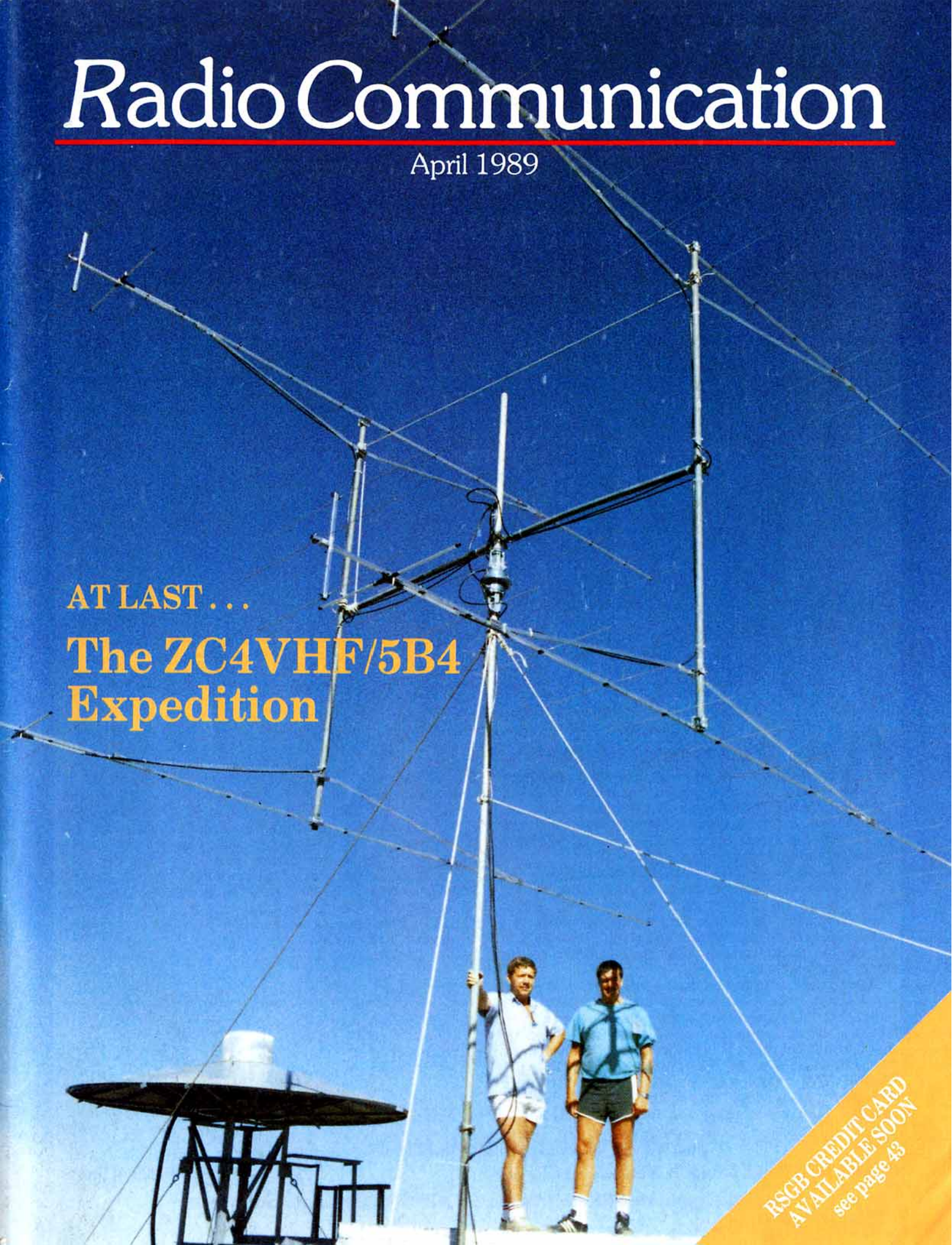
Radio Communication

April 1989



AT LAST . . .

The ZC4VHF/5B4 Expedition

KENWOOD

TS-680S — Performance plus

Plus what? Well, as avid ad. watchers will realise, the TS-680S bears a truly remarkable resemblance to the successful TS-140S, as indeed it should, because they are basically the same animal under the skin, and that is why the TS-680S has all the performance of the TS-140S plus the added feature of the 6 metre band.

Kenwood seem to have timed the introduction of the TS-680S extremely well because reports indicate that we are on the run up to a splendid sunspot cycle, and under those conditions six metres is an amazing band. The potential for DX on six metres is really high, and chatting "across the pond" is like a cross town net on an otherwise silent band.

My original comments on the TS-140S concentrated on its value for money, and in this respect the TS-140S represents the perfect balance between performance, features, and price. For the man who wants to extend his amateur radio horizons that bit further, the TS-680S does this admirably. The TS-140S currently costs £862; the TS-680S £985. I'll let you decide whether six metres appeals to you enough to warrant the difference. It's certainly more cost effective than adding a transverter.

As always, a comprehensive colour brochure is available from us, which gives full details of both the TS-140S and TS-680S. If you want to have "hands-on" experience, the managers of our branches around the country will be delighted to assist, as will any of the appointed Kenwood dealers. For the record, the only appointed dealer in London (apart from our own branch at Eastcote) is Radio Shack, in Broadhurst Gardens. Anyone else offering you Kenwood equipment in London has no connection at all with the UK sales and service network for Kenwood.

TS-680S £985 inc vat

LOWE ELECTRONICS LTD.

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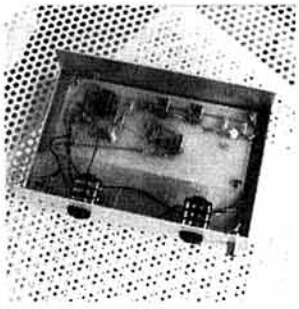
Radio Communication

VOLUME 65 No 4 APRIL 1989

CONTENTS

Impressive 144MHz antenna array used during the ZC4VHF/5B4 expedition.

DTI announces sponsorship of the Young Amateur of the Year award for the 2nd year running. See page 9.



Convert your RC14 for 80m. See page 39.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded 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 secretary, from whom full details of Society services may also be obtained.

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Affiliated club or society/registered group (UK): £20.50 (including *Radio Communication*): **£12.30** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)
Membership application forms available from RSGB HQ

RSGB PRESENCE AT MORE RALLIES

The RSGB intends to be present at every future rally, and yet make savings in the process.

A few years ago, when amateur radio was still growing, the Society's HQ staff attended a rally almost every weekend. The reason was to bring the Membership Services Department to the grassroots and provide members with a face-to-face service. The cost of this exercise was, however, high. Staff who attended had to be both knowledgeable and able – and because these same skills were required at headquarters, giving them time off in lieu was almost impossible to arrange.

HQ attendance at rallies is far from cheap; in addition to the fixed costs of transport and overnight accomodation, the cost of supporting an average of two members of staff, each claiming around 20 hours overtime, had to be borne by the Society. These costs were not offset by the sale of books and enrolment of new members. In the past, this was an implicit cost which Council was prepared to pay for obvious public relations benefits.

Nowadays, amateur radio is fairly static and the Society must look very closely at its costs while still maintaining – if not improving – its image at local level. It's become apparent that many of the larger traders are now attending fewer rallies, and in some cases none at all. In the light of these prevailing circumstances, the Society has been reviewing its policy for rally attendance.

During the past two years we have seen the introduction and establishment of the RSGB Liaison Officer (RLO) Scheme. Its aim is to provide members with a more local access to the Society. Now that the scheme is under way and RLOs are begining to make their presence known locally, it makes sense to build upon the scheme by inviting RLOs to attend rallies in their official capacity as representatives of the RSGB. This has a number of advantages. It will:

*enhance the image and status of the RLOs
*provide them with a definite and clearly perceived role at rallies
*permit RSGB to be represented officially at all UK rallies by spreading the workload between over 60 people instead of just two or three members of HQ staff – something which has not been possible in the past.

It is unlikely that any RLO will be invited to attend more than one or two rallies in their area. Consequently it is more likely that all rallies can be covered in a given year. In the past, RSGB has been forced to decline offers of stand space at rallies simply because there were no members of staff available on the particular weekend in question.

Clearly, if RLOs are to attend rallies they will need some supporting material. They will continue to receive a complimentary copy of the latest callbook which now contains much of the standard reference material used by HQ Membership Services staff. In addition, the briefing notes sent to RLOs on their appointment will be revised substantially to give them detailed advice on how to handle specific queries.

A new feature will be the introduction of a system whereby the RLO can take money for new and renewed membership subscriptions, RSGB Newsletter subscriptions, and to take orders for books or products not actually available on the bookstand. Such a system will inevitably involve the RLO in handling members' money and, in order to safeguard the RLO and the customer while satisfying the Society and its auditors, the systems will have to be tightly controlled and use proper

THE WIRELESS TELGRAPHY ACTS 1949 and 1967

The DTI has recently published a list of prosecutions concluded in the courts and warning letters issued during 1988.

Categories	Persons Prosecuted	Persons Convicted	Total Fines (£)	Forfeitures	Warning Letters
CB AM	59	59	4770	57	92
CB FM	47	47	4009	15	589
Unlicensed Broadcasters	117	111	50070	80	7
Cordless Telephones	6	6	1000	6	73
PMR	15	15	4280	6	104
Amateur	5	5	2800	4	2
Marine	2	2	200	–	91
6.6MHz	5	5	1900	4	–
Others	14	14	5200	2	7
TOTAL	270	264	74229	174	965

accounting procedures. Consequently, this facility will only be made available for specific occasions such as rallies.

The Society will not be asking RLOs to organise and staff a bookstand, since this would overload them to the extent that it could prevent them from providing proper attention to queries and memberships. The Society will, however, be encouraging rally organisers to approach local clubs with a view to running a bookstand, with the RLO on hand to handle the queries. Books will be offered to the club on the usual sale-or-return basis. If the club orders realistic numbers of books for the event, it should be able to recover any expenses from the profits.

HQ staff will still, of course, attend some events during the year. The Society already organises a number of conventions which will continue to have a comprehensive RSGB Bookstand and Membership Services counter. HQ staff will also attend the RSGB's traditional mobile rally at Woburn, as well as the Leicester Amateur Radio Show. In addition to these commitments, HQ staff will be in attendance at one 'guest' rally which will change from year to year. This year it was the Trafford Rally held at the G-Mex Centre in Manchester last month.

HQ staff will be present at the following remaining rallies this year:

16 April	RSGB VHF Convention
25 June	Longleat Rally (since there is no Welsh Convention)
29/30 July	RSGB Data Symposium/ AMSAT UK Colloquium
6 August	RSGB (Woburn) Mobile Rally
September	RSGB HF Convention
September	Scottish Convention
October	Leicester Amateur Radio Show

VHF COMMITTEE VACANCY – *VHF Frequency Registrar*

The VHF Committee is planning to operate a register of VHF frequency usage as an aid to the management of the VHF spectrum. The committee is looking for a volunteer willing to take on the post of VHF Frequency Registrar. Detailed guidance will be given to the Registrar by the VHF Committee as it develops its frequency registration project.

The registrar's duty is to maintain a database of usage on the 50, 70, 144 and 432MHz bands. This will be done, in the main, by recording information supplied by groups of amateurs for information from the database. The registrar may also be expected to advise individual amateurs on the availability of particular frequencies for particular purposes. The registrar should be familiar with current patterns of usage of those parts of the VHF spectrum allocated to amateurs, and with the current bandplans.

The registrar should have regular access to a suitable computer system on which to keep the register, and should be familiar with database techniques. Familiarity with a database package such as Ashton-Tate's dBase III is desirable. The registrar will be required to liaise with RSGB headquarters to ensure that an up-to-date copy of the register is also maintained at headquarters.

The frequency registrar will become a full member of the VHF Committee, and would be expected to attend meetings of the committee. The committee meets about five times a year in central London, and out-of-pocket expenses for attendance at meetings are met by the Society. If you are interested in the post, please write to the committee's chairman, Malcolm Appleby G3ZNU, Willowbank, Chapel Road, Otley, Ipswich IP6 9NX. Please include a brief outline of your amateur radio activities, and indicate what expertise you have in database programming.

WANTED – *Regional Co-ordinator for South-east England to join the Repeater Management Group*

The person appointed should have an active interest in repeaters and live within the area which includes Bedfordshire, South Cambridgeshire, Hertfordshire, Suffolk, Greater London, West Sussex, East Sussex, Kent, Essex, and Surrey. The main commitments are attendance at approximately six RMG meetings per year usually held in London and the vetting and processing of repeater proposals and site changes. Please apply in writing, within one month of publication of this advert, to the Chairman of RMG, G4AFJ, QTHR.

BOUNCED CHEQUES

Like so many other businesses the Society receives cheques which when presented to the bank are returned "REFER TO DRAWER". The bank is now charging the Society £5 for every 'bounced' cheque. The Finance & Staff Committee considers that this charge, on top of existing administrative costs, should not be borne by the Society. It has therefore been decided that in future the £5 will be passed on to the member concerned by adding it to his outstanding liability.

YOUNG AMATEUR OF THE YEAR 1989

Britain is suffering from a serious shortage of skilled engineers, and national media have already exposed the consequent plight of the British electronics and manufacturing industries. There is no single, simple solution, but the RSGB believes that it holds a vital key in its Project Y.E.A.R initiative. Already, plans for Project Y.E.A.R have attracted serious attention from senior company managers who clearly appreciate the scheme's long term potential.

The DTI's determination to encourage young people to choose Industry as a career is strengthening day by day, and we are particularly gratified to learn that special encouragement for budding electronic wizards of the nineties comes in sponsorship of the 'Young Amateur of the Year Award' for the second year running. The Society appreciates this gesture, which it sees as a vote of confidence in our work in this area. Full details of the 1989 Award are published on page 9 of this issue.

Council wishes to emphasise that this excellent scheme deserves maximum support from everyone, and implores every one of you reading this to propose a suitable candidate or, if you are young and keen enough, even to send in a personal application.

Every entry will be considered seriously and tabled before a panel comprising 'judges' from the DTI and the RSGB. They will take into consideration factors such as age, ability and accomplishment. Perhaps we may see a YL capture the limelight this year!

A NEW BENEFIT TO RSGB MEMBERS

From time to time the RSGB is able to secure a new major benefit for its members. Another one is imminent, and you will find an announcement on page 43 of this issue. It is a direct result of an agreement recently concluded by the Society's Council.

What we are offering is a credit card which can be used just like any other credit card in the marketplace. But unlike almost every other credit card available today, the RSGB's affinity card offers interest rates lower than you would normally expect. At an APR of 19.6% (for a single annual payment of £6) the RSGB affinity card is amongst the lowest available in the UK today.

To avert any confusion, the RSGB credit card is not just for purchasing RSGB products; it can buy anything from petrol to an airline ticket, or indeed even a new rig. With finance at 19.6% APR you would probably have to go a long way to find a better deal.

As the Society believes that every member should examine this new benefit in detail, we will shortly be writing to you with full information. The Society believes that this new benefit is well worthy of your consideration, especially as it is backed by MasterCard.

This new card is but one of a range of exciting benefits offered by the RSGB to its members; do not miss the brief outline which appears on page 43. *David Evans, G3OUF*

NEWS & REPORTS

Last month heralded the birth of a new look to RadCom and many of you have already written to say how much you liked it. However, one or two of you seem to be little confused about where some of the regular items had moved to, so it's appropriate to explain what's happened.

First of all, we brought all the month's news - including some of the items which used to appear in the 'band' columns, such as awards - to the front of the journal, in a compact new typeface from our desk-top publishing equipment. It is now set in four columns in order to give greater flexibility.

We've introduced a new column 'World News Brief', with short snippets of international news which will be of interest to our UK and overseas readers alike.

We drew the Society news and information (Society Affairs) into one prominent, easily locatable section.

We isolated the band reports - HF through to microwaves, and SWL - and placed them in the new 'Spectrum Analysis' section.

The 'Events Diary' moved to a new slot at the back of RadCom. In fact, about the only section of RadCom to remain untouched was the central technical and constructional features, introduced as always by Technical Topics.

The look of RadCom took a big step forward, thanks to the skills of our newly appointed designer, Linda Penny. This is only the start, of course; by next month we should have every bit of type back into conventional, professional typefaces, without any sacrifice to topicality.

Having taken this first step, other production and policy changes are lined up. This month, for instance, Norman Fitch, G3FPK, takes over the responsibility for providing our VHF/UHF band reports, and in time for the May issue another new face will join the editorial team at HQ. (We offer our thanks to Ken Willis for his contributions over the past several years.) When the dust has settled, we can get down to the job of improving and expanding the core of RadCom - its technical and constructional features.

Such a radical shake-up doesn't happen easily, and critics are far from few. I am confident, however, that all of these moves will bring to the RSGB an easily digestable magazine, which is more representative of the needs of its silent majority.

Trevor Preece, G3TRP - **Editor**

Massive Opening at 50MHz

Several UK stations had contacts with Japan and Hong Kong in the course of two 50MHz openings on the weekend of 25/26 February. Some of the JA stations were extremely strong although best beam headings to copy them were between 40 and 70° off the expected Great Circle bearing.

An initial report on who worked what appears in 'Spectrum Analysis'.

The 50MHz band has also been open to parts of Africa on almost a daily basis in the course of the last month, and many UK stations have worked exotica such as TR8 and J52. GJ4ICD has now worked 38 countries on 50MHz. As this report went to press there had been a number of reports of stations in Finland and Norway having 50MHz QSOs with VK6 and VK8, and there was an opening between Greece and South America on 7 March.

