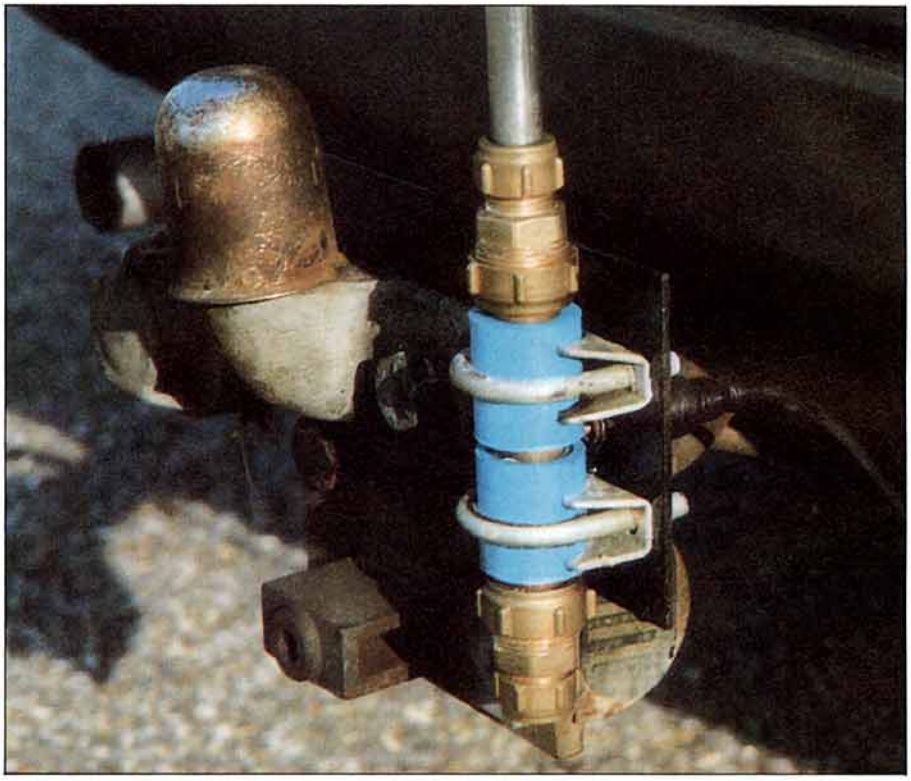
Leave an inch of copper protruding at each end. Pre-heat the polythene tubing or slit it lengthways to aid fitting. The resulting gap in the insulator is electrically and mechanically unimportant. This insulated tube can be rigidly fixed to the mounting plate using exhaust pipe clamps available in a range of sizes from the local car accessory shop. A 22mm to 15mm brass reducer fitted top and bottom allows the antenna bottom section to pass right through the mount and be compression clamped into position. The shallow ring of brass machined into the bore of each reducer to prevent 15mm tubing going right through, must be filed or drilled away. Discard the brass sealing ring (called an 'olive') from the bottom reducer - the mast is clamped only by the olive in the top one. Finally, a panel-mounting coaxial socket is fixed to the plate, and the centre pin soldered to the mid-point pigtail on the 22mm mount copper tube. A short coaxial cable goes from this connector, through a small hole in the car bodywork, into the matching unit in the boot.

A good earth to the car body is essential and this is best achieved by cutting off half an inch or so of the cable outer insulation just inside the boot, and making up a small clip to fix it to the car body. Remember to scrape the paint off well, and seal with a little grease.

At 80 and 160m, the voltage induced across the coil can cause corona at the tip of the whip, with consequent loss of power and matching. This is easily cured by forming a small button on the end of the whip using self-amalgamating tape or epoxy resin, to reduce the surface electrical field strength.

DESIGN DETAIL

DETAILS AND DIMENSIONS OF the various elements of the antenna were given in Figs 2 and 3. The length of whip above the coil determines the capacity to ground and hence the coil inductance required. In this case, it is about 11.5pF. Even a straight wire has inductance (and capacitance to ground), and the inductance of a 4ft (1.2m) length of 15mm tube - the lower half of the whip - is about 1.5



µH. The coils, therefore, have to have an inductance which when added to the base mast inductance of 1.5 µH, resonates with the 11.5pF capacitance at the required frequency. These values, together with the radiation resistance, coil and matching data are given in **Table 1**. It may be necessary to alter the length of the upper whip by a few inches to resonate the antenna.

High efficiency coils for the lower frequencies can get embarrassingly large, and since antenna efficiency also drops off with reducing frequency, (as r_R falls), performance here is most difficult to maintain. To keep coil losses within acceptable bounds, the gauge of wire used must not become too small nor the length too great, which requires larger diameters of former. Even so, other measures may be necessary to reduce coil losses. For example, 95 close-wound turns of 22SWG wire on a 1.6in (41mm) diameter former will resonate nicely with 11.5pF at 80m. The necessary length of wire is about 40ft (12.2m) and the straight-wire RF resistance of this at 3.5MHz is only about 2.4Ω. RF resistance is much increased, however, when the wire is formed into a coil, and unless care is taken, the unloaded Q of the coil can be as low as 120, giving an equivalent loss resistance of nearly 32Ω. This more than doubles the antenna circuit losses causing most of the power to be dissipated as heat in the coil. Coil losses can be reduced by increasing the wire gauge or winding the coil with spaced turns even though a greater length of wire is required to achieve the inductance. I found the second of these to be the most effective, and have chosen this method of construction for all coils even though it is not strictly necessary above 10MHz.

Larger diameters of coil would reduce losses further, but only at the expense of size, and it is a matter of personal choice exactly how far one goes down this line. Coil losses at the lower frequencies mean that the design must be adjusted for an acceptable compromise between loss and physical size. Data on my choice of coils is given in Table 1, with losses reduced to the point where, except on 1.8MHz, they are no longer significant.

Matching the antenna base impedance to the transmitter's 50Ω is easily done by shunting the antenna feed point with a 150V mica or polystyrene capacitor whose value will vary between zero and about 1000pF depending on antenna impedance, frequency, ground conditions and type of car. Figures for my installation are given in Table 1. This

matching method requires the antenna impedance to be slightly inductive which is simply achieved by extending the whip slightly from its self-resonant length.

The matching capacitor is switched in, and the whip moved in and out for minimum VSWR. If the VSWR is still too high, the value of the matching capacitor is changed and the whip retuned until an acceptable match is obtained. I bought a small aluminium box, fitted two connectors into opposite sides, joined the centre pins together with a short length of 16SWG wire, and arranged a rotary switch to connect any of nine different capacitors across the feed. A cheap switch will do, so long as it is not operated with the transmitter on.

As the coax between antenna and matching unit can carry currents up to double that on the matched line itself, the matching unit-to-antenna cable should be kept reasonably short to minimise losses.

COIL CONSTRUCTION

I FOUND THAT THE BEST METHOD of attaching the wire to the end couplers was to drill two small holes through the polypropylene just beyond where the end of the coil would lie, and pass the wire into the tube and out through the coupler to which it was then connected. It was found best to solder a hairpin of wire onto the inside of the coupler before fitting it into the plastic former. The coil wire was then easily soldered onto this pigtail at the appropriate time.

The coil former was covered in two or three lengths of double-sided tape, and a sufficient length of enamelled copper wire cut for the coil in question. Seven x number of turns x diameter of former allows a comfortable amount of spare. The coil was spaced by winding two lengths of wire onto the former side by side and subsequently removing one of these. Double-sided tape held the remaining one in position. Half an inch or so was wound beyond the holes through which the wire endings were taken and, after removing the spacing wire, the winding was coated with polyurethane varnish. When dry, the coil was wound back at each end until the required number of turns was obtained, and the ends fed through into the former, out through the end couplings and soldered to the coupling hairpins. The two small holes in the former were sealed with varnish or mastic and the winding bound with a double layer of self-amalgamating tape.

COMPLETION AND WATERPROOFING

SOLDERED CONNECTIONS WERE pushed well down into the coupling, out of the way, and the coil was given two coats of polyurethane varnish to finish the job. The self amalgamating tape can be omitted if you prefer the appearance of varnished copper coils, but it is easy to use and provides additional protection against knocks and bangs. It is available from some electricians or more likely, yacht chandlers. Do not be tempted to use PVC insulating tape - it can be very lossy. Make sure there is not the smallest hole left for water to get in. I did not find it necessary to seal off the internal bore of the couplers. Water cannot get in very readily, and if it does, it drains out easily. It is the small nooks and crannies in an otherwise sealed item that present the danger since sealing always seems to keep water in easier than it keeps it out!

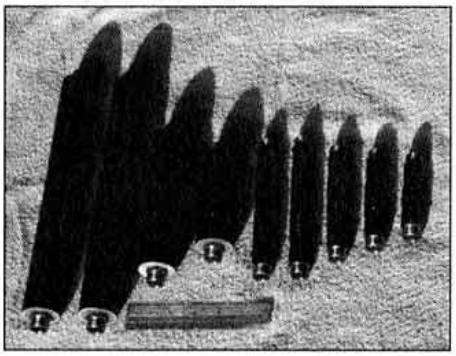
Self-amalgamating tape was used to waterproof the antenna feed cable connector where it fits onto the antenna mount. All other parts of the mount - outrigger, insulator etc, - were given a generous coating of polyurethane varnish to prevent corrosion.

COIL DATA

F MHz	D ins	l_F ins	Wire SWG	N	l_c ins	L µH	r_R* ohms	r ohms	C_M pf
29.0	0.8	3.0	18	9	1.1	0.9	35	48	18
24.9	0.8	3.5	18	15	1.7	1.7	29	48	27
21.2	0.8	4.5	18	23	2.6	3.0	22	47	37
18.1	0.8	5.75	18	34	3.75	4.5	17	43	74
14.25	0.8	5.5	20	45	3.6	8.4	11	34	150
10.13	1.6	4.5	20	31	2.6	19	6	26	300
7.05	1.6	6.5	20	58	4.6	41	3	20	544
3.65	1.6	12.0	22	160	10.1	153	0.8	21	1000
1.9	1.6	11.0	28	294	9.3	558	0.2	37	1000

F=frequency (MHz)
l_F=length of coil former tube (inches)
l_c=length of coil winding (inches)
r_R=theoretical radiation resistance (ohms)
C_M=matching capacitor (picofarads)
D=coil former diameter (inches)
N=number of turns
L=coil inductance (microhenries)
r=antenna load, $(r_R+r_L+r_E)$, (ohms)
*=theoretical value

TABLE 1



RESULTS

BECAUSE A MOBILE STATION is small, simple, and cheap, there is a tendency to assume that it is therefore ineffective. In fact, the ability to change to a better location, does much to counter any shortfall in performance. In practice, it is rare when, as a member of a mixed home base/mobile net, I am unable to work a station, and on occasions, because of the low level of background noise and all-round directivity of the antenna, readability is better than at a home station. Reports are normally two or three S points lower than those of big home stations with their beams and linears, but in practice, I have rarely felt seriously disadvantaged.

In the course of one year of rather low-key operation from the car, I have been able to enjoy Q5 SSB contacts with countries in all continents, (except Antarctica), from home, holiday and business locations. Above 7MHz and when the band is open, world-wide coverage is to all intents and purposes routine - solid QSOs with ZL, VK, JH, PV, W, K, etc - and on holiday 7MHz has proved good for UK coverage (including mobile to mobile), much of the continent, and the occasional early morning VK. Performance noticeably degrades on 80 and 160 metres, but even so, I have worked ZL4 on 80 metres although 300 miles is more usual. On Top Band, ranges up to 200 miles are typical.

Thus for a very modest outlay of less than £50, I am able to work all HF bands, take my hobby around with me wherever I go, and avoid annoying the neighbours. The antenna, fixed to a balcony railing or with a counterpoise, has also been used, with a home station. Overall, I have been surprised and delighted with the performance and capability of this highly cost-effective antenna.

ACKNOWLEDGEMENTS

MY GRATEFUL THANKS GO OUT TO G4WEY, G0GKT, G4AQ, G3MDH, G4XYX and other friends too numerous to mention, without whose generous help, advice and patience this article could not have been written.

USEFUL EQUATIONS

$L = N^2D^2 / (18D + 40l_c)$

where:

L = inductance of a coil (microhenries)
N = number of turns
D = diameter of coil (inches)
l_c = winding length of coil (inches)

$C_m = \sqrt{(Rr-r^2)}/0.00000628FRr$

where:

C_m = matching capacitor (picofarads)
R = output impedance of transmitter in ohms, (usually 50)
r = resistance (impedance) of antenna (ohms)
F = frequency (MHz)

USEFUL FURTHER READING

Radio Communication Handbook (RSGB)
ARRL Handbook (ARRL)
The ARRL Antenna Book (ARRL)
HF Antennas for All Locations, Les Moxon, G6XN (RSGB)
'A Mobile Antenna for 1.8 to 28MHz', Mike Grierson, G3TSO, *RadCom*, Feb 1988

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Satellites

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21 Romany Road, Oulton Broad, Suffolk
NR32 3PJ

I HAVE JUST RECEIVED my copy of the *Proceedings* of the 1992 AMSAT-UK Colloquium. Although not all presentations are covered (due to not being submitted in time) it makes fascinating reading.

Ingemar Lundegard, RSGB Council Member, G3GJW, in his welcoming address, pinpointed the reasons for this event's continuing success. The University of Surrey's satellite expertise and its friendly staff under Professor Martin Sweeting, G3YJO, played a great part and of course, satellite enthusiasts come from all parts of the world due to their global mode of communication. This neatly lends itself to an international forum where they can meet face to face, debate with friends and identify 'critical paths' of action for the future benefit of all.

G3GJW, drew attention to a matter which has concerned me quite considerably of late. He said: "My idea has always been that there should be an upward path for newcomers to amateur radio satellites. Satellites should not exist for a declining company of ageing specialists - they should attract young newcomers to this fascinating aspect of communications - and not just ones who are chequebook enthusiasts and follow the hobby for a year or two only to drop out in favour of another fleeting hobby craze. Please do what you can personally to enthuse and help shortwave listeners and amateurs alike. We all had to start from humble beginnings when we were young and poor".

Amongst the topics covered in the *Proceedings* was: Pat Gowen's, G3IOR, 'Using RS-12 Mode K Anomalous Propagation for DX'. This pleased the experimentally minded, particularly those interested in propagation, and illustrated the useful experimental work which can be done with simple equipment and relatively inexpensive satellites.

Mike Dorsett, G6GEJ, of MuTek Ltd showed how to improve receiver sensitivity with his talk on 'Optimisation of System Sensitivity with regard to Atmospheric Noise'. Those with an interest in computers were pleased with M Malhotra's 'The Architecture of a Parallel Processor for the UoSAT Spacecraft'. Global Positioning Systems (GPS) were explained by Martin Unwin, G7MBF, in his lecture 'Lost in Space'!

The French Satellite ARSENE, was fully described and illustrated by Bernard Pidoux, F6BVP. Of particular interest too, was the 'Susie' Project - 'Bringing Space into the classroom', by Joe Kasser. 'Oscar Zero, An Introduction to EME for the Satellite Operator' by Ray Soifer, W2RS, described how to put your Oscar 13 station 'On the Moon'. Finally, there was an excellent exposition by Frank Bell, G7CND, on the 'Use of Amateur Satellites in a school', and a write-up of the UoSAT Educational Challenge.

By common request the Colloquium will be held again this year during the last weekend in July the University of Surrey. How about making this year's 'New Year's Resolution' to come along and have a memorable weekend? Put it in your new diary right away!

HELEN SHARMAN ON TOUR

SEPTEMBER SAW THE START of a sponsored tour by Helen Sharman, which lasted through to December. Her first visit was to Norwich where she gave a fascinating lecture to schools who had taken part in radio contacts on her historic MIR space flight. Pat Gowan, G3IOR, was one of those fortunate enough to be present and he sent me the following account:

"Helen came to the University of East Anglia today for her first lecture on the tour and gave an excellent showing of many photos she took from MIR, plus a video. Her audience was 95% young people. She did not wax academic or technical, but at a level for the age group present. Afterwards she came to lunch at the Hewett school, as arranged by Alan, G0KRU, and Sheila, G0KWP.

I had a nice long chat with her and gave her an edited tape of her many 145.550 MHz transmissions. Alan gave her a copy of the video they made at GB3JUNO. She said that 90% of the time all she could hear on 2m FM was noise, from hundreds and hundreds of FM stations all mixing as a result of the wide footprint of transmissions from the spacecraft. Only as she came within range of the UK, before Europe appeared in the footprint, was she able to resolve any callsigns.

"She quite enjoyed the trip it seems, despite the rigours of training, the rise of body fluids, the perspiration weight loss and all the other problems of weightlessness. Her description of using the 'loo' in space really got the kids chuckling! She is a delightful young lady, with not a single pretension of grandeur about her!"

Frank Bell, G7CND, told the AMSAT-UK Colloquium about the space activities of the Royal Grammar School, Guildford. He is seen with Helen Sharman who visited the school in October.

Dr Arthur and Margery Gee with the clock and certificate presented by AMSAT-UK on Arthur's retirement as chairman.

DOVE

IT IS MUCH REGRETTED that this microsat is still not fully operational. The last progress report we had was several months ago, when those responsible for its operation undertook to sort out the hardware problem and, if possible, get round the faults by changes to the software. After some weeks the hardware problem was located - the failure of an AART handshake line from the DOVE module. They worked around it and got DOVE talking. This problem was in addition to the previously known failure of the S-band modulator.

Next a bug was found in the voice software. The solution was to reload new code, but N4HY, the S-band loader, had an increase in foliage around his antenna which made it impossible for him to do the loading! However, NK6K has started to get an S-band system running at his QTH and it is hoped that DOVE will then be back on 2m again soon.

UNAMSAT-1

THIS IS THE FIRST MEXICAN amateur satellite. which may have been launched by now. UNAMSAT-1's primary mission is to act as a meteor sounder. It will contain a 40.097 MHz transmitter with 60 watt output giving pulses which can be varied from 1 to 10ms duration. The pulse repetition rate of one to ten seconds is controlled by a computer receiver at the same frequency will detect the echoes and measure their Doppler shift. The meteor sounder will gather research data on the full-sky spatial and velocity distribution of meteors, with the main focus on high velocity meteors from outside the solar system.

When UNAMSAT-1 is not involved in meteor research, it can be re-tuned to amateur radio frequencies and used for standard PACSAT (store-and-forward message) data. Frequencies have not been determined at the time of writing. UNAMSAT-1 will signal the beginning of a new era in satellite launches. Along with a larger meteorological satellite, it will be launched by the Russians on a decommisioned SS-18 ICBM rocket into an orbit about 1000km high.

Microwaves

MIKE DIXON G3PFR
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SINCE THE LAST COLUMN there have been several changes of position in the operating tables. Whilst the multi-band operating ladder published in the *Microwave Newsletter* (from which these tables are derived) changes its method of ranking from month to month, for the sake of continuity I shall continue to report the ranking by the multiplied product of Best DX and number of *different* callsigns worked.

Notice that the multi-band operating ladder (**Table 1**) now includes both fixed station operation and portable operation: you can now put in two entries, one for your fixed operation and one for your portable operation, with a few exceptions. Suppose you are operating fixed: if you work Gnxxx and Gnxxx/P, these do *not* count as *different* callsigns, although if you work Gnxxx then GWnxxx/P (or any other country prefix), these *can* count as different callsigns. If you are working /P, then similarly, you can't count Gnxxx and Gnxxx/P, though you *can* count Gnxxx and GWnxxx/P and so-on.

The most significant changes in the all-band table (Table 1) have again been in the 10GHz band where it is very noticeable that 50% of the first eight callsigns, with accumulated scores above 10,000 points, are operating fixed, narrow-band stations. It is also obvious that, without exception, the five callsigns with best DX above 500km are also operating narrow-band from fixed locations.

The moral of this story is that, by being able to monitor distant beacons (including personal callsign beacons) on a regular basis, the fixed station operator is in a much stronger position to detect and exploit openings than the portable operator whose outings might or might not happen to coincide with an opening! It is also noticeable, according to G3WDG, that European DX stations are now beaming towards the UK whenever there is an opening, knowing that there will now be a significant number of fixed stations monitoring conditions and looking for DX contacts.

In the 10GHz 'All-time Squares Worked' **Table 2**, G3WDG has pushed his score up to 21 squares/8 countries by working F1JEB/P (in JN09CQ), HB9AMH/P and HB9MIN/P (both in JN37OE) during a strong tropo opening over the period 13/16 September 1992.

In the absence of the acceptance of a microwave 'slot' on any of the 'DX-Clusters' in the UK data network - (microwave DX really is no different to any other DX, it is simply a matter of what constitutes DX in the mind of the users) - it has been suggested by G3WDG, in the October newsletter, that an impromptu telephone 'microwave DX-net' be activated, as shown in **Fig 1**. The idea is that the net starts in East Anglia (where European DX is most likely to be heard first) and then spreads westwards and northwards throughout the UK as shown in the 'directory tree' of Fig 1. There is no reason why monitoring stations anywhere outside the proposed network should not initiate an 'alert', spreading out in different directions, as the need arises.

I'm pleased to note that another Novice - Jonathan, callsign 2E1AYB/P - has joined the tables, largely through the efforts of Andy, G4JNT, who made the effort to take 2E1AYB out portable to make 12 contacts from Bell Hill, Dorset (IO80UU). Andy raises the very valid point that Novices *must* be accompanied on such expeditions, since the terms of their licences are such that they are denied talk-back by total lack of access on the 144MHz band and limited access on the 432MHz band. It is a matter of concern to the Microwave Committee that such restrictions have become apparent in the light of practical experience: rest assured, this matter will be addressed as soon as possible! Meanwhile, why don't *you* either take out a Novice licensee on a /P expedition during one of the many microwave cumulatives or, as G3PHO suggests (*Microwave Newsletter*, October 1992), lend or donate your old wideband equipment to him/her, not forgetting some 'on-the job' instruction, teaching and support!

TECHNICAL CORNER

NEWS FROM THE Components Service is that the G4JNT transverter interface and control module, G4JNT001, is being offered as a complete kit apart from a box and connectors.

For those of you who, for whatever reason, cannot make a Waveguide 16 to SMA transition, the Components Service also offers a well proven, ready-made transition suitable for interfacing the 'WDG 10GHz modules to a waveguide feeder - all you have to do is solder on a WG16 flange!

Other news from the Components Service is that a surface mount device (SMD) version of the G4DDK001 1.1-1.3GHz source is under test: this is not only smaller than the original design and eliminates the use of the difficult-to-get trapezoidal capacitors, but will also fit inside a standard tin-plate box, like all the other recent designs. If proven, the older design will be phased out in favour of the G4JNT version using the newer chip components. The spec is otherwise unaltered.

Work still continues on the very low noise (sub 1dB) HEMT 10GHz preamplifier mentioned some time ago: difficulties were encountered when G3WDG found that the semiconductor manufacturer had discontinued production of the device on which the prototypes were built! Because of this and other

	G0API	G3NKL					
G4FUF	G4JNT	G3FNQ	???	G8AZA			
G3LQR	G3JVL	G8AGN	G4EQD	G3ZTR	???	???	
G4BYV –>	**G3WDG –>**	**G3PHO –>**	**G4PMK –>**	**G3NWU –>**	**GM3WIL –>**	**GI8GJX –>**	**???**
G4DDK	G3BNL	G4CBW	G3PYB	???	???	GI4SQL	
G0BPU	G3FYX	G3UKV	???				
	G3KEU	???					