Still on the subject of propagation, after a very large solar flare on 6 March it was initially thought that there would be chance of a good chance of a good auroral opening, but in the event nothing materialised apart from a few weak Scotsmen on 144MHz on the evening of 8 March.

In a separate development, 25 Swedish stations have been granted 50MHz permits. Each permit-holder has been given permission to use one of three power levels, depending on his or her distance from a Band 1 TV transmitter, although the band can only be used outside TV hours. It's understood that the permits are valid until the end of the year.

Final thought - watch your ERP. Remember that 50MHz is still an ERP-limited band and any instances of interference to other users is likely to cause its withdrawal. There are currently one or two Clever Dicks who have bought amplifiers capable of running more than legal power. Everyone knows who they are, so if the band is lost because of their activities we'll all know who to kick. Please use the ERPogram and remember that you MUST NOT run more than 20dBW (100W) ERP on sideband.

Full Transfer of 18 and 24MHz Delayed

During January 1989 the Society approached the Department of Trade and Industry with regard to the full release of the **18 and 24MHz bands** to the amateur service in the UK.

It was agreed at the World Administrative Radio Conference in 1979 that the transfer of services would take place nominally on 1 July 1989, but with the caveat that this was subject to "...the completion of the satisfactory transfer of all assignments to fixed and mobile services operating in (these) bands and recorded in the (International) Master Register in accordance with the procedure described in (ITU) Resolution 8".

In late February, the Society learned from the DTI that the IFRB (International Frequency Registration Board) in Geneva is having difficulties in providing replacement frequencies for existing services. Apparently the IFRB intends to send a circular to all administrations (including the DTI in the UK) to explain the problems and to propose a new transfer date in 1992.

Such information will no doubt be disappointing to the many avid users of these bands within the UK but this matter is quite outside the control of the RSGB - and indeed the DTI. When we have any more news we'll report it in these pages.

75th Anniversary lottery prizewinner Sally Gook, with her husband (left), being presented with the key to her new Ford Escort car by Sir Richard Davies, KCVO, G2XM — see page 45 for full story and pictures.

CEPT Operation –

Advice to members

The new amateur licence permits UK amateurs to operate in certain European countries under CEPT agreement TR61-01.

When operating in another country it's essential to abide by the terms of the host country's licence and also by the terms of your own licence where it's more restrictive. For example, the UK licence permits operation in the 50MHz band - but if there is no 50MHz allocation in the host country, you may not operate in that band. Conversely, if the host country permits the use of powers up to, say, 1kW, you may not operate at that power level since the UK licence restricts you to a lower power level.

Although the RSGB would like to be able to hold stocks of CEPT countries' licence conditions in order to send these to members who require the information, it would be almost impossible to keep up to date with every licence amendment in every country. If licence conditions were held at HQ, each document would have to carry the rider "Please check with the local PTT that these conditions are current." This would defeat the object of such a service and, at worst, might mislead members into believing they were operating under the host country's licence conditions when in fact they were not.

The Society feels that, in the interests of accuracy, members must write to the appropriate licensing authority to obtain the latest information. The Society can provide members with the addresses of overseas licensing authorities and a full list is also included in the 1989 edition of the RSGB Callbook.

Andy, G0JXM, gave an illustrated talk and demonstration on the industrial uses of RF and induction heating to members of the Cheltenham ARS, recently. The photograph (above) shows Andy holding a water-cooled RF power triode which has an output of 166kW at frequencies up to 30MHz. Some members of the club were entertaining thoughts of using the valve in a linear amplifier until Andy pointed out that it need 4kW to drive it and costs in the region of £3,000. Oh well, back to the drawing board....

Christmas Quiz - The Winners

Well, by the closing date we'd received about 30 replies to the Christmas Quiz - including one grumpy gentleman who commented that since the questions were so hard he'd have expected nothing less than a car as the first prize! Hmm - what happened to self-training...?

Anyway, no-one got all the answers correct but one entrant only had one missing and wins the star prize. Step forward Graham T Barrell, G3TKQ, of Wymondham, Norfolk - well done, Sir.

Runner-up was Roger Blackwell, G4PMK, of Leeds and in third place came the Shardlow family, Martin & Jenny from Derby.

Well done, all, and your prizes will shortly be in the post.

Once again this year we received an entry from Petr Doudera, OK1CZ, who did extremely well - could *you* answer a moderately difficult quiz in Slovak? We've awarded Petr a special prize for 'Best DX' entrant.

We're a touch short of space this month, so we'll have to hold the answers over until next month.

Meteorology and All That

We had intended to run another item by Anglia TV weatherman Jim Bacon this month - this time on Sporadic E. Unfortunately Jim's wife has been in hospital and he's been a trifle busy so hopefully we'll be able to run it next month: we're sure you'll all join us in sending Mrs Jim our best wishes.

Talking about Jim reminds us of a very interesting forthcoming meeting. Weather can plays a large part in radio propagation, and indeed radio plays quite a large part in meteorology in one way or another, both in research and day-to-day operations. In order to cross the common ground between the two disciplines, the Royal Meteorological Society and the RSGB have decided to hold a joint meeting on the subject of 'Radio and Meteorology' on Saturday 28 October 1989. We very much hope that the subjects selected will appeal to a broad range of interests in the amateur radio community, and we're sure that you'll come away from it knowing a lot more about the weather than you did. You might even find that it'll give you a leg-up when it comes to the next 144MHz opening...

The meeting will take place at Imperial College, London and entry is free to members of the RSGB and the Royal Meteorological Society. However, non-members can attend on payment of a registration fee of £5.00 (£2.50 for students). Cheques should be made payable to 'The Royal Meteorological Society' and all bookings will be acknowledged with a map showing the location of the meeting.

If you are interested, you MUST reserve your place by writing to:

The Executive Secretary
Royal Meteorological Society
James Glaisher House
Grenville Place
BRACKNELL
Berks RG12 1BX

...enclosing a stamped addressed envelope.

The lecture theatre can only hold a finite number, so book early to avoid disappointment - it'll be strictly 'first come, first served'.

Schedule of the meeting:

0930-1000	- Arrival and registration
1000-1015	- Chairman's introduction
1015-1045	- 'Radio transmission of weather data' Martin Stubbs (Met Office)
1045-1115	- 'Radio-sonde - how it works and what it measures' Richard Pettifer (Vaisala UK - provisional)
1115-1145	- COFFEE
1145-1215	- 'Satellite picture reception at home' Henry Neale, G3REH (Remote Imaging Group)
1215-1245	- 'Thunderstorm location by radio' Dr Tony Lee (Met Office)
1245-1415	- LUNCH
1415-1445	- 'The Chilbolton Radar' John Goddard (Rutherford Appleton Laboratory)
1445-1515	- 'Please do not adjust your set - atmospheric ducting' Ray Flavell, G3LTP (RSGB Propagation Studies Committee)
1515-1545	- COFFEE
1545-1615	- 'Weather in the ionosphere?' Jim Bacon, G3YLA (Anglia Television)
1615-1645	- 'Observing auroras' Charlie Newton, G2FKZ (RSGB Propagation Studies Committee)
1645-1715	- Question-and-answer session
1715	- MEETING CLOSES

Second International Conference on Frequency Control and Syntheses

The Institution of Electrical Engineers is to host the 2nd International Conference on Frequency Control & Synthesis (FCS '89) at the University of Leicester between Monday 10 and Thursday 13 April.

The Chairman of the Organising Committee, Peter Chadwick, G3RZP, will open the proceedings at 2pm. Subjects to be covered include Oscillators, PLL Techniques, Synthesis, Atomic Standards, Quartz, and Applications.

Because the RSGB is an Associated Society, RSGB members may take advantage of the reduced registration fee of £250.00 instead of the full price of £325.00. Accommodation for the full period, including bed & breakfast, evening meal on Monday and Conference Dinner on Wednesday, can be booked at a cost of £80.00 and lunches can be booked at a cost of £7.50 per day. Registration forms are available from:

Conference Services
IEE
Savoy Place
London WC2R 0BL
tel: 01-240 1871 ext 222
telex: 261176 IEE LDN G
fax: 01-240 7735

If you are unable to obtain a registration form in time for the event, it may be possible to register on the day. However, it would be in your own interest to contact the Conference Services by telephone, especially if accommodation and lunches are required.

Incidentally, if you think that the RSGB Data Symposium/AMSAT-UK Colloquium is expensive at only £37.50/day, think again! That price includes overnight accommodation, all your meals, and registration for a very comprehensive programme of lectures.

See the advertisement elsewhere in this issue!

The European EMC Directive

By the time you read this the EMC directive will have passed through its final reading in the European Parliament. "What is the EMC Directive?" you may ask. The RSGB has said little about this Directive so far because many of the implications for Amateur Radio remain speculation and not fact. The EMC Directive is not a law, but purely a Directive. It directs the National Standards Bodies of the European Community (the BSI in the UK) to create common EMC standards and National Governments to enact legislation for EMC. The RSGB is already involved in the standards-making process, and it intends to be involved when legislation is drawn up. Some of the common standards have been agreed already, and the majority should have been set by the end of 1992.

If all goes to plan, most electronic equipment sold after 1 January 1992 will have to comply with an EMC standard and display a Community CE mark. So how might the Directive affect Radio Amateurs? The effects are bound to be slow to show because much non-standard equipment will remain in use for many years to come. However, once the standards are mandatory, we should see a reduction in the level of strange noises that plague our bands. Also, we should see less equipment collapse at the first sniff of RF from an Amateur Radio transmitter.

EMC standards will need to be applied to a few types of Amateur Radio equipment as well. EMC problems, however, rarely caused by Amateur Radio equipment. The RSGB is therefore taking steps to ensure that effort is not wasted on setting exacting standards to cure a non-existent problem. It was encouraging to note the following comments by the Commission in their final report to the Parliament: "The Council considered it necessary to provide for an exclusion from the scope of the Directive of radio equipment used for Radio Amateurs' activities as defined in the ITU Convention. They are subject to individual licensing by the competent authorities of their country who control compliance with disturbance requirements before delivering a licence. The Commission can accept this exclusion." More News on the Directive from the EMC Committee when the facts become available.

DTI Press Release . . .

On 6 March, the Department of Trade and Industry issued the following press release:


dti

PRESS NOTICE

"AWARD FOR YOUNG RADIO AMATEUR OF THE YEAR"

"The Department of Trade and Industry today announced its sponsorship on the Young Amateur of the Year Award for 1989's outstanding achievement by a young amateur radio enthusiast.

"Anyone who is under 18 and:

- is keen on DIY radio construction; or
- is interested in using radio and gaining operating skills; or
- is using radio for community service, such as helping the disabled or in emergency communication networks; or
- is good at encouraging interest in amateur radio; or
- is involved in amateur radio in any way, such as in a school scientific project,

is eligible for the 1989 Award and its £250 cash prize.

"The prize, for the most outstanding achievement between 1 April 1988 and 31 July 1989, will be awarded by the DTI and presented at the Radio Society of Great Britain's HF Convention in October.

"On top of the £250 prize, DTI will provide every genuine entrant with a copy of its coloured chart of radio frequency allocations in the UK. The winner will also get to see the DTI's radio experts at work at its Radio Monitoring Station at Baldock in Hertfordshire.

"Last year's Awards went to 15-year-old Andrew Keeble, from Norwich, for his enthusiasm in encouraging others' interests in radio, his radio construction skills, and voluntary activities. He was presented with his prize by HRH Prince Philip who is the patron of the RSGB.

"Andrew also got some surprise awards which were: a one-week training course at the College of Marine Electronics, sponsored by the Mobile Radio Users' Association; and engraved RC14 receiver given by the RSGB; and a week in Vienna as guest of OVSV, the Austrian national radio society.

"Closing date for applications is 31 July 1989. Entrants do not need to be a radio licence holder to enter and the competition is open to anyone in the UK, the Channel Islands, or the Isle of Man, who is under 18 on 31 July.

"Through its sponsorship of the Award, the DTI is encouraging young people tlo become involved with amateur radio which gives invaluable 'hands-on' experience for anyone considering a career in radio or electronics.

"It complements part of the RSGB's education and training initiative 'Project Y.E.A.R' which aims to introduce more people to the hobby, and the Department's Enterprise and Education Initiative which encourages young people to gain the skills, aptitudes, and abilities they will need for the world of work.

"Applications or nominations for the Award must be sent to:

The Secretary
Radio Sociaty of Great Britain
Lambda House
Cranborne Road
Potters Bar
Hertfordshire
EN6 3JE
Tel: Potters Bar (0707) 59015."

RSGB Response . . .

The Society is delighted to welcome the announcement by the Department of Trade and Industry on 6 March 1989 that they will once again be sponsoring the Young Amateur of the Year Award for the current year.

From the full text of their press release, reproduced here, it is clear that the DTI remains committed to the encouragement of young people in their pursuit of amateur radio as a hobby and as an invaluable aid to their possible future career prospects in the electronics industry.

This might be a good time for us all to give some thought to those young people who we feel may well qualify for this national award. We invite individual members and non-members alike to consider and discuss their likely candidates, with a view to selecting someone who would make a worthy successor to Andrew Keeble, G1XYE - who of course won the first Award during our 75th Anniversary year.

Similarly, groups and club committees are asked to consider the matter urgently and to encourage their members to put up a local candidate. Perhaps you might care to debate the possibility at your next meeting? Undoubtedly, there will be a valuable element of prestige to a club with the successful award winner - not to mention the local PR possibilities.

A PLAQUE FOR THE PROPOSER

In addition to the DTI presentation to the winner and the charts to be given to every entrant, the RSGB will take the greatest pleasure in presenting a commemorative plaque to the private individual or club which proposes the successful amateur. All of these presentations will be made at this year's RSGB HF Convention in October.

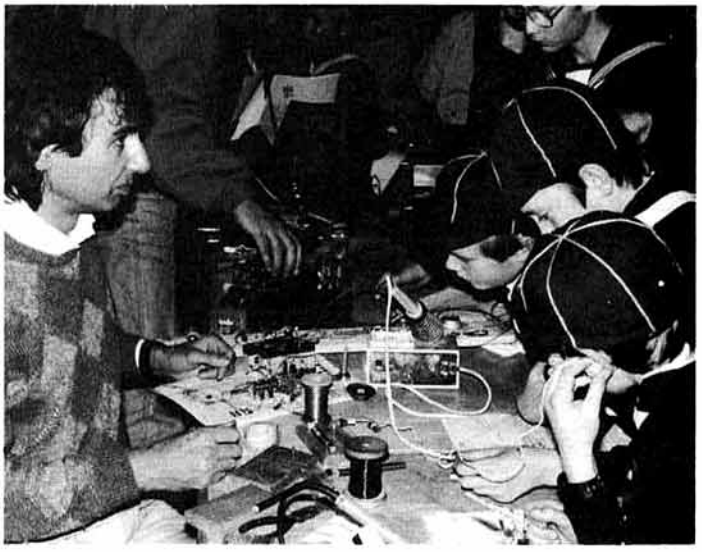
THANK YOU DTI

We are indebted to the DTI for its sponsorship of this Award. There is no doubt in the minds of Council that the DTI's practical support and enterprise has contributed significantly to the Society's programme for the enhancement of our hobby, and also to the development of the Project Y.E.A.R scheme. The DTI's 'official' involvement at the national level is opening doors that would otherwise prove difficult for a specialist Society such as ours.

HOW TO PUT UP YOUR CANDIDATE

We shall be publishing an entry form for the Award next month to help you formulate your proposal.

However, there is actually no need to wait for this if you wish to just drop a line right away to the Secretary at RSGB HQ giving the name, address and callsign (if any) of your nominee together with an outline of his or her special accomplishments.



Towards the future

It's been said many times - both in Radio Communication and many other societies' journals worldwide - that amateur radio needs to maintain steady and healthy growth if it is to stand any chance at all of protecting its precious frequency bands from other services and those intent on the commercial exploitation of the radio spectrum. Such growth needs to take place right across the board, with people of all ages - including the very young - adding to the mix and bringing a new dimension to the hobby.

A glance at the membership list of the average club shows that it is heavily loaded at the top end of the age range, with only one new member under 20 joining in the past few years. Take a look at your club's membership list and we bet you'll find a similar pattern. On a bigger scale, the RSGB - together with practically every other national society in the world - is in the same situation. In the RSGB's case there are only 200 members under the age of 18 - and it doesn't take too much thought to reach the conclusion that at this rate the radio amateur will be about as common as the Dodo in a few years' time.

How are we going to ensure that this hobby of ours flourishes and that we return to the image of amateurs as innovators? Well, the answer lies in the youth of today. Project Y.E.A.R has already inspired many radio club Chairmen and Youth Leaders to introduce amateur radio to youngsters in their particular areas; some with great success, others (unfortunately) finding that their efforts were in vain.

Beginners' can mean newcomers of any age and Project Y.E.A.R embraces this concept - which brings us to what this item is all about. As Chairman of the Verulam Amateur Radio Club at the time, Hilary Claytonsmith, G4JKS, welcomed the launch of the RSGB's Project Y.E.A.R, even though her aims for the Verulam Club had a slightly different slant from those of the Society. In the Verulam Club there is a steady influx of older members, some of whom are licensed. Recently, however, far more of them have been SWLs and complete newcomers, and the club is still faced with the problem of attracting youngsters to complete its age spectrum. So last year the Verulam ARC decided to promote amateur radio amongst the youth of St.Albans and surrounding areas. This is the story of what happened, told by Hilary, G4JKS....

"Like all other clubs, we have a hard core of very active and enthusiastic members who are the 'doers'. However, we also have an even larger number who can be relied upon to turn up on the night and help out. The 'doers' in this case were 100% behind the project. If this were not the case, making a success of the event would have been much more difficult.