Fig 1: G3WDG's suggested DX Net. Telephoned DX alerts spread westwards (to the right via the 'backbone') and northwards (up and down from the 'backbone').

1992 OPERATING LADDER

Band (GHz)	Posn	Callsign	Best DX km (A)	Stations worked (B)	Multiplied score (AxB)
2.3	1	G4EQD *	900	16	14,400
	2	G4PMK *	720	13	9,360
	3	G4DDK *	398	5	1,990
3.4	1	G4PMK *	661	5	3,305
	2	G4EQD *	110	3	330
5.7	1	G4EQD *	200	3	600
	2	G4PMK *	60	2	120
10	1	G3BNL *	1,027	52	53,404
	2	G3WDG *	1,008	52	52,416
	3	G8KQW/P	390	56	21,840
	4	G4FCD *	1,039	19	19,741
	5	G3FYX/P	364	47	17,108
	6	G3PHO/P	338	50	16,900
	7	G4DDK *	624	25	15,600
	8	G3ZME/P	292	38	11,096
	9	G4PMK *	739	13	9,607
	10	G4JNT/P	279	33	9,207
	11	G0API/P	277	32	8,864
	12	G8AGN/P	338	26	8,788
	13	G3FYX *	535	16	8,560
	14	G4BRK/P	228	31	7,068
	15	G3PYB/P	362	17	6,154
	16	G3FNQ/P	330	18	5,940
	17	G3JMB/P	245	24	5,880
	18	G8LSD/P	245	20	4,900
	19	G3JMY/P	211	23	4,853
	20	G4DKK *	276	16	4,416
	21	G3UYM/P	158	22	4,136
	22	G4EQD *	311	13	4,043
	23	G4JNT *	215	16	3,440
	24	G3ZME *	242	14	3,388
	25	G3NKL/P	340	7	2,380
	26	G0API *	184	12	2,208
	27	2E1AJE *	245	9	2,205
	28	G3JMY *	157	14	2,198
	29	2E1AYB/P	170	12	2,040
	30	G3GRO *	143	10	1,430
	31	G8AYY/P	84	4	336 (WB only)
	32	G4KNZ/P	85	3	255
	33	2E1AIZ *	70	3	210
	34	G3JMY *	7	2	14 (ATV only)
24	1	G4KNZ/P	90	17	1,530
	2	G3PHO/P	86	6	516
	3	G8AYY/P	86	5	430
	4	G3FYX/P	67	4	268
	5	G3NKL/P	52	5	260
	6	G8AGN/P	86	2	172
	7	G3ZME/P	90	1	90
	8	G0DJA/P	8	1	8

* = Fixed (home) station operation

Table 1: 1992 Operating Ladder ranked on highest multiplied score, from 1.1.92 to 1.10.92

10GHZ ALL-TIME SQUARES TABLE

Postn	Call	Locator Squares	DX(km)
1	G3WDG	IO92RG 21	1,008
2 =	G4DDK	JO02PA 15	1,027
2 =	G3BNL	IO92KA 15	624
2 =	G8KQW/P	IO91GI 15	300
5 =	G8AGN/P	IO93EH 12	338
5 =	G3PHO/P	IO93EH 12	338
7 =	G4FCD	IO91JV 11	1,039
7 =	G3JMB/P	IO90TV 11	245
7 =	G8LSD/P	IO90TV 11	245
10	G8BRK/P	IO91FW 9	228
11	G0API/P	IO90UU 8	277
12	G0API	IO80XS 5	184
13	G3NWU/P	IO94MJ 4	290
14	G3JMB	? 4	48

Table 2.

RSGB MICROWAVE COMMITTEE COMPONENTS SERVICE

Many difficult-to-get components available. Contact Petra Suckling, G4KGC, 314a Newton Road, Rushden, Northants, NN10 0SP. Telephone: 0933 41446.

matters, the proposed 750mW (minimum) GaAs FET PA is also somewhat delayed. More news as soon as available.

Another technical 'snippet' from Andy, G4JNT, published recently in the Microwave Newsletter. It concerns how to use a simple 2.3GHz MMIC amplifier at mast-head to overcome the feeder losses when the G4DDK-004 source is used in the shack, as a driver for either a 2.3GHz beacon or as a driver for a masthead G3WDG-001 10GHz multiplier/amplifier also used as a beacon. Both signal and DC are fed up the same coaxial feedcable. **Fig 1 and 2** are self-explanatory, This is built on a simple PCB and provides enough gain to overcome about 8dB feeder loss. I feel sure that, should you require further information, an SAE to Andy (QTHR) will bring you more details than possible here.

I recently mentioned some new Mitsubishi devices in the MGF0900 and 7000 series of GaAsFETs and MMICs: Mike Quee, G3ZWW, director of European Microwave Components Ltd; tel. 0376 515200, wrote to remind me that his company is the exclusive distributor for these products in the UK and that he is happy to supply small quantity devices and full data to seriously interested amateurs to save them the difficulty of trying to get information from the manufacturer - often a difficult thing to do, as I well know. Please (my words) don't ask for the data unless you are seriously interested - that would simply be a waste of everyone's time! In passing, Mike mentioned that the MGF4310 HEMT series offers low noise/high gain performance up to 26GHz - maybe the subject of the G3WDG-005 modules?! Just to make your mouth really water, the MGFX 35V0005 and 38V0005 internally matched (50Ω), 10 to 10.5GHz devices offer 8.5dB gain with power outputs of 3.5 and 6W. Now that really is some power, even though the price is rather higher than surplus TWTAs.

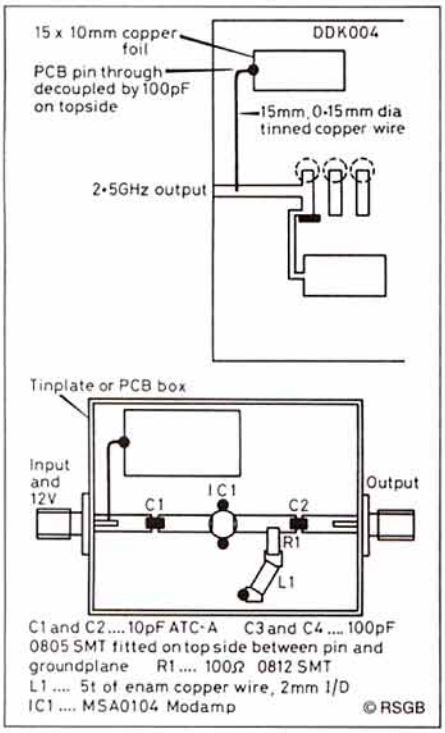


Fig 1: Using a simple 2.3GHz MMIC mast-head amplifier to overcome feeder losses: (top) simple modifications to the 'DDK-004 and (bottom) the MMIC amplifier layout.

THE POLITICS OF BANDPLANNING - YET AGAIN!

STAND-BY FOR SOME 'political' comment - this seems to be the flavour of the moment in Europe! You may remember that a little over two years ago (July 1990) and in several columns since, I've commented on (and asked for reader's comments on) a number of possible (or probable) band plan changes in the 2.3, 3.4, 5.7, 10 and 24GHz bands. The response has been largely negative or non-existent! Perhaps unilateral action may be needed - shades of Maastricht?

Changes in the 2.3GHz allocation now seem inevitable, due to most of the band being allocated (WARC '92, Primary allocations) to digital sound broadcasting, wireless LANs and ISM. In the UK, as previously mentioned, we will be looking for some protection of the narrowband segment in this band by proposing an Amateur Primary allocation: probably around 2.37 to 2.39GHz which seems most likely to be acceptable to our licensing authority, but this remains to be seen.

The Dutch national society, VERON, restricted to 3,400.00 to 3,400.20MHz in the '9cm' band, suggested (through PA0EZ, IARU Region 1 coordinator) that all other Region 1 countries should move down from the common 3,456MHz frequency to accommodate their changes. This was resisted by a majority of European users (including the RSGB), with the exception, apparently, of a few German amateurs near the Dutch border: we, in the UK, may need to reconsider the situation if (or when) the proposed 'Ionica' telephone system comes into operation. Meanwhile, we reserve our position - which is to seek an Amateur Primary allocation somewhere in the band and, for the moment, to continue to use 3,456MHz or, if wishing to work Dutch and nearer German stations, to be capable of operating on *either* frequency!

PHOTOGRAPH: G4JNT

The South Birmingham Radio Society (G8OHM/P, G1OHM/P, G3OHM/P and G4JNT/P) sported this antenna farm for the 1.3, 3.4, 2.3 and 5.7GHz bands during the October 1990 '432MHz and up' Contest.

The change from 5.760/5.762GHz to 5.668/5.670GHz for narrowband working, originally proposed by the German national society, DARC, and recommended by RSGB for acceptance, on sound technical arguments, was later refuted and ignored by both Dutch and German amateurs, despite general agreement at no less than two Region 1 Conferences. This was the subject of strong comment by the UK Microwave Manager, G3WDG, in the January 1992 column.

The proposal to move the 10GHz narrowband frequencies from 10,368-10,370MHz to 10,450-10,452MHz was not generally accepted and, indeed, was rejected by the Microwave Committee as being totally inconsistent with any other usage or allocation!

It now seems that the search for 'common' allocations may have been dealt a further blow insofar as German amateurs seem to be intent on retaining 24,192MHz as the narrowband operating frequency in the '12mm' band. In the UK, as elswhere in IARU Region 1, it has been strongly recommended that the use of the top 2MHz of the (Amateur) Primary band ie 24,048 to 24,050MHz for narrowband usage, with wideband in the remaining 24,000 to 24,047MHz sector, offers the best protection to the Amateur Service, the Amateur Satellite service and, also, has the advantage of being a world-wide Primary allocation.

24,192MHz is outside the UK 'no-go' area of 24,050MHz to 24,150MHz, and has been 'freed' for UK users, no longer needing written permission for operation as it was previously. Indeed, both 'unrestricted' areas of the band are shown in the latest edition of the *RSGB Callbook* as being Amateur Primary, but amateur users "must accept interference from ISM users" - this part of the band is *nott* allocated to the Amateur Satellite Service, however. By the time you read this column, the matter will have been discussed in detail at both the Martlesham Round Table (22 November) and a Microwave Committee meeting (19 December) and it is hoped that a firm recommendation will emerge from these discussions!

I have no doubt that band-planning will continue to occupy a lot of the Microwave Committee's time in the next few months. It will also almost certainly be on the agendas for the various Round Tables in the coming months! The September 1993 IARU Region 1 VHF and Microwave Managers' Conference may be the last real opportunity to iron out these differences of opinion. What do you think? Whatever transpires in the coming months, you can rest assured that your Microwave Committee will be very circumspect in its approach to 'Pan-European' band-planning, whatever the ultimate outcome!

DataComms

RICK STERRY G4BLT
1 Wavell Garth, Sandal Magna, Wakefield,
West Yorkshire WF2 6JP

I HAVE RECEIVED a number of letters and messages, concerning the September 1992 article by Colin, 9M2CR, 'Stop the Packet Racket', including one from Colin himself.

Colin is totally unrepentant, but does say that he would endorse the use of PACTOR rather than AMTOR as the best mode for HF use. However, whilst many people agree with Colin to varying degrees, others found the article emotional and lacking in objectivity; "a good rant" was one description. Still, even HF packet's greatest fans seem to concede that it is far from ideal, but whether AMTOR or PACTOR are the natural alternatives is highly debatable! AMTOR, though effective when the going gets tough, is far from error-free, and never very fast at the best of times. Neither AMTOR nor PACTOR are channel-sharing modes like packet, but PACTOR is supposed to address many of the criticisms of AMTOR, and so I am making this month's column something of a PACTOR special.

PACTOR - WHAT IS IT?

THE GERMAN DESIGNERS describe it thus; "PACTOR is an improved half-duplex synchronous ARQ system combining the reliability of Packet Radio with the fixed AMTOR time frame, and is specially designed for operation in noisy and fluctuating channels". That sums it up nicely, but if you want to put it even more simply, you could call it a sort of AMTOR Mk2.

Like AMTOR, the system is synchronous, and the transceiver is switched between Tx and Rx at fixed intervals. However, whereas with AMTOR this total cycle time is only 450ms, ie just under 0.5 seconds, with PACTOR it is much longer at 1.25 seconds. As with AMTOR, the longer transmitted blocks (packets) are acknowledged by shorter Control Signal blocks sent out by the receiving station. There is also a 'long path' mode, with a cycle time of 1.4 seconds, thus overcoming one limitation of AMTOR. If you listen to PACTOR on HF, eg at the lower frequency end of 40m, it does sound very much like AMTOR, except for the longer cycle time, which makes it instantly recognizable.

The tone shift used is 200Hz, slightly wider than the 170Hz used for RTTY and AMTOR, though existing modems or terminal units can handle it without problems. (See the information about BMK-MULTY later in this column.)

Unlike AMTOR, which has very primitive error-checking, PACTOR uses proper CRCs, (Cyclic Redundancy Checks). Also, tone shift polarity is irrelevant, and is defined at synchronisation time. In fact, the shift polarity is reversed with every cycle, which helps support the 'memory ARQ' function. This attempts to reconstruct one good packet from a corrupted one plus a corrupted repeat. Opinions vary as to how effective this technique actually is, and it does add considerably to the cost and complexity, as it requires an 8-bit A/D converter. I understand that the BMK-MULTY PACTOR package implements the memory ARQ somewhat differently, yet apparently functions well.

The system supports the full ASCII character range, which was always AMTOR's failing, despite the very ingenious 'tweaks' applied by Peter Martinez, G3PLX, lately. However, in order to increase throughput, a Huffman compression coding technique is applied to the data, and is effective if lowercase characters are predominant.

The Baud rate used is toggled between 100 Baud and 200 Baud, depending on conditions. Some doubters have suggested that this may not always be very effective, as they believe that the system may 'hunt' continually between the two baud rates if the 200 Baud packets are corrupted, but users say this isn't the case. The proof of the pudding is in the eating, as the saying goes!

In use, the system is very similar to AMTOR (see description on page 51) in that apart from the ARQ mode, there is an FEC mode for calling CQ or engaging in a multi-way QSO, and of course an ARQ listen mode. AMTOR users should adapt very easily.

HOW WELL DOES IT WORK?

Well, this is where on-the-air experience counts. All of those users who contacted me were extremely enthusiastic about the mode, and considered it significantly better than AMTOR under all band conditions. It is difficult to quantify this, and I am deliberately steering well clear of the 'how many characters per second' minefield!

However, I have received quite a number of cautionary comments from learned sources. For example, they claim that the signals are rather wide at 200 Baud. They claim that it is too small an evolutionary step over AMTOR, and for that reason is likely to be rapidly overtaken by newer and more novel modes, and may therefore be rather short lived. Clover II has been mentioned in this column previously, but I have yet to see any practical evidence that it is going to appear in a practical form in the near future, if at all. I have also heard of a commercial system called ARTOR. We shall see what happens!

WHAT ABOUT HARDWARE?

The original German PTC controller is available from Abacus in Northumberland at around £250. This unit includes RTTY and AMTOR, so can completely replace an existing terminal unit. The version licensed to PacComm is available from Siskin Electronics of Southampton, and has a port for a future add-on Packet module.

Kantronics have announced that PACTOR is to be made available as an upgrade to the KAM controller, and it seems likely that the same will happen for the PK232 controller. Memory ARQ may be implemented in a similar way to the BMK-MULTY, due to hardware limitations. Prices are yet to be announced.

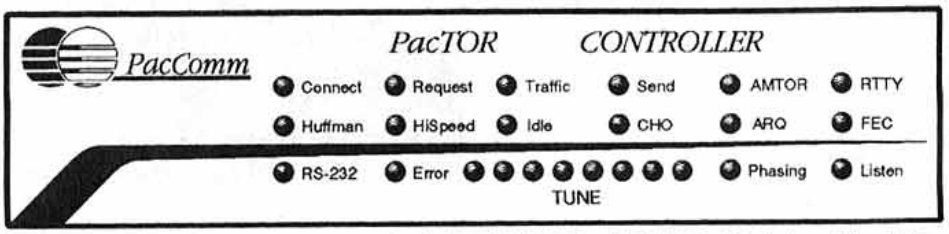
An exciting development is that, as I have hinted earlier, PACTOR has been added to the BMK-MULTY PC software suite from Mike Kerry, G4BMK, of Grosvenor software. If you already have the AMTOR software module, and a suitable terminal unit, then the PACTOR module upgrade is only £35! In fact Mike offers a range of software module options, and also supplies suitable RTTY/AMTOR/PACTOR terminal units.

COHERENT CW

COHERENT OR 'SYNCHRONOUS' CW (CCW) is a mode which is rather difficult to categorize; this is because it is partly 'manual' and partly a data mode. The keyer and transmitter are very tightly frequency-controlled, synchronised in fact, by locking the oscillators to a suitable frequency standard. The claimed result is a drastic reduction in bandwidth, down to 9Hz, and very accurate reliable copy even when running QRP. The speed used is only 12WPM, so it comes in the category of 'slow but sure'.

It seems that some of the newer commercial transceivers, such as the Kenwood TS450, are easily adaptable to CCW use. This fact should remove one the biggest obstacles to the use of CCW, which is the need for specially modified equipment. Apparently, the ARRL is hoping to compile a list of 'synchronous' transceivers, ie those fully locked to one oscillator. This also has implications for the use of the revolutionary data mode known as Clover II, which also requires very high stability in the transceiver.

If you want to find out more about CCW, then try the *ARRL Handbook*: my 1988 edition has a section on Coherent CW. Also, there was a short article in the Spring 1991 issue of the BARTG *DataCom* magazine, by Bert Arnold, G3RHI. A bi-monthly CCW newsletter is available, compiled by Peter Lumb, G3IRM, and he also has copies of most of the known published information on CCW. The newsletter is available free, though a contribution towards postage etc is always welcome! Copies of technical information are available at 5p per page, to cover copying costs. The only proviso is that anyone subscribing to the newsletter itself has a genuine interest in CCW, and will attempt to get on the air with this mode. If you would like to write to Peter, his address is: 2 Briarwood Avenue, Bury St Edmunds, Suffolk, IP33 3QF. Please enclose an SASE. Overseas amateurs are also welcome, and they should enclose IRCs.



A front panel view of the PacComm controller for RTTY, AMTOR and PACTOR. A Packet module will be available later. See above for how PACTOR compares with AMTOR.

RADCOM TECHNICAL FEATURE

A Proposed Code of Practice

for Amateur Optical Communications

B. Chambers, G8AGN, RSGB Microwave Committee

NOW THAT A NUMBER of amateurs are starting to experiment with optical communications, it seems timely to issue a code of good practice for building and operating such systems. The guidelines given below have been arrived at after discussions in committee, and having consulted others professionally involved in safety practices. Comments and suggestions for improving or clarifying these guidelines are invited and should be sent to the author (QTHR) for possible inclusion in future versions.

1. Use only visible light sources such as visible laser diodes or He-Ne lasers.

   High power infra-red laser diodes are readily available, but the radiation from such devices cannot be seen; hence the danger of inadvertent over-exposure and possible eye damage is much greater than would be the case when using visible sources.

2. Recommended levels of MPE (maximum permitted exposure) mean that a visible laser source having a power output of less than 1mW is generally regarded as not being dangerous due to the protection afforded to the eye by its automatic blink reflex.

   Care should be taken, however, not to stare at a source of even this low power level for any prolonged period of time, since this could result in eye damage. The obvious example to give here is that of looking at the sun. A quick glimpse does no lasting damage but prolonged viewing, especially through a light-gathering device such as a telescope would lead to blindness, as some early astronomers found to their cost!

   Laser sources having power outputs greater than 1mW should be treated with respect as they are potentially dangerous, not only to the operator but also to bystanders who may be some distance away from the apparatus.

3. A laser should be used with a beam expander,which is basically a telescope used back to front.

   Not only does this reduce the optical flux density close to the laser output aperture, which makes accidental over exposure less likely, but it also reduces the beam divergence over long distances. (This is analagous to reducing the beamwidth of an antenna by increasing its aperture).

4. Although visible red laser diodes having output powers up to 10mW are now available, they are still expensive and hence most amateurs are still likely to use He-Ne lasers. These need a high voltage power supply providing typically 1 to 2kV running voltage and 5 to 10kV striking voltage. Current requirements are typically a few mA.

   Mains PSUs are best avoided and an invertor supply based, for example, on a TV line output transformer is preferred because of its soft regulation characteristics.

5. The laser, together with its beam expander and power supply should be enclosed. The enclosure should be fitted with a prominent warning light to show when the laser is energised. Ideally, the power switch should be of the key-operated type rather than a toggle which could be inadvertedly knocked on. The end of the enclosure from which the beam emerges should be prominently marked. The beam should be shuttered except when actually in use and the shutter should only be openable through a deliberate action, not by accident. When running, the laser should not be left unattended.

6. The laser enclosure should be securely clamped to a solid structure such as a heavy tripod, fixed to the ground in such a way that it cannot be knocked or blown over. Because the laser beam is very narrow, some thought will need to be put into devising a means for moving it very precisely in both azimuth and elevation. A system of lever arms controlled by fine screw threads (eg 0BA) has been found to work well in practice. A refinement would be a sighting telescope, fitted with cross hairs, which could be located on the laser enclosure and 'zeroed-in' to the beam.

7. In operation, the laser beam must not be shone deliberately onto reflective surfaces such as shiny buttons, car windows or microwave dishes, or be deliberately pointed at moving vehicles including aircraft.

8. If a laser with a power output greater than 1 mW is being used, then goggles should be worn. These may be made from dark green (for red laser light) photographic filter material.

9. For initial adjustment of optical receivers, a low power visible LED or a torch can be used as an inherently safe signal source.

10. Most of the above points in this code of practice may be summed up in the phrase 'Use common sense at all times'

To accompany this code of practice, a BASIC computer program has been devised which will estimate, from the parameters of a particular laser transmitter and receiver, the received optical field strength and hence the safe viewing distance using the unaided eye or viewing the laser through some form of optical aid.

The calculation of the safe viewing distance is based on the formula:

$$R = \frac{\sqrt{(4\,Po/MPE)} - a}{\phi}$$

where Po = laser power output in watts

MPE = maximum permitted exposure

$= 18\ t^{-0.25}\ W\ m^{-2}$ for He-Ne lasers up to 5mW output

a = diameter of emergent laser beam in metres

ϕ = emergent beam divergence in radians

If the laser is being used with a beam expander then ϕ is reduced and a increased by a factor equal to the expander magnification.

If the laser is being viewed through binoculars or a telescope then the effective output of the laser is increased to kPo, where k is dependent on the objective lens diameter and the eye's pupil size. The latter depends on the ambient light level, but only a distinction between day and night-time viewing is included in the program.

To put things in perspective, however, the Philips He-Ne lasers (nominal 2mW output) currently available in the UK look like a very bright street-light 'star' when viewed against a dark night sky from a distance of one mile. The light intensity is bright enough to be unmistakeable, but not quite bright enough to cause one to avert the eyes.

```
100   REM LASER SAFETY CALCULATIONS
110   REM based on BS7192:1989
130   REM v 2.0 December 1991  copyright
      B Chambers, G8AGN
150   REM -------- DISCLAIMER ---------
170   REM Note that although reasonable care has
      been taken to ensure that the calculation of the
      minimum safe range for intra-beam viewing is
      valid, NO responsibility whatsoever will be accepted
      by the author for any mishap which may arise due
      to the use of this software.
220   REM ------------------------------
230   pi = 4. * ATN(1.)
240   INPUT 'Enter laser output power in mW '; Po
250   Po = 0.001 * Po
260   INPUT 'Enter initial beam diameter in mm '; a
270   INPUT 'Enter beam divergence in mrad '; phi
280   INPUT 'Does the laser have a beam expander
      fitted? '; yn$
290   IF yn$ = 'Y' THEN INPUT 'Enter expander
      magnification factor (>1) '; emf
300   phi = phi/emf
310   a = a * emf
320   PRINT 'Effective initial beam diam now '; a ;
      'mm'
330   PRINT 'Effective beam divergence now '; phi ;
      ' mrad'
340   a = 0.001 * a
350   phi = 0.001 * phi
360   INPUT 'Is the beam being viewed through optics
      ? '; yn$
370   IF yn$ = 'Y' THEN INPUT 'Enter collecting lens
      diam in mm '; od
380   INPUT 'Enter lens system magnification '; mag
390   PRINT 'Is beam being viewed
            1) . . . . at night'
400   PRINT '2) . . . . in daylight'
410   INPUT 'enter choice '; itime
420   IF itime = 1 THEN deye = 7. ELSE deye = 3.
430   dopt = od/mag
440   IF deye > dopt THEN k = (dopt/deye)^2 ELSE k
      = mag^2
450   INPUT 'Enter exposure time in seconds '; t
460   IF yn$ < > 'Y' THEN r =(SQR(4.* Po/(pi *18.* t^(-
      0.25))) - a)/phi
      ELSE  r = (SQR (4.*Po*k / (pi * 18.* t^(-0.25))) -
      a)/phi
470   ir = INT(r)
480   PRINT 'Estimated minimum safe intra beam
      viewing range is '; ir; ' m'
490   END
```

C.M.HOWES COMMUNICATIONS

Mail Order to: Eydon, Daventry, Northants NN11 6PT
Tel: 0327 60178

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***PLEASE ADD £1-50 P&P** for kits, or £4-00 if ordering hardware.*

HOWES KITS are produced by a professional RF design and manufacturing company. They contain good quality printed circuit boards with screen printed parts locations, full clear instructions and all board mounted components. Sales and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets. Normally all items are in stock and delivery is within seven days.

72 & 73 from Dave G4KQH, Technical Manager.

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RG174U, 2.3mm, 50 ohm, miniature coax	30p/m
UR95, 2.3mm, 50 ohm, mini nylon coax	30p/m
UR111, 2.3mm, 75 ohm PTFE mini coax	40p/m
UR57, 10.3mm, 75 ohm low loss coax	70p/m
UR70, 6mm dia, 75 ohm transmitting coax	30p/m
Double screened, 75 ohm coax, 8mm dia	40p/m
UHF low loss TV downlead, 75 ohm	25p/m
75 ohm twin balanced feeder, 400 w PEP	20p/m
300 ohm standard ribbon	20p/m
RG62AU, 6mm dia, 95 ohm coax	50p/m
Single core screened cable, 2.3mm dia	12p/m
Two core screened cable, 5mm	30p/m
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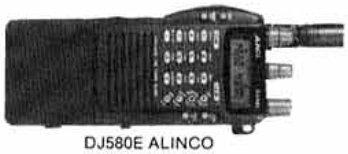

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103BAS	10m 3 element Beam
TH7DXS	20-15-10m 7 element Beam
TH5MK2S	20-15-10m 5 element Beam
EXP14	20-15-10m 4 element Beam
TH3JRS	20-15-10m 3 element Beam
TH2MK3S	20-15-10m 2 element Beam
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18VS	80-10m Vertical
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CONTEST CLASSIFIED

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

HF GENERAL RULES

GENERAL RULES FOR RSGB HF CONTESTS 1993

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 those visiting, 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 three 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
3 30 - 39 feet

and so on up to

8 80 - 89 feet
9 90 or more feet.

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

GENERAL RULES FOR RSGB VHF/UHF CONTESTS

The rules governing all RSGB VHF/UHF/SHF Contests held in 1993 (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 will 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 24 as and when felt necessary.

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. 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.

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 for 1993, as 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 devicecs. In multiband events entrants must also complete a multiband sheet (Form 4422). In contest using a county/country multiplier scheme, a multiplier check list 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, Army or Airforce 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 24-hour 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 contest all contacts over 650km will score 25 points.

10. Final Tabulation of multiband and cumulative contests

The final tabulation 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 a 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 be 1000.

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 SAE (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 entrants callsign, IARU locator, contest title and sheet number, (the top of any computer generated log sheet must duplicate a standard RSGB VHFlog sheet). Logs must be tabulated as follows.

(i) Date/time (GMT)

(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 multipliers

a) 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.

b) 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.

c) The score obtained under rule 9 is multiplied by the total number of multipliers worked to provide the claimed score.

d) A separate list of claimed multipliers must be included showing as a minimum the counties and countries 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 or country.

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 13cm.

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.

GENERAL RULES FOR RSGB LISTENERS VHF/UHF CONTESTS 1993 AND THEREAFTER

1. The 1993 general rules for VHF/UHF contests will apply except where modified by these rules.

2. Listeners contests are open to all non-licensed members of the RSGB, and to foreign SWLs. Only the entrant may operate the receiving station.

3. Logs must show in columns: (a) date/time (GMT), (b) callsign of station heard, (c) my report on his/her signals, (d) report and serial number sent by station heard, (e) callsign of *station being worked*, (f) IARU locator given by station heard, (g) QTH given by station heard (if appropriate), (h) points claimed.

On 144MHz the callsign in column (e) may only occur once in every ten contacts logged. CQ and test calls do not count for points and should not be logged. If both sides of a QSO can be heard, both can be claimed for points. The Hansen Trophy will be awarded to the entrant with the highest aggregate score in all SWL contests between March and September 10th inclusive of each year. The aggregate score will calculated in accordance with General Rule 10.

CODE OF PRACTICE

VHF/UHF CONTEST OPERATION

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 beleiving 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, preferabley 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.

HF RULES

APOLOGIES

Please note that the dates for certain of the 7MHz & 3.5MHz sessions of the LF Cumulatives were shown incorrectly in the November and December Contest Calendars. The dates in this month's calendar, and in the contest rules, are correct.

Apologies are due to Peter G2AFV, and Ross G3DYY whose callsigns appeared incorrectly in the Commonwealth Contest listings (Nov.92) as G3AFV and G3DDY respectively. Sorry, gentlemen! We'll try harder next time.

FIRST 1.8MHZ CONTEST 1993

1. The General Rules for RSGB HF Contests (January *RadCom*) apply.

2. When: 2100GMT Sat 13 Feb - 0100GMT Sun 14 Feb 1993.

3. Sections:

(a) UK.

(b) Overseas.

Single-operator entries only. UK entrants for the transmitting contest may enter the **BINGO TABLE.**

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

5. Exchange: RST + Serial Number starting at 001. UK stations send their County Code.

6. Scoring: Overseas stations work only UK stations for points.

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

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

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

8. Awards:

(a) The Somerset Trophy to the leading station in the British Isles. Certificates of Merit to the second- and third-placed entrants.

The Maitland Trophy to the Scottish entrant with the highest aggregate number of points in this contest combined with the Second 1.8MHz Contest 1992.

(b) Certificates of Merit to the leading three entrants in the Overseas section.

(c) Certificates of Merit to the Leader and Runner-up in the BINGO TABLE.

RECEIVING CONTEST

Rules as for the Transmitting Section except:

Logs: as for transmitting except the following columns:

(2) Callsign of station heard

(3) Report and serial number sent by that station

(4) Callsign of station being worked

In log column 4 the same callsign may appear only once in any group of three consecutive contacts, except if the "Station Heard" counts as a new bonus.

Awards: Certificates of merit to the leading entrants in each section.

HF RESULTS

LF CUMULATIVE CONTESTS 1992

An excellent response to these ever-popular contests - the entry increased by almost 50% over last year and the number of G0s was up fourfold! Congratulations to the winning operators and thanks to all those who made the effort to send in entries and checklogs. Many other stations were active regularly, particularly in the run-up to AFS; of these GM3ALB appears the most persistent non-entrant. Special thanks to LA1IE, who supported so many of the sessions AND sent in the logs. He is included in the tabulation, although not eligible to enter.

Nearly 650 logs were received, which made it possible to cross-check around 80% of all contacts made. Your adjudicator pleads this as an excuse for the time it takes to get the results out! Several 'old friends' from the top ten of past years are missing this time, but even so a number of entrants managed more than 100 QSOs in a two-hour session on both 80m and 40m and the three-band total has passed the 2000 mark for the first time. G4BWP's log for one Top Band session included VK6HDI

Once again the heaviest losses of points were due to unmarked duplicates and wrong callsigns. One or two logs contained contacts which are excluded by General Rule 2a - these are very easy to spot in these contests. It was encouraging to be able to see an improvement in the logging accuracy and contact rates of some of the less experienced operators when comparing their later sessions with early ones - this shows that these contests are still effectively carrying out their original purpose as training events.

From the comments received with many logs it would seem that we can look forward to some more fun and another good entry, same time next year.

DON'T FORGET THE QRS CUMULATIVES, SEPTEMBER/OCTOBER!

G3MCX

1.8MHZ CONTEST

Posn	Call	6/1	14/1	22/1	30/1	7/2	Total
1 *	G4BWP	ck	ck	219	207	219	645
2	G0IVZ	210	204	180	-	ck	594
3 =	G3HEJ	170	174	ck	186	-	530
3 =	G4OGB	168	191	ck	ck	171	530
5	G0JNZ	162	186	ck	174	ck	522
6	G3YAJ	180	169	-	ck	165	514
7	G3JJG	173	174	ck	155	-	502
8	G3RSD	-	ck	165	164	168	497
9	G3ZGC/P	174	-	-	159	162	495
10	G3OXC	156	176	156	ck	ck	488
11	G3GLL	ck	161	ck	161	137	459
12	G0AMY/P	ck	144	ck	136	166	444
13	G0EBW	147	129	140	ck	ck	416
14	G2HLU	ck	139	ck	135	139	413
15	GM3UM	ck	135	ck	134	139	413
16	GM0MYV	132	119	-	-	147	398
17	G3BPM	129	ck	ck	127	133	389
18	G0IDE/P	-	141	105	137	-	383
19	G3KNU	ck	126	ck	110	125	361
20	G3AWR	126	ck	117	117	ck	360
21	G3XZK	111	-	-	124	122	357
22	GW3SB	113	129	114	-	ck	356
23	G0JQN	-	121	120	ck	114	355
24	G4GLC	103	123	ck	ck	125	351
25	G3LIK	-	136	106	97	-	339
26	G3GMS	113	ck	105	120	ck	338
27	G0LZL	110	100	116	-	-	326
28	G3JSR	ck	110	-	96	119	325
29	G3GMM	103	-	101	111	ck	315
30	GW4HBK	ck	109	84	83	-	276
31	GW4KVJ	87	-	83	98	-	268

32	G4JSN	ck	71	ck	64	75	210
33	G3BCC	48	-	69	75	-	192
34	G0AIZ	-	52	48	ck	58	158
35	G3WPK	-	-	33	65	48	146
	LA1IE	-	37	36	-	60	133
36	G3DPX	-	-	-	-	84	84
37	G0ORY	-	42	-	-	-	42
38	G3WYW	32	-	-	-	-	32

Checklogs: G3MCX, G3OLU, G4DJR, G4ECI, GM4SID, GW0KZW.

7MHZ CONTEST

Posn		Call	6/1	14/1	22/1	30/1	7/2	Total
1	*	G5LP	267	311	-	270	-	848
2		G0IVZ	249	300	252	ck	ck	801
3		G3OXC	267	267	251	ck	-	785
4		G4ARI	248	300	227	ck	ck	775
5		G3JJG	258	261	240	ck	-	759
6		G3GLL	213	252	230	ck	ck	695
7		G3YAJ	227	234	231	ck	ck	692
8		G3ZGC/P	230	242	219	-	-	691
9		G0JQI	ck	241	212	231	ck	684
10		G4OGB	220	231	219	ck	ck	670
11		GM4SID	222	234	213	ck	-	669
12		G2HLU	219	219	213	ck	ck	651
13		G4KGK	218	209	198	ck	ck	625
14		G0JNZ	-	227	194	198	ck	619
15		G3RSD	171	ck	213	222	-	606
16		G0LZL	181	215	-	207	-	603
17		G4EBK	192	211	ck	195	-	598
18		G0HIN	205	176	216	ck	ck	597
19		G4SND	181	203	202	ck	ck	586
20		G3ZVW	ck	155	230	198	ck	583
21		G0EBW	168	207	207	ck	ck	582
22		G0IDE	190	-	190	197	ck	577
23		GM3UM	186	207	ck	179	ck	572
24		G4LZB	165	216	-	189	-	570
25		GW4HBK	195	184	176	-	-	555
26		G3JSR	ck	232	173	ck	147	552
27		G3KNU	-	ck	196	174	180	550
28		G0ADH	176	ck	184	189	ck	549
29	=	G0IBN	228	-	168	150	-	546
29	=	G4BLI	ck	206	ck	184	156	546
31		G0JQN	183	192	-	-	168	543
32		G3GMS	180	173	ck	165	ck	518
33		G3BPM	169	192	153	-	ck	514
34		G3DPX	-	150	179	179	-	508
35		G3AWR	166	165	ck	174	ck	505
36	=	G0ORY	ck	181	144	179	ck	504
36	=	G4XPE	165	159	180	-	-	504
38		GW3SB	156	159	176	-	-	491
39		G0OGN	ck	131	ck	165	141	437
40		G0AMY	125	143	ck	ck	149	417
41		G3WYW	103	ck	136	158	-	397
42		GM0MYV	ck	126	135	-	135	396
43		G4JSN	137	118	123	ck	ck	378
44		G3GMM	123	-	ck	144	106	373
45		GM4WLN	114	-	-	127	126	367
46		G3BCC	ck	ck	114	125	119	358
47		G4GLC	-	-	113	115	127	355
48		G0KKG	ck	114	105	129	-	348
49		GM0JKF	113	113	-	-	120	346
50		G0KZO	86	-	122	120	-	328
51		G0AIZ	ck	87	ck	97	98	282
52		G3WPK	-	-	83	91	100	274
53		GW4KVJ	72	120	54	-	ck	246
54		G0NID	66	ck	ck	71	86	223
55		G4EZA	-	-	60	149	-	209
56		G0MRH	ck	ck	51	60	75	186
	LA1IE	-	72	111	-	-	183	

Checklogs: G0FDX (op G0IDE), G2AFV, G3LIK, G3MCX, G3OLU, G4DJR, G4ECI, G4ZYF, GW0KZW.

3.5MHZ CONTEST

Posn		Call	6/1	14/1	22/1	30/1	7/2	Total
1	*	G5LP	-	222	264	321	ck	807
2		G3OXC	ck	202	257	275	ck	734
3		G3HEJ	ck	218	204	300	ck	722
4		G3KAF	ck	206	251	255	ck	712
5		G0IVZ	ck	213	245	252	ck	710
6		G3ZVW	ck	194	242	225	ck	661
7		G0JNZ	-	ck	201	256	200	657
8		GW3WWN	198	194	ck	248	ck	640
9		G3RSD	188	203	ck	231	-	622
10		G3YAJ	ck	189	205	226	ck	620
11		G4LZB	-	194	191	222	-	607
12		G3JJG	ck	-	207	202	180	598
13		G4OGB	ck	ck	196	212	180	588
14		GM4SID	ck	183	176	227	-	586
15		G0IDE	-	186	213	-	186	585
16		G2HLU	-	186	189	204	ck	579
17		G0JQI	ck	ck	197	201	180	578
18		G4KGK	177	199	201	-	ck	577
19		G3OLU	ck	-	223	180	170	573
20		G0LZL	-	191	180	201	-	572
21		G3JSR	ck	ck	190	194	162	546
22		G0ADH	ck	159	180	203	ck	542
23		G3GMS	ck	180	ck	192	165	537
24		G3KNU	ck	-	177	189	162	528
25		GM3UM	-	-	174	183	168	525
26		G4EZA	-	-	177	201	137	515
27		G4SND	-	158	177	177	ck	512
28		G3ZGC	-	132	177	201	-	510
29		G0ORY	132	170	-	178	-	480
30		G4ARI	-	-	-	273	204	477
31	=	G3AWR	ck	141	147	183	ck	471
31	=	G3BPM	-	ck	136	180	155	471
33		G0EBW	ck	175	135	157	ck	467
34		G0OGN	ck	ck	137	161	160	458
35		GW4HBK	ck	147	150	155	-	452
36		G4XPE	120	-	-	158	164	442
37		GW3SB	125	129	144	-	-	398
38	=	G3GLL	207	-	-	188	-	395
38	=	G3WYW	ck	147	-	115	133	395
40		G3GMM	-	111	-	124	132	367
41		G4JSN	ck	ck	120	109	114	343
42		GM0MYV	96	117	-	123	-	336
43		G0KKG	ck	ck	107	111	111	329
44		G4GLC	-	-	96	80	145	321
45		G0KZO	-	ck	88	109	106	303
46		G4ZYF	-	75	ck	102	125	302
47		G0IBN	165	-	-	135	-	300
48		G3DPX	87	-	-	204	-	291
49		GW4KVJ	-	95	102	-	89	286
50		G0GKH	-	-	-	105	162	267
51		G0AIZ	73	87	ck	99	-	259
52		G0NID	ck	42	-	83	71	196
53		G3WPK	-	-	72	79	32	183
54		G0MRH	ck	ck	47	60	67	174
55		G3BCC	45	30	-	86	-	161
		LA1IE	-	-	79	81	-	160
56		GM4WLN	-	-	-	122	-	122

Checklogs: G0JQN, G3LIK, G3MCX, G4DJR, GW0KZW.

3-BAND COMBINED CONTEST

Posn		Call	Points
1	*	G0IVZ	2105
2		G3OXC	2007
3		G3JJG	1859
4		G3YAJ	1826
5		G0JNZ	1798
6		G4OGB	1788
7		G3RSD	1725
8		G3ZGC/P	1696
9		G2HLU	1643
10		G3GLL	1549
11		G0IDE	1545
12	=	G0LZL	1501
12	=	GM3UM	1501
14		G0EBW	1465
15		G3KNU	1439
16		G3JSR	1423
17		G3GMS	1393
18		G3BPM	1374
19		G3AWR	1336
20		GW4HBK	1283
21		GW3SB	1245
22		GM0MYV	1130
23		G3GMM	1055
24		G4GLC	1027
25		G0ORY	1026
26		G4JSN	931
27		G3DPX	883
28		G3WYW	824
29		GW4KVJ	800
30		G3BCC	711
31		G0AIZ	699
32		G3WPK	603

* Certificate Winner

1.8MHZ SSB CONTEST 1992

The winner of the UK section of the 1992 1.8MHz SSB contest, with a score almost twice that of the runner up, was G4FPH, operated by M Hill, G4FPH, and P Daniells, G4CBQ. The overseas and receiving sections were won by EI9FK and BRS28198 with scores of 5712 and 8554 respectively.

Disappointingly, the UK entry at 13 stations is substantially down on last year, but Overseas entries doubled to two, and in contrast to last year when no entries were received for the SWL section, this year there were a healthy five including one from overseas.

Logs were generally well presented and accurate, although all but two stations lost points and two logs had to be substantially rescored as a result of claiming bonus points rather than multipliers for counties/countries worked. These stations will find their adjudicated scores substantially in excess of what they claimed!

Conditions appeared to have been reasonably good to Europe, but no real DX appeared in the logs. There is no doubt that the concurrent WPX contest was responsible for the appearance of a wide spread of European callsigns (15 non-UK countries appear in the logs) allowing scope for stations to chase multipliers as a means of boosting scores.

The equipment coding for this tabulation is as follows:
1st Char (Power): '?': not given, '2': 5-20W, '3': 20-100W.
2nd Char (Antenna): 'C': Centre-fed, 'W': other wire.
3rd Char (Ant height expressed as ([feet agl/10] rounded down to the next lowest integer) ie: 0 = 0-9ft, 5 = 50-59ft etc. *G3WRR*

UK SECTION

Posn		Call	QSOs	Mults	PTts	Eqpt
1	*	G4FPH	139	61	25792	3C9,3C8
2	*	G4RFR	95	47	13301	3C5
3	*	G0OCE/P	99	42	12474	3C6,3W?
4		G0OMY	92	42	11550	3W?
5		G0PWA	89	38	10032	2W?
6		GW4WKS/P	67	38	7638	2W?
7		G3ZBU	58	40	6960	3W2
8		G3ZLS	65	34	6630	3C5
9		G4ADV	51	36	5508	3C4
10		G3FFH	54	32	5152	3C5
11		G3GMM	29	22	1848	2C?
12		G3TKR	25	22	1650	3W?
13		G0NYL	16	14	1092	3W?

OVERSEAS SECTION

1	*	EI9FK	56	34	5712	3W?
2	*	EI7GL	32	25	2350	3C2

RECEIVING SECTION

1	*	BRS28198	61	47	8554	-W2
2	*	RS91477	62	43	7912	-W?
3	*	BRS20249	51	32	4864	-W2
4		BRS37798	41	31	3689	-???
5		ONL383	4	4	48	-C1?

* Certificate Winner

SUMMER 1.8MHZ

Analysis of the logs during the checking process shows that out of the 30 UK logs received only four were perfect and five had lost more than 5% of their claimed score. Only one unmarked dupe was found. Of the overseas entry three of the 15 logs had no errors while 10 had greater than 5% score loss. There were no unmarked duplicates.

The main causes of points loss with UK stations were callsign errors (44%), serial number errors (31%) and county code errors (11%) while for overseas stations the figures were 34%, 41% and 22% respectfully.

Entrants please note that for DXCC purposes Germany only counts as a single country since re-unification. Logs were adjusted as required to reflect this for those entrants still unaware, which explains some stations' loss of claimed points.

Conditions were generally reported as good without a lot of the usual summer static, although one station did report problems from a nearby sodium street lamp. The end of the contest was generally reported as poor but there was at least one station wished for a further 30 minutes to include VE1 and SV8, who he only QSO'd after it was all over!

Congratulations and certificates go to Dave Lawley, G4BUO, who won the UK section with a perfect log, and Steve Knowles, G3UFY, the runner-up. In the Overseas section Bob Hope, LA2UA, took the honours in a very close run battle with Bertin Butz, DJ9WH, runner-up. Checklogs gratefully received from: GM4WLN, GW0KZW, SP5NOG. *G4HTD*

HF CONTESTS CALENDAR - 1992/3.

Please note; some of the dates for 3.5 & 7MHz Cumulatives were incorrect in the last calendar . . . . the dates shown below and in the contest rules are correct.