"The planning began many months in advance of the October date and - working on the old saying "it's not what you know but who you know" - feelers were put out to the membership for them to come up with the names of youth leaders with whom they had personal contact. By the end of the week a list had been compiled which covered most of the local youth movements. Schools seemed the most obvious place to make contact with children and a list of local schools was compiled from which 25 targets were chosen. A publicity pack, containing material from the RSGB and the Club, including a first-class SAE and acceptance slip, was made up and dispatched to the youth leaders who had been contacted previously and had shown an interest. The pack was also sent to the Head of Physics at all of the selected schools.

"Within a few days the envelopes began to return and the numbers mounted. Originally we anticipated that about 15 to 25 children might attend; at the end of the following week some 60 children and 12 adults had indicated that they would be attending and we began to have doubts as to whether the Club QTH could accommodate such numbers. At this stage we had had no response whatsoever from the schools.

"The day before the event I had telephone calls from two youth leaders wanting to increase their head-count. One school had now responded - the only one with which I had had personal contact. This taught us two important lessons for future events - target the youth groups, since the youngsters there have already demonstrated a commitment, and use the personal approach where ever possible. Knowing the numbers expected, we could now plan the finer details of the evening.

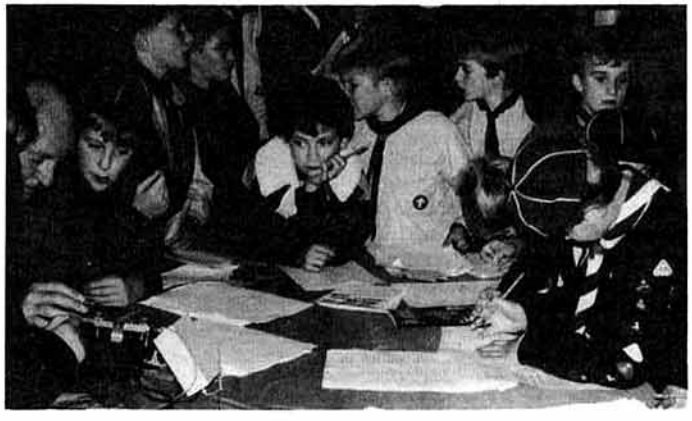
"Much thought was given to the layout of the room and the logistics of moving large numbers of youngsters around the exhibits and demonstrations which we had planned. Having two teachers involved helped a great deal in the running of the evening. Children are used to having their time structured, so the evening was divided into three sessions: 1) an introductory talk giving an outline of Project Y.E.A.R and an overview of amateur radio, with emphasis being placed on the ways in which radio amateurs have influenced advancements in the communications field 2) an hour looking around the various exhibits and demonstrations with some 'hands-on' experience, and 3) a question-and-answer session including collection of the questionnaires and answers to the quiz.

"We had originally intended to give each of the youngsters a crystal set to take away with them and club members had built 25 sets over the weeks before the event. However, with 82 youngsters present on the night the only way around the problem was to draw the first 25 names out of a hat. The whole evening was rounded off with fizzy drinks and crisps before everyone went home.

"Having had such an enthusiastic response, including a number of encouraging letters from youth leaders, we now had to keep up the momentum. Most of the youngsters had come from within a 30-mile radius so 'satellite groups' were set-up - monitored by the youth leaders and club contacts - to tackle some of the projects contained in the club's 'Novice Newsletter', which is published every two months (if anyone would like copies of the first two issues, please send a large stamped addressed envelope to G4JKS, QTHR). In addition, the club's informal evenings are open to any youngsters who would like to call in. In January we had nine of the youngsters return and I was quite satisfied with a response of more than 10% There are now two 14-year-olds, one 15-year-old and one 19-year-old who are members of the club. The two younger boys are hoping to take the RAE in May this year.

"By the time you read this we will already have held our second open evening, which featured a more detailed look at Packet radio and weather satellites as well as a video. As far as the long-term plans are concerned, if the junior membership increases to between 10 and 15 the basis for tuition for any 'student' licence will be there. We hope to tap the expertise of the older members by introducing an 'adoption' scheme so that the youngsters can gain first-hand experience 'at the knee', as it were. Older members can fire the youngsters of today with the same enthusiasm that they had in their youth but which they may have subsequently forgotten about!

"If Project Y.E.A.R is to succeed at the grass-roots level in clubs, public-spirited radio amateurs within those clubs must be prepared to train the amateurs of the future. Some of the fears expressed by a few RSGB members about lowering the standards of amateur radio can be alleviated by them taking an active part and providing good quality training themselves."



If Verulam ARC's story tells us anything at all it is that, with proper planning and specific targeting, clubs can play a very valuable part in the success of Project Y.E.A.R. As we've said many times before, the Society can only start the ball rolling and provide back-up in the form of publicity material, videos and a magazine aimed at youngsters. We can negotiate with the DTI and the electronics industry and all the rest of it - but the real future of amateur radio at the grass-roots level is in your hands! Will YOU take up the challenge?

Go for it!

Gilwell Park to Install £5,000 Amateur Radio Demonstration Station

The Gilwell Scout Amateur Radio Group has been a well-known fixture at Gilwell Park since the early 1970s operating most weekends under the callsigns G3WGP and G8WGP. More recently, the callsign GB2GP was issued as a permanent special event licence. In July last year the group disbanded and the shack closed.

In November, the Scout Association Committee of the Council accepted a proposal for a demonstration amateur station based at Gilwell Park. Before reaching the Committee of Council, the proposal had been agreed by the General Purposes and Finance Sub-Committees. The proposal was based on a paper submitted by the Estates & Property Manager who, amongst other things, is responsible for the operation of National Campsites including Gilwell Park.

Quoting from the minutes of the General Purposes Sub-Committee:

"The Estates & Property Manager presented a paper proposing that a new amateur radio station be opened at the Gilwell Park Camp Site. He stated that there was a definite need for a demonstration station and that a meeting had been held between the Camp Site Warden and his Senior Assistant, the Public Relations Officer, the Bursar of Gilwell, the Programme & Training Advisor (Activities), and himself to work out how this should be achieved. The proposal is as follows;

a) The station to be called the 'Gilwell Park Demonstration Amateur Radio Station'.

b) A Management Committee to be created consisting of the Warden, Senior Assistant Warden, Public Relations Officer, National Advisor for Amateur Radio (to be appointed) and two other Scout (non-staff) members. The Estates & Property Manager and the Programme & Training Advisor (Activities) to be ex-officio.

c) Station staff to be recruited on the same basis as Service Teams and, indeed, to be considered as members of the Gilwell Park Service Team. It is suggested that all members of the Service Team should wear a special sweatshirt or other identifying item and that the radio station staff do likewise.

d) Control of the activities of the radio station staff will be exercised by the Committee but with the Warden having final authority and responsibility.

e) That equipment be purchased at a cost of approx £5000, which might be reduced by sponsorship."

The initial funding of £5,000 is not simply to pay for equipment. It will have to cover other things such as building works (there will have to be a complete refurbishment of the existing wooden building) together with display facilities and other set-up costs. Because of these it is hoped that sponsorship can be found to help establish the HF and VHF stations.

In January, the shack was completely gutted and all the existing internal walls removed. There will be a large open-plan display area and two dedicated operating rooms situated where the old HF and RTTY rooms once stood. During major events such as JOTA, small operating booths will be created in the display area. There will also be a small kitchen for the provision of light refreshments. The overall intention is to make the new shack more accessible and 'airy' than its predecessor, and large exterior windows are being fitted so that passers by can see what's going on inside. Most of the building work should be complete by the time you read this and it is hoped that the shack will be fully operational in time for the Gilwell Park 70th Anniversary Celebrations in July.

The Scout Movement was one of the first to give its full blessing to the aims of Project Y.E.A.R and this recent development is a clear indication of its enthusiastic support.

(Thanks - Scout Radio Newsletter, February 1989)

IARU VHF/ Microwave Meeting

This month there is to be a meeting of specialist VHF and Microwave cognoscenti from IARU Region 1 (Europe, Africa, and the Near East) societies. RSGB will be represented by VHF Manager Keith Fisher, G3WSN, and Microwave Manager Dr Charles Suckling, G3WDG. Some of the many topics to be discussed include Beacon co-ordination, the 144MHz beacon band (both from RSGB), the 24GHz band plan, EME contests, peaceful coexistence on 430MHz and many others. The meeting will discuss items in depth and the result will be papers for consideration at the full triennnial conference next year. From that will come majority decisions - *made by representatives of member societies including our own.*

RAYNET NEWS

In the January issue of Radio Communication, a call was made for Raynet Zonal Representatives for Zones 1 and 6. Only one valid nomination for each zone was received by the closing date and, as a result, both nominees were elected unopposed for a three-year term of office.

The new Zonal Representatives are as follows:

Zone 1 (North East England) - Mr Alan Wallis, G4YMU

Zone 2 (South East England) - Mr John Witts, G6BBW

Leicester RS Supports Special Olympics

The 1989 Special Olympic will be held in Leicester between 18 and 26 August.

Special Olympics is the World's largest programme of sports training and athletic competition for mentally handicapped children and adults. Programmes are run by an international network of more than half-a-million volunteers who support every aspect of the Special Olympics cause, from fund-raising to coaching, and officiating at Special Olympic Games.

As a result of a fund-raising appeal, the Leicester Radio Society responded by donating £500 and committing itself to running a special event station during August, hopefully using the callsign GB2SOL (Special Olympics Leicester).

The photo above (courtesy of the Leicester Mercury) shows the Leicester RS Chairman Taff, G4ITP, handing over the cheque to Terry Harrison, Director of the Games, with Frank, G4PDZ looking on.

Communications for the Special Olympic Games will be in the capable hands of RAYNET.

Phone or Not Phone?

You may remember that the IARU Region 1 Bandplans were published in the February issue together with a note recommending that they should be followed at all times - even though they are not mandatory. However, members occasionally raise the question as to whether they should follow the bandplan or the licence.

The problem is that, although you may try to follow the bandplans to the letter (and that's very commendable), there are some apparent anomalies - especially with regard to the 18 and 24MHz bands. These arise because, although the bandplan shows 'phone' sections for these bands, the licence does not.

The problem with bandplans is that they need to cover all countries within the particular IARU region. However, each country's licensing administration can (and does) impose its own restrictions with regard to the modes which may be used on any particular band. In a nutshell, what this amounts to is that amateurs must adhere to the lowest common denominator. So although the bandplan permits 'phone' within the 18 and 24MHz bands, the UK licence only permits A1A (CW) operation. If you transmit using any other mode you will be in contravention of your licence, regardless of anything the IARU Region 1 bandplan has to say about it!

So what about the 10MHz band?

The problem with this band is that although the UK licence permits modes other than CW in this band, IARU considers it desirable to restrict operation to CW only, as recommended in the bandplan, because the band is only 50kHz wide.

It must be said that bandplans are *NOT* designed to restrict radio amateurs and their activities. Quite the contrary; they are designed to make the best possible use of the band space available to the amateur radio service within any given IARU Region. Your co-operation would be appreciated.

RSGB Secretary to Visit Aylesbury Vale Radio Society

The Aylesbury Vale Radio Society will welcome David Evans, G3OUF, Secretary of the RSGB to its meeting on 3 May in the Village Hall, Hardwick, near Aylesbury. The meeting will commence at 8pm and G3OUF will lead a discussion on the work of the RSGB. All are welcome to attend and details can be obtained from Martyn Jones, G4XZJ (QTHR).

The Squarebashers - Next Destination

The Squarebashers have de-classified their 1989 DXpedition plans. Eight splendid chaps and Mrs 'DAZ are off to CT3 (Madeira) for the Es season; Porto Santo will be their base and they'll be on HF, 50 and 144MHz, possibly with 70MHz crossband activity as well. 144MHz intentions involve 4 x 17-ele Tonnas courtesy of HB9CRQ and loads of power, so some EME ought to be possible. MS skeds will be taken, but only on the 144MHz VHF net. Alan Kelly of MET is providing the other antennas and BNOS is providing some of the power. Planned dates are 31 May-14 June. More on this next month - in the meantime, get your requests for leave into the boss as soon as you've got to the bottom of this page!

Scottish Tourist Board Expedition Group

In previous issues we've mentioned the Scottish Tourist Board Expedition Group, which was set up in conjunction with the Tourist Board to promote sites of interest around Scotland. The group has recently sent us a list of special event stations which will be active in the spring and summer.

April 29/30
GB2DWR - Distillers Whisky Route.
This is a repeat of last year's successful event with stations located at various famous distilleries. This particular station is located at Blair Athol Distillery in Pitlochry, Perthshire.

May 27/28
GB2RB - Robbie Burns.
Located at the Burns House Museum, Mauchline, Ayrshire.

June 24/25
GB2RBC - Royal Balmoral Castle.
Located at Balmoral Castle, Crathie, Aberdeenshire.

July 29/30
GB2NTS - National Trust Scotland.
GB2NTU - National Trust Ulster.
GB2NTW- National Trust Wales.
GB2NTE - National Trust England.
A series of four stations, one in each country, operating from a National Trust property. A special award will be available for UK/Eire stations who work three of the four sites or overseas stations who work two of the sites.

QSL cards or log extracts should be sent to PO Box 59, Hamilton, Scotland ML3 6QB. Certificate is free of charge but UK/Eire stations should send an 18p stamped addressed LABEL (NOT envelope) and overseas stations should send $1.00 US or equivalent for airmail postage.

August 26/27
GB2SSD - Scotland's Smallest Distillery Located at Edradour Distillery in Pitlochry, Perthshire.

The group will also be issuing two colour certificates, 'The Thistle Award' and 'The Supreme Tartan Banner Award'. Details of both awards will be given on the QSL cards issued by the group.

Further details can be obtained from either Paddy, GM3MTH (QSL Manager/ Co-ordinator) or Robbie, GM4UOG (Awards Manager), both QTHR or via the above PO Box address.

Inexpensive Software Speeds PCB Design

During his final year at Cambridge University, Lawrence Rao developed an inexpensive commercial software programme for the design of PCBs. The software - named 'Easy PC' - was launched in March 1988 to immediate acclaim and on 31 January this year won a 1989 British Design Council Award for its manufacturer Number One Systems of St.Ives, Cambs.

The 'Easy PC' programme will run on any IBM PC or equivalent computer and is used for the preparation of artwork for PCBs and drawing schematic circuit diagrams. It has three pull-down menus and provides a full 'WYSIWYG' (what you see is what you get) screen with tracks and pads drawn solid and to full width, complete with fixing holes and connectors. The user can define his or her own pad shapes and sizes, track widths and symbols. Editing of existing tracks is very simple. There is a choice of outputs, including camera-ready artwork from 9-pin or 24-pin dot matrix printers or, using optional drivers, to a pen or photo-plotter.

'Easy PC' costs £275, but if that's a bit too much for you there's a much slower version - the 'Tiny PC' - available for hobbyists and schools at a mere £95.

Further details can be obtained from Number One Systems Ltd, tel: 0480-61778.

DATASPACE '89

(incorporating RSGB Data Symposium & AMSAT-UK Colloquium)

As announced last month, these two popular events have been combined this year since many people wish to attend both.

The basic programme will be as follows:

FRIDAY 28 July
Registration at 10am.
Lectures predominantly on Data topics.

SATURDAY 29 July
Lectures on Data and Satellite orientated topics.

SUNDAY 30 July
Lectures predominantly on Satellite topics.

MONDAY 31 July
Satellites in Education Forum aimed at teachers, lecturers and other interested parties.

COSTS

ALL IN - £37.50 per person, per day, inc breakfast, lunch, dinner, tea & coffee and overnight accommodation in single student accomodation.

Luxury, on-suite accommodation will also be available at an extra cost of £15.00 per person, per night.

Other options, including day-only packages, are available. Further details and booking form can be obtained from:-

Ron Broadbent, G3AAJ, AMSAT-UK, London E12 5EQ

or from:

RSGB Headquarters, Lambda House, Cranborne Road, Potters Bar, EN6 3JW

...marking your envelope "DATASPACE '89".

Overseas parties should contact G3AAJ for transport arrangements from UK ports/airports.

TRADERS/GROUPS:

Satellite and Data orientated traders will be invited to attend. Satellite or Data clubs and groups who wish to have display/demonstration space should contact Ron Broadbent at the above address as soon as possible since the number of spaces available is limited.

LECTURERS:

Prospective lecturers/authors on either data or satellite topics MUST submit a synopsis of not more than 200 words by 15 May 1989 (papers must be submitted by 15 June) to:

SPACE/SATELLITE TOPICS
Dr Martin Sweeting, G3YJO, UoSAT Engineering Unit, Electronics Dept, University of Surrey, Guildford, Surrey, GU1 3XB, England.

DATA TOPICS
Mike Dennison, G3XDV, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts, EN6 3JE, England.

These may be sent either in writing or on disk (ASCII).

All papers taken up for presentation become the property of the joint organisers and will be available for sale at the event.

BARTG News

The British Amateur Radio Teledata Group celebrates its 30th anniversary this year. BARTG has come a long way since its inception in 1959, when a few enthusiasts got together to form a self-help group with the aim of bringing teleprinters into amateur use. During the intervening years the use of microcomputers in the shack has spread steadily, initially as a replacement for teleprinters and latterly in their own right to provide AMTOR and packet communications. These two relatively new modes are now commonplace in the HF and VHF bands and, since changing its name recently, BARTG aims to cater for the whole span of data orientated amateur radio communication, taking in mechanical RTTY right through the spectrum to packet radio and beyond.

BARTG hopes to mark this important milestone in its history with a number of appropriate souvenir items.