27 Dec	LF Cums 7MHz (Dec 92)
2 Jan	LF Cums 7MHz
3 Jan	LF Cums 3.5MHz (Dec 92)
4 Jan	LF Cums 1.8MHz (Dec 92)
9 Jan	LF Cums 3.5MHz
10 Jan	AFS (CW) (Nov 92)
12 Jan	LF Cums 1.8MHz
16 Jan	AFS (SSB) (Nov 92)
16/17 Jan	*HA DX CW*
16/17 Jan	*AGCW-DL QRP*
17 Jan	LF Cums 7MHz
20 Jan	LF Cums 1.8MHz
23 Jan	LF Cums 7Mz
24 Jan	LF Cums 3.5MHz
28 Jan	LF Cums 1.8MHz
30 Jan	LF Cums 3.5MHz
30/31 Jan	*CQ WW 160m (CW)*
30/31 Jan	*UBA SSB*
30/31 Jan	*REF CW*
31 Jan	LF Cums 7MHz
5 Feb	LF Cums 1.8MHz
7 Feb	LF Cums 3.5MHz
13/14 Feb	1st 1.8MHz CW (Jan 93)
13/14 Feb	*PACC*
20/21 Feb	*ARRL CW*
26/28 Feb	*CQ WW 160m (SSB)*
27/28 Feb	7MHz DX
27/28 Feb	*REF SSB*
27/28 Feb	*UBA CW*
6/7 Mar	*ARRL SSB*
13/14 Mar	Commonwealth
20/21 Mar	*Bermuda*
20/22 Mar	BARTG Spring RTTY (rules de G3UFY/G4SKA)
27/28 Mar	1st 1.8MHz CW
27/28 Mar	*WPX SSB*

THE TYPEFACE in Contest News has been reduced at the request of the HF Contests Committee in order to do justice to the large amount of contest information requiring publication, whilst retaining the same page allocation.

UK SECTION

Posn		Call	Score
1	*	G4BUO	634
2	*	G3UFY	596
3		G6KQ	595
4		G0FDX	589
5		G4BVH	573
6		G3VER/P	568
7		G3VYI	559
8		G3HEJ	517
9		G3YAJ	516
10		G3RSD	481
11		G2HLU	474
12		G3UOF	470
13		G4OGB	465
14		G4CZB	445
15		G3HJF	415
16		GM3CFS	407
17		G0LZL	404
18		G3SQX	398
19		G4OFR	396
20		GM3UM	394
21		G3KKJ	393
22		G3AWR	382
23		G3BPM	376
24		G3IQF	352
25		G0JQN	345
26		G3GMS	344
27		G3KNU	334
28		G3KKQ	329
29		G0ADH	326
30		G3IZD	296

OVERSEAS

1	*	LA2UA	286
2	*	DJ9WH	285
3		SP5ZIM	284
4		DL1IAO	280
5		PA3AAV	265
6		LA1IE	200
7		LY2BIP	172
8		DL2SBF	158
9		OK3TQX	146
10		F5YG	144
11		DK7FP	129
12		DL8WCM	126
13		UZ3AWO	82
14		Y21CB	65
15		SP9HAX	59

* - Certificate Winner

LOW POWER CONTEST 1992 RESULTS

The entry in the Low Power Contest rose to 29 compared with 21 last year, but as the leading scores were similar, it looks as though last year's plea for more operators to take the trouble to write up and post their entry was heeded, and the HFCC thanks all those who contributed. G3SQX who sent a checklog remarked that some QRPers seemed to be too timid to call CQ, but points out that casual callers will often pick out a QRP CQ if the frequency is clear. Several remarked on the concurrent OH contest which made a clear frequency harder to find on 7MHz, but the lack of OH callsings in any log suggests that they were not interested in working UK QRP stations. Activity may have been somewhat reduced because, unusually, the contest date clashed with Easter Sunday.

Perhaps the West Country is the place to be for success in this event, because following G4EDG's win in 1991, Jan Fisher, G0IVZ, in Cornwall improved over his fourth place to win the 1930 Committee Cup, while at the other end of the country Brian Waddell, GM4XQJ, was the leading 1W station. Harold Owen, G2HLU, wins a certificate for the leading operator using all homebrew equipment, and apologies go to the 1991 winner in this category G0LTO, incorrectly listed last time as G3LTO.

The comprehensive details supplied by most entrants on outboard power, amplifiers and modifications to comply with the power reduction rule made fascinating reading, and the widespread use of the Stockton power meter was noticeable. G3YHV sent a photograph of his internal modification to the FT757GX which uses the existing driver/pa module but bypasses the PA transistors. G3HEJ submitted a paper running to ten pages on RF power calibration at low levels, and also gave the circuit of his plug-in replacement PA using BC237B and BD135 devices. It is hoped that such information might be given a wider audience through *Radcom*, but in the meantime inclusion of some detail in the tabulation may act as a spur to budding QRP contesters to build their own, or perhaps to take the lid off the 'black box' and see what can be done. Also, how about an entry from a novice next year?

G4BUO

Posn	Call	Pwr	80	-QSOs- 40	Pts	Rig	Antenna
1 *	G0IVZ	5W	33	51	1250	TS120V	Dipoles @ 65ft, 35ft
2 *	G4PZQ	3W	31	55	1225	Howes TX	G5RV
3 *	G4ARI	5W	39	47	1175	Sugiyama F850	Dipoles @ 40ft
4	G3OZF	5W	25	52	1125	TS930S+BD123 pa	Dipole @ 85ft
5	G3JKS	5W	37	54	1090	TS120V	Dipoles
6	G6UQ/P (G0JQI)	3W	33	41	1055	Corsair, internal ALC	Dipoles
7	G3HEJ	5W	29	43	1030	FT-one + BD135 pa	264ft loop
8	G0OGN	5W	23	47	1025	TS120V	Dipoles @ 20ft, 15ft
9	G4OGB	4W	27	43	1020	2xIRF510	Doublet, dipole
10 *	G2HLU	5W	33	35	995	G3TSO, 2x2SC1945	168ft @ 25ft
11	G4CZB	5W	30	39	988	Century 21	40ft @ 25ft
12	G0IDE	3W	24	42	965	Homebrew EL84 pa	40m loop
13	G0CGB	5W	22	32	785	KW Viceroy driver stage	50m doublet
14	G3BPM	3W	19	34	755	2N3866	50ft vert, 300ft lw
15	G0CLP/P	2W	25	38	715	Mizuho MX-3.5S, MX-7S	350ft @ 40ft
16	G3GMS	4W	7	29	535	IC735 modified	30ft vert
=	G3YHV	5W	22	36	535	FT757GX driver only	160ft end fed @ 50ft
18	G3KDP	2W		36	525	Homebrew 2x2N5321	Dipole
19	G3DOT	4W	15	21	515	HW9	Lw, half 5RV
20 *	GM4XQJ	1W	7	31	505	Argosy II	Delta loops
21	G3KZR	1W	17	17	470	FT107 + outboard pa	G5RV
22	G4RVW	2W	7	27	445	Howes CTX, Oner	W3DZZ
23	G4AFU	1W	12	17	435	Homebrew	G5RV
24	GW3SB	3W	14	13	405	HW8	W3EDP
25	G0LTO	1W		26	385	Homebrew 2N3053	G5RV
26	G3AWR	5W		24	330	Corsair, internal ALC	Quad loop
27	GM0GNT	5W	3	14	240	Century 22	W3DZZ
28	PA0ATG	3W	2	16	190	HW8	20m endfed
29	G3BIK	0W8	13		160	Homebrew	60m endfed @ 10m

Checklog acknowledged with thanks from G3SQX
* Certificate Winner

DIRECTION FINDING RESULTS

B SIMMONDS MEMORIAL ROSEBOWL

OVERALL RESULTS (EIGHT QUALIFYING EVENT)

	Name	Club	Pts
1	A Collett	Chelmsford	35
2	C Wells	Mid Thames	21
	B Bristow	Mid Thames	21
4	C Plummer	South Manchester	16
5	A Mead	Colchester	13
6	A Simmons	Mid Thames	10
	D Holland	South Manchester	10
8	G Foster	Mid Thames	9
	M Hawkins	Colchester	9
10	D Brocks	Colchester	6
	P Cunningham	Colchester	6
	D Gethin	Mid Thames	6
13	B Gray	Mid Thames	5
	G Whenham	Coventry	5
	T Gage	Mid Thames	5
16	G Nicholls	Banbury	4
	D Yorke	South Manchester	4
	P Lisle	Mid Thames	4
19	M Standen	Mid Thames	3
	J Hall	Ripon	3
21	P Clarke	Torbay	2
	C Merry	Dartford Heath	2
23	P Tyler	Mid Thames	1

COLLIER CUP

BEST 3 OF 5 EVENTS

	NAME	CLUB	PTS
1	G Whenham	Coventry	-10
2	C Boyce	Mid Thames	-31
3	M Standen	Mid Thames	-65
4	T Gage	Mid Thames	-66
5	B Gray	Mid Thames	-83
6	B Bristow	Mid Thames	-84
7	B North	Mid Thames	-85
8	G Brightman	Mid Thames	-90
9	G Foster	Mid Thames	-93
10	C Wells	Mid Thames	-37 (2 events)
11	G Nicholls	Banbury	-81 (2 events)
12	M Mallinson	Banbury	-86 (2 events)
13	A Simmons	Mid Thames	-106 (2 events)

MID THAMES QUALIFYING EVENT 6 SEPTEMBER 1992

The season's last qualifying event and one more suitable for ducks as it rained and blew for most of the afternoon.

The start was on the Ridgeway some 2 miles SW of Wantage. At the start Station 'A' G3WFT/P situated some 14 miles South of the start on Inkpen Hill was strong. Most of the competitors visited this station first only to find a steep hill to contend with.

Station 'B' G3UJO/P was barely audible at the start and some competitors required approximate bearing. This station was some 17 miles from start on Ashampstead Common. A typical G3UJO aerial kept many competitors guessing his exact location.

Refreshments were provided at Hampstead Norreys, where the winner Andrew Mead was presented with the cup. He also qualified for this year's final, along with Dave Gethin who came second.

POS	NAME	CLUB	TX A	TX B
1	Andrew Mead	Colchester	14:41	15:54
2	Dave Gethin	Mid Thames	14:42	16:09
3	Andy Collett	Chelmsford	15:04	16:21
4	Chris Wells	Mid Thames	14:58	16:21.30
5	George Whenham	Coventry	15:14	16:21.40
6	Brian Bristow	Mid Thames	16:22	15:13
7	Paul Clark	Torbay	15:03	16:22.20
8	John Hall	Ripon	14:59	16:22.30
8	Min Standen	Mid Thames	15:00	16:22.30
10	Graham Nichols	Banbury	15:09	16:22.50
11	Chris Plummer	S Manchester	14:59	16:23.10
12	Trevor Gage	Mid Thames	16:24	15:28.50
13	Colin Merry	Dartford	15:00	16:24.10
14	Peter Lisle	Mid Thames	15:30	—
15	Bill Pechey	Mid Thames	15:41	—
16	Keith Howell	Mid Thames	—	16:22

VHF RULES

VHF CONTESTS CALENDAR

17 Jan	144MHz CW Single Op/Fixed/All Other (Dec 92)
24 Jan	70MHz Cumulative (Dec 92)
31 Jan	70MHz Cumulative
7 Feb	432MHz Fixed/AFS/SWL (Dec 92)
21 Feb	70MHz Cumulative
28 Feb	70MHz Cumulative
14 Mar	70MHz Cumulative

OVERSEAS CONTESTS

VHF Contests Committee member, Andy Cook, G4PIQ, has rules and dates for a number of European VHF Contests. Write to him at: Fishes Farm, Colchester Road, Tendring, Clacton-on-Sea, Essex CO16 9AA.

VHF RESULTS

70MHZ CUMULATIVE (JAN-MAR 1992)

The usual contestants known on this band participated in the cumulative contest which appears to have been well supported by four metre standards. One would have hoped for more class B participants in the fixed station section. Several /P entrants complained about the 0900GMT start, requesting that it be put back by an hour - any comments? Conditions were poor, but many stations worked GM or EI for best DX. Logging errors, poor handwriting and sending of wrong information cost stations points. Congratulations to the Windbreakers CG, G4ZTR/P, and David Butler, G4ASR, for winning their respective sections, as well as to the runners-up.

G8HHI/G0RAW

OPEN SECTION

Pos	Callsign	Points	Norm	Loc	Sessions	Best DX	km
1	G4ZTR/P	645	2881	01HW	1,2,4	GM4AFF	593
2	EI2CA/P	554	2709	63WC	1,2,5	G4ZTR/P	474
3	G3UAX/P	596	2661	91GI	1,2,4	GM4AFF	632
4	G4DSP	525	2512	92WS	1,2,5	GM4AFF	490
5	EI9FK/P	588	2000	63WC	3,4	G3FIJ	492
6	G7APD	358	1702	91IJ	1,2,5	EI2CA/P	334
7	G8FMC/P	304	1438	91NT	1,2,5	EI2CA/P	384

SINGLE OPERATOR FIXED STATION SECTION

Pos	Callsign	Points	Norm	Loc	Sessions	Best DX	km
1	G4ASR	632	2712	81MX	1,2,4	GM4AFF	562
2	G4SEU	613	2566	92FM	2,4,5	GM4AFF	502
3	G3FDW	580	2514	84ME	1,2,3	G0IJN	379
4	G3UKV	472	2345	82RR	2,3,4	GM4AFF	477
5	GM4AFF	425	2185	87VA	2,4,5	G3UAX/P	630
6	G3WHK	284	1203	91VJ	1,2,3	EI2CA/P	445
7	G1EHF	185	887	91PJ	1,3,4	EI9FK/P	414
8	G3FIJ	178	811	01KV	1,2,3	EI2CA/P	492
9	G4OUT	158	796	92AT	2,3,4	EI9FK/P	280
10	G0HFU	156	776	91JJ	2,3,4	G4WDL	236
11	G4SJH	108	468	91PI	1,2,3	EI9FK/P	416

Checklogs received with thanks from G3BPM, G0EHV and G0AEV. No SWL Entries.

144MHZ TROPHY SEPTEMBER 1992

Despite the IARU contest creating continental activity, many stations felt conditions were poor to average with the weather worsening on Sunday. DX was available though in the North and South of England, on both days. Complaints regarding signal quality were in evidence, when high power "linears" driving large multi element arrays, with 400W at the antenna, were pointed at each other over relatively short distances. (Remember its a *total* of 400W at the feedpoint of your array, not 400W at *each* antenna! G4DEZ). Has everyone forgotten the poor Rx front end, the ERP involved, or the pre-amps getting overloaded when working close to (say 10-12KHz off) the other stations frequency. *Move apart!*

If the large groups feel problems exist, why don't they inspect each others stations during the duration of the contest,and also listen to complaints. (It was agreed at VHFCC meeting on 7/10/92, that such inspections should be allowed. G4DEZ). It is almost impossible for the adjudicator to do anything after the event.

The leading stations logs were not of the standard expected, and errors were noted. Also, it was evident that many operators were not prepared to use CW on marginal contacts. Congratulations to the Northern Lights Contest Group, for retaining the Trophy yet again. Also we must not forget the Single Operator Portable and Fixed Station Certificate winners.

G8HHI/G0RAW

OPEN SECTION

Pos	Callsign	Pts	QSOs	Loc	Pwr	Ant	Best DX	Km
1	G4KUX/P	12557	809	94RJ	400	164	EA1TA	1354
2	G4VIX/P	12457	830	01PU	400	2X15	EA1DH/P	1159
3	G8LNC/P	9380	668	90JO	400	4X19	EA1TA	975
4	GM3CKR/P	8401	463	85UU	400	128	DG5DBV	932
5	G4DSP/P	7358	527	03CE	400	178	DK0BTH	869
6	G5RS/P	6149	507	00EW	400	86	EA1TA	1073
7	G4ERG/P	4689	385	94PH	400	76	Y35LG	815
8	G6WVG/P	3485	343	84VB	275	2X9	F6APE	754
9	G2XV/P	3173	305	02AD	250	4X17	DF3XD	743
10	G8SMR/P	3153	314	93EH	200	2X19	DF2VS	740
11	G6CTU/P	2480	290	91XG	400	2X17	EB1DNK/P	985
12	GI4KSO/P	2382	172	74AI	300	16	F6HPP/P	849
13	GU8NIS	2248	172	89RK	100	14	EA1TI/P	877
14	G0ODX/P	2188	296	83RO	100	2X13	F/DK0GR/P	735
15	G3WRS/P	2156	217	94MJ	400	4X17	F1JKK	751
16	G8ZKE	2040	292	82QL	150	19	EB1DNK/P	1044
17	G6ARC/P	1641	200	92FM	400	2X17	TM0E	—
18	GW3ZTT/P	437	43	73AJ	10	9	ON7EG	609
19	GM1FML/P	202	22	75UQ	100	8/8	G8LNC/P	601

SINGLE OPERATOR PORTABLE

1	GM4ZUK/P	3439	225	87RW	400	17	EA3TI/P	1654
2	GM8DOH/P	402	35	75MB	8	8	FF6KBF/P	698

SINGLE OPERATOR FIXED

1	G4PIQ	7279	574	01MU	400	101	EB1DNK	1080
2	GD4IOM	5395	424	74QD	400	4X9	LX/PA3FPS/P	861
3	G8FBG	1623	165	91SG	400	4X16	GM4AFF	652
4	G8OQV	1291	120	81QR	150	10	EB1DNK	964
5	G4DEZ	1250	122	01IN	400	17	DF0CI	658
6	G0MYE	1181	153	91PV	400	10	HB9WW/P	767
7	G6ZWP	706	97	82SQ	80	17	ON4AML/P	509
8	G0NFH	690	80	81QM	100	8	EB1DNK	942
9	G4MJC	689	80	00BT	270	9	GM3CKR/P	585
10	G8ZRE	676	116	83NE	100	8XY	ON7EG	495
11	G0ADH	497	66	91KO	50	13	ON6HC/P	528
12	G5UM	300	44	92MP	12	8	PI4GN	510

Checklogs received with thanks from PE1EWR, G3MEH, G0EIY (No cover sheet).

432MHZ CW JUNE 1992

Well, what can I say! Only 2 entries from the ever faithful Andy and Richard. The committee will have to look seriously at the format of this one for next year - if it takes place at all. Your comments are welcome as usual. Thanks to both stations for their efforts.

G4XUM

Pos	Callsign	Score	QSO	Loc	Best DX	km
1	G4PIQ	250	26	01MU	DJ9BV	630
2	G4WKN	135	21	92OG	F6HPP/P	440

Members' Advertisements

RSGB Members wishing to place an advertisement in this section must use the official form incorporated on the label carrier of Radio Communication. This will prove membership and must be for the current month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged pro rata. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Ads for CB equipment will not be accepted. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsign and QTHR, provided their address in the current edition of the RSGB Amateur Callbook is correct. RS members will have to provide their name and address or telephone number. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available editon of *RadCom*.

Warning: *Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid.*

FOR SALE

5,000 items: Emigration Sale: Books and magazines, back to 1920 and earlier, components, test gear, valves, old/vintage stuff. Bakelite collection, 405-line TV, early video, 4Cx250 new valves, 19" cabinet, SRTs, magnetrons, loads of semiconductors, data books, 500+ circuits/manuals, all at ridiculous prices (sorry no lists). Buyers view, strictly cash/carry only, no timewasters please, must sell urgently. (Birmingham) 021 472 3688.

ADONIS AM 508 compressor microphone, purchase 1992: £45. Ten Tec 2KW ATU 1.8-30MHz, built in SWR/PWR meter + switched co-ax outputs, 1 balanced output CW manual: £175. Hewlett-Packard frequency counter, 0-3GHz, model 5248L, CW manual (ex BBC laboratories): £70. Beckman industrial 20MHz dual beam oscilloscope, model Circuitmate 9020, CW probes, manual: £135. GM3HAT "Dipole of Delight" multiband antenna, model MP/DD/7,14,21,28: £25. All items are in excellent condition. G3HEE. (Stamford) 0780 55001.

ANTENNAS. Jaybeam D5/2M: £20. Jaybeam D8/50cm: £20. Diamond CP4/HF vertical: £45. All VGC with instuctions. G0PGF. (London) 081 505 0568.

AR3000 scanner, as new: £375ono, first to see will buy. Steve after 6.30pm. (S Manchester) 0831 875 245.

BRAND NEW valves: £1 each. DAF91, DAF96, DF91, DF92, DF96, DK91, DK92, DK96, DL92, DY802, DY86/87, EAF42, EB91, ECC81, EBF80, EF89, EBC90, ECL83, ECL85, EBC81, EBF89, ECH84, ECL84, ECL86, EF42, EF85, EH90, E281, EF183/4, EF91, EF80, EL81, EL85, ECC84, PL36, EL32, ECL80, PCL85/805, PCF80, PCL86. All valves £1 each, add postage £2. Cheques to: K Bailey, 40 Seymour Close, Birmingham, B29 7JD.

COMMODORE 64 with Compakratt comfax cartridges RS 232 cable: £95. Dragon 32 with joystick: £30. Sinclair spectrum+ with Maplin R5232 modem interface 300/2400 baud: £55. Radio shack TR5 80 DMP 100 printer with spare ribbon: £40. 5amp PSU: £8. BNOS 6amp PSU: £35. Oscar 2 10FM tx/rx: £30. RX R500: £150. Buyer collects or plus P&P, reasonable offers considered some items. G0BOO QTHR. (Banham) 0953 878678.

COMPUTER Goldstar, GT212 IBM compatible, 286, AT, 2MB RAM, 40MB hard disk, 3.5" floppy disk drive plus mouse, keyboard, 4 14" VGA, 0.39mm dot colour monitor, bubble jet printer, exact Clone of Canon, BJ10E resolution, 300 DPI software installed: Timeworks, Publisher II, Desktop Publishing Program, deluxe paint enhanced graphics art program. All as new, still under warranty, teach yourself books, 50 disks. Bargain: £700ono. (Maidstone) 0622 691411.

DXERS: cherished car registration number, (DX1 955) for sale: £260. plus £80 DVLA fee. I arrange transfer. G4OBK QTHR. (Stoke on Trent) 0782 201001 or 0257 272561.

EX MILITARY 12'x12' heavy duty frame tent, ideal for field days, complete, good condition: £350. Kenwood TS430S filters FM, as new, only used rx: £650. Ex military B70 tcvr, microwave system, complete PSU, antennas: £200. Various aluminium transport boxes from: £25. (Worcestershire) 052 789 2282.

FT101ZD, as new, complete with Reace RC1000 monitoring unit and Rama stand power mic, one owner, with instruction manual: £450ono. (Bridgewater) 0278 683539.

FT102, The real amateurs receiver, sparkling condition, only used rarely as a back-up rig, inbuilt power supply, manual etc, all for just: £450 to a good home. G4UYM QTHR. (Welford) 0858 575557.

FT726R VHF/UHF all mode tri-bander 2Ms fitted, VGC, little used on transmit, owned by non smoker: £450ono. (Driffield) 0377 87342.

ICOM 725 tcvr, unused except for initial check, cost £779 but will accept: £590ono. G3NJP QTHR. (Truro) 0872 501487.

ICOM AH2A, brand new digitally controlled HF band antenna tuner: £375. Diamond KB105 vertical antenna 35,7,14,21,28MHz bands. Instructions in Japanese but translated by me (laughable): £100ono. G0GZS. (Upminster) 0708 228896.

ICOM IC901 radio with 23cm module, fibre optic control pack, boot mount and aerials for 2,70,23cm. Possibly the ultimate mobile rig?: £800ono. Marcus G8HDN. (Leeds) 0532 390054.

KENWOOD PS430: £60. BNOS power supply, type 12/12A: £50. Icom IC-R70 comms rcvr: £350. Daiwa CNW419 ATU: £100. All items ono. (Oswestry) 0691 657696.

KENWOOD Trio TS430S FM board, MC 60 mic, PS430, ATU 230, all mint, bxd and manuals: £800. Phone after 6pm. (Preston) 0772 38899.

KENWOOD TS430S tx/rx only with FM board, SSB, CW and AM filters. Also mobile bracket, mint cond, never used: £425. Also Icom 3210E 2M/70cm mobile rig, as new, little used: £325. Carriage at cost. Phone Peter G8WYT QTHR. Evenings. (Haywards Heath) 0444 450265.

KENWOOD TS790E with matching power supply PS31 and matching spkr SP31, desk mic with preamplifier MC80, all in immac cond. Total cost: £1909 sell for: £1400ovno. Would deliver 200 mile radius. GW4IQL QTHR. (Cwmbran) 0633 873018.

SHACK clearance FT101ZD: £450. FT290R: £225. FT790R: £225. Eddystone EA12: £160. BNOS TL50-28-25 (28-50MHz transv): £170. MM 432MHz 50W amp: £55. Datong FL3: £65. FTDX 401: £125. (Lanark) 0555 892540.

SILENT KEY SALE. Yaesu FT101ZD, mic, fan, CW filters, spare final valves, as new, original packing: £375. Navico 1000S 2M mobile, 4 months old, with mic etc. guarantee: £150. Snip. . . . Yaesu FT301 ATU SWR, power meters, 500W: £90. All with manuals. Wireless World 1967-82, 66 issues, any offers? Phone evenings. (London) 081 452 9436.

SILENT KEY sale: Kenwood TS850S, little use: £1150. Kenwood TS120S: £250. Heatherlite Hunter: £625. Cushcraft R5: £160. Yaesu FT290MK1: £150. Alinco DJF1: £175. Capco SPC300 ATU: £130. Microwave Modules Morsetalker: £85. Daiwa CN620A: £50. CN610M: £30. Telereader CD660: £70. Star Masterkeyer: £40. G4ZPY key: £45. Bencher: £50. Alinco ELH2300 2M amp: £35. Yaesu MD1 basemike: £55. FC700ATU MD1 basemike: £55. FC700ATU: £50. FP12 PSU: £55. SP67: £45. All ex G0COS. Phone Mike. (Leamington Spa) 0926 420164.

TEN TEC Argosy HF tcvr, 5W/50W output: 8 pole filter, xtal CW filter, switched RF/amp, PSU, realigned, tested/by KW: £220ono. Racal RA17L, h/book, GWO, sensible offers. GDO kit: £15. ATU kit, 25W: £10. SWR bridge, 50W: £10. (Nr Stockport) 0625 586069.

TRIO TS830S with 250Hz, CW filter, little used, virtually as new, h/book, service manual, spare valves, orig box: £635. (Chester) 0829 40301.

TRIO TS120S PS30 SP180 2M TR7800 DM801 dip meter, MC50 aerials, no reasonable offers refused. G6XWL QTHR. (London) 081 690 1619.

TRIO TS930S, superb cond with new Kenwood MC85 mic, also hand mic, Revex SWR/PWR meter, HF .2K 2K 5K, all little used due recurring illness: £825. Illuminated oskerblock SWR/PWR meter HF- 50-144-430MHz: £30. Jaybeam 3B vertical: £35. Original boxes. Prefer buyer collects, tests. GW3CMR. (Neath) 0639 635059.

VIGLEN 4 (computer) 33MHz 80486, 80487 co processor, 8 meg memory 5.25, 3.5, floppy drive, 338 meg hard disk drive (SCSI type) Paradise S-VGA card fitted, super VGA colour monitor, MS-DOS V5.0. All software on hard disk, cost £3500, accept: £1550. Capco SPC300D ATU 1.5KW aerial selector switch 4 to 1 balun: £170. Ring David. (Halifax) 0422 842243.

YAESU FT4700 2M/70cm dual band mobile - 5/45W, as new: £350 ono, was over £500 new. Steve after 6.30pm. (S Manchester) 0831 875 245.

YUPITERU airband receiver, VT-125 II, as new: £60. No offers. Please telephone (day) 0992 24429 (eve) 081 904 3282.

1 VHF aerial, matching unit 120-157MHz: £25. 1 UHF aerial matching unit 350-450MHz: £25. Made by SRG Microwaves. (Ipswich) 0473 785203.

4METRE Westminster 70.260, 70.450, 70.475, GWO: £50. 10M linear, unused, bxd: £15. Green monitor, bxd: £20. G0LXA. (Woodford) 081 504 9084 eves.

AEA isoloop HF antenna, 14/30MHz, complete. Used only indoors, ideal for loft, car, caravan or boat: £110 ovno. G0EXY QTHR. (Hull) 0482 51836.

AEA Pakratt 232 MBX, latest model with mailbox, Packet, Amtor, RTTY, Fax, CW, HF/VHF. Much software, mint: £210. Alinco DR112EM 2M xceiver, 5/25W, mint: £160. Both purchased for project which failed. G3MWH QTHR. (Leominster) 0568 616608.

ALINCO DJ460 70cm 3W h/held radio, immaculate condition, 6mths old: £200ono. Great for novices. (Bracknell) 0344 486625.

ALL MODE TR-751E, new 1992: £495. Phone anytime. (Winsford) 0606 556779.

ALTRON 4 section lattice tower, 55 complete with head unit: £575 ovno. 2 years old, buyer collects. (Woking) 0483 481202.

AMSTRAD 1640, ECD monitor, 20MB HDU, two 5 and a quarter FDUS, one 3 and a half PDU, mouse, MSDOS 3.1, GEM software and manual: £250. (Dorset) 0202 4844211.

AMSTRAD CPC464 expanded to CPC6128 3" & 5 and a quarter inch drives, ROMboard with various ROMS, disc and tape software inc amateur programmes, RTTY-TU complete with leads for above. The lot for: £200, buyer collects, contact Mark GW0POA. (Cardiff) 0222 795268.

ANNUAL SUBSCIPTIONS to the Brecon Beacons Repeater, GB3BB - only: £2.50. When on holiday or passing through the area please use 'BB and help towards the costs. Cheques "GB3BB Repeater Group" (Your callsign on back). Treasurer, Ty'r Ysgol, Cathedine, Brecon, Powys, LD3 7SX.

AR88 LF receiver with manual, buyer collects, good working order: £40. Morse cassette C90 8WPM with text: £4. (Caterham) 0883 343 369.

AR88 owners, brand new range switch, M-253097 and tuning dial K-98947., Offers? Various mains transformers, 60 to 1200V out: cheap. G3XFB QTHR. (Stafford) 0902 850033.

ARMY Larkspur series harness cables, approx 30 different, 50 total: £50. Pye PMR2, A band, complete: £50. G4NCE QTHR. (Birmingham) 021 357 6139.

ATARI ST E Morse transceive up to 20WPM auto speed finding, noise filter. RTTY transceive up to 50 bauds. Auto speed finding. Both have split screen type ahead buffers and are written in STO5 V2.6 Basic uncompiled. When compiled will work up to 10 x faster if required. £5 each, P&P £1.50. Mr V McClure, 43 Roman Way, Seaton, Devon EX12 2NT.

AVO VALVE tester, complete in transit case with instructions: £39.99. KW1000 C linear amplifier, complete with handbook: £199.99. FRG-7700 receiver and handbook: £175. Solartron 1170 frequency response analyser: £65. NSC 440A mini ubiquitous and spectrum analyser: £85. Yaesu FT480R complete: £275. Sony FM/SW/MW/LW 32 band receiver CRF320: £299.99. Radio Shack TRS-80 colour computer, disc drive, joysticks, software: £45. All good working order. (Bicester) 0869 244166.

BBC Master 128, 14" monitor, disc drive: £300. G3GHS. (St Austell) 0726 348487.

BBC-B computer, VGC, Watford DDFS, twin 40/80T disc drives, RAM ROM board WW+ ROM Manager, dumpout 3 beeb, speech synthesiser, Apollo modem, Eprom programmer, blank Eproms, UV eraser, joystick, manuals, books, games, radio general software: £350ono. Buyer collects. (Guildford) 0483 33792.

BBC-B series 7, metal cased with twin drives and separate keyboard, sideways RAM, mouse, speech module, many ROMS, wordwise printmaster, enigma etc, masses discs, tapes, books, mags: £195. Philips 7502 green monitor: £35. Or all: £210. Consider exchange WHY? G3OHC QTHR. (York) 0904 728779.

BOAT Security Alarm with PIR detector, backup battery, siren and transmitter, brand new, unused. Cost £350, accept: £150. (IOW) 0983 78756.

CALLBUOY 19 marine emergency tx/rx: £70ono. RadComs, Jan 72 to Dec 82 - offers. G3VSL QTHR. (Southampton) 0703 292125.

CAN anyone use a number of reel to reel recording tapes, most are 1200ft, all boxed. G3IJL QTHR. (London) 081 749 1454.

CODAR 12X CR70A 560-30MHz with PR30 preselector: £45. Eddystone RX40A with manuals: £65. Both plus carriage, need light elevation rotator. (Buckfastleigh) 0364 43608.

COLLECTORS items. Tcvr WS C12, wireless set, ZC1 MK1 receiver, C52 manpacks A41 A43 WS38 handhelds PF08. PF9 starphone u.s PRC6 Codar tx & PSU A13 manpack telereader CWR 680. RTTY to TV conv MM2000 SSTV tx MM-MTV 435 NC1 chrgr for FT202. (New Malden) 081 949 2317.

COMMODORE 64 computer, PSU, datasette 1541 drive, Vic 1525 graphics printer, mouse, all leads, handbooks: £165. Omal money checker (bank scales): £10. Drum orange coloured polystyrene half inch thick cord: £6. Pair US Navy 813s: £25. Amiga mouse: £8. 2M 5el 'J' beam: £15. Radcoms late 50s/current, offers? (High Wycombe) 0494 530018.

COMMODORE PET 8032, 8050 dual disk drive, 4022 printer: £50. C64, 1541 disk drive: £80. 30W car spkrs: £10. 60W soldering gun: £5. G6DID QTHR. (Horsham) 0403 733774.

DAIWA DK-210 electronic keyer unit: £40. Datong ANF noise filter: £40. Welz RS455 3-15V 4A+ PSU metered: £35. Woodpecker blanker: £30. MET 3ele 6M and 4M antennas (brand new): £29 each. Tandon 286 PCA 12/40. PC 40Mb h/drive super VGA etc: £200. Monitor extra if required. Panasonic A1 video camera/PSU (new): £95. Must sell. Postage at cost. Paul G4XHF QTHR. (Crawley) 0293 515201.

DRAKE R4C 1-30MHz rcvr, excellent physical/electrical condition with manual: £300. HRO 5T 1-30MHz rcvr with 8 bandspread coils and separate original spkr, manual, all in VGC: £150. (Leamington Spa) 0926 313534.

EDDYSTONE receiver, model 940, gd condition, no mods, manual: £100. US army signal corps valve tester with adaptor: £15. (Choreley) 0257 273976.

EIMAC 4CX350A ceramic tetrodes (suit Dressler D200S) used-tested: £18 each. PTFE

chimneys: £4 each. GM3WOJ QTHR. (Invergordon) 0862 842762.

EX MILITARY SR A13 manpack, headset, handset, Morse key, ATU, co-ax, batt leads, hand gen, carry frame etc: £300ono. Paul GW0HCB. (Cardiff) 0222 842114.

FDK 750E with 430E expander 2M plus 70cms multimode, good condition. Stuart Donald, G0EDD. (Royston) 0763 242876.

FILTERS. Two NRD535 CFL232 500Hz IF crystal filters, one-half retail price: £65 each plus postage. (Reading) 0734 722085.

FOR CHRISTMAS. Alinco DJ460E 70cm h/held hand mic, case, bxd as new: £180 or swap FT290. WHY? ideal for Novice. (Kent) 0322 347550.

FOR SALE. KW2000B complete with PSU and spkr plus KW500W linear and six spare 813 valves. Will not split: £400ono. G3FEV. (Rossendale) 0706 211339.

FRDX400/FLDX400 HF tx/rx, nice cond, prefer inspect and collect: £120. Phone evenings or weekend. Don G0MDO. (Bradford) 0274 567570.

FREE to genuine collector. Absolutely pristine full set service tools for Creed model 7 teleprinter (sadly original tool roll missing). Please write in full with reasons for wanting to take advantage of my generosity. G4HYD QTHR. (Beverley).

FT ONE all band, all mode HF tcvr solidstate, all options, as new: £750. KW2000B PSU mic, VGC: £125. 2M handy's Alinco DJ100S, 10 memories, LCD display, VGC extras: £125. Kenwood TH27E spkr mic, softcase etc as new: £165. G4JXK QTHR. (Fareham) 0329 230737.

FT101ZD Mk3, immac, bxd FM WARC, fan, CW filter, DC converter, matching SP901 speaker, manual: £400. Going QRT. G0KPZ QTHR. (Sidcup) 081 309 1295.

FT203, FT703 h/helds, spare nicads, chrgr, spkr mic, car adaptor, mobile bracket etc, as new: £340ono. Dressler active HF antenna ARA30: £45. Hamgear PMX HF preselector with preamplifier: £35, as new. G7JAI QTHR. (Kenilworth) 0926 54556.

FT209RH: £100. FT709RH: £100. FRG7700 with memories: £250. RTTY terminal unit: £30. 144/432 transverter: £95. Icom 10M: £40. Matthew G1MPC. (Leighton Buzzard) 0525 373147.

FT221RD Mutek front end, good condition: £300. Datong speech processor: £50. Microwave Modules MML 144/50-S: £40. 3.5" floppy disk drive suits Amstrads: £60. Philips colour monitor CM8833: £150. Sold as seen, buyer collects. Phone after 6pm week days. (Spalding) 0775 724290.

FT290 Mk2 complete with carrying case and chrgr: £300. G3ABA QTHR. (Southampton) 0703 732997.

FT290R Mutek chrgr, nicads, rubber duck, mobile mount, carry case, strap: £200. John G0LPQ QTHR. (Liverpool) 051 525 4103.

FT707 tcvr, 100W, good condition, hand mic: £350ono manuals. 2M transverter GAS-FET front end 20W: £120. Lunar 100W solid state 3.30 MCS 13VDC amplifier, little used: £95. Tonna 5ele 6M beam: £25. (Brackley) 0280 703512.

FT736, gd cond: £900ono. Also FT101E, gd cond: £250. (Wolverhampton) 781139.

FTV901 CW 6M, 2M, 70cm, ALC units for 901/102: £300. IC701 HF rig CW IC701PSU, ICSM2 desk mic, ICRM3 remote: £300. Complete satellite TV system 1.8M dish Luxor receiver: £300. Mutek SBLA144E masthead preamp: £40. Wanted FT736R urgently. G4JBH. (Yeovil) 0935 23873.

HEATHERLITE 2M amplifier 4Cx350 400W out, GWO, new fan fitted. Will deliver North Wales: £350ono. (Pwllheli) 075 888 339.

HEATHKIT HW12A 80M tcvr with PSU: £50. B40C rcvr: £25. KW204 160-10m tx: £25. Trio 2200G 2M tx/rx and 10W PA: £50. All with manuals. Codar AT5 with mains and mobile PSU, Codar T28 rcvr, offers. Chris G4AQW QTHR. (Blandford) 0258 456391.

HEATHKIT SA 2040 ATU, 80-10M, 2kw, (not original panel): £100. Heathkit cantenna dummy load: £20. KW-108 monitor scope: £50. PC XT clone, 640k RAM, 2x5.25 FDD, green monitor: £100. Tatung einstein, CW80 column card, 2xFDD, colour, selection software: £75. Panasonic 4-col graphic penwriter (RK-P400C) with computer interface: £100. Buyers to collect. G3MUL QTHR. (Newark) 0636 525513.

HEATHKIT SB200 linear, GWO, manual, VGC: £375ono. (Huddersfield) 0484 430801.

HENRY 5K 10-80M A cool 400W O/P max drive 250W 13db gain, one careful Sunday owner: £3250. TAU SPC3000 ATU with blown balun: £100. FTI: £895. FL7000: £1150. FRG965: £350. (Southampton) 0703 255631, night 0703 813922.

HITACHI colour video cameras GP-7U, aluminium case, PSU and accessories 2 off: £150 each. Hitachi camera operation panel OP-7U: £35. Panasonic U-matic portable video recorder NV-9400, nicads, chrgr and 20 minute tape: £75. G1EFP QTHR. All in good working order. (Bolton) 0850 783101.

IC02E tcvr only, no accessories: £75ono. Jaybeam 2M 6ele quad: £15. 19ele Cushcraft boomer, switched mode,Norwegian mascot 12 volt 5amp PSU, type 8620 (new): £30. Akai 4000DS: £75. Yamaha TC520: £45. (Croydon) 0883 624656.

IC735 g/cov tcvr, CW, filter, service manual, Kingshill 20A PSU: £700. Azden PCS5000 25W/2M fm mobile, Heatherlite mic: £100. Trio TM401A 12W/70cm FM mobile: £120. PK232 terminal 30-12-88 firmware: £190. AMT3 Amtor/RTTY terminal with s/ware: £125. Vibroplex vibrokeyer electronic keyer paddle: £25. Welz SP225 SWR/PWR 1.8-200MHz twin meters: £50. Datong Morse keyboard: £50. All plus carriage or collect. G3RFI QTHR. (Potton) 0767 260800.

ICOM 271E 2M multimode with samp power supply: £430 ono. Transverter Howes HC266 2/6M: £70. Yaesu 727R dual/bander 2-70 hand held with acc: £270 ono. Butternut HF5 & element beam: £120 ono. (Northampton) 0604 585042.

ICOM 726 HF/6M gen receive, original packing & manuals: £685. PS55 20amp power supply: £122. SM8 Icom mic: £45. SEM ATU: £75. IBM PS1 PC 286/30MB colour, VGA, comes with software already installed, LOGm, Packet, ICS, Wefax: £595. G7GMD QTHR. 0273 440600.

ICOM IC-2410 dual band FM tcvr with speech chip. Complete with extra remote mic - HM56. Never used, as new. Accept: £450 ono. G4EHH. Please telephone office hours. 0533 340810.

ICOM IC02E h/held in VGC, with orig packing, chrgr etc, fused car supply lead (Icom) included: £230. G4LUF QTHR. (Totnes) 054 882442 eves.

ICOM IC3200E dual band mobile: £285. BNOS 2M 50W linear amp, 10W input: £60. Spectrum 6M tvtr kit, 2M IF: £30. VHF Comms 1984-1991 bound volumes: £30. AR1000 scanner: £195. All VGC post paid. G6DBX QTHR. Phone 6-9pm please. (West Sussex) 0444 248767.

ICOM IC725 HF tcvr, HM12 mic, narrow CW filter: £550. BW VS300A ATU: £99. Revex P300 DC power supply unit: £99. All VGC. G4HHR QTHR. (Crawley) 0293 885137.

ICOM IC725, mint, AM/FM board and narrow CW filter fitted plus HM12 mic: £600. 20A power supply: £80. Datong FL3 filter: £90. Buyer collects, all bxd. Phone 6-9pm. (Southampton) 0489 577033.

ICOM IC726S HF+6 meters AM/FM board fitted: £700. Yaesu FT290R II + FL025, mint condition: £400. Jaybeam D8/2M: £15. Dave G1OQG. (Ash) 0252 319865 eves.

ICOM IC726 all band HF tcvr, gen cov rx and 6 metres covergae, little used, VGC: £695. G8RHU not QTHR. (Seaford) 0323 492707.

ICOM IC740. Scanning mic, FM board, electronic keyer, external supply, good condition: £550ono. Yaesu FT200 with FP200 power supply, mic, LPF, SWR bridge, spare valves. Good condition, original packing: £160ono. Microwave Modules 2M/70cm transverter: £60ono. G3ZVW QTHR. (London) 081 882 5125.

ICOM RC1 handheld scanner, 100kHz-1.3GHz, CW Skyprobe and rubber duck antennae, handbook, VGC: £300ovno. (Portsmouth) 0705 592885.

ICOM W2E 10 mths warranty, loads of extras, mint cond: £350ono. Exchange considered for dual band mobile rig. (Telford) 0952 200280.

ICS AMT3 AMTOR/rtty modem, new: £120. IBM HF weefax system: £85. Watford fax/phone power machine controller: £50. Call G0CKX. (London) 081 851 7266.

IMHOF 6' enclosed rack with castor base and locking door: £50. Fan unit, assorted blank 19" panels and various items test gear to fill. Prefer buyer inspects and collects. Rack dismantled for transit. Would exchange wanted items. G3IJW not QTHR. (Bexley Heath) 081 303 1879.

JRC JST135 HF tcvr, general coverage rx NBD 520E PSU-spkr mic, manauls, boxes, mint condition: £950 or PX mint Yaesu FT980 HF tcvr. GW4RLP QTHR. (Caernarfon) 0286 5264.

JUNKERS straight key: £30. Thermocouple ammeters, 2" 0-3A R.F G.E (USA), US Navy 1940s. Pair: £10. All good condition plus post. GM3LGU QTHR.

KAM all mode TNC: £120. 9" b/w picture monitor: £25. Green screen version: £15. Both monitors little used. Ikegami CTC 4730 2/3" vidicon camera with genlock: £30. Marconi TF868/1 universal bridge: £15. All items plus post at cost. (Bury St Edmonds) 0284 754318.

KENWOOD R1000, as new, general coverage, handbook, bxd, first class reciever, collect or carriage axtra, Datong speech processor. G3XBE QTHR. (Bradford) 0274 728219.

KENWOOD SP430 speaker, PS430 PSU with circuit, both boxed: £120. G3CCX Peter Craw, 117 Sea Lane, Rustington, W Sussex. 0903 850859 carriage extra.

KENWOOD station clearout. TS450SAT + auto ATU + mic + 2.4kHz filter etc: £1050. TM241E 2M 50W mobile: £225. TH27E 2M handheld + nicads chrgr + soft cacse: £200. MC80 mic + toneburst: $40. HMC2 vox headset: £25. All excellent condition, bxd with manuals, no offers, buyer collects. Phone Duncan after 6pm. (Lochgilphead) 0546 603965.

KENWOOD TH-27E 2M h/held 5/8 ant; charger, s case, little used, excellent: £145. No offers. (Largs) 0475 675967.

KENWOOD TH205E 2M hand held with accessories: £120. Datong Morse tutor: £45ono. G6TPQ. (Oldham) 061 633 3895.

KENWOOD TS430 narrow CW filter, FM board: £610. Tel Paul, office hours please. 061 491 3300.