Information regarding membership of BARTG can be obtained from:

Mrs Pat Beedie, GW6MOJ
'Ffynnonlas'
Salem
Llandeilo
Dyfed A19 7NP
tel: 0558-822286

New Competition

Since the Christmas Quiz seemed to go down like the proverbial lead balloon, we thought we'd try something a bit easier in the competitions department. With effect from this month, we're looking for photographs of your shack - but by 'shack' we mean a real shack, not a row of gleaming commercial transceivers and linears with some tasty wallpaper behind them and a Habitat coffee cup next to the key. No, folks - we want to find the "Most Shambolic Shack in Britain". Preferably it should be possible to see something remotely resembling a transmitter or receiver in there somewhere, but it ought to be at least three layers down. There should be piles of magazines in strategic places, and high marks will be awarded for well-developed cobwebs.

Entries featuring other than threadbare carpet on the floor will be regarded with disfavour. In other words we want to find some real "shacks", if you catch our drift.

The closing date will be *1 August 1989*, which means that you've plenty of time to root out those old pics of how your shack used to be in the good old days. A prize will be awarded for the "Most Shambolic Shack in Britain", and the three leading entries will be featured in the Radio Communication.

The Ultimate Mobile?

Back in April 1988 we published a pic of a rather intriguing-looking mobile station dating from around 1938, and we ventured to say some words to the effect that this was quite the most spectacular variety of / M we'd ever seen. We should have known better...take a look at the pic reproduced here. This extraordinary device is (or was - see later) owned and operated by Paul Godolphin, G4XTA, who writes:

"The Reliant three-wheeler (seen here atop Shap Summit, about 2,000ft ASL) contains a Yaesu FT480R 144MHz transceiver and Microwave Modules 100W amplifier. The battery fitted to it is from a Ford Granada, and the alternator from a Triumph 2000. The mast is based on a 20' three-section telescopic portable and can be rotated from a handle inside, where it's nice and warm.

"The antenna is a Jaybeam 8-ele crossed Yagi, fed by coax running inside the mast. Bearings have been installed in the roof and floor, the latter between the front seat.

"Although the car can be driven with the mast extended with no effect on stability, the mast telescopes down on to roof rests for high-speed work (!)

"DX worked with this system includes an SSB contact with CT1BZT in Lisbon whilst driving south on the A6 near Penrith. This is a distance of about 2250km and it has been suggested that this is the current British 144MHz record for a mobile. Switch to vertical polarisation and it's easy to get into repeaters several hundred miles away.

"Readers will no doubt be interested to know that the vehicle has been certified fully roadworthy and in compliance with the 'Construction and Use of Vehicles' Regulations by a police-appointed company of consultant vehicle examiners.

"Sadly, the vehicle has met with two accidents since conversion. In the first case the driver, intent on a good DX opening, drove off late for work and forgot that the antenna was extended until hitting a tree branch at about 60mph. The resulting mess was quite spectacular.

"Finally, and terminally, the 'DX-mobile' ended its days in a pall of smoke on the motorway when it overheated and caught fire on a trip to Scotland. It is sorely missed, not least by my wife Rosemarie, who used it to dry the washing..."

Well, what can we say? Anyone else got any exotic mobile stations they'd like to show us?

Raising Funds for Amateur Radio Clubs

We saw an interesting item in a recent edition of the Wolverhampton Express & Star which highlighted the plight of a local amateur radio club.

The West Bromwich Central Radio Club was seeking funds to help pay for badly needed new equipment to replace the ageing equipment in the shack. Half of the target figure of £1000 was obtained by a grant from Sandwell Council and the club's Chairman John Bates, G0BZP, set about contacting local businesses to see if he could obtain sponsorship in raising the balance. Unfortunately, this course of action was not too successful with only another £45 being raised but it was worth a try. In the end, the club decided to purchase a good second-hand FT101ZD.

Like us, you might be wondering how the club obtained a grant of £500 from the local council - nice one, chaps; can anyone have a go? We spoke to John Bates about this and it appears that 'Inner Area Grants' may be awarded to youth organisation to fund activities and since the West Bromwich Central Radio Club is registered as a youth organisation, an application was made. The club gave details of the RSGB's Project Y.E.A.R and outlined its own plans to encourage youngsters into the hobby by running demonstration stations and giving talks to local youth groups and schools. There are already a few youngsters who are members of the club and it seems that if there had been a higher percentage at the time the application was made, the full target of £1000 may well have been awarded.

During Spring and Summer this year, the Fareham & DARC will be running the special event station GB4HMS on Board HMS Warrior 1860. The station will be active in the HF and VHF bands during most weekends and, since the ship is open to the public, the emphasis will be on phone transmissions. HMS Warrior 1860 is a three-masted square-rigged sailing ship which is also fitted with a twin-cylinder steam engine. It was launched in December 1860 at a time when war with France seemed inevitable. Today, after eight years of restoration costing over £7m, HMS Warrior 1860 is on display and is berthed just inside the Victory Gate in the Heritage area of Portsmouth's historic naval base. It is open every day from 10.30am to 5.30pm between March and October. The Fareham & DARC would like to thank Portsmouth City Council and South Midlands Communications Ltd for their sponsorship in the fields of publicity and equipment. Further information on the event can be obtained from:

Rodney Smith, G0ERS
59 High Street
Southwick
Fareham
Hants PO17 6EF
Tel: 0705 373572 (after 6pm)

International Marconi Day

Following the tremendous success of last year's world-wide event, the Cornwall Radio Amateur Club is pleased to announce that this year's International Marconi Day will be held on Saturday 22 April for 24 hours between 00.01 UTC and 23.59 UTC.

The stations participating in this year's programme will be the same as last year's with one additional station, located on the Isle of Wight. All of the stations involved have a direct connection with Marconi or are operating from sites which were used by Marconi or his associates during his early radio experiments. The stations are as follows:

K1VV/IMD - from the Cape Cod area where the first Europe/USA contact was made.
VE1IMD - from the Marconi site in Nova Scotia (a new museum will opened there later this year.
VO1IMD - from St.Johns, Newfoundland where the first trans-Atlantic contact was made.
EI2IMD - from a site close to that where the first Irish experiments took place.
IY4FGM - from the official Marconi club station in Italy.
GB0IMD - from the area on the Isle of Wight where experimental transmissions were made by Marconi and his colleagues.
GB4IMD - the Cornish RAC's own station located at the original Marconi site at Poldhu Cove on the Lizard peninsular.

Operations are likely to take place in the following parts of the bands:

80m band:	3770 - 3780kHz (SSB)
40m band:	7070 - 7080kHz (SSB)
20m band:	14.260 - 14.280MHz (SSB)
15m band:	21.360 - 21.380MHz (SSB)
10m band:	28.360 - 28.380MHz (SSB), 28.760 - 28.780MHz (SSB), 29.360MHz (FM)
6m band:	50.260 - 50.280MHz (SSB)

Once again, the club will be offering the 'Marconi Award' for working 6 out of the 7 stations taking part. However, this year there will be an extra award for short wave listeners who have recorded at least 6 of the 7 stations, together with the stations being worked and the times (UTC) at which the contacts were heard.

The costs of the awards are as follows:

Licensed amateurs - £2.00 or (US)$5.00 or 10 IRCs
Short Wave Listeners - £1.50 or (US)$3.00 or 6 IRCs

QSL cards can be exchanged via the bureau or via the Cornish RAC. If you chose the latter, please enclose stamps or a small donation towards postage costs.

Applications for the award should be sent to:

CRAC
PO Box 100
Truro
Cornwall TR1 1RX
England

If you have any queries, further information can also be obtained from the above address.

GB75TOT

You may remember that in May last year, a group of amateurs from several of the West Midlands Clubs and British Telecom PLC operated the special event station GB75TOT as part of a Funday Sports Day to raise money for the Birmingham Children's Hospital. Recently we received a report from Stuart Granger, G4NSG, the GB75TOT Station Manager, in which he says that the event raised a sum of £1900 - much of which came from the generosity of Amateur Radio Clubs and Societies throughout the Midlands. The money has been put to good use in the purchase and maintenance of intravenous 'Kangaroo' pumps which are used predominantly for feeding very sick children who have had treatment for cancer and leukaemia.

RAOTA News

The Radio Amateur Old Timers' Association now has a new Hon.Secretary/ Treasurer, Mrs Sheila Gabriel, G3HCQ who has taken over from Mrs Sylvia Harvard, G4USN.

Membership of RAOTA is open to all licensed amateurs and short wave listeners who have been interested in amateur radio for more than 25 years. RAOTA holds regular nets under the control callsign of G2OT. These take place on the following days, local times and frequencies:

Wednesdays	1100 - 3765kHz SSB
Thursdays	1100 - 3765kHz SSB
	1400 - 3765kHz SSB
	1900 - 3765kHz SSB
Sundays	1100 - 3505.5kHz CW

Members and non-members are welcome to join the nets.

RAOTA also publishes the 'Old Timer's News' quarterly which is sent to all fully paid-up members, and an award certificate is available for contacting 50 RAOTA members.

Full details about RAOTA membership can be obtained from:-

Sheila Gabriel, G3HCQ
Millbrook House
3 Mill Drove
Bourne
Lincs. PE10 9BX

BYLARA — 10 Years Old

The British Young Ladies' Amateur Radio Association celebrates its 10th birthday this year with an Anniversary Get-together at the Drayton Manor Mobile Rally, Drayton Manor Park, Tamworth, Staffs on Sunday 14 May.

All BYLARA members are invited to attend and meet in person some of the people that they may only have spoken to over the air. There will be a BYLARA stand at the rally and members will have the opportunity of meeting up at around 2pm.

Further details about BYLARA can be obtained from the Secretary:

Alison Soars, G0ALI
84 Ridge Road
Kingswinford
West Midlands
DY6 9RG

For those who may not remember the T&R Bulletin (forerunner to Radio Communication), the September 1938 issue carried a report on the formation of the RAF Civilian Wireless Reserve following an announcement at the RSGB's 1938 Convention. There was considerable response to the announcement from the amateur fraternity, who were duly mobilised at the outbreak of hostilities. During the war they served with distinction in the RAF. Fifty years later, in September 1988, some of the survivors met for a reunion at the Roundel Restaurant at the RAF Museum, Hendon, to celebrate the Golden Jubilee. The photograph shows (left to right) Bob Roberts, G3CDY; Bob Udall, G2HKS; Derek Aston, G8DR; Les Gunnell, G8HB; Ernie Henman, G6HM; Bob Lever, G2DXU; Arthur Clements, G3AOJ; Brian Herbert, G2WI; Harry Tupling, G2HNN; Jack Byrne, G2AFD; Ron Hewson, G3RH; Bert Newman, G2FIX; Harold Fenton, G8GG; 'Buck' Buckstone, G5JR, and Sid Hall, G3BR. The splendid aircraft in the background is a Blackburn Beverley.

WAB News

On 26 May a group of WAB enthusiasts will be venturing into the bleak and barren lands of the Out Skerries, situated to the east of mainland Shetland. The party intends to operate in all bands from 160m to 70cm from a Coastguard look-out post on the Island of Housay (HU67), which now belongs to Colin, GM0AVR.

After departing from Aberdeen at 1800 GMT on Friday 26 May, the party will be involved in providing rarish QRA squares by transmitting from the deck of the P&O ferry St. Clare. The ferry will be passing through ZR, ZS, ZT and ZU squares. Permission has already been obtained from P&O and Steve, G1SGB, will commence the VHF activity by operating in the 144MHz band. Other members of the group will work their way through the HF bands. It should be noted that, although the group would like to operate in all bands from the ferry, it is impractical to attempt this on the one journey. Consequently the 50MHz and 70MHz bands will get a good airing on the return journey, approximately two weeks later. On arriving in Lerwick, the group will make a short dash to the second ferry terminal at Vidlin for the next part of the journey to the Island of Housay in the Out Skerries.

Once the 'land legs' have been regained - after around 17 hours at sea - the group will set about erecting the various antennas, some of which have been loaned by Randam Electronics of Abingdon, Oxon. With this task completed, the generators will be fired up and the action will commence.

During their stay on Housay, some of the members will venture out to the more remote and uninhabited islands. Transport will be by inflatable boat or helicopter, both of which have been organised by GM0AVR with the help of the Sullom Voe Oil Terminal folk. However, because of the risks involved these portable activities will be limited to one VHF band and HF.

On the Tuesday the group will leave Housay and return to the mainland of Shetland, where the decision to head north to Fetlar or south to Bressay will be made. On-air requests and preferences will be taken into account before the final decision is made. After two weeks of activity, the party will return to Lerwick on Saturday 9 June and board the St.Sunniva at 12 noon for the return trip to Aberdeen. On this part of the journey the ferry goes by a different route via the Orkneys. This means some activity from QRA squares YT and YS.

The callsigns to be used during this DXpedition will be GB1SI and GB4SI from the Coastguard post on Housay, with GM1WAB and GM4WAB causing pile-ups from the portable locations.

The Shetland Tourist Organisation has taken a very keen interest in this DX-pedition and have offered to provide special QSL cards relating to the islands, which should prove very collectable.

When the group has returned home and had time to relax, we hope to be able to bring you the full details of this DXpedition in a subsequent issue.

As a postscript, you may be interested to learn that the Shetland Archepelago consists of over 100 islands, of which only 15 are inhabited continuously. The 24,000 people who live on these islands are far outnumbered by 30,000 gannets, 140,000 guillemots, 250,000 puffins, 300,000 fulmars, and 330,000 sheep. The islands boast a coastline of over 900 miles, cover an area of 552 square miles, and are 200 miles north of Aberdeen. Finally - and perhaps the most surprising fact of all - the distance between London and Lerwick is the same as the distance between London and Milan.....

Overseas Bookholders Award

The 'Overseas Bookholders Award' has been generating a great deal of activity over the last couple of months. Dennis, GW6JNE has become the first to receive the award for working 10 overseas bookholders on 144MHz SSB. Endorsements are available for each additional 10 bookholders worked.

G4WZA/M has been activating squares for overseas WABers with so much success that he's been awarded the first WABEMA (WAB Expedition and Mobile Award) Basic on 28MHz SSB.

The 28MHz band has been very active WAB-wise with quite large nets being heard on 28.660MHz nominal, but often on 28.650MHz. Many US and Canadian stations can be heard working the UK around lunchtimes. All are welcome to join in the net, whether WABbers or not. However, you may be asked for your WAB area, so please have it ready just in case. The WAB area is based on the National Grid 10km squares (eg. TL10 or SU67).

Further information about the Worked All Britain Awards can be obtained from Brian Morris, G4KSQ (QTHR).

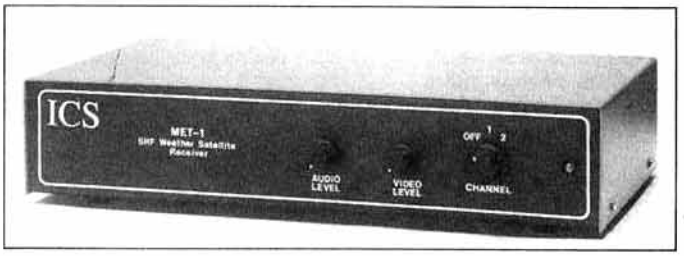
UK Amateur G3AYO Receives Icelandic Knighthood

Since 1970 Tony Welch (G3AYO, G3AYO/TF, F/G3AYO) has been Consultant Radio Engineer to the Icelandic Civil Aviation Administration (ICAA). During the course of his 70th trip to Iceland, on 14 February 1989, he was created a Knight of the Icelandic Order of the Falcon. He was invested by the President with the Knight's Cross of that Order for long and distinguished service to Iceland - particularly for the conception and development of an ATC radar system to promote safety for international air traffic traversing Icelandic airspace en-route from Europe and North America. During the course of his work for ICAA Tony has also been able to assist the Icelandic Foreign Office, the Coastguard, the PTT, and the Engineering Institute of the University of Iceland.

Amongst those present at a reception given by ICAA after the ceremony were many of Tony's old friends - Olafur Tomasson, Director General of Posts & Telegraphs, Stefan Arndal, TF3SA, Gulli Valdimarsson, TF3GV, and Saemundur, TF3UA. Stefan, TF3SA and his wife Rosa, were also among the guests at a dinner in the evening hosted by Petur Einarsson, Director General of ICCA.

G3AYO has held a Guest Licence in Iceland for many years and has a small station comprising of an FT77 and 33' doublet antenna established in Reykjavik. Unfortunately, with the events and celebrations during this visit there was no time available to get on the air, but Tony hopes to be working old friends using his TF suffix during his visit this month.

New WX Satellite RX System From ICS



ICS Electronics Ltd is pleased to announce a new low cost, high quality receiver, the MET-1, for use with the Meteosat satellite - currently in orbit above west Africa. It gives noise-free visible and infra-red pictures of Europe every half an hour with 24 hours per day coverage.

As well as providing a normal FAX audio signal output, the MET-1 incorporates its own AM demodulator with separate video output. This may be required by certain weather picture display systems. An audio monitor amplifier and loudspeaker are also built in so that signal quality can be monitored; a particularly useful feature when aligning the antenna.

Accompanying software and interfaces are available to run on the Commodore Amiga, Archimedes, IBM-PC and Atari computers. Suitable antennas and connecting cables are also available.

The MET-1 is made in the UK and is priced at £399.95 for the receiver and £119.95 for the matching preamplifier (inc VAT).

Further details can be obtained from:
ICS Electronics Ltd
Unit V
Rudford Industrial Estate
Arundel
West Sussex BN18 0BD
or by telephoning Alan Clemmetsen on tel: 024 365 655

AWARDS

NATIONAL

Birmingham Centenary Award

This year Birmingham celebrates 100 years of City status and the Midland Amateur Radio Society (MARS) will be joining in with the celebrations by offering the 'Century Award'.