KENWOOD TS440S, PS50, SP430. Automatic ATU and voice synthesizer fitted. MC-435 mic. Together including overnight delivery. All in superb condition: £1000ono. Cliff Smith, G6REW, Trelawney, Old Post Office Hill, Stratton, Bude, Cornwall, EX23 9DB. (Bude) 0288 354963.

KENWOOD TS530S HF rig: £425. Yaesu FT221R 2M base rig: £250. Kenwood R-5000 HF receiver: £550. Yaesu FT102 150W HF base rig: £450. Yaesu FV707DM digital VFO for FT707: £80. All VGC or as new. (Colchester) 0206 575258.

KENWOOD TS830S, CW filters, mic, VGC: £600ono. Yaesu FT7075 10W HF rig, mic, VGC: £395ono. 5x200N scanner: £75ono. (Cardiff) 0222 892020.

KENWOOD TS850AT: £1290, matching PS52 p/supply: £170. Alinco DR-510T/E 2M/70cm 45W/35W: £295. Icom ICR7000: £600. Scanmaster for ICR-7000: £90. Diamond 5x200 meter: £40. Kenwood MC60 mic: £35. Amiga B2000 HD, 40Mb scsi hd, PC 2286 AT bridgeboard 3 drives: £550. AMA3 CapCo loop: £110. AOR 2000: £125. Discone: £28. All mint. (Aberdeen) 0224 649451.

KENWOOD TS940 fitted YK88C YG455C filters: £925. Also IRC CW filters for above 400Hz, excellent selectivity: £150. SP940 speaker: £50. (Liskeard) 0579 62652.

KENWOOD TS940s, fitted ATU, AM/CW filters, mic: £1100. PK232MBX: £210. Kent twin paddle key and keyer: £70. Navico AMR1000S 2M FM: £80. G0BSX Packet TNC: £45. 13V 10A power supply: £40. CP-1 terminal unit: £35. G3KNJ QTHR. (Watford) 0923 244069.

KW 1000 linear, 1st class cond, manual: £250. Prefer buyer collect, no offers. (Beaconsfield) 0494 675528.

KW 2000B with manual, large circuit, "Ham Radio" articles, new 6146, spare valves and metered power supplies. In regular use with excellent signal reports. Prefer buyer tests and collects. Best offer over: £100. G3MFW QTHR. (St Austell) 0726 73608.

KW2000B + AC PSU, Shure desk mic, manual, excellent condition: £110ono. Kent twin paddle Morse key: £25ono. G3YYG QTHR. (Leighton Buzzard) 0525 376269.

LK550 linear 3x3-500Z tubes: £1400. MFJ differential ATU balanced/unbalanced endfed roller inductor 3KW: £195. MFJ Grand Master memory keyer: £85. Heil headset with 1000M mic: £40. Paddle key: £20. 3.5 + 7.0MHz traps, unused: £35. Current balun, new: £35. Oil filled dummy load: £35. PL259's 50 239's n-plugs elbow straight & t-connectors desk scanner with text recognition software: £850. Linet 300/300 1200/75 BPS modem: £30. + Comm plus software: £30. Apricot internal 300/300 1200/1200 1200/75 BPS IBM card modem: £30. (Bristol) 0272 656783.

LOWE HF125 general coverage rcvr, 30kHz to 30MHz, mint, bxd, manual, PSU: £220ono. G7KJH. (Bristol) 0275 373889.

MAGAZINES, components, books. 5 band vertical telephone, your requirements FT980, mint condition, aerial rotator, dynamic microphone. (Bridgwater) 0278 455613.

MAPSAT weather satellite decoder and framestore: £160. Martelec meteosat converter and indoor two channel rx (137.5MHz): £160. Reduced price for both items. G8FDJ, J Roberts. (Sheffield) 0742 333847.

MFJ752C tunable filter: £70. Sentinel pre-amp 2-40MHz 15DB gain, bomb proof to 150W. G3JLB QTHR. (Gravesend) 0474 534694.

MONITOR receiver, AR1500, covers 500KHz to 1300MHz. Handheld, almost brand new, cost: £269 accept: £200. G4FMO QTHR. (Staffordshire) 0283 840667.

NAVICO AMR1000S 2M FM 5/25W scanning mobile rig: £175. Fairmate HP100E handheld scanner 25/1300MHz 1000 memory: £175. Both above items bxd with all accessories. Grundig satellite 3400 professional rcvr 150kHz/30MHz AM/SSB/CW 88/108MHz FM, digital readout, clock, mains/battery, nicads included, very clean: £100. HRO all coils inc, bandspread, 2-PSU. Considered exchange for HF gear or dual bander h/held. G4FEQ. (Castleford) 0977 552862.

OFS1 freq standard 100KHz/1MHz: £45. Deviation meter Marconi TF791D, mint cond. 4MHz/1042MHz: £75. Sig gen digital/analogue 6 digit 300kHz/150MHz, mint: £150ono. Capacitance meter auto DCM302 2000pf/200mfd: £50. Frequency counter, 10 digit Lodestar FC5600B mint: £175ono (not used) plus many other items. Send SAE for bargain list never to be repeated. Buyer to pay post or collect from G4IZW. (Hexham) 0434 220636.

POWER Supply stabilised fully protected 25amp continuous 35amp surge: £90. LPF: £10. (Exmouth) 0395 277479.

PYE MX294 VHF FM mobile radio telephone 148-174MHz 16ch synth. Complete unused with manual: £75. 70cm 100W linear amplifier SSB electronics PA432-100: £110, Bird 8085 50W 50ohm load. DC-2GHz: £20. AVI8 MK5, perfect working order: £50. 4CX350, bxd: £30. (Horsham) 0403 864222.

RA117 HF communications rx with h/book and case: £150. (Derby) 0332 703778.

RACAL 9070 bench digital universal meter, mains, precision instrument: £75. Kent twin paddle key: £35. Ken Iambic keyer: £40. G0GXJ. (Sheffield) 0742 465713.

RACAL SWR with sideband converter, computer, printer, spare rolls of print paper, frq book, Rx4 tape, copy tape, tape labeller. Good condition: £185. (Hemsworth) 0836 712714.

REGENCY Scanner MX4200 20 channels, 8 bands. Aircraft Marine etc, usual functions: £125ovno. John G4KGT. Please phone evenings.(Great Missenden) 02406 6828.

RS44155 complete receiving station, Drake R8E, Pocom 1000 decoder, VDU's, SSTV, decoder, scanner AR2800, Akai 400D, reel-to-reel record player, tapedeck amplifier, HRO AX, 2 bxs coils, spares etc, mic, spkrs, cables, sockets, the lot, buyer collects: £1950. (Northampton) 0604 718707.

SILENT KEY sale. Trio 530SP HF tcvr: £490. FT211RH Yaesu 2M tcvr: £180. (Cambridge) 0954 51564.

SIX speaker mics for Pye pocketphone, 70 series: £5.50 each i/c postage. Two old Creed teleprinter. Offers. Bob GW0AIY QTHR. (Llandeilo) 0558 668274.

STRUMECH P30 telescopic mast, need post with DX33 antenna rotator bearing: £300. G4OEF not QTHR. (Lincoln) 0522 544689.

SWAN Astro 150 solid state HF tcvr, matching ST3 ATU. Yaesu FF-501 filter. Morse Key, mic and G5RV: £435. Richard G1VBL QTHR. (Bicester) 0869 253895.

TECTRONIX scope, two channel model No. 422: £100. (Wolverhampton) 0902 781726.

TEN TEC Corsair II with Ten Tec PSU, manual, orig box, perfect condition: £650. (Ferryside) 0267 267649.

TEST equipment, Heathkit monitor scope 40-10 R/C bridge C-3V, valve voltmeter V-7A/UK: offers! Radiovision Commander rcvr: £45. (Sheffield) 0742 303686.

THREE element Jaybeam TB3 HF antenna: £195. Micronta three range power 500W modulation, SWR, test meter monitor calib: £25. (East Wittering) 0243 553282.

TRANSCEIVER IC575H, 10-6M, SSB-CW-AM-FM, 28-50MHz and matching PSU55. 13.8V-20A, bxd, new, unused: £900. Oscilloscope Hitach V522 50MHz: £500. Silent key G4BPY. (Walsall) 0922 413193.

TRIO 2300 2M FM, auto tone Rev repeater, mobile mount, 15W PA, good condition: £130. (Walsall) 0922 413958.

TRIO 530S HF tcvr, gd cond: £385. Yaesu FRG-7 communications rcvr, h/book: £125. (Suffolk) 0379 783214.

TRIO R600 AM/SSB/CW 150kHz, 30MHz, h/book, perfect: £190. MOD National HRO p/supp, 7 coils, h/book, rough but works, hence: £40. Buyer collects. MFJ422B-X Curtis keyer, fits bencher or Kent paddles, new: £40. Ar-

gosy CW filter: £20. Co-ax switch: £10. Postage extra. (Sheerness) 0795 873100.

TRIO TS930 plus AATU, manuals etc: £800. Icom R-700 plus remote plus TV adaptor: £600. (Ipswich) 0473 311665.

TS820 HF rig with Daiwa filter, GWO, manual and box: £350ono. Phone eves. (Saffron Walden) 0799 522100.

TS830S: £599. R600: £199. 10x8 Cedar shack: £450. Kawai x430 organ: £699. G3XLL QTHR. (Diss) 0379 652043.

TS940 with ATU operation service manuals: £1075. TS440 with ATU, CW filter: £720. AT230 antenna tuner: £120. MC60 mic: £35. Icom IC211 all mode 2M base station: £275. Icom IC02AT handheld with BC30 chrgr, manual: £175. BP-7 battery: £25. Azden 25W PC2000 mobile: £105. Tandy PRO 400 scanner: £175. Datong FL-2 audio filter: £30. Butternut HF6 vertical: £85. Laresn 2M mobile antenna: £30. (Scunthorpe) 0724 858184.

UBIQUITOUS audio spectrum analyser UA500A 10u-100Kc/s with separate tracking adaptor for vibration measurements and handbooks: £100. MESL swept signal source 12.5 GHz to 18GHz with MP backward wave oscillator: £50. Buyer collects. G3LMR QTHR. (Leicester) 0533 871522.

V/UHF DX array, four 16ele 2M Jaybeam Yagis, Tonna 4way splitter, 8 21ele 70cm Tonna Yagis, splitter and harness, frame to suit both: £350. Poss split by freq, buyer collects. GW4TTU. (Gwent) 0495 224432.

WELZ AC-38M ATU 200W: £45. SEM 'Ezitune' antenna, tuning bridge: £20. Ten-Tec dummy load 300W: £15. G0EJZ QTHR. (Gravesend).

YAESU FRG7700 complete with FRT7700, VGC: £225. Buyer to collect or pay postage. (Carlisle) 0228 35177.

YAESU FT-one tcvr, FM board etc. Yaesu YM-38 desk mic with up-down buttons separate, professionally built PSU, operating and technical manuals: £650. Also Kenwood R2000 G/C receiver, fitted YG455C 500Hz CW filter: £365. G3RDG QTHR. (London) 081 455 8831.

YAESU FT101E 10-160+17, excellent condition: £265. YC601 frequency counter: £135. Spkr mic. GW4IUY QTHR. (Aberdovey) 0654 767367.

YAESU FT101ZD for sale, good condition: £350. G4YSM. (Doncaster) 0302 537686.

YAESU FT221 2M all modes: £200. Bearcat BC200 scan rx: £80. Icom IC2E: £60. Heathkit stereo alignment generator IG37: £75. (Peterborough) 0733 231812.

YAESU FT290R, case, nicads, chrgr, mobile mount, bxd: £220. MML144/300LS 30W linear: £30. SMC polarphasor, 2M: £25. Jaybeam 8XY/2M: £20. Tonna 9el portable: £20. Tonna telescopic masts 3x2M, 4x1M: £10 each. G6GTC QTHR. (Sidcup) 081 302 0059.

YAESU FT301D solid state tcvr, CW filter fitted and FV301 external VFO: £285. FP301 PSU: £75. Kenwood TR9130 2M all mode tcvr: £295. All with instruction manuals. Carriage extra. G4HQJ QTHR. (Folkestone) 0303 256318.

YAESU FT690 MK1: £230 6M rig. Trio 9130: 320 2M multimode rig. MM 2M linear 3in watts 40 out: £40. Converted Sperstar 120 10M FM: £50 with DTI paperwork. Telephone after 7pm. (Bristol) 0272 693231.

YAESU FT77, fitted FM, CW filter, FP700 PSU, hand mic, h/book, VGC, any test: £550. Datong matched speech processor: £75. G3OAZ. (Basingstoke) 0256 465126.

Z88 Cambridge computer + 512K RAM: £100 or swap for Atari STE. Shack clearence of capacitors, resistors, connectors, pots, heatshrink, floppy discs, 12 volt supplies. Send SAE for full list. Callers welcome. Hans G4XFD QTHR or ring after 6pm. (Winsford) 0606 552834.

WANTED

AP1086 issue 1 (RAF Radio stores Ref Nos) Also Air Publications relating to radio, radar equipment, exc prices offered, would purchase post war to current magnetrons, klystrons T/R cells, TWTs, photo-multipliers, microwave and special CV types, Required static or rotary inverter AC or DC input with output of 80/115V 1500/2000 cycles. Also r/x type R1355 10D/13032 unmodified. Please phone anytime. (London) 071 511 4786 or 071 790 2846.

AP1086 issue 1 (RAF Radio Stores, ref nos) Also Air Publications relating to radio, radar equipment, excellent prices offered. Would purchase post-war to current magnetrons, klystrons, T/R cells, TWT's photo multipliers, microwave and special CV types. Required static or rotary converter AC/DC input with output of 80/115V 1500/2000 cycles. Also R/X type R1355 10D/13032 unmodified. Please phone anytime. (London) 071 790 2846 or 071 511 4786.

COLLECTOR needs the following bits: RF11 tuner for C13, 12 volt power supply for 19 set. 500/5000 ohm speakers for early radios, especially Halicrafters. S-Meter for SX-28 R103 or similar 6 volt radio. GD3XPA QTHR. (Isle of Man) 0624 801374.

PUMP-UP tower in good working order. May view/collect if reasonable distance of M25. G0POS QTHR. (Gillingham, m Kent) 0634 379140.

WANTED- Trio TX599 transmitter, working or not. Also AM transmitter in any condition. Gordon G4ATS QTHR. (Leeds) 0532 603823 after 6pm.

WANTED. DR410E or similar 70cms FM mobile. GW3UMD. (Cardiff) 0222 761813.

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wa1**ST OR 2ND** edition of Surplus O Way Radio Conversions by Chris Lorek. Write or Phone Alan G4BLI QTHR. (Plymouth) 0752 41437.

2C39B valves and suitable finger stock, must be in good condition. Would consider completed/uncompleted 1296MHz amplifiers or WHY? Also required any design information on 1296 amplifiers. Telephone Bill after 6pm. (Port Glasgow) 0475 745009.

3CX1500/8877, power tube required by contest group. Tel Paul office hours please. 061 491 3300.

BASE for 4CX1000 valve wanted - any type or condition (even with screen capacitor u/s) please. (Invergorden) 0862 842762.

BC-1031-A US signal corps, panoramic adaptor. Can anybody help G3KXB with the circuit diagram of this apparatus please, costs refunded. (Whitstable) 0227 792340.

COLLECTOR requires wireless set, no 22 (xtal), WS38, WS68, no. 52RX, no. 76 sender, C12. Please check your garage, loft and shed. Also info sought on eqpt designated *RT-44/PPN-1A. Origin circuitry etc. WHY? Thanks. Martin G4NCE QTHR. (Birmingham) 021 357 6139.

DRAKE linear L4B in any cond, also ATU MN2000. Can collect. Ted G3RUG, please make my day! (Stockport) 061 491 3814.

DRAKE R7A receiver or late R7 with all options. Service manual, also Drake UV3 tcvr + P53 PSU PK232 terminal, Datong FL3 filter. (Notts) 0602 609345.

DRAKE RR3 SPR4, Racal heads MA2294, MA2295, MA2296, MA2303, RA1792, any units. Cushman CE4B plug-in models 301A, 303, 313, 325, any cond. STC 455 xtal filters, also Racal 5MHz standard, old valves type PM1LF. Thanks. (Shrewsbury) 0743 884858.

EDDYSTONE "Beehive" cast S Meter and speaker, also Eddystone valve general coverage RX, working or not, WS 18 or WS 62 still sought. (Mongomery) 0686 630255.

FLDX400 TX by Yaesu, gd condition if possible please. G3JJU Bob. (Fleet) 0252 615831.

FT101Z digital readout, must have MSM9520RS I/C latest model, Sangean ATS803S digital receiver, free to vendor. Bob G0PFE QTHR. (Scarborough) 0723 372794.

GOOD PRICE paid for pre-war American UX '10, 210, and 250 etc valve. G4IMT QTHR. (Chippenham) 0225 891254.

GPO or similar rheostats, type C/D (two ranges 0-400/0-4000 ohms), condenser box (with pegs), Duplex switch (six terminals marked SKDRUL, two position DX/SX), relays, sounders WHY? Any books on line telegraphy. Jon GW0FJT QTHR. (Swansea) 0792 795517 9-5pm will call you back.

ICOM IC16U. Will pay original purchase price for mint condition. G4AUX QTHR. (Warrington) 0925 752661.

INFO on Taylor valve tester 45D2, Furzehill scope 0.100. Pre-war "Radio Times", "World Radio", wireless mags, books etc, G3KPO QTHR. (Ryde, IOW) 0983 567665.

KENWOOD or Icom 2M or dual band hand held and mobile modern compact tcvrs with accessories, only pristine condition please. G0OPG. (Wilmslow) 0625 531154.

KENWOOD TM-531E 23cm FM mobile tcvr and Jaybeam D15 beam or similar, as above. (Colchester) 0206 851343.

MAINTENANCE manual Telex ITT-3000 (Cheetah). Also marine DF loop (crossed). Tony Bull G3ICB QTHR. (Thatcham) 0635 864345.

MANUAL for Heathkit valve voltmeter, model V-7AU to borrow for copying or purchase. Postage expenses paid. Paul G4GXQ QTHR. (Wilmslow) 0625 532338.

MANUAL wanted for Microwave Modules linear and pre-amp MML144/30-LS purchase or loan for photocopying. Expenses refunded. G3YYZ QTHR. (Harwich) 0255 880893.

MFJ 2-knob 'differental-t' antenna tuner type MFJ-786. G3TJY QTHR. (Poole) 0202 622142.

MR750U motor unit for Daiwa multi torque rotator, required urgently. Brett G0OQQ. (Nottingham) 0602 222176.

PACKET RADIO with Atari 800 XL: who has experiences? Write to DH5RVL, Frank Vogel, Wielandstr 20, D-1570 Potsdam, Germany.

RACAL MA79 SSB drive unit. Unmodified and in good working order, complete with manual if possible please. (Buxton) 0298 83286.

RACAL RA17L service manual, purchase/loan. All costs paid. (Linlithgow) 0506 844001.

SCANNING receiver, handheld or base model. Also crystal filter 10.7MHz, bandwidth 50kHz. G3XFB QTHR. (Stafford) 0902 850033.

SP430 matching speaker for TS440S wanted. Also wanted disc drive for Commodore 64. Contact Robert G0MCT QTHR. (Sunderland) 091 534 5743 (home) 091 510 3218 (work).

TRANSFORMER. Approx 3kv 1.5A, Racal ATU, motorised LC. Your price, please help. Please write. Bucknell, 7 Cavendish Drive, Clowne, Chesterfield, Derbys.

UNIOHM EP738b panaoramic TV field strength meter. G8FYD QTHR, (Didcot) 0235 816947.

WANTED G2DAF rx/tx. My own lovingly constructed items after years of garage storage have finally called it a day. Dust to dust etc. Reasonable price please. John G3RPI. (Orpington) 0689 837955.

WANTED TS440 with ATU in gd cond, also Heath SB220 HF linear or similar. G3TCO QTHR. (Bristol) 0272 681068.

WANTED. Tech info/crkt dia for Puma 73 Cheetah 87 telex and Plessey Vutel units. Cliff Mee GM8GXQ. (Peterhead) 035 85 203.

WANTED: 100kHz and 1.6MHz IF transformers (valve usage). G3JSP QTHR. (Nottingham) 0602 604563.

WANTED: Zenith trans-oceanic world radio for cash or exchange. (Hitchin) 0462 441867.

YAESU FT101ZD external VFO and speaker unit, mint/VGC, complete with PSU ALA. GW3IEQ QTHR. (Caernarfon).

YAESU switch box SB1, Yaesu headset YH1 wired and plugged for FT208R handheld, Trio GDO, moel DM801. Des G0JCF QTHR. (Ruislip) 0895 633118.

YAESU YP150 dummy load watt meter, also FT101-E series, workshop manual. Will collect reasonable distance. G3XSI QTHR. (Sheffield) 0742 551417.

EXCHANGE

LARGE air ministry Morse key, type B1, ref no. 10F/7839 for Marconi 365 or glass covered GPO key NF5B. Dave Johnson, 15514 Ensenada Drive, Houston, Texas 77083-5008, USA. Tel 713 498 8945.

EXCHANGE (nearly 50 years) full collection of Radio Communication magazines, 1945-1992 for aircraft scanner rx. (Cleveland) 0642 318237.

EXCHANGE. Two element tri-band quad, H/B, superb. For any one of the following:- old T/Rx, computer (BBC) VFO230 or AT230. Bill. (Guisborough) 0287 642596.

FISHER 1235X metal detector with lots of extras, cost £399, only 6wks old, consider radio equipment. WHY? 0266 878385.

STRAIGHT SWAP. Icom IC32E, A1 condition with all accessories for this superb dual-band hand-held, including spare bits, 12V lead, carry cases, Want a Yaesu 7700 receiver with VHF converter, no cash involved. (Sheffield) 0909 566724.

GB CALLS

The list below shows all special event stations licensed for operation during this month and up to 8 August. It was taken from the HQ computer on 6 June. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

1 JANUARY

GB100MR Man Railways
GB2GMM Guglielmo Marconi Memorial

19 JANUARY

GB0HLC Harrogate Ladies College
GB1HLC Harrogate Ladies College

28 JANUARY

GB0CDA Coastal Defence 'A'

CLUB NEWS

DEADLINE - Items for inclusion in the February 1993 issue must be sent to HQ marked "Club News - DIARY", to be received by 14 December 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

SOUTH BRISTOL ARC - 6, CW night; 13, talk 'Simple Computer Programming' by Bill, G6PJS; 20, darts evening - club match; 27, bring & buy junk sale. Details 0275 832222 on a Wednesday evening.

WESTON-SUPER-MARE RC - 4, Annual General Meeting. Details 0934 415700.

BERKSHIRE

BRACKNELL ARC - 13, Annual General Meeting. Details from G4AUC.

MAIDENHEAD & DARC - 7, TBA; 19, talk 'Moonbounce' by Ian, G3SEK; Feb 4, talk 'The History of GB2SM (Science Museum)' by Geoff, G3JUL. Details 0628 25952.

NEWBURY & DARS - 27, electronic junk sale. Details 0635 63310.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 13, annual dinner and presentations; 20, AVRS v Chesham & DARS quiz. Details 044 282 6651.