The award - a specially designed certificate - will be available to any person who works either of the MARS HQ stations, callsigns G1MAR or G3MAR, plus any two special event stations and 100 amateur stations located within the city boundary (NOT to be confused with postcodes), using simplex only in any band and using any mode other than packet. Neither Raynet nor talk-in stations may be included.

Certificates may be endorsed for any special circumstance requested by the applicant, eg QRP, CW only etc. The award will run throughout 1989 and will also be available to short wave listeners.

In order to claim the award, prospective applicants must first send a stamped addressed envelope to:

Paul O'Connor, G1ZCY
100 Coldbath Road
Billesley
Birmingham B13 0AH

Paul will then send the necessary application and log forms in return. When these have been completed and verified they should be sent back to Paul with the fee of £2.00 (£1.50 for MARS members) and the certificate will be despatched. The closing date for completed applications is 1 April

Gloucester ARS Worked Members Award

The Gloucester ARS has launched an award scheme designed to encourage greater activity on the bands. Certificates will be awarded to successful applicants in three classes:

Class 1 - 15 points
Class 2 - 10 points
Class 3 - 5 points

Points are available for successful contact with any of the following; Gloucester ARS members - 1 point; Club stations G1AYM and/or G4AYM - 2 points; Special event stations run by the club or any of its members - 2 points. QSL cards are NOT required but applicants should send a log extract signed by another amateur. The award is available for contacts in all bands using all modes and is also available for SWLs who have heard contacts involving members of the club. The fee is £2.50 (payable to 'GARS') or 10 IRCs and applications should be made to:

GARS Awards
7 Bibury Road
Gloucester
England

INTERNATONAL

CQ WPX Award

The rules defining exactly what is meant by a prefix for the purpose of CQ Magazine contests and awards have been revised. The all-important Rule 3 now says that the letter/numeral combinations which form the first part of the amateur call will be considered the prefix. As examples of this K6, KK6, KK200, Y22, Y23, HG1, HG19, U3, GB75, ZS66 and NG84 are considered as prefixes. Any difference in the numbering shall constitute a separate prefix. Any prefix will be considered as legitimate if its use was licensed or permitted by the governing authority of the country of operation after 15 November 1945. In the case of portable operation in another country or call area, the portable designator would become the prefix - K6ZDL/7 would count as K7, J6/K6ZDL would be J6.Portable designators without numbers will be assigned zero at the end of the designator to form the prefix - LX/K6ZDL would thus be LX0. All calls without numbers (eg RAEM) will be given a 0 after the first two letters - in this case RAEM counts as RA0. Mobile or portable designators like /A, /P, /M do not count. In future only current prefixes will count for the WPX Honor Roll and a list of deleted prefixes will be published yearly and

LX10CE Award

This is being issued by the European Institutions Radio Amateurs Club to celebrate its 10th anniversaries, and also to mark the 10th anniversary of direct elections to the European Parliament. It is available to licensed amateurs and listeners and requires confirmed QSOs with each of the 12 EEC states during the calendar year 1989. These are ON, OZ, DL, F, SV, EI, I, LX, PA, CT, EA, and the UK. Send a certified list (the undermentioned can supply copies - SASE please) plus five IRCs (if applying from an EEC country) or 10 IRCs from elsewhere, to:

CARIE
LX10CE Award
PO Box 1776
L -1017
Luxembourg.

Applicants should also include a self-addressed, stiffened, A4 size envelope.

WORLD NEWS BRIEF

CHINA

Amateur radio expanding in China. Until recently, only club stations using BY prefixes were permitted. However, individual stations using BG prefixes, special event stations using BT prefixes and foreign operator stations using BW prefixes will soon be heard.

ISRAEL

Until recently, the Ministry of Communications has been adamant on the question of automatic phone patches for Israel Amateur Radio Club repeaters - 'no' . However, it's now understood that the Ministry has authorised auto-patches for IARC repeaters on condition that they be used for emergency numbers only - eg fire, police and first aid services. The IARC executive is currently ironing out the details and it is hoped that this new facility will become available soon.

About 18 months ago the Post Office in Israel issued a commemorative postage stamp honouring amateur radio. The Israel Amateur Radio Club purchased a number of first-day-cover envelopes, which bear a special cancellation with the IARC logo. There are still some of these available and readers can obtain them by sending 8 IRCs each, including air mail postage and packing,to IARC, PO Box 4099, Tel Aviv 61040.

POLAND

According to Polish regulations, foreign amateurs visiting the country may obtain a Polish amateur licence or permission to operate Polish club or individual stations.

The request (in duplicate) for such a licence or permission to operate should be addressed to the Polish licensing authority; Pjanstowowa Insekcja Radiowa, Glowny Inspektorat, Warszawa, Poland, and sent via the headquarters of the Polish Amateur Radio Society (PZK):

Polski Zwiazek Krotkofalowcow
Zarzad Glowny
PO Box 320
00-950 Warszawa 1
Poland.

In the request, you should include your full name, home callsign, home permanent address, proposed period of operation in Poland, exact address of the station on Polish territory (NO mobile operation is permitted), and the proposed input power, emission types and bands to be used. A photostat copy of your home licence or official certificate (validation document) should also be sent together with a 35mm x 50mm photograph of yourself.

If you intend to take your own equipment you should give the date and location of the frontier crossing. However, if you wish to operate the station of a Polish amateur you should give the address and callsign of the station and enclose a letter of agreement from the owner of the station. If the station is to be installed in an apartment, the owner's agreement must be attached.

All of the above documents and information should reach the proper Polish authorities at least **three months** before the intended visit and applications may be written in Polish, English, French, Spanish or Russian. There are no special application forms and the licence is sent to the applicant via PZK.

The licence itself is free of charge and there are two basic licence categories; 1, HF and VHF; 2, VHF only. Within each category there are 10, 50, 250 and 750watt classes.

SOUTH AFRICA

Starting in mid-April 1989, Marion Island will become active again after 10 years' silence. Peter Sykora, ZS6PT will spend 14 months on the island as the resident radio technician and member of a meteorological team. He has applied for the callsign ZS8MI (ZS8 is the new prefix for the island) and activity is planned in the HF and 6 metre bands, with the added possibility of some satellite operation.

USA

On 30 January, the FCC issued a news release which announced the opening of the new amateur 17 metre band (18.068 - 18.168MHz) at 0001Z (7.01pm EST) on 31 January. When 0001Z arrived there were wall-to-wall signals welcoming the US to the band. W1AW, the ARRL HQ station, worked 70 stations before closing down that evening.

The 17 metre band is one of three new HF bands allocated to the amateur service by the 1979 World Administrative Radio Conference (WARC). Although it does not become exclusive to US amateurs until 1 July 1989, the FCC said that the Dept of Defense *(sic)* was still utilising major portions of the 17m band and would continue to do so until 1 July. However, DoD had agreed to allow secondary use of the band by US amateurs, subject to immediate termination if interference is caused to Government operations.

The band is open to all General, Advanced and Extra class licensees with a maximum output power of 1.5kW and using modes as recommended in the IARU 18MHz bandplan. *TNX - The ARRL Letter.*

It's understood that Ron Paraise, WA4SIR, is expected to be the next US 'ham in space'. Ron will be taking part in the ASTRO-1 mission, scheduled for March 1990.

TALKING POINT

BANDPLANNING

We get a lot of letters about the topic of bandplans - and it's obvious from what we hear on the air that many of the newly-licensed bretheren are a touch hazy about what it's all about. We thought that the obvious thing to do was to ask the VHF Committee to tell us all about it, so here's Steve White, G3ZVW, to fill us in:

"The bandplans have been read by just about all radio amateurs at some time or another; they're printed in the Callbook and also in RadCom from time to time. However, the meaning of the bandplan and the philosophy behind it are sometimes misunderstood - for example, how much is mandatory and restricting and how much is simply to help us all work what we want to work? I'll try and explain what bandplans exist and how they might evolve in the future.

"Taking 144MHz as the obvious example, you can imagine the mayhem which would exist if there were no separation between the various modes of operation. The first level of bandplanning is therefore to divide the band into "sub- bands" for what are currently the most popular modes - CW, SSB, FM, beacons and satellites. This division is shown in the left-hand column of the bandplan. The idea is to separate clearly defined interests which are incompatible with one another. The segmenting of the band in this way is agreed throughout IARU Region 1, and so it is a co-ordinated policy which is thoroughly discussed and carefully evolved by all the national societies. However, it is not a mandatory feature of the licence in the UK although it is in some other countries. Thankfully, almost everyone looks upon the segregation of modes as mandatory and in general the bandplan works very well.

"Having said that, the left-hand side of the bandplan isn't set in concrete. From time to time, as trends and developments dictate, there are alterations - although it usually takes a lot of time and negotiations before a fundamental change can be agreed upon and implemented. An obvious example of a radical restructuring took place on 144MHz in the 1970s. Before the days when FM and SSB were extensively used on the band, it was divided into four geographical segments. In those days most activity was with crystal-controlled AM transmitters and - apart from a few nets - a QSO would be conducted almost invariably with transmitter and receiver on different frequencies. In the early 1970s the 'Liner 2' brought SSB to 144MHz (well, 145MHz to be precise) and various commercial FM crystal-controlled transceivers appeared. This marked the beginning of large-scale co-channel operation on 144MHz, and it became clear that a bandplan based on geography could not continue. It was, therefore, revised and indeed it gave way to one very similar to the 144MHz bandplan we have today. Unfortunately all the equipment mentioned above had to be re-crystallized - a requirement which was emphatically not well received at the time, but undoubtedly the later benefits have far outweighed the initial cost and resistance to change.

"The second level of bandplanning is the defining of certain frequencies which have clearly defined uses within the sub-bands - ie MS calling frequencies, the SSTV calling frequency, etc. These are shown in the right-hand column of the published bandplans. Repeater input and output frequencies also appear here although they ought to be thought of as more permanent. It is at this level of planning where national differences start to be introduced, in order to cater for various activities or interests in a particular country. In other words, the bandplan is not intended to be restrictive - it is meant to be helpful, by advertising meeting-places for people with specific interests.

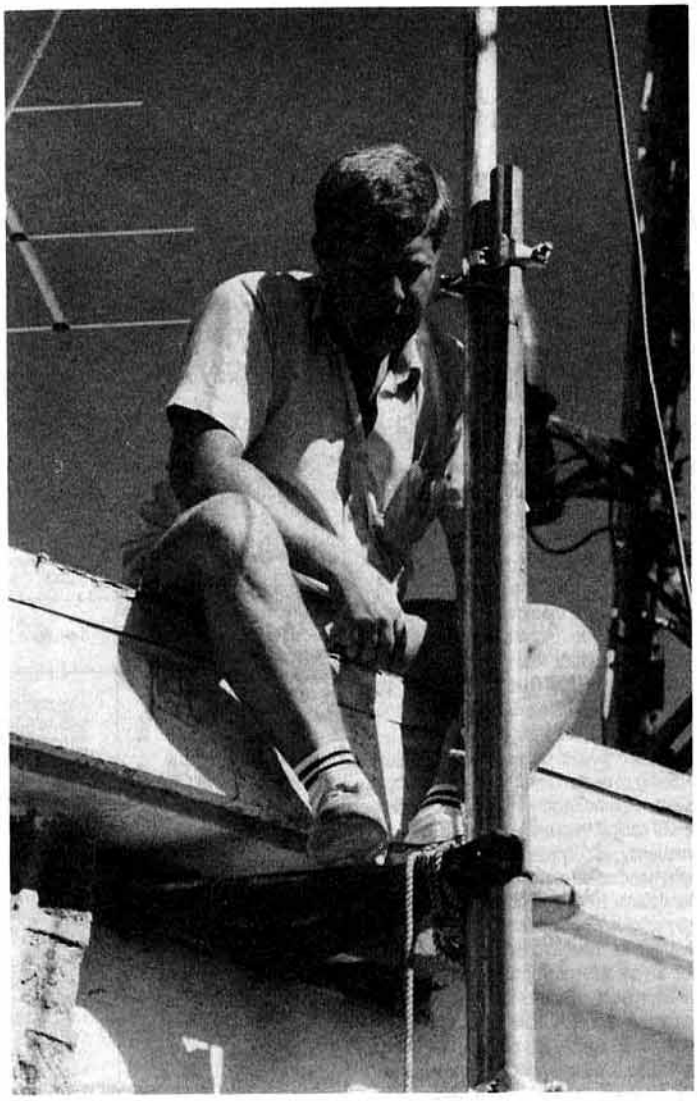
"It is important at this point to say that it is not possible to provide a dedicated frequency for every possible form of activity on the band - basically because there would be nothing left of it! Indeed, the Society is sometimes criticized for having produced an over- complicated bandplan as it is. At this level the bandplan works by virtue of what is usually referred to as a gentleman's agreement, and it works very much better if gentlemen abide by the agreement than if they don't.

"The subject of bandplanning is not taken lightly by the VHF Committee. We see ourselves emphatically not as "band policemen" but as a group entrusted with protecting and making best use of our precious allocations. The situation is never static for very long, so minor changes to the bandplans as they currently exist are being made quite often. Indeed, the concept of "frequency registration" is something which we are currently thinking about as a possible 'third column' (or partial replacement of the 'second column') of the bandplans. For example, this could help those wishing to start a club net or something similar to find a frequency in their area which is not guaranteed to be occupied at the time they want to use it (although it could never be guaranteed to be unoccupied). It could also help identify spots in the bands which are over- or under-used, and would be a kind of on-going poll on activity.

"In the not too distant future you might well see a request in RadCom for a volunteer Frequency Registrar to look after this aspect of bandplanning - so if you would like to help your fellow amateurs, please consider offering us your assistance".

UK 144 MHz Band Plan

144.000		
CW only	144.000 – 144.025	*Moonbounce*
	144.050	*CW calling frequency*
	144.100	*MS cw reference frequency*
144.150		
SSB and cw only	144.250	*Used for GB2RS (ssb) and slow morse transmissions*
	144.260	*Used by Raynet*
	144.300	*SSB calling frequency*
	144.400	*MS ssb reference frequency*
144.500		
All modes non-channelised	144.500	*SSTV calling frequency*
	144.600	*RTTY calling frequency*
	144.600±	*RTTY working (fsk)*
	144.625	*Data and packet radio*
	144.650	*AX.25 packet radio repeaters and mailboxes*
	144.675	*Data and packet radio*
	144.700	*FAX calling frequency*
	144.750	*ATV calling and talkback*
	144.775	*Raynet*
	144.800	*Raynet*
	144.825	*Raynet*
144.845		
Beacons	144.850	*Raynet**
144.990		
FM repeater inputs	145.000 R0	
	145.025 R1	
	145.050 R2	
	145.075 R3	
	145.100 R4	
	145.125 R5	
	145.150 R6	
	145.175 R7	
145.200		
FM Simplex channels	145.200 S8	*Raynet*
	145.225 S9	*Used by Raynet*
	145.250 S10	*Used for slow morse tone modulated transmissions*
	145.275 S11	
	145.300 S12	*RTTY alsk*
	145.325 S13	
	145.350 S14	
	145.375 S15	
	145.400 S16	
	145.425 S17	
	145.450 S18	
	145.475 S19	
	145.500 S20	*FM calling channel*
	145.525 S21	*Used for GB2RS (fm) broadcast*
	145.550 S22	*Used for rally/exhibition talk-in*
	145.575 S23	
145.600		
FM repeater outputs	145.600 R0	
	145.625 R1	
	145.650 R2	
	145.675 R3	
	145.700 R4	
	145.725 R5	
	145.750 R6	
	145.775 R7	
145.800		
Satellite service		
146.000		



ZC4VHF/5B4 expedition to Cyprus 1987

ADRIAN POORE ZC4AP
and IAN TOUGH, exZC4IT

One of the more interesting DXpeditions of recent years was the 1987 Cyprus epic mounted by the Cyprus 'branch' of the Royal Air Force Amateur Radio Society. This was a VHF DXpedition intended to celebrate the acquisition of a new clubhouse and some interesting times were had by all.

You might be wondering why it's taken so long to reach us. Well, its the usual military problem in that most of the people involved in the expedition have been posted to the four corners of the globe and its been a bit of a problem getting all the information together. However, we've finally managed to get the story and here it is - read on.....

So there we were in our brand-new clubhouse complete with radio room, workshop, lounge area and bar. We were sitting there having some beer and reflecting on the fact that - for once - life was being very good to us. At that moment some idiot (who shall remain anonymous) says, "This is all very fine, chaps, but how are we going to make our existence known to all the other radio amateurs in the world?"

"Seeing that we're already on the map in a big way and nineteen-deep pile-ups are a fact of life round here, is there any point?" replies the club cynic.

MONSTER PILE-UP

(At this stage I should perhaps explain that we're based in ZC4-land. If you so much as switch on the club RX the rest of the band goes quiet in anticipation - and one ten-second CQ call running 15 picowatts is enough to generate a monster pile-up. You will then spend 24 hours non-stop having rubber-stamp QSOs, which is hard work.)

"Yes, but we *must* do something special to start the club off on the right foot and all that", replies another inebriate.

It was clearly time for more beer, after which it was generally agreed that an HF extravaganza wasn't perhaps the best solution. Someone then said "What about a VHF DXpedition?" Seemed like a good idea and a consensus was soon reached - a VHF DXpedition would do very nicely, thank you, and who's going to brief the club secretary and station manager and tell them what to do...?

This, then, was the scenario for the ZC4VHF/5B4 expedition which took place on the island of Cyprus in 1987 - and as soon as the decision had been taken, the fun started. Despite the fact that the club had a fair number of members, very few of them had ever done much in the way of VHF operation - so the whole thing had to be planned and formulated from scratch. The station manager, ZC4AP, thought that it would be a good start to advertise the project in the UK amateur radio press and seek any comments, opinions and advice. The resulting avalanche of paper almost sank the island of Cyprus, but the consensus seemed to be that the bands people were interested in were 50, 70 and - above all - 144MHz. So we decided to plan on the basis of making a good 144MHz station a primary aim, with 50 and 70MHz as secondary. Mind you, we thought we might just have a little tiny problem with this latter bit of the plan - you'll see why in a moment...

The first major difficulty was that of equipment - basically we hadn't got any. There was also nothing at all available anywhere on the island which was suitable. So there was nothing for it but to write some begging letters to a number of UK companies asking for advice and assistance and - if possible - the loan of some equipment. While these were winging their way to the recipients, we started twisting arms and pulling strings and generally doing our best to wangle a suitable operating site. The obvious one was the top of Mount Olympus - which at 6404ft ASL is the highest point on the island. The RAF authorities very kindly gave us permission to use this site (of which, incidentally, the locator is KM64KW), so we were very happy. Since it's actually on an RAF base, we had the added advantages on on-site accommodation and food together with nearby medical assistance if we needed it - something to which the average DXpedition crew doesn't give enough thought, incidentally. If you're planning a large-scale DXpedition to some remote spot this year, have you considered what you'd do if a member of your team had a medical problem? Worth thinking about....

The second big snag - the one I hinted at earlier - was that, although we'd been asked (nay, pleaded with) to put on 50 and 70MHz stations, there aren't any 50 and 70MHz amateur allocations in Cyprus! Bit tricky, that. The only answer was to work on it - and we ended up writing numerous letters, making about twenty thousand phone calls and paying several visits to the Cypriot Minister of Communications. Talk about an initiative test... Eventually we were granted permission to use two spot frequencies on both bands. These had been allocated to the Cyprus Amateur Radio Society for beacon use, and we could use them provided that CARS had no objections. Fortunately they didn't, and indeed their members bent over backwards to help us. They even loaned us the beacons for the duration of the DXpedition, in case we needed them as back-up!

MEANWHILE

Meanwhile, back at the clubhouse we were still waiting to hear from anyone in the UK about equipment, etc, and time was getting on. We'd decided to run the DXpedition to coincide with the Es season but it was getting perilously close and we hadn't got very far. Mind you, no-one was panicking, probably because we weren't experienced enough to know anything about the size of the task facing us! As well as equipment, there was another little shortage which needed seeing to - we didn't have enough operators to man the station properly. Happily, the Eastern

Sovereign Base Area Club, ZC4ESB, were crazy enough - sorry, I mean good and kind and keen enough - to join us, so that was another problem out of the way. We spent a large number of hours working out an operating rota and offering up prayers that everyone would turn up at the allotted time.

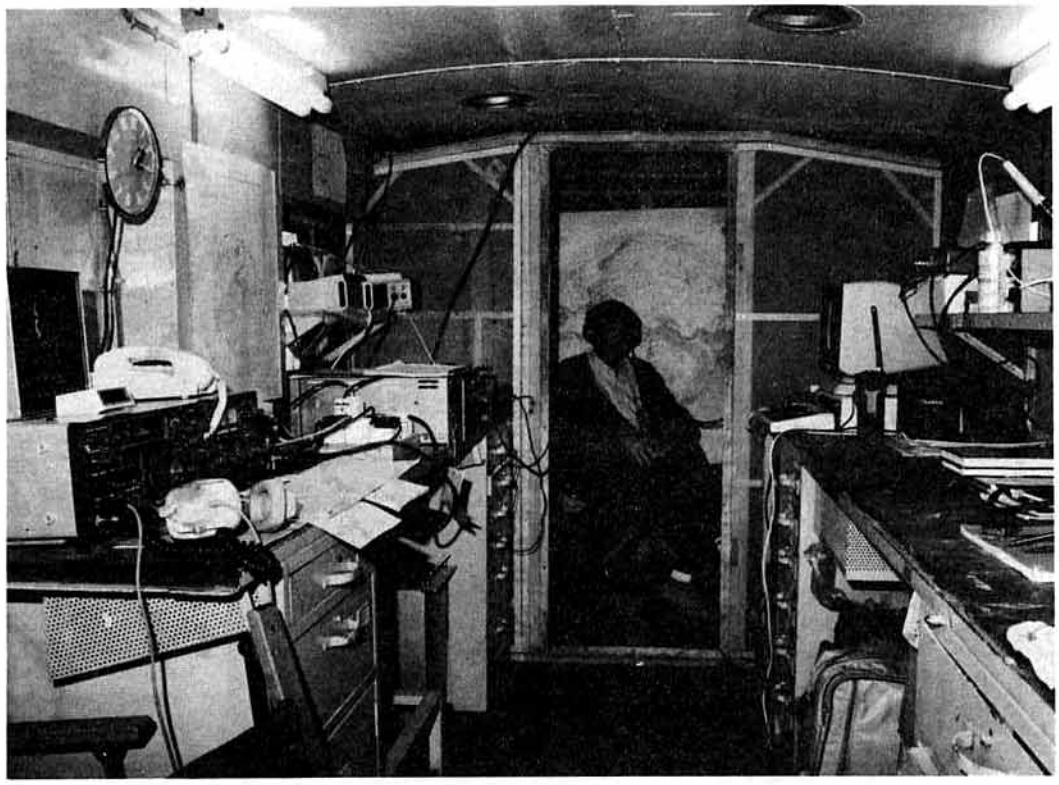
LOCAL BREW

But there was still no news from the UK about equipment; time was getting on and we were beginning to wonder whether our DXpedition would ever get on the air. At almost the eleventh hour there was a heaven-sent phone call from Ray Withers, telling us that he was coming to Cyprus for a holiday and could he discuss the project with us? To cut a long story short, a few weeks and several meetings (and a tour of the proposed site) later, we'd managed to achieve two things: a) we'd discovered that Ray's resistance to our local brew could be measured in milliohms and b) we'd managed to convince him of our sincerity and determination to make the DXpedition work. There is, of course, no connection whatsoever between the two!

We sent Ray home with some fond (?) memories of the island and a promise to see what he could arrange for us. The next fortnight seemed like a lifetime, but eventually we received a phone call which confirmed that we were in business. Morale promptly went higher than a Lightning in reheat! After an agonizing wait, the equipment duly materialised. We had an Icom IC275E with a Henry Tempo amplifier (and special permission to run it at 1kW) together with 4 times 17-ele Tonnas and a Kenpro rotator with which to turn them. Actually, we had a bit of a panic when the antennas didn't turn up when we expected them to, but a couple of frantic phone calls tracked them down and they were erected two days before the expedition was due to start. Ray had sent us some FHJ4-50 Heliax but we couldn't get hold of any connectors, so we had to make do with URM67 - since in the event the feeder run turned out to be only about thirty feet we weren't too worried.

50MHz was a bit more tricky. Ray had kindly sent us an MM 50/144 transverter but initially we didn't have a spare 144MHz rig with which to drive it. However, Aris (5B4JE) chipped in with his IC250A until ZC4AK could fetch his own rig from the other end of the island. This set-up ran into an MET 50-3 antenna, with the beacon station firing into it when the normal station wasn't manned.

There were all the usual last-minute hitches, snags and panics but operation commenced on schedule at 1930 on 6 June 1987 on both 50 and 144MHz. A check with ZC4AK at Dhekalia showed that the 144MHz transmission was both strong and clean, so we were happy. The following day a spectrum analyser was 'obtained' and mounted at the operating position, with a 50MHz dipole plugged into its input - the idea was to be able to see any 50MHz openings as they occurred. Also, our resident DX TV man, Mark Sayer, set up his gear to monitor Bands I and II for us. Both these systems proved to be invaluable, saving a great deal of ear strain on operators who would otherwise have been trying to work bands that were dead.



Suntanned ZC4AK sitting in the 144MHz part of the shack, with the HF and 50 MHz stations in the foreground.

The first thing seen on the TV display was a test card from Hungary, and sure enough a check on the spectrum analyser showed that an opening was brewing up on 50MHz. We waited with bated breath - and about 45 minutes later we had our first crossband contact, with YO2IS. Reports of 5 and 7 were exchanged, which seemed pretty good to us. Two hours later we worked HG1YA, also exchanging 5 and 7; we followed this with our first true simplex QSO, which was with GI8YDZ. In this we exchanged 5 and 4 reports. It was looking good, and indeed we found that there was a regular pattern. Most QSOs with Europe took place early or mid-morning, with the UK tending to come in from about mid-afternoon up until mid-evening.

144MHz DISAPPOINTING

The 144MHz operation was a bit disappointing, although this certainly wasn't for want of trying. There were long periods of inactivity, punctuated with local calls from 5B4 and 4X operators asking after our progress and wishing us luck. At times we also had a character re-transmitting broadcast music, presumably because he felt we needed entertaining! Fortunately this vanished after a few days. Our first chance of some real DX on 144MHz came in the form of a tip-off from a GJ station who we worked on 50MHz - apparently there was a massive 144MHz opening to Greece. We called and called for ages and heard some very weak signals from somewhere, but no-one was worked.

The next chance on 144MHz came on 12 June, when we sent a 539 report to YU3EU. Unfortunately the propagation only lasted a few seconds and we didn't receive our report.

A few days later we had a call from HG1YI/MM in the eastern Mediterranean, who kindly promised to give us a call from his various ports-of-call to see how we were doing. As it turned out he was always 5 and 9 even though he never got closer to us than about 270 miles!

METEOR SCATTER

The next step was to try a bit of meteor scatter, with ZC4AK pressing his BBC computer into service for the keying - no luck there either. Finally, desperate to work *somebody* on 144MHz, we arranged some EME skeds. This always was a trifle optimistic, since we had no elevation rotator - and what with that, some Faraday rotation and one or two other odds and ends we had only minimal success. Our one real EME achievement was in working DL8DAT on 19 June at 1200, about 45 minutes before moonset - we exchanged 319 both ways. And that was about it on 144MHz, despite 25 days of continuous operation between sunrise and well after sunset. Well, we tried - the Force just wasn't with us!

We haven't mentioned 70MHz operation yet - well, the reason is that we never got it together. Basically, we just couldn't lay hands on a suitable receiver, so that side of the DXpedition never got off the ground.

So, to sum up, the station was in operation for a total of 872 hours, with 26 SSB and 9 CW contacts on 144MHz into 5B4, 4X, HG/MM and of course DL8DAT. On 50MHz we made 132 SSB and 42 CW contacts, reaching CT1, DJ, EI, G, GI, GM, GU, GW, HB9, HG, SV, YO, 4U1 and 9H1 - with most of the latter making first-time contacts with Cyprus. At this stage, incidentally, we must thank our resident antenna wizard, "Wolfie" Smith, for all his help. He made some 50MHz antennas for the DX TV system, and without exception they worked extremely well.

Two points ought to be made to all those who still need Cyprus on 50 and 70MHz. The first is - we're sorry we missed you. The second is that, despite any rumours you might hear to the contrary, there is no prospect of any operation on these bands from Cyprus in the foreseeable future because of the use made of them in both the Republic and the Sovereign Base Area. This situation is rather sad, but nevertheless it will not change for some time to come.

THANKS

Last of all, heartfelt thanks to Ray Withers for his invaluable assistance, without which we would never have got started. We also offer our sincere gratitude to the following: ICOM UK for lending us the IC275; Randam Electronics for the antennas and accessories, Microwave Modules for the transverter, SMC for the rotator, Ray Withers for the Tempo amplifier and all sorts of other vital bits and pieces and finally Aris, 5B4JE, for the use of his rig. Also, our thanks go to 5B4AP, President of the Cyprus Amateur Radio Society, and all the CARS members for their help and kindness throughout the expedition. □

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25 years in amateur radio

Random Ramblings.

When compiling advertising copy, often some two months before the magazine actually appears on the news stand, it is all too easy to concentrate on the major items of equipment such as the latest receivers or transceivers, and lose sight of the fact that an amateur station needs a lot more in the way of accessories before it is complete. Naturally, we stock a wide range of these often inexpensive items, and I thought it high time I mentioned just a few of them, really to show that we carry most things you may need to complete or enhance your own station set-up.

We have represented the Hokushin company for years, and have come to know and appreciate that their aerials and aerial accessories are amongst the best in the business. Their new HS-WX1 base station colinear is one of the most attractive and well made aerials I have seen. The slender glass fibre enclosed pole contains not only a 4.5dB aerial for 2 metres, but also a 7.2dB aerial for 70 centimetres, and in an overall height of only 1.8 metres. The HS-WX1 matches perfectly with the new dual band transceivers from the major manufacturers, and requires only a single feeder, so you can save on cable cost (or buy better cable). Price: £59.62 plus carriage. For the HF user, the Hokushin HS-VK5 is the answer to high performance in a limited space. This is a five band trapped vertical which comes complete with tuned radials for all five bands. It's a classic ground plane aerial, and you all know how well the ground plane performs with its low angle radiation. Rated at 1kW p.e.p., the HS-VK5 is no lightweight, but a real performer. £218 plus carriage. Hokushin also make a comprehensive range of mobile aerials, including slim line gutter mounts with quick release tilting, for example the new SS-B2 to fit hatchback/boot lid, complete with cable and plug at £22.32, and the matching Super Slim aerials such as the VM2SS. Half wave gain whip for 2 metres and the VM7SS for 70 centimetres, or even the dual VM720SS at only £23.54.

The Hokushin range is too wide to fully describe here – just ask us for details, but one last item which has enormous appeal is the HS-1300MT; an in line preamp for the wide range scanner enthusiast. Giving up to 20dB of gain over the frequency range of 20 to 1300MHz, and powered from any 9 to 28 volt dc source, the HS-1300MT will boost your scanner performance when used with a mobile or small aerial. Of course if you precede it by a 10 element Yagi, you will certainly suffer from overload effects, but you all know that anyway. Priced at £25.86, it's a low cost way of giving your VHF/UHF receiver a shot in the arm.

From Kenwood, we have just received the latest SMC-32 miniature speaker/mic. unit, which fits most of the Kenwood hand held tranceivers such as the TH-205/215/405/415/25E/45E, and the earlier TR-2600/3600 series (but not the Th21/41). An excellent high quality unit as one expects from Kenwood, at £23.92. For those who like to take their handheld when they go hiking, but don't want it to get wet, there is a new Kenwood waterproof outer bag for all their handheld range, at £7.27 (could prevent a lot of grief and distress).

John Wilson
G3PCY/5N2AAC

SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3FKM

I would like to thank the following for contributing this month: G3VW/EA6, G2HKU, GM3CSM, GJ3EML, G3s GVV, KSH, NWG, YRM, G4EHQ, GW4KGR, G4s MUW, NXG/M, OBK, SDK/M, SFU, UZN, XAH, XRV, G0s CGV, CKP, and RS25419. CW stations printed in italics.

1.8MHz
2100 *EA6NB.*
2200 *TK5IU, UA9ADN, YT2R.*
2300 *OH0AM, 9H1CG.*

3.5MHz
0000 *YL2RG.*

7MHz
0000 *A41BJ,* I5JHW/VP5, *ZD8JP, 6W8JX,* 9X5NH.
0100 *VP2MT.*
0300 HK0NAF, ZS6BRZ.
0500 XE1ND, WP4U.
0600 J6LQC.
0700 NL7DU, UA1OIL.
0800 N7AVK.
1600 *VK9ZM.*
1700 9K2JX.
1800 JX1UG.
1900 A41KA, HL1IVH, VK6YX, YB8AX/0.
2000 AP2KS, JW0A.
2100 A92BE, HL5BAJ, JA3CMU/JD1, SU1ER, UA1OT, 3W0A, 9M2AX.
2200 DU7BE, TN4NW, TZ6MG, S01A, *YB2BNJ,* 3DA0AH, 5Z4SS.
2300 CE, HH7PV, VP8BUO, JA1UXC/4S7, 6T2MG.

10MHz
0000 *VE1CIL, W1-W4, W8, ZD8AN.*
0100 *HP/N9GWP.*
0700 *W6, VE6UX, WA0E.*
0800 *AL7KJ, CO3VG, CT3CF, VK2, VK3, W1-W4, ZL2IN.*
1500 *TF3EJ.*
1600 *OY7ML.*
1700 *EA8ABR, UL7LB.*
1800 *SV9TJ.*
1900 *VK4FE, ZS5BH, ZL3KR.*

14MHz
0700 YI0BGD, 3D2CC.
0800 FO5BI, KC4USH, KC6MH, VR6TC, YJ8GP.
1000 4W0PA.
1200 *UZ0YWA.*
1400 *BV2A.*
1500 *KL7PJ, 8Q7CS,* 9M2CW.
1600 VK0MP, VK9ZM, XX9CT.
1700 *AH2BT, KH6CF,* ZL.
1900 3W0A, 6T2MG.
2000 *Y88POL,* YW5LR.
2100 *JY1,* VK, 3B9FR, 4W0PA.
2200 NL7KJ, 4U1UN.
2300 *P48ADI,* S01A, TZ6AS, *3W0A.*

18MHz
1200-2200 *Ws.*
1400 *JXIUG.*
1600 *TR8SJP.*
1800 *K7AU, VE6UX.*
1900 *KV4AD.*

21MHz
0800 BY5QA, 3X1SG.
0900 D44BC, JT1s *KAA,*KAI,KC6IN, VK9ZM, YK1AA.
1000 *HL9CWN,* YJ8JS.
1200 JT1BS, *PP5SG.*
1400 *CQ8LN, 9Y4NW.*
1500 *3A2AG.*
1600 W6-W7,ON5NT/P/6W1.
1700 A22BW, FH4EE, *T32AB,* VP8BUD.
1900 D68JL, S79D.
2000 3DA0AH.
2100 KL7XD.