CHESHAM & DARS - 6, general meeting; 13, technical topic TBA; 27, quiz with Aylesbury - away. Details 0923 283911.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 8, Morse practice; 15, talk 'Brunel, the Great Engineer' by George, G0OEL; 22, talks 'Ink Jet Printing' and 'A Guide to Decibels' by Tony, G0OEG; 29, talk 'Speech Processing Using Compressors and Clippers' by John, G6UGI. Details 0763 260811 (daytime).

CHESHIRE

CHESTER & DARS - 5, Annual General Meeting; 12, construction contest winners night; 19, talk 'Satellite Positioning System' by G1NTX; 26, computer questions answered. Details 051-355 2833.

WOODFORD (RATEC) - 18, talk 'Sight of Sound' by Chris, G4HON. Details 061 485 3912.

CLWYD

CONWAY VALLEY RC - 7, talk 'Affordable Radio Equipment' by Dr Chris Barnes; Feb 4, talk 'Successful Fault Finding' by Gwyn Hughes. Details 0492 530725.

RHYL & DARC - 4, TBA; 18, ATV demonstration by GW3JGA; 25, CD Rom demonstration by GW4AMZ. Details from GW3UTG.

WREXHAM ARS - 19, visit to British Telecom, Oswestry; Feb 2, projects night - bring along your latest project. Details 0978 845858.

CO DOWN

BANGOR & DARS - 8, quiz night followed by a mini talk on Curing TVI (1st Part) by GI3USK and GI4JTF; Feb 5, visit to the Electronics Dept, Bangor Technical College for practical demo 'Curing TVI' (2nd Part). Details 0247 460251.

CORNWALL

CORNISH RAC - 7, talk 'Beetling Around Africa' by Peter, G3WKP; 11, computer section; Feb 4, further talk by St John Ambulance Service. Details 0209 820836.

DERBYSHIRE

BOLSOVER ARS - ***CHANGE OF VENUE*** c/o 'The Horse and Groom', Scarcliffe, Bolsover, Chesterfield. - 20, video night. Details from G0RXT, 0246 822856.

BUXTON RA - 12, discussion of membership categories; 26, discussion of FOCUS special event; Feb 9, talk 'Basic PC Construction'. Details 0298 25506.

DERBY & DARS - 6, New Year junk sale; 13, talk and demonstration 'Narrow Band Television' by Doug Pitt; 20, illustrated talk 'North American Travels' by Martin Shardlow, G3SZJ; 27, 'The Anaesthetic Room - or making sure they wake up afterwards!' - a talk about putting people to sleep!; Feb 3, junk sale. Details 0773 852475.

DEVON

APPLEDORE & DARC - ***NEW SECRETARY*** Reg Lyddon, G4ETJ, QTHR, tel: 0237 477301. - 18, construction night and setting up/tuning of club transceiver by G0DLC. Details from the Secretary.

TORBAY ARC - 22, contest and construction night. Details 0803 526762.

DORSET

BOURNEMOUTH RS - ***SECRETARY*** Ian D Brotherton, G2BDV, 6 Cranfield Avenue, Wimborne, Dorset BH21 1DE, tel: 0202 886887.

EAST SUSSEX

HASTINGS E&RC - 20, talk 'Packet from Scratch'. Details 0424 830454.

SOUTHDOWN ARS - 4, Annual General Meeting; Feb 1, talk 'PMR Problems' by Keith, G8HGM. Details the Secretary, 0323 412699.

ESSEX

BRAINTREE & DARS - 4, talk/video 'Work of the Trinity House Lighthouse Tenders' by G7EIG; 18, PMR conversion - theory - with G3PEN/G0DEC. Details 0376 327431.

VANGE ARS - 7, junk sale; 14, talk 'VHF Communication of RAF' by George, G8CUN; 21, film 'The Red Arrows'; 28, talk 'Aerial Matching' by Roy Jackson, G3ASH; Feb 4, junk sale; 11, round table discussion. Details 0268 762496.

FIFE

DUNFERMLINE RS - 14, committee meeting; 21, talk 'An Introduction to Weather Satellites' by Dick, GM4YJL. Details 031 331 4340.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK RC - 19, Annual General Meeting and club quiz. Details 081 749 9972.

BROMLEY & DARS - 19, Annual General Meeting. Details 081-462 2689.

CLIFTON ARS - 13, Christmas party; 22, QRP evening; Feb 5, talk on Scanners. Details 081 859 7630.

COULSDON ATS - 11, talk 'Transformers' by Dr G Sowter, G2OS. Details 081 684 0610.

EDGWARE & DRS - 14, Annual General Meeting; 28, Winter Morse training evening with help and advice from the members. Details 081 953 2164.

GRAFTON RS - 13, Annual General Meeting followed by talk 'The Enemy is Listening' (WW2 experiences) by George Morley, G0OXH. Details 081 368 8154.

HAVERING & DARC - 6, Annual General Meeting and first business meeting; 13, first business meeting (cont'd); 27, talk 'An Introduction to Packet' by Dave Bartlett, G4VIX; Feb 10, talk 'A Purpose-built Shack' by Oliver Tillett, G3TPJ. Details 0708 445135.

SOUTHGATE ARC - 14, talk and demonstration 'The Latest PC Technology' by David Goodman; 22, Annual Dinner and Social; 28, final planning and preparations for 1993 London Amateur Radio & Computer Show. Details 081 360 2453.

SURREY RCC - 4, talk 'Rommel' by Jan Nichols; Feb 1, talk 'Interference' by Peter Burton, G3ZPB. Details 081 660 7517.

SUTTON & CHEAM RS - 21, talk 'Siberian Adventure' by Paul, G0BXC. Details 081 644 9945.

GREATER MANCHESTER

ECCLES & DARS - 5, talk 'History of the NARSA Exhibition' by G8VF; Feb 2, discussion 'Club Stand at the Norbreck Rally'. Details 061-773 7899.

GWYNEDD

DRAGON ARC - 4, an evening with Alison, GW0NUV 'Looking Forward to Another Year'; 18, talk by Mr Bob Williams, GW3CGN on a maritime subject; Feb 1, talk by Geoff Spencer, GW4DRR on a technical subject. Details 0248 600963.

MEIRION ARS - 7, Annual General Meeting. Details Dolgellau 422 447.

HAMPSHIRE

HORNDEAN & DARC - 7, talk 'The Portsmouth Repeater GB3PC' by John Lewis, G3MYI; Feb 4, junk sale. Details 0705 472846.

SONY BROADCAST ARTG - 23, talk 'How to Avoid EMC Problems and the New EEC EMC Regulations' by Mike Hooper, G8NLY. Details from Stephen Harding, G4JGS, QTHR.

WINCHESTER ARC - 15, Annual General Meeting. Details 0962 89550.

HEREFORD AND WORCESTER

VALE OF EVESHAM RAC - 7, Annual General Meeting. Details 0386 41508.

HERTFORDSHIRE

CHESHUNT & DARC - 6, members' forum; 13, 16 bit midi, a musical evening with Alec, G0CZZ; 27, talk 'Dowsing' by Paul, G0BQF. Details 0992 464795.

HODDESDON RC - 7, social night; 21, talk 'Wartime Radio' by Brooke Verral. Details 081-804 5643.

STEVENAGE & DISTRICT ARS - 5, practical night - HF rig checking & alignment; 12, construction evening; 19, arrangements for forthcoming Annual Darts Challenge with G7IEG; 26, talk 'SHACKLOG computer log program' by Alan Jubb, G3PMR. Details 0438 724509.

HUMBERSIDE

BRIDLINGTON & DARS - 7, talk 'Low Profile DX' by John, G3EZZ; 21, talk 'Packet Nodes' by Chris, G6KIA; Feb 4, talk 'CW and Raynet' by Brian, G4XBU. Details 0262 673635.

GOOLE R&ES - 8, contest review; 15, talk 'Raynet' by Geoff 'FRX; 22, CW night; 29, social evening. Details 0405 769130.

KENT

DARENTH VALLEY RS - 20, video 'The Story of TV'; also an informal visit by Neil Lasher, G6HIU, RSGB Zone C Council Member; Feb 10, talk and demonstration 'Fast Scan TV' by Peter Martin, G0GIR. Details 0474 703322.

EAST KENT RS - ***NEW SECRETARY*** Matthew Gainsford, 2E1AWE, tel: 0227 741741.

MAIDSTONE YMCA ARS - 17, RSGB Morse tests. Details 0622 670936.

SOUTH EAST KENT (YMCA) ARC - 20; talk 'VSWR' by Dick, G0BPS; 27, talk by the Kent Repeater Group; Feb 10, talk on 'Raynet' by Ken, G0FAK. Details 0304 372656.

LANCASHIRE

HESKETH ATC - 5, open evening for everyone interested in communications; 19, Annual General Meeting. Details 0704 63344.

PRESTON ARS - 7, talk 'Paddle Keys - International: by Mr Crowhurst, G4ZPY; 21, Annual General Meeting. Details 0772 686708.

LEICESTERSHIRE

LOUGHBOROUGH & DARC - 19, talk 'Going Mobile' by G0LCU; 26, open evening. Details Loughborough 218259.

LINCOLNSHIRE

GRANTHAM RC - 5, talk 'HF Antennas' by John, G3VSX; Feb 2, talk 'Electric Shock' by member of the St John Ambulance Brigade. Details 0476 65743.

SPALDING ARS - 8, Annual General Meeting; Feb 12, talk 'Communications and Motor Sport' by G7HNM. Details 0778 425367.

MERSEYSIDE

WIRRAL & DARC - 13, Annual General Meeting; 27, surplus equipment sale. Details 051 648 5892.

LIVERPOOL & DARC - 5, talk 'History of Liverpool Club' by G4CVZ followed by NARSA arrangements; 19, talk 'Construction Techniques' by G0IFK; 26, surplus sale; Feb 2, talk 'Homebrew Test Gear' by G4GEB. Details from Ian, G4WWX, QTHR.

NORFOLK

NORFOLK ARC - 6, TBA; 10, 80m AFS; 13, 'Real Radio' evening; 20, TBA; 27, informal & committee meeting. Details from G0KWP 0603 618810.

YARMOUTH RC - 7, informal; 14, contest plans for 1993. Details Yarmouth 721173.

NORTHAMPTONSHIRE

KETTERING ARS - 26, talk 'Radio Communications' by Fg Off Rose from RAF Wyton. Details 0536 514544.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - 7, talk 'How to Deal with Electrical Emergencies' by Andrew Farrar of the British Red Cross; 14, talk 'Morse and the Morse Test' by Ron, G4NZU; 21, construction evening; 28, junk sale; Feb 4, forum; 11, talk 'Generating your own Power'. Details 0602 232604.

MANSFIELD ARS - 7, talk and slides 'The Uplands of the Andes and The Lowlands of the Amazon Forests' by Mick, G8EHX. Details from G0NZA, 0623 755288.

SOUTH NOTTS ARC - 8, Annual General Meeting (members only); 15, junk sale; 22, construction (Fairham College); Feb 5, open forum; 12, construction. Details 0602 211069.

SHROPSHIRE

TELFORD & DARS - 13, talk 'Screws, Bolts and Fixings' by G6UDX; 20; club dinner - The Malthouse, Ironbridge; 27, club project night. Details 0746 761203.

SALOP ARS ***NEW VENUE*** - Oak Hotel, Shelton, Shrewsbury. (off the old A5 near the Shelton water tower). Club meets on Thursdays at 8pm. Further information from Margaret Blakeley on 0939 290609.

SOMERSET

MENDIP REPEATER GROUP - ***CHANGE OF ADDRESS*** PO Box 73, Wells BA5 2WE. Details from Pam, G7FPW, 17 Bedford Road, Wells BA5 3NH.

SOUTH GLAMORGAN

BARRY ARC - ***NEW SECRETARY*** Ann MacKay, GW7LCP, QTHR.

CARDIFF RSGBG - 11, video show 'Amateur TV' by Eric Edwards, GW8LJJ; Feb 8, annual radio quiz with South Glamorgan Raynet Group. Details 0446 773212.

SOUTH YORKSHIRE

BARNSLEY & DARC - *Club is running an 8-day trip to Friedrichshafen next year. Anyone interested contact E Bailey, G4LUE, 0226 716339* 18, talk TBA; 25, proposed rig check night by G8OWN. Details from G4LUE.

STRATHCLYDE

KILMARNOCK & LOUDON ARC - 12, Annual General Meeting. Details 0563 820052.

WEST OF SCOTLAND ARS - 15, talk 'Developments in the Packet Network' by MACPAC; 29, talk 'Maplin Electronics - A profile of facilities' by Gavin; Feb 12, talk 'Vehicle Electronics - Old and New' by Joe, GM3HOM. Details 0698 350926.

SUFFOLK

LOWESTOFT DISTRICT & PYE ARC - 7, talk and demonstration 'Home-Brew Test Gear' by Mike Coan, G4EOL; 21, talk and demonstration 'Wax Recordings and Early Gramophones' by Tony Besford, G3NHU; Feb 4, surplus equipment sale. Details Lowestoft 564325.

SURREY

THAMES VALLEY ARTS - 5, talk 'DX' by Roger Brown, G3LQP. Details 04865 4279.

WARWICKSHIRE

STRATFORD UPON AVON & DARS - 11, New Year social; 25, talk on Contesting and IOTA; Feb 8, talk 'Trials and Tribulations of an OWL' by Stan, G4AXW. Details 060 882 495.

WEST YORKSHIRE

HALIFAX & DARS - 19, visit by Derek Pearson, G3ZOM of Jandek. Details Halifax 202306.

KEIGHLEY ARS - 14, talk 'Mountain Rescue - Search Dogs' by Neville Sharp; 25, Annual General Meeting. Details 0274 496222.

NORTHERN HEIGHTS AR&ES - 6, video evening; 20, Annual Dinner. Details Halifax 360574.

TODMORDEN & DARS - 4, talk 'The Novice Licence' by Gerald, G3SDY; Feb 1, AGM and planning for TDOTA. Details Halifax 882038.

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'.

24 JANUARY

LANCASTRIAN Rally - University of Lancaster. Admission £1. Doors open 10.30 for disabled visitors. Details from Sue, G1OHH QTHR, 0524 64239.

OLDHAM ARC Mobile Radio Rally - Queen Elizabeth Hall, Civic Centre, West Street, Oldham. Doors open for Morse Test participants at 10am, for disabled visitors at 10.30am and 11am for others. Admission £1, free for under 14's. Catering facilities in the Fallsworth Suite (back to their usual standard after kitchens refurbished last year); parking facilities free (space for approx 2000 vehicles). Talk-in on 2m S22 from 9am using callsign GB4ORC. Morse Test applicants should contact RSGB for application forms prior to 20 December 1992. General and traders' enquiries to Kathy, G4ZEP on 061-633 0550 (W) or 061-652 8617 (H).

7 FEBRUARY

SOUTH ESSEX ARS Radio Rally - Paddocks Long Road, Canvey Island (at the end of the A130). Doors open 10am. Trade stands; bring & buy; home-made refreshments; free parking plus parking outside main door for disabled visitors. Talk-in on S22. Details from Ken Hendry, G0BBN, 0268 755350.

14 FEBRUARY

CAMBRIDGE & DARC Radio and Computer Rally - Addenbrookes Hospital Ambulance Station. (Easy access from M11/A604). Doors open 10.30am. All the usual attractions. Bookings and details from George on 0954 719273.

2ND NORTHERN CROSS Rally - Rodillian School, A61 between Leeds and Wakefield (near jnct M1/M62). Opens 11am (10am for disabled visitors and bring & buy). Usual dealers; ample parking; bar and refreshments; Morse test; talk-in S22. Details from Dave Gray, 0532 827883.

21 FEBRUARY

EAST COAST AR&C Rally - Leisure Centre, Vista Road, Clacton-on-Sea. Doors open 10.30am. Major suppliers of radio and computer equipment; bring & buy; ample car parking; easy access for disabled; fully signposted from A12. Sports facilities and children's adventure playground; bar; cafe. Details from CLPK, 0255 474292.

KIDDERMINSTER & DARS Rally - Harry Cheshire School, Kidderminster. Opens 10am; usual traders; flea market; bring & buy; refreshments. Details G8JTL 0384 894019.

TRAFFORD Rally - Greater Manchester Exhibition Centre, Manchester. Doors open 10.30am (disabled visitors' priority queue). Admission £1.50. Usual traders; RSGB stand; bring & buy. Morse tests (apply via RSGB HQ). Free cash draw; licensed bar; refreshments; ample car parking. Talk-in on S22. Details G Oldfield, G1IJK, 061 748 9804.

WELSH MOBILE RALLY - Barry Leisure Centre, off Holton Road, Barry, S Glamorgan. Doors open 10am (9.30am for disabled visitors). Details Colin, GW0LBJ, 0222 530070.

27 FEBRUARY

RAINHAM Radio Rally - Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. M2, jnct 4. Traders; bring & buy; snacks; bar; talk-in on 2m & 70cm. Details G0AMZ, 0634 376991.

TYNESIDE ARS Annual Rally - Temple Park Leisure Centre, South Shields. Doors open 11am (10.30 for disabled visitors). All usual visiting trade stands will be in attendance, together with some new ones and we believe the Rally will have much of interest for electronic hobbyists and computer users as well as amateur radio enthusiasts. For those not wishing to partake in the Rally itself, all the amenities of the Leisure Centre are there, including heated leisure pool and gymnasium. Plenty of free parking for visi-

EVENTS DIARY

tors, and the Centre is readily accessible from all parts of the Tyne & Wear area as well as outside. Talk-in station will be operational on S21 to provide guidance for visitors. Details from Jack Pickersgill, G0DZG, tel: 091 265 1718.

28 FEBRUARY

6th TAW & TORRIDGE Rally - Bideford Halls. Details 0271 860930.

6 MARCH

VHF Convention - Sandown Park Exhibition Centre. Stand bookings to Les Hawkyard, G5HD, 0409 281 342. Details from Geoff Stone, G3FZL, 081 699 6940.

13/14 MARCH

LONDON AR&C Show - Pickets Lock Centre, Picketts Lock Lane, Demonton, London N9. Large trade presence, free parking; lectures; facilities for the disabled; bring & buy; Special Interest Group section. Talk-in on 2m/70cm.Details 0923 678770.

14 MARCH

WYTHALL RC Radio Rally. - Wythall Park, Silver Street, Wythall (nr Birmingham, on the A435, 2 miles from jnct 3/M42). Opens 11am, closes 5pm. Usual traders in three halls; bar and refreshments; bring & buy stall run by the club. Talk-in on S22. Admission still only 50p. Details Chris, G0EYO, 021 430 7267.

21 MARCH

NORBRECK Radio Rally - Radio, Electronics & Computing Exhibition - Norbreck Castle Hotel Exhibition Centre, Queens Promenade, North Shore, Blackpool. Doors open 11am - 5pm; (10.45 for disabled visitors through ramped entrance); admission £1.50, over 65s £1, under 4s free; Free car parking and free shuttle service; Novice Licence details and practical demonstrations; bring & buy stall; radio talk-in on S22; competitions for NARSA associated club stands; your home constructed items and an inter-club quiz; hotel accommodation; bars and restaurants; assistance for disabled visitors; RSGB stand. Details from Peter Denton, G6CGF, 051 630 5790.

TIVERTON RC Annual Rally - Pannier Market, Tiverton. Details from D G Clarke, G0IMJ, 0884 252604.

28 MARCH

BOURNEMOUTH RS - 6th Annual Sale - Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open 11am to 5pm; talk-in from G1BRS on 2m S22; amateur radio and computer traders; clubs and specialised groups; excellent refreshments. Admission £1 including free raffle ticket. Details from Ian, G2BDV QTHR, 0202 886887.

MAGNUM Rally - Magnum Leisure Centre, Irvine, Ayrshire. Usual traders; bring & buy; lucky programme prize; raffle etc. Details from Peter, GM0FCI 0294 72253.

PONTEFRACT & DARS 13th Annual Components Fair & Spring Rally - Carleton Community Centre, Carleton, nr Pontefract. Admission by prize programme - 3 prizes plus free prize draw for lady visitors; traders; bring & buy; bookstall etc; licensed bar; hot & cold snacks; 2m talk-in. Car boot spaces available. Details from Colin Wilkinson, 0977 677006.

4 APRIL

LAUNCESTON 7th AR Rally - Launceston College. Details 0566 777027.

WHITE ROSE ARS Radio Rally - Change of venue to: Allerton High School, King Lane, Leeds 17. Detail from A A Bartram, G7ELS, PO Box 73, Leeds LS1 5AR.

12 APRIL

CENTRE OF ENGLAND Easter Rally. (On Easter Monday this year). Details from Frank Martin, G4UMF, 0952 598173.

18 APRIL

MARSKE-BY-THE-SEA Radio Rally - Marske Leisure Centre, High Street, Marske-by-the-Sea. Details 0287 610030.

SWANSEA ARS Rally - Swansea Leisure Centre. Details from Roger Williams, GW4HSH, 0792 404422.

24 APRIL

MARCONI Birthday Exhibition - Puckpool Park Wireless Museum, Seaview, Isle of Wight. Free admission to public and plenty of free parking. Details from Douglas, G3KPO QTHR 0983 567665.

25 APRIL

BURY RS Hamfest. Details from Laurence, G4KLT, 061 762 9308 (eves).

2 MAY

ANGLO-SCOTTISH Rally - Tait Hall, Kelso. Details 0573 224654 (eves).

BATC Rally - Harlaxton Manor, Nr Grantham. Details: Paul G8MJW, 0522 703348.

3 MAY

MID CHESHIRE ARS Rally - Civic Hall, Winsford. Details: David G4XUV, 0606 77787.

9 MAY

MARS/DRAYTON Mobile Rally. Details: Peter G6DRN, 021-443 1189. Traders bookings Norman G8BHE, 021-422 9787 (eves).

9th YEOVIL QRP Convention - Preston Centre, Monks Dale, Yeovil. Details: G3CQR, 0935 813054.

16 MAY

RSGB'93 Exhibition - NEC Birmingham. Details from Norman Miller, G3MVV, 0277 225563.

30 MAY

17th EAST SUFFOLK Wireless Revival - Maidenhall Sports Centre, Ipswich. Details: Bob Baal G7HZV, 0394 271257.

MAIDSTONE YMCA Radio Rally. Details 0622 743317 for pre-Rally booking of camping/caravanning facilities. Trade bookings etc 0622 750709 (before 9.30pm).

6 JUNE

25th SPALDING Mobile Rally. Details: Mr T Kettlewell, G4TWR, 0775 722940.

13 JUNE

24th ELVASTON CASTLE Mobile Rally. Details from John Robson, G4PZY, tel & fax: 0332 767994; trade enquiries: Peter Neal, G3WFU, tel & fax 0332 700265 (evenings).

33rd RNARS Annual Mobile Rally - new venue Sports Field, HMS Collingwood, Fareham. Details: Cliff G4UJR, 0703 557469.

20 JUNE

DENBY DALE & DARS Annual Mobile Rally - Shelley High School. Details 0484 644827.

NEWBURY & DARS Annual Car Boot Sale - Ackland Hall, Cold Ash. Details: N Jaques, 0635 863310.

27 JUNE

36th LONGLEAT AR Rally. Details from Shaun, G8VPG QTHR, 0225 873 098.

4 JULY

KINGS LYNN ARC Rally. Details 0553 841189.

YORK Radio Rally. Details from Andy Suter, G0GXI 0904 708164.