24MHz
1200 *VK6RO.*
1400-1600 *VE1-VE3,W1-W0.*
1600 *OK1AEX/5N0.*
1700 *W1-3,6,8,0.*
1800 *OY1R, ZS6AOR.*

28MHz
0700 *TA2BU.*
0800 BV2FA, *BY1BJ,*BY4WNG, BY8AC, D68MG, VK9ZW.
0900 BY5s RA, RT, JH3JUZ, JY8LX, OD5YL, *SU1EE,*VK6BA, *VQ9JT,* VS6BL, XX9KA, YI2LVB, *7J6CAB,* 9N88C.
1000 A71BK,*AP2UR, FR5EL,* HL3IID, KG6AJH, KH0/JA1QGG, *VK9ZM,* YI0VP, *W6QL/5N0, 9Q5UN,* 9M2CW.
1100 A41KN, AL7HC, *J28CW,* TA2AU, YI1BGD.
1200 *A41JZ, AP2TN,* NP4A, PY0FF, UV3BCC/UA1, VU2CPV.
1300 KH0AC, KP2BH, *OX3CS, TJ1PS,* TL8WD, VP9BO.
1400 *VP8PTG.*
1500 A22RA, DK8OT/C6A, *J79ROJ,* V31PC,I5JHW/VP5, W6-W7, *XF1C,* YB0XX, *9X5AA.*
1600 KC4GMT/HH5, KW7J (Mont),TA2/ G3UIN.
1700 *FO5BI/P,,NS7B* (Utah), T77C, VR6ID.
1800 *CE0FFD.*
1900 *KL7CYL,* VP5/G0AZT, *8R1J.*
2000 *TI4SU/5,* VP8WA.
2200 W1-W5.Do you want a QSL

1989 28MHz COUNTRIES TABLE

G4ZYQ	72	G4NXG/M	51
G4DXW	69	G4OBK	45
G4MUW	60	GM4ELV	26
G0CKP	53		

Thanks yet again to the following for information extracted : *DXNL* (DL3RK), *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G4DYO), the *Ex-G Radio Club Bulletin* (WA8TGA), *DX Report* (VK9NS), the *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), *CQ Magazine* (W1WY), and the *DX Bulletin* (VP2ML).

For **June** issue please send in items to reach me by **21 April.**

Do you want a QSL manager? A few weeks ago I received a letter from Aemar Higgins, GI3YMT, in which he offers his services to any UK or DX station who requires them. Please write direct (QTHR).

Ted Allan, G3DRN, the Society's QSL Bureau manager has asked me to write a few words on his behalf this month. It seems that with the improved radio conditions the number of cards passing through the bureau has increased a lot. Moreover, following the mail strike a large amount of overseas mail was allowed to accumulate at the docks until the UK items were cleared - with the result that there is a large backlog, mostly from the USSR, which has yet to be processed. This is causing some distress to those collecting Oblasts, and Ted asks for forbearance please - some priority should have been given to these items by now. He further questions whether the practice followed by some - to QSL every contact - is really necessary. If the QSO wasn't something special why bother? Enforcing any limitations at the bureau would be impossible and undesirable but it does seem a pity that between 30 and 40% are at present going into the waste-paper basket as unclaimed.

QTH CORNER

A22RA	Private Bag 1, Orapa, Botswana.
A22BW	via DK3KD, W.Daub, Solingerstr 79, D-4018 Langenfeld, FR Germany.
DL7FT	(new) PO Box 1421, 1000 Berlin 19, FR Germany.
T32AB	N7YL, Janice Weaver, 2195 E.Camero Av, Las Vegas, Nev, 89123, USA.
TZ6MG	PO Box 2095, 8203 AB Leylstad, The Netherlands.
XF4T	XE2TCQ, Box 66-D, Tijuana, BC 22150, Mexico.
3W0A	via W4FRU, John Parrott, POB 5127, Suffolk, Va, 23435, USA.
3W1A	as 3W0A.
4W0PA	John Fung-Loy, Strausslaan 4, 2551 NM The Hague, Netherlands.
W6QL/5N0	Yasme Foundation, PO Box 2025, Castro Valley, Calif, 94546, USA.
5U7AS	Agada Nagogo Saley, BP 133, Niamey, Niger (do not put callsign on envelope)
8Q7CS	via G3NOH, G.D.Eddowes. Flat 1, 47 The Grove, Ealing, London, W13 8JR.

DX NEWS

Dave, G3LCS, reports a contact with UA3PIP who told him that the English/ Soviet Friendship Club now meets at 1000 on Saturdays on 14.065, 21.120, and 28.065MHz. The UK co-ordinator is believed to be G3IFN. G3RHM has also sent news from RB5FF that the Russian DX Net is reactivated on 3.639MHz and that requests for a QSY to 1.8MHz (say 1.860MHz) seem to be in order. The USSR stations are looking for GD,GJ,GU,GI etc and 0100 seems to be a good time. Jim Smith, in his *DX Report* lists QSL routes for four stations on **Franz Josef Land.** These are UA1OT (via UB5KW), UA1OIL (UA9MA), UA0BEZ/UA1O (RA3YA), and UA0BDU/UA1O (UA4HCU).

G4AWT has sent me a note received from LX2BQ in which he says that he will only QSL direct to those who send him return postage either in the form of ircs or postage stamps. He does not send out any cards via the bureaux. From **Monaco** 3A2LF will use the callsign 3A9F and 3A2EE will be 3A9E during major contests this year. Stations in **French** territories are being allowed to use the prefix F89/ before their normal callsigns on 5 May, 20 June, the whole of July, and on 4 and 26 August. Those in Corsica and the overseas departments can substitute their normal number with 89. This is to mark the bicentenary of the French Revolution.

In commemoration of the highly celebrated mutiny on the *Bounty* the radio amateurs on **Pitcairn Is,** some of whom are direct descendants of the mutineers, will be operating special event stations on the 200th Anniversary of the mutiny on 29 April 1989. They will operate for the whole 24h as time and conditions permit. Look for VR6s ID, KB, KY, MW, TC, and YL on 14, 21, and 28MHz and obtain a report and contact number. For a special QSL send your own card (showing the QSO number) plus SAE and Ircs to: Bounty Mutiny Day, 7462 W.Lawler Av, Niles, Ill, 60648, USA. According to the VK2SG packet mailbox 5W1GP will make visits to A35, KH8, ZK1, and ZK3 this month.

There is some confusion over the zone in which BY8AC is located. It is not in zone 23 - which only includes Chinese stations with the prefixes BY3G-BY3L, BY9A-BY9F, BY9G-BY9Z, BY9T-BY9Z, and all BY0s. Father Moran, 9N1MM, has now returned to **Nepal** following his world tour. At long last there is some activity from **Yemen.** 4W0PA appeared on the bands at the end of January. He is a doctor and is not an experienced DX'er.In spite of an original intention not to do so at first he had to resort to the use of lists in order to make a few contacts possible. However he now operates split-frequency. *DXpress* suggests looking around 14.150 or 14.250MHz around 1800 and also at 1200. He will be there for two years and may be on most days other than Tuesdays and Wednesdays.

The DX Bulletin says that XE2TCQ and

others will operate as XF4T from **Revilla Gigedo Is** for two weeks in early May. Look 25kHz up on CW and around 1.830, 3.795, 7.050, 14.250, 21.300, and 28.500MHz. LU2ZC should be on King George Is in the **S.Shetland Is** for the rest of the year. He tends to operate around 3.505, 7.005, 14.025, 21.025, and 28.025MHz. 4K1DV is a new station on the air from the USSR polar station 'Progress'. VK0MP is located at Casey Base in **Antarctica** together with VK0JV who will be there for a year and who has 100W and vertical antenna and hopes of access to a rhombic later as well as a linear.

Nao, N1CIX, and Claudia, HB9CUY, will be on the air from Aruba again from 8 to 18 May on all eight bands 3.5 to 28MHz both CW and SSB. Nao mentions that he is receiving QSLs for several P40 stations for whom he does not have logs. In addition to those for his own P40P operation in October 1987 and June 1988 he has only the logs of P40M (operated by WR6M in October 1987). QSLs for the P40M operation of February 1986 should go to KB9AW.

There are two new stations on **Amsterdam Is** - they are FT4ZE and FT4ZY and have been worked on 14.033MHz around 0100. FT5ZB has left the island. FH4EE on **Mayotte Is** has been reported in the *Long Island DX Bulletin* to be found near 21.335MHz around 1900. There is a new station on **St Helena** - this is ZD7VC who has an FT107 and has been worked on 28MHz. *DX News Sheet* says that ZD9BV on **Tristan da Cunha** meets his QSL manager at 1700 on 21.265MHz most days and will accept callers before and after his schedules. DJ6SI was hoping to be in **Benin** very early in April as TY9SI and accompanied by his wife who will be TY9YL. 5U7AS is new in **Niger** and is using equipment left there by DJ6SI during his recent visit. He is often on 21.333MHz at 0800. QSLs go to the address in *QTH Corner* but please do not mention amateur radio on the envelope and note that IRCs cannot be used.

VIETNAM

My good friend Olle, SM0KV, has very kindly sent me some information about the recent visit by the Hungarian team to Vietnam as described in *Quan Doi Nhan Dan* (a local military publication). This goes as follows: "International amateur telegraphists and stations had been waiting for signals from Vietnam which they considered a blank spot. A Hungarian amateur telegraphic team came to Vietnam. This is the first group of world amateur telegraphists to come to Vietnam, marking the beginning step in the process of renewal of international contacts in the field of amateur telecommunications.

Prior to the departure of the team to Vietnam, the Hungarian mass media facilities, as well as material issued by amateur telegraphists in many countries paid special attention to this trip. With sophisticated and light equipment the three man delegation led by comrade Kinchec Frense, general secretary of the Hungarian Amateur Telegraphic Association, obtained permission in order to carry out research and experiments on amateur radio transmission reception in addition to participating in the international amateur contest with the callsigns 3W8CW and 3W8DX. Nowadays, amateur telegraphy is widely developed in many countries and has become a sport or recreation. It is also actively serving the training of technicians for the army and national economy, and enables strengthening friendships among peoples of the world without discrimination between social regimes. Hungary is one of the countries that has a large number of amateur telegraphists with 12,000 men operating at 4,500 stations in 150 clubs under government licence for operation. In Vietnam amateur telegraphy has not really been developed or cared for and it has been little known to the people.

At present we have some civil communication clubs lying within the framework of army clubs, but with very few members and inadequate equipment. So this will be a good opportunity for our civilian communications clubs and those who have knowledge of telecommunications to learn and exchange experiences profitably.

Preliminary results made by the Hungarian team are very encouraging. During only two days of experiments whilst also participating in the international contest on 29 and 30 October, in 48h, the team established radio contact with 5,650

HF F-LAYER PROPAGATION PREDICTIONS FOR APRIL 1989

The time is represented vertically at two-hour intervals 00(00)GMT for each band, ie 00=0000, 02=0200, 04=0400 etc.
The probability of signals being heard is given on a 0 (indicated by a dot) to a 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1.8MHz openings are indicated by a plus (+) sign in the 28 and 3.5MHz columns.

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	....123332..	...13455641.	...46778873.	1.1677788962	535666667897	876433334689	76311..11478	53.....4+
MALTA	....234333..	...14566651.	...478888851	211688888974	765876667898	998643345799	986311112578	++3.....24+
GIBRALTAR	.....11112..	....1333341.	....4666673.	1..277888862	532677777897	998754445799	998532112478	++52.....4+
ICELAND	.....	.....11..	.....222342.	14556641	2..156667885	864554445678	887522112357	5+52.....7
** ASIA								
OSAKA	....122.....	...134421...	...25443311.	...253234342	....2...3674	462	.....13.	.....
HONGKONG	...2345553..	...25666651.	...245457731	1...33236863	2.....3786	1475	252	2
BANGKOK	...3566663..	...35667761.	..1235457841	2...13236874	4.....3788	3.....1477	1.....255	.....2.
SINGAPORE	...3566664..	...45777862.	..1235457852	2...13236874	4.....3798	3.....1478	255	22
NEW DELHI	...3567651..	..145677732.	1.2334457652	311112236875	74.....3798	62.....1478	4.....257	24
TEHERAN	...56777741.	..1666778731	214533457863	435311236886	864.....3799	851.....1478	63.....257	4.....24
COLOMBO	...46777751.	..1457778731	212234457863	421..2236886	83.....3799	71.....1478	4.....257	24
BAHRAIN	...56777752.	1.1666778742	324433458975	645211236898	974.....3799	851.....1478	73.....257	4.....24
CYPRUS	...46787762.	1.1788888842	323877888975	6467666789998	987533346899	9852..113689	862.....368	+3.....35
ADEN	1..677888732	212666778864	645423457988	8662..136899	985.....3799	972.....478	74.....257	4.....24
** OCEANIA								
SUVA/S	.....111...	.....12222..	....2333442.	...24322563.	..153...363.	...3.....4..	...1.....1..	.....
SUVA/L	531241....75	54256211.286	344773211584	125862112762	..363...263.	...4.....41.	...1.....1..	.....
WELLINGTON/S	.....122....	....223321..	...24434442.	..1453235641	..263...3651	..13....143.	...1.....1..	.....
WELLINGTON/L	43111.....35	55233.....56	565651...176	456851...275	12573...1562	..24.....43.	...1.....1..	.....
SYDNEY/S	...245542...	...4666642..	..1665456531	..1653236752	...32...3774	...1.....1462	.....23.	.....
SYDNEY/L	1...3.....23	211152....45	33237311..77	323562111186	1.153...1474	...21.....351	.....12.	.....
PERTH	...567731...	..15777521..	1.247545532.	3112533235541	51..2...3785	2.....1476	254	.....2.
HONOLULU	.....1....	.....1..221.	....1211442.	....2211551.	..2331..33..	..341....1..	..11.....	.....
** AFRICA								
SEYCHELLES	1..566776532	212653777764	644323457888	8651..236899	973.....3799	961.....478	73.....257	4.....24
MAURITIUS	1..678888743	422666778976	754433457998	975211226899	984.....3799	961.....478	73.....257	5.....24
NAIROBI	31.677788854	522666678987	865522357999	9873..126899	996.....3799	984.....478	761.....157	53.....24
HARARE	42.578889866	742766678988	975733357999	997611126899	9983....3799	995.....478	773.....157	54.....24
CAPETOWN	2..488++9976	5..687778998	83.864457999	96.842225899	99361...2799	8973.....478	7751.....157	442.....24
LAGOS	531387++9976	862576668998	985863237999	998831.15899	99961...2699	8974.....478	6751.....157	352.....24
ASCENSION Is	431178777754	762387667887	986674225899	998762..2899	99963....689	8874.....378	7751.....57	442.....24
DAKAR	331178888974	652387667997	886674324899	9987621.1799	99973....489	8874.....168	7751.....47	442.....4
LAS PALMAS	57777751	11.178888973	842488888997	875787777899	998865445799	998632112489	88631.....158	++4.....25
** S. AMERICA								
Sth SHETLAND	1888975	2....3778987	51...4447899	832.23225889	98632...2678	8974.....346	6851.....14	352.....
FALKLAND Is	32...4888874	5422.5778886	885525446799	998743224689	99973...1368	8974.....36	7751.....14	452.....
R DE JANEIRO	22..18866874	442227766786	875545433699	998753211389	99973....169	9874.....48	7651.....16	542.....4
BUENOS AIRES	21...6888873	432216776786	775535453588	997753221379	99973.....58	99741.....26	7751.....4	552.....
LIMA	11676662	21..32676665	542263443357	77556322..37	99863.....6	79741.....3	5751.....1	252.....
BOGOTA	2666652	11..13665564	432144432247	76445321..27	99864.....6	79741.....3	5751.....	252.....
** N. AMERICA								
BARBADOS	16666762	11..26655675	542255422367	7754632..158	99863.....27	89741.....5	7751.....2	452.....
JAMAICA	1455552	1....2555554	421123442246	65324322..27	89753.....5	79741.....2	4751.....	.52.....
BERMUDA	2455552	1....4555664	321.24442367	65323321.148	88753.....16	79741.....4	5751.....1	252.....
NEW YORK	233431	1344553	31...2343456	531112221247	886431....16	68741.....3	4651.....	.42.....
MEXICO	133431	244442	21..1.343223	531131221..3	676431.....	37741.....	1552.....	.22.....
MONTREAL	122331	1334452	21...2343455	5311112222247	775431....16	68741.....3	3652.....	.32.....
DENVER	.....11.	1231	1.....22233	32.....22113	56432.....1	26741.....	.351.....	..2.....
LOS ANGELES	.....111.	2321	1.....14322	21..1..14111	25432...1...	.4741.....	.251.....	..2.....
VANCOUVER	.....	.....	1.....1111	21.....2112	24332...2...	.3641.....	.131.....	.....
FAIRBANKS	.....	.....	....1.1111..	1..121112211	12243...221.	.1341.....	..11.....	.....

The provisional mean sunspot number for January 1989, issued by the Sunspot Index Data Centre, Brussels, was 161.6. The maximum daily sunspot number was 233 on 13 January and the minimum was 120 on 4 January. The predicted smoothed sunspot numbers for April, May, June and July are respectively: (classical method) 165, 169, 175 and 181; (SIDC adjusted values) 162, 168, 176 and 183.