11 JULY

SUSSEX AR&C Fair. Details & traders' booking: Ron Bray, G8VEH QTHR, 0903 763978 (H) 0273 415654 (W).

18 JULY

10th McMICHAEL Rally and Car Boot Sale. Details 0628 25952.

25 JULY

COLCHESTER Radio & Computer Rally. Details: Frank, G3FIJ, 0206 851189.

8 AUGUST

DERBY & DARS Mobile Rally. Details from Martin Shardlow, G3SZJ QTHR 0332 556875 or via packet @ GB7LTN.

22 AUGUST

WEST MANCHESTER RC Summer Rally. Details: G1IOO, 0204 24104 (evenings).

5 SEPTEMBER

BRISTOL Radio Rally (incorporating Bristol Computer & Electronics Fayre). Details from Muriel Baker, G4YZR, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG, tel: 0275 834282.

19 SEPTEMBER

CENTRE OF ENGLAND Autumn Rally. Details: Frank Martin, G4UMF, 0952 598173.

PETERBOROUGH R&ES East of England Rally. Details from Mike, G0CVZ 0733 222588.

14 NOVEMBER

BARNSLEY & DARC AR Rally. Details Ernie, G4LUE, 0226 716339 (6pm-8pm please).

MARS/STOCKLAND Radio Rally. Details from Norman, G8BHE 021 422 9787.

21 NOVEMBER

WEST MANCHESTER RC Winter Rally. Details 0204 24104 (eves).

SILENT KEYS

WE HAVE BEEN advised of the deaths of the following radio amateurs:

G0BVE	Mr S K Bowden	
G0DAQ	Mr D Moore	21.10.92
G0IGE	Mr D H Hunt	May 92
G0LIH	Mr H N Oakley	
G0RUI	Mr J J Newman	29.11.92
G1DBB	Mr D Gaylor	13.10.92
G1GQA	Mr M Bagshaw	17.11.92
G1OCM	Mr D Mytton	26.08.92
G1UPI	Mr R A J Philpott	Feb 92
G2BLZ	Mr C W Strong	20.07.92
G2CCC	Mr R A P Patterson	25.01.92
G2CCQ	Mr W L Pollard	17.09.92
G3AQR	Mr C Merrett	
G3DUX	Mr D A Newman	18.06.92
G3EQU	Mr J E A Mortimer	27.10.92
G3FTR	Mr G T Allen	15.10.92
G3FXB	Mr A J Slater	11.11.92
G3GSZ	Mr J S Tempest	27.09.92
G3HS	Mr D T Boffin	28.10.92
G3JFA	Mr B Williams	27.11.92
G3JU	Mr S G Abbott	29.05.92
G3LLO	Mr W J Cain	22.10.92
G3LSG	Mr C A J Cotton	20.07.92
G3NAZ	Mr F J Barkas	11.09.92
G3NQD	Mrs G Western	28.11.92
G3OHG	Mr E Simkin	06.06.92
G3OVJ	Mr V Teague	
G3RRX	Mr G Oxby	17.09.92
G3SSL	Mr N G Ward	Mar 92
G3TRY	Mr W North	18.08.92
G3TSL	Mr M Jackson	15.11.92
G3WXV	Mr W Armstrong	01.10.92
G3XFM	Mr D E Dobson	07.10.92
G4DQS	Mr A V Lee	08.11.92
G4LHH	Mr J A Richardson	28.10.92
G4MDL	Mr J A Fenton	05.10.92
G4SAH	Mr J Pinner	
G4UKJ	Mr D Costello	
G5QO	Mr F L C Firmin	08.11.92
G5YY	Mr W Mead	10.10.92
G6CB	Mr R L Castle	
G8SR	Mr S Hemmings	04.10.92
GM0IPZ	Mr J Cross	
GM3GFQ	Mr J W Blackery	
GW3EYG	Mr J Price	14.10.92
GW3GIA	Mr A J White	27.10.92
RS16075	Mr E R L Bassett	
RS34795	Mr A E Card	
RS4809	Mr M S P Wicks	
RS94694	Mr H Chiverton	27.09.92

Correction:

G4UOE Mr G Bowes 30.8.92

not G4VOE as printed in December *RadCom*.

Al Slater, G3FXB

THE DX and Contesting Community were shocked to learn of the death of Al Slater G3FXB on 11 November, 1992 at the relatively early age of 64.

Al Slater's introduction to radio was through medium wave broadcast listening in the mid-1930s. He was first licensed in 1949 developed a long association with the international and competitive aspects of the hobby. But, although very dedicated to contesting, he was always to be heard, on CW and SSB. He was the Chairman of the First Class CW Operators' Club and was a past President and Secretary.

He reached the top of the DXCC Honor Roll in 1975. In May 1988 he was only the third amateur to be elected to the CQ Contest Hall of Fame, in company with K2GL and KH6IJ. There was no major contest in which he had not attained top honours. The CQ Contest was a special challenge and he had, at various times, held a number of continental records. The RSGB Commonwealth Contest, with its unique demands on equipment, antennas and, propagation knowledge, was an annual favourite. He first won the Thomas Trophy, for the leading UK station, in 1973 and went on to capture it on a total of 18 occasions and, in 1990, won the Senior Rose Bowl, for the leading station overall, when operating as ZC4ESB.

His home in Sussex, became a crossroads for visiting amateurs and since moving there in 1974 Al and his wife Maud had entertained a total of 303 different callsigns. The two acres provided plenty of scope for antenna experimentation and construction. The four-element quad and the fixed wire beams maintained G3FXB as one of the outstanding UK signals on the bands.

Outside radio, Al was a dedicated family man. He had two sons, four daughters and ten grandchildren. He had a lifetime passion for Jazz - something he shared with many other radio friends, especially in the USA. He was a keen gardener and prided himself that he grew enough organic produce to feed the whole family. He was always deeply concerned with the countryside and conservation issues.

Al was a flamboyant, outward-going "people person". He was never happier than when he was exchanging ideas and experiences. He was always prepared to give as much of himself and his time as another individual or group needed. Such people inevitably become very bound-up in the lives of others and their departure leaves very large holes to be filled.

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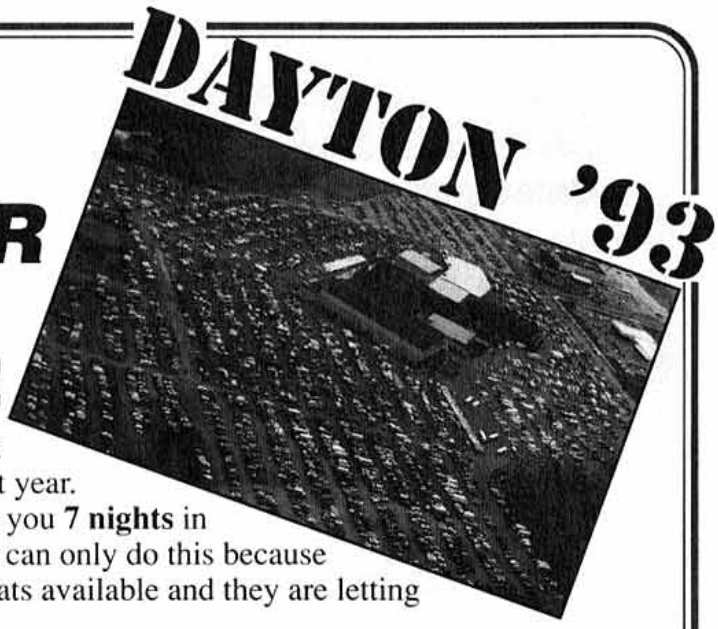

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Roger Hall G4TNT

P.S.: Don't forget to ask about our other trips to Friedrichshafen and Orlando.

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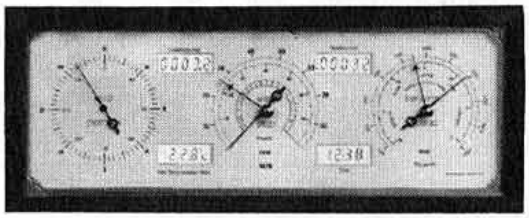

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The Tiny 2 MK II is available NOW! The UK's best selling dedicated packet TNC now sports exciting new extras including: 64K eprom (including the famous PacCom PMS) plus an additional rom such as DED Host mode, TheNet/NetRom or we'll even give you a second language such as French, German or Spanish etc); Current firmware now implements TAPR 1.1.8 features; 6MHz CMOS CPU with 10MHz option; low power consumption for portable operation (<40 mA); 300 to 38,400 computer baud rate, optional 9600 add-on modem. What's more we'll supply the Tiny-2 MKII complete with free software, ready made radio cables and computer leads for YOUR setup.
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Kantronics PACTOR (!?)

Yes, Kantronics KAM owners will also be able to benefit from an exciting new Kantronics upgrade that sports PacTor. This should be available from Siskin (bugs permitting!) sometime in December. (phone us around Mid-December).

Our range of amateur data products has grown to such an extent over recent months we just can't cram it all into a tiny ad like this. We also have excellent support programs for not only the PC range but also the Amiga, ST, Archimedes, BBC B, Spectrum (all models), CBM 64 and the MAC to name but a few. Please feel free to call or write for more information. Our telephone support lines are generally manned from 8am to 8pm most days including weekends!

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The LAST WORD

A PAT ON THE BACK

I am writing to you to express my pleasure at the good customer service provided by 3TH, who advertise in *RadCom*.

3TH supply PC kits and systems at a price far lower than many other advertisers, yet provide a gold-star service.

I bought a 286 PC motherboard from 3TH in October last year, after a very helpful telephone discussion with Mike Harper, the managing director.

The new board was to be an upgrade for an old IBM AT belonging to my employer. I had no problems with the upgrade, and a few weeks later wanted a memory enhancement, which necessitated removing the old memory chips and replacement by a different set. Mike sent me the upgrade set as a straight swap for the old chips, and simply charged me the difference in price between the old chips and the new set. So that I would be able to use my PC without a break, he kindly supplied the new chips in advance of receiving my old chips.

Since then I have added extra peripherals, including a new IDE drive when my existing drive died. With every 3TH-supplied item came brief, clear, written instructions on how to install and configure the equipment.

A few days before writing this letter, Mike repeated the swapping exercise when I ordered a 386 motherboard replacement. Again, he only charged me the difference in price between the old and new boards, and he sent the new board out in advance of receiving the old 286 board back into stock.

I am very pleased with the 386 implementation, which now largely consists of 3TH-supplied parts and I have no hesitation in recommending 3TH for a reliable, budget system with good after-sales service.

Tony Wells.

AN INTERMEDIATE LICENCE?

I would like generally to endorse John Carp's comments (*The Last Word*, December), and at the same time suggest a good old British compromise - the introduction of an Intermediate Class licence. This would have no age limit, give access to the same bands and modes as the corresponding Full Licence, but with a power limit of 25W where a limit of 400W applies to the Full Licence, and pro-rata where lower limits apply.

Qualifications for a Class B Intermediate Licence would be either: Having held a Novice Licence for at least a year, with an assessment of the station log to confirm adequate operating experience from a sufficient level and variety of activity during that time; *or* having held an RAE Certificate for at least a year, and evidence of operating under supervision submitted to confirm adequate experience from a sufficient level and variety of activity during that time.

Qualifications for a Class A Intermediate Licence would be either: As for (or holding) a Class B Intermediate Licence, and having passed an 8WPM Morse test; *or* holding a Class B Full Licence, and having passed an 8WPM Morse test.

Bringing a licence offering a more useful power level within reach of those who are too young to hold a Full Licence, and those who are older but have difficulty passing the RAE, perhaps because of their lack of formal technical education, would, I believe, be an acceptable way of increasing the appeal of both the Novice Licence and amateur radio.

Roger Piper G3MEH

NICE TO C YOU

I have been listening to a special event station giving, in difficult conditions, reports of "5 and 1", which I think means "You are faint, barely audible, and perfectly readable", and even "5 and 0" - I have no idea what that means.

Is it time to turn Q5 over to the contesters (who will use it all the time) and institute a new 1 - 10 'C' Scale (C for copy) ranging from C1: "I think you're still there, but I'm not sure", through C5: "Run that past me one more time", to C8: "My S-meter is smoking", and C10: "You have just cracked my spectacles". Any thoughts?

Peter Jackson GW3ADV

ANONYMOUS CONVICTIONS

Over the past few months *RadCom* has contained details regarding the conviction of several licensed amateurs who were engaged in illegal acts - but why has the editor chosen *not* to publish their names? Is it a case of the fox guarding the chicken-house?

Ray J Howes G4OWY

[Information on prosecutions involving amateur radio comes from the RA who will not release the names of those concerned - Ed]

A QUESTION OF ATTRIBUTION

The article 'Stop the Packet Racket on HF', by 9M2CR (*RadCom*, Sep 92) was attributed to the Australian magazine *Amateur Radio*. BARTG published this article in our magazine *DATACOM* (Spring 1990), way before *RadCom* published it.

A copy of that issue of *DATACOM* would have been sent to the *RadCom* office so the editor should have been aware that the article had already been published in the UK. I do appreciate that this was before you took on the post of editor.

DATACOM is written and edited by volunteer staff and it is rather nice for us to see that we have beaten a professional journal into print (and I do mean that in a nice way), but we would appreciate an acknowledgement of this.

Finally, and on my own behalf, not on BARTG's behalf, I shall take this opportunity to say that I have been pleased with the changes you have made to *RadCom*. I like the interesting use of colour and I like very much the news and contents pages styles. For me, your changes have all been very much for the better.

Ian Brothwell G4EAN, Secretary BARTG

[RSGB member 9M2CR sent us the article a considerable time ago with a copy of the Amateur Radio *pages. I am happy to acknowledge that your excellent specialist publication published it in the UK before we did. I hope the article will generate a keener interest in HF data techniques - see pages 49 and 51 for AMTOR/PACTOR details - Ed]*

SUB UP = MEMBERSHIP DOWN

After reading the *RSGB Annual Report 1991-1992*, I note the information concerning the increase in subscription income (up by 33%) and the attendant fall in membership of 2123.

You refer to the disappointing fall in members but I would have thought that this was only to be expected. It seems that financial returns are more important than active members. The fee of £30 is more than many people can afford - even pensioners with their £5 concession.

The strength of a society lies in its membership, not just in its finances. Like British Rail, frequent increases in fares are self-generating because fewer people can afford to travel!

John L Green F/G3WLK

[A glance at the Annual Report *graph 'Trading Surplus After Tax' will show why the 1990 sub increase was essential. However, there has been no increase in the Corporate Membership subscription for two years now and none is planned for at least another six months - Ed]*

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.

/AM IS DANGEROUS

Why on earth do we want 'Aeronautical Mobile'? Are there not enough facets to our hobby without adding another 'ego trip' for some? The purpose of our hobby is, to quote 1(i) of the Amateur Licence, for the purpose of self-training in communication by wireless telegraphy etc etc.

As a Civil Aviation Authority Licensed Avionics Engineer for 20 plus years, and a licensed amateur, I dread to think of some of the dangerous 'lash ups' I can envisage in some aircraft. Already there is a profusion of hand-held transceivers which various 'amateur pilots' connect up to external antennas and/or audio systems, not to mention the recent advent of GPS (Global Positioning Systems, SAT NAV) which various enthusiasts 'velcro' to the aircraft instrument panel. And while we're at it, how about a moving map display to place on the seat beside us. Can one imagine what loose articles in a cockpit constitute safety-wise?

Officially any radio equipment installed in a UK registered aircraft has to be of a type approved by the Authority (CAA) and then installed in a manner approved by the Authority by a person approved by the Authority (Licensed Engineer). If implemented, are hand-helds or hand-held microphones forbidden? I've always felt headsets and control column transmit switches are the safest, although many light aircraft still use hand-held microphones.

Let's not forget possible hazards to on-board navigation systems, ie the compass proximity to loudspeaker magnets or other influences such as current leads. The VOR/ILS systems may be subject to stray RF from a poorly set-up transceiver. Where is the prospective operator going to pick up the power supply? If from the aircraft power then I hope it is using proper circuit breakers or fuses and non-inflammable wiring to prevent toxic fumes.

Already air traffic is a busy business and the average aircrew have enough to work at, ie normal flying, instrument flying, navigation, normal RT procedure, looking out for other aircraft, without adding one more problem to reduce time devoted to the aforementioned. Sorry to put a downer on this proposal, but I reckon on safety first.

David Gipp G4OCU

RAE WORTH THE EFFORT

Please can I thank those who helped me to study and teach me for the RAE which I sat in May this year, and was successful in obtaining my City and Guilds pass certificate.

Having been a SWL for the past 30 years I became more active when I joined the RSGB in 1983.

It was whilst I and a friend were attending the Preston ARS Mobile Rally of last year when he suggested that he would be going to evening classes to sit for the RAE; I replied "If you do, please let me know, as I may join you." This we did in September last year, and attended evening classes at Cross Hall, Ormskirk, under the tuition of Mr D Duff, G3VYV. Neither of us knew what it entailed in sitting for the RAE. It isn't all plain sailing as one may think, but under the tuition of G3VYV we were taught the correct way in fault finding and how to present oneself on the amateur bands, etc. Unlike my friend, I took on extra lessons, given freely by John, G7FBR. I have spent 1000 hours in studying, and when I now look back, I do not regret one second of it - it has taught me a lot about amateur radio, but had it not been for the dedication of Dave, G3VYV and John, G7FBR I would not be a licensed radio amateur as I am now. So please may I thank them via the 'Last Word' column of *RadCom*.

May I just add that if there are any SWLs who, like me, have kept putting off the day to sit the RAE, go on - give it a try; it is a great hobby and it is even better when one can transmit and know the correct procedure in transmitting and maintaining one's equipment to the highest level of non-interference to others on or off amateur radio.

M B Marsden G7NDP (ex RS85477).

"NO" TO CODE-FREE ON HF

I read with dismay 'A Code-Free HF Licence' (*News & Reports*, December). Surely if an individual wants to gain access to the HF bands then he/she should take the time and effort, which most of us have done, to learn and take the Morse test. After doing that it is up to the individual whether he/she keeps up their Morse.

I took my test four months after getting my Class B call and I had no prior knowledge of the code. If I am sent a ballot paper for such a licence I will vote "No".

D W Dixon G0AYD

RSGB BOOK CASE

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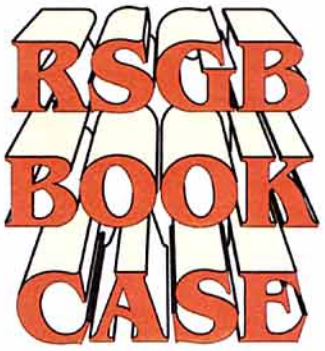

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While the publishers will give whatever assistance they can to readers having complaints, under no circumstances will the magazine accept liability for non-receipt of goods ordered, or for late delivery, or for faults in manufacture. Legal remedies are available in respect of some of these circumstances, and readers who have complaints should address them to the advertiser or should consult a local Tradings Standards Office, or a Citizen's Advice Bureau, or their own solicitor.

Readers are also reminded that the use of radio transmission equipment is subject to licencing and the erection of external aerials may be subject to local authority planning regulations.

ADVERTISERS INDEX

NEXT COPY DATE

The display advertisement copy date for our March 1993 issue will be **13th January 1993.**

FORTHCOMING REVIEWS

February 1993 — ICOM IC32/38, Dual Band Transceiver by Peter Hart

MOBILES IN MOTION

IC-229E/H
144MHz FM transceiver
IC-449E
430MHz FM transceiver

- Ultra-compact body.
- One-touch access functions.
- 20 memory channels.
- Illuminated switches and controls for night driving.
- 140(w)x40(H)x105(D) mm.

Photograph shows U.S.A. version

IC-3230H *NEW!*
144/430MHz Dual-band FM transceiver.

- Simple dual-band operation.
- Optional remote control capabilty, tone squelch and voice synthesizer unit.
- 30 memory channels.
- Full duplex QSO.
- 140(W)x40(H)x165(D)mm.

IC-1201E
1200MHz FM transceiver

- High sensitivity receiver.
- Stable 10W output power.
- Convenient AFC, RIT and VXO functions.
- 20 memory channels.
- Priority watch.
- Programmable call channel.
- 140(w)x40(H)x200(D) mm.

IC-901
144/430MHz dual-band FM transceiver

- Detachable remote controller.
- 6 band capability: 28, 50, 144, 430 and 1200MHz.
- Simultaneous dual-band reception.
- Optional wideband receiving unit.
- 150(w)x50(H)x191(D) mm.

ICOM mobile transceivers give the performance and power you need when 'on the road' and will enable you to operate a flexible and therefore more useful system.

For further information about ICOM products and your nearest authorised dealer please contact:
Icom (UK) Ltd. Dept RC Sea Street Herne Bay Kent CT6 8LD
Telephone: 0227 741741 (24hr). Fax: 0227 741742

ICOM

Top of the Range

YAESU

UK Sole Distributor
South Midlands Communications Ltd, S.M. House,
School Close, Chandlers Ford Industrial Estate,
Eastleigh, Hants S05 3BY.
Tel: (0703) 255111.

To be a truly world-class competitor, you have to have a truly world-class rig. And it's here now. The versatile FT-1000 from Yaesu.

The FT-1000 will blow away your competition with a spectacular combination of power and operation flexibility. There will be no contest.

Just superb performance...yours and your FT-1000

FT-1000 HF All-Mode Transceiver

- ✔ **Direct Digital Synthesis (DDS):** Two ten-bit DDS plus three eight-Bit DDS
- ✔ **High RF Power Output:** Up to 200 Watts.
- ✔ **Dual Receiver:** Two tuning knobs.
- ✔ **Automatic Antenna Tuner:** Built-in with 39 memories.
- ✔ **Built-In Vox.**
- ✔ **100 Memories:** Independent ATU and mode/IF Filter memory.
- ✔ **CW Audio Peaking Filter:** Additional selectivity on CW for weak signal work.
- ✔ **CW Spot:** Provides audible tone for alignment.
- ✔ **High Dynamic Range:** 108dB (Typical).
- ✔ **Multimode Selection on Packet/RTTY:** Switchable FSK tone, RTTY shift and CW pitch.
- ✔ **Front Panel RX Antenna Selection:** Allows quick switching.
- ✔ **Digital Voice Storage:** Option provides instant playback.
- ✔ **BPF-1 Module Option:** Allows crossband dual receive.

SPECIFICATIONS:

Receiver Range:	**100kHz-30MHz.**
Transmit Range:	**160-10 Meters.**
Power Output:	**Adjustable Up To 200 Watts (50 Watts AM Carrier).**
Emission Types:	**LSB/USB (J3E), CW (A1A), FSK (J1D/J2D), AM (A3E), FM (F3E).**
Antenna Impedance:	**16.5-150 Ohms Nominal.**
Power Consumption:	**95 VA (Receiver). 1050 VA (Transmit).**
Sensitivity:	**SSB/CW <0.25V For 10dB S/N, 1.8-30MHz..**
Dynamic Range (Typical):	**108dB @ 500Hz BW, (Preamp off).**
Maximum Audio Power Output:	**2 Watts Into 4 Ohms with <10% THD.**
Audio Output Impedance:	**4-8 Ohms.**
Weight:	**56.2 lbs. Standard Version.**

Performance without compromise