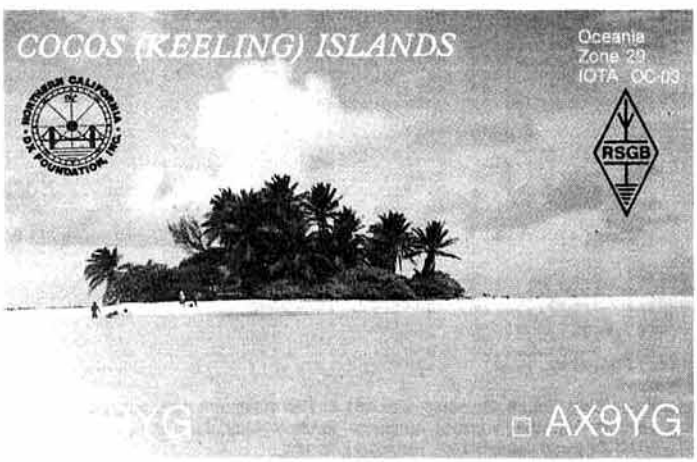
amateur stations from 150 countries. The target is for the team to make radio contact with 60,000 amateur stations in the world. This represents a record for Asia." (Olle was lucky and was able to operate for a while as he happened to be in Hanoi during the expedition. It certainly looks as though amateur radio has made a breakthrough in Vietnam).

COCOS (KEELING) REPORT

Steve, G4JVG, reports great success during his visit with his TS440S, and FL2100B to Cocos-Keeling Is. He was AX9YG from 18 to 28 October and VK9YG on 29-30 October. His very attractive QSLs record the fact that he made about 5000 QSOs (3000 in the CQ WWDX Contest earning him 3.67 million points). It also advises anyone wishing to visit these beautiful islands to contact Cress Thursby-Pelham (VK6YX/VK9YC), 107 Melvista Av, Nedlands 6009, W.Australia (please enclose return postage). He thanks the NCDXF and YB0WR for his most attractive QSLs. In passing he mentions that YB0WR has recently produced a 422 page International Awards Guide Book which is printed on glossy paper and details more than 750 awards - 634 in their actual colours. It measures 8.5 by 11.5" and costs US $37.00 (by surface mail) from M.S.Lumban gaol, YB0WR, Jl.Garuda No.62, Jakarta 10620, Indonesia. Steve considers this to be a superb book.

For those interested in Contest claimed scores, Steve amassed 3,671,258 points made up as follows – he was extremely lucky with conditions on 28MHz during the whole of the stay, but the LF bands were something of a disappointment.

Band	QSO	Points	Zones	Countries
1.8	1	0	1	1
3.5	33	68	12	21
7	117	328	20	36
14	215	606	27	53
21	679	1872	33	82
28	1954	5644	35	110
Total	2999	8518	128	303



PROPAGATION

This month's offering from Smithy reads as follows: "Any suspicion that the upsurge in solar activity in December might prove to be a flash in the pan was soon dispelled in the early weeks of 1989. The 27-day running average of the solar flux observations is a very useful short term measure of progress, and this rose steadily for 56 days before levelling off at 242 SFU towards the end of January. Daily values reached a peak of 299 at the middle of the month and the month's average was 236 SFU.

It is dangerous to make too much of small differences but it must be said that this value of 236 was higher than any monthly value during Cycle 21 and was in fact the highest monthly average *for 30 years.* Also, it was reached in the 28th month of the cycle, three months earlier than in Cycle 19.

Sunspots and solar flux are only loosely related and SIDC's provisional monthly sunspot numbers of 179.4 for December and 161.1 for January, though high, were both below the peak values in Cycle 21 - but the latter were not reached until months 39-42. The effect of all this on HF band conditions was somewhat mixed. The upsurge was accompanied by many major solar flares, some causing black-outs as they occurred and magnetic upsets subsequently. On the other hand, MUFs were mostly high and the potential of the HF bands very much in evidence.

To summarise, the signs continue to be that, unless it has a quite exceptionally early peak, the present cycle is set to outstrip its predecessor by a substantial margin. Also, on the basis of data up to the end of January it continues to be something like two months ahead of Cycle 19 and, perhaps more significant,to be rising more rapidly than the latter. With the possibility of a very high peak, readers might like to know what are the existing records. The highest recorded daily 2800MHz solar flux was 457 SFU on 4 April 1947, the highest in Cycle 19 was 383, the highest monthly average 286.5 (December 1987) and the highest three-month average 276. The highest recorded final daily sunspot numbers were 355 on 24 and 25 December 1957, the highest monthly average 253.8 (October 1957) and the highest three-month average was 235. A year from now it will probably be clear whether any of these records have toppled or are in danger."

VHF/UHF

NORMAN FITCH G3FPK

50MHZ

Undisputed jewel in the VHF crown in the four weeks or so before this report was assembled has been the 50MHz band. At this rate the walls of a number of shacks in the UK will soon be adorned with 50MHz Worked All Continents awards - and some of the stations that have been worked would be very welcome in many HF logbooks, let alone those for 50MHz.

Beginning on 1 February, Mike, G3SED (Hants) heard ZD8MB at 1700 and, as he said "...At last! After many months of hearing the beacon Mike was actually at home and we exchanged 5/9 reports!". ZD8MB went on to work G6ION, G6YXT, G3JVL, GW4EAI, G4JCC, GJ4ICD, G3OBD, G4MAW, G5KW and finally G8VOI.

The beacon was heard in the UK again on 5 February but Mike was not around and no QSOs resulted.

On 8 February J52US, KP2A and FY5DG were working into Europe and the FY7THF beacon was audible; on 9 February it was a similar story, with J52US working a number of G stations between 1030 and 1230 and FY7THF a strong signal.

Byron, G6HCV (West Midlands) had a frustrating time on 10 February; he copied G3GJQ/5N0 for about 90 minutes but was not able to make contact.

On 11 February there was an opening to North America. G4UPS (Devon - does this man ever move more than a few feet away from his 50MHz rig?) worked K1TOL, VE1BPY, VE1APG, W1CGI and W2CAP/1, with a few gotaways. On the following day a number of stations worked CT4KQ and someone was heard to say that he would be sending that station a bill for a new front-end transistor; another observed that, "...there's a smoking hole where my S-meter used to be". On the same date GJ4ICD made what is almost certainly the first Jersey-San Marino 50MHz contact by working T77C. Apparently he has a 50MHz permit and his licensing conditions are the same as those for T70A.

13 February brought signals from HC5K, HC2FG, KP2A and K8WW/VP9 into a number of UK 50MHz receivers, and on the following day CT0WW, KP2A, 9Y4VU (Barbados, and a welcome guest at G4AHN, GJ4ICD, G4IGO and G3UKV amongst others) and the FY7THF beacon were audible.

GJ4ICD worked 9Y4VU for another GJ first on 14 February; Geoff has now worked 41 countries and 173 squares since 1 June 1987. Incidentally, Geoff says that a number of UK stations are still sending him direct QSL cards and enclosing UK stamps for returns but UK postage stamps are NOT valid in the Channel Islands.

On 16 February G4UPS found a new one in the shape of TU2MA (Ivory Coast). He is apparently using 10W to a 5-element, and his first QSO was with J52US.

Dave, G4OAE (Berkshire) worked J52US at 1200 on 23 February for a new one at 5/9 both ways.

A very memorable 50MHz weekend began early on Saturday 25 February although there was an interesting prelude to it on 22 February. Colin, G0DAZ (Worcester) worked LU5EZT/MM (3N 27W) at 1325 and exchanged reports of 5/3, and on 24 February it seems that HC5K and HC1BI worked 300 JA stations! The Saturday affair began at 0755, when LA3EQ worked VK6WD and VK6RO. At 0847 G3JVL (Hampshire) heard the VS6SIX beacon, and between 0856 and 0909 VS6UP worked PA0RDY, PE1EVX, G4UPS, G3KOX, PA3CII, PA0PKD, G4AHN, G3COJ, G3JVL, G3SED and G4JCC. The contact with Ted, G4UPS, took place at 0858 and looks likely to be the first G-VS6 on 50MHz. VS6TC, VS6WA and VS6GU were also heard and worked by South Coast stations. At around 0910 the Japanese stations started appearing, but initially many UK operators were fooled by the distinctly non-Great Circle beam headings they were appearing on. For many the required heading was somewhere between 060 and 080 (as opposed to the expected 035 or thereabouts) and Colin, G0DAZ, reported that he had to beam at 120 to hear them. Star turn was JA4MBM, who managed to be audible in the UK for over an hour with signals about 2 S-points stronger than his compatriots. Unfortunately, it isn't clear whether any UK stations actually managed to work him - when called he came back with a report but not a callsign, and with the size of the pile-up that wasn't helpful. There were also problems with video sidebands, which were extremely strong in the UK. Other JAs audible included JH4IUO, JH4APO, JA6TEW and JE3GUG and JA4MBM was still audible at G0DAZ at 1102. It seems that many of the Japanese stations are running QRO to large antennas. Seems that JA4MBM is actually a club callsign and that some of the callsigns heard were just those of club members operating the station - shades of a 144MHz opening to OK!

As the signals from JA were beginning to fade at about 1030, an opening to Africa started. Between 1040 and 1225 G4ASR (Herefordshire, or "...On the Golf Whisky border" as he says hopefully when calling CQ DX) took time out from editing the VHF Newsletter - now, incidentally, retitled 'Six-Metre & Up DXer' - and worked ZS6BMS, ZS6WB, ZS6LW, ZS6SJ and ZS6OB, with a number of others heard. The ZS3VHF

beacon was a good signal, and between 1123 and 1200 5H1HK in Tanzania was being heard in beacon mode by G3SED. As icing on the cake, G3JVL worked TR8CA in Gabon and he, J52US and G3GJQ/5N0 worked a large number of G stations.

To round off the Saturday report, a few snippets. PA0RDY worked JR1FWH/DU1 at some stage and apparently LA1ZE worked several VK6 stations. One report said that LA3EQ worked VK6XW, VK6OR and VK6HK, and Colin, G0DAZ, reported that all the Maltese stations QRV on 50MHz had worked VS6. G4VXE (Gloucestershire) and G4ASR both said that they thought they'd heard an HL station, which was later thought to have been HL9TG. Finally, G3COQ (Gloucestershire) worked J52US using 10W to an indoor antenna!

Hardened 50MHz DX-chasers were out of bed at wholly unaccustomed hours on the following Sunday, and their diligence was duly rewarded. The Japanese started appearing at about 0945 and this time there were more of them. Furthermore, the same funny-beam-heading syndrome was in operation: instead of the expected 035-040 it was necessary to beam anywhere between 080 and 110 degrees to hear them. In passing, it would be interesting to know which way they were beaming to hear us - anyone know? This time, some JAs were definitely worked. Dale, G3XBY (Warwickshire), who normally works all the DX on 144MHz that your scribe can't hear, opened the batting by nailing JA6TEW, JA6IEF, JE6JYT, JR6KJL, JH6DFJ and JI3OPA; he also heard JE3GUG and JA4MBM. Just for fun, Dale also worked TR8CA at 1120 and followed that with five ZSs. Between 1248 and 1642 Dale then had an opening to the States and worked 12 stations. One most unfortunate gotaway was N5JHV in New Mexico, who Dale thinks was in DM69; his teeth were still grinding when your scribe spoke to him on the phone a week later... Still with the African opening, Dave, G4ASR, worked the following between 1120 and 1545: TR8CA, J52US, S4S, ZS4AAB, ZS6CE, ZS6SS, ZS6LN, ZS6BMS, ZS6BTL, ZS6ADH and ZR6KE. Dave said that the Stateside opening was weak with him and he only heard four stations. Getting back to the JA event, by all accounts it faded out at about 1110 GMT. Mike, G3SED, worked JA4MBM and it's believed that a few other G stations also managed a QSO. G3UKV (Salop) may have done so, and apparently he definitely worked JR6JYT.

Quite a weekend, and there may well be some more reports to come. Things kept happening, though; on 28 February there was apparently an opening from the Falkland Islands to the Caribbean and W-land (no details at press time) and on 1 March at 0732 OH2TI worked VK8ZMA and VK8ZLX, followed at 0909 by VK8GF. In the afternoon of 4 March there was an opening to Africa. Many UK stations worked TR8CA, including G4OAE who exchanged 5/7.

All in all, quite a month on 50MHz; here are a few loose ends which haven't been fitted in so far. For those who worked him and those who may do so in future, TR8CA's QSL manager is W6BF. The following stations are said to be QRV on 50MHz; Z23JO (Zimbabwe), ZD7CW (St Helena - Julian is definitely active and has worked into the Mediterranean area), CO2KK (Cuba - Colin, G0DAZ, thinks he may have heard him), HK0HFU (San Andreas - apparently he's acquired a rig and is building a beam), 8R1AH (Guiana - he's definitely operational with 150W and has worked Brazil, Ecuador, the USA and Canada so far), 9Y4U (Barbados - definitely QRV and his QSL manager is W3EVW), HK4EB (Colombia), PJ9JT (Netherlands Antilles - apparently PJ4B has been heard in PY5-land), TG9AWS (Guatemala, allegedly running 100W to a J-pole) and finally FM5AB (Martinique). Forthcoming attractions include W6JKV, who will be on from T20 in the last week of March and T30 in the first week of April. Some operation from 3D2 is also threatened.

Finally, if you feel your luck's well and truly in, VK9NS on Norfolk Island is QRV on 50MHz...!

70MHz

If you need IO67 on 70MHz, keep an ear open for Calum, GM0EWX - he of the mighty 144MHz signal when there's a whiff of aurora. He's borrowed a 70MHz transverter and at press time was putting up a dual 50/70MHz antenna. Another northerly

Looking ahead . . .

As you will witness here, you have a new compiler of the VHF/UHF section of Spectrum Analysis. No readers' letters have been passed on to me, which prompts apologies to those who have written and whose comments and information cannot be published in this issue. However, this does give me some space to outline ideas for the future.

Having been writing about VHF, UHF and microwave activity since 1975, I hope I have a pretty good idea of what the majority of readers want from this type of feature. I see my role as a dual one; a reporter gathering information about what has been happening on the bands and a journalist editing it into a readable whole. Of course, the vital ingredient is your input - without which it would be difficult to produce an authentic and balanced report every month.

BANDS COVERED

It is very important that the balance of the piece be right, but the proportion of space devoted to individual bands cannot be predetermined. For example, at the time of writing the 50MHz band was opening to exotic places and bringing new countries to work on almost a daily basis. In contrast, the 144MHz band was very boring, with no decent openings for several weeks to crow about; however, in the summer months I expect that 144MHz Sporadic E reports will demand considerable space.

A significant change is the editorial decision to include activity reports on the lower microwave bands as a supplement to Mike Dixon's excellent 'Microwaves' feature. This means that the VHF/UHF item in 'Spectrum Analysis' will now carry reports on both the 1.3 and 2.3GHz bands. This is quite logical, since many operators now use 1.3GHz as regularly as 430MHz. Commercial transceivers and antennas are readily available for 1.3GHz, making it much easier to get going on this band.

Until a few years ago, if you wanted to operate above 440MHz you had to make some of the equipment yourself, either from scratch or by modifying commercial products intended for other bands. This resulted in an arbitary demarcation line between 'VHF/UHF' below 440MHz and 'microwaves' above 1.24GHz, creating two different worlds. I suggest that this is no longer valid. However, apart from brief mentions of microwave station equipment, I don't intend to include any technical notes, these being much more appropriate to Mike's own feature.

TABLES

While some amateurs seem content to talk to a small group of local friends, many more enjoy the challenge of a little competition. For this reason I have always included various tables in my VHF columns and intend to introduce them in RadCom. As always, it is a question of balance and I would appreciate your constructive comments on this topic.

An Annual Table based on counties and countries has always proved popular so it will be introduced. The counties will be the 79 listed on page 63 of the January issue, and to bring the table in line with the Society's awards, up to three QSOs with stations in the large Scottish regions may be included to make a possible 103 points. The countries will be the recognized DXCC ones as listed in the new RSGB Call Book.

Locator square hunting is a popular pastime so I propose to include a table based on squares worked after 1 December 1978, again to keep the scores in line with the 4-2-70 Squares Award programme. The bands will be 50, 144, 430 and 1296MHz on a 'rotating' basis so that the same entrants are not always at the top of the heap. The tables will not necessarily be published every month, since reporting of activity will take precedence.

YOUR REPORTS

It is a very lengthy task reading through reader's letters, especially since they vary from very neat and concise reports composed on a word processor to scribbled notes that are almost impossible to decipher! As I shall be reporting on activity on a band-by-band basis, it would be helpful if you would write your reports in the same way. Daily records of operation on several bands can be ambiguous, especially if handwritten. Please be sure to date your letter and write your name and callsign to avoid confusion. When referring to counties, please adopt the code letters as per the RadCom list but use HBS for South Humberside and HBN for North Humberside.

I would appreciate your highlighting anything unusual, such as having a QSO with CN8 on 144MHz via Es when everyone else was working Balkan stations, or only being able to hear 50MHz DX stations by beaming 60° degrees off the true azimuth.

Incidentally, those who have an E-mail capability may like to note that I have a 'Telecom Gold' mailbox. The address is 76:MSX022 and readers are most welcome to send their reports to me by this mode if they wish.

DXPEDITIONS

If you plan any activity from a rare county, country or square, either as an individual or as a member of a group, or you hear of anyone else doing so, please tell me. Columnists aren't clairvoyant (although some people assume that we are) and we do need to be told about these things!

CONTESTS

I won't be reminding you of those contests which are listed in the 'Contest News' section but I would appreciate details of any non-RSGB events which might be interesting. An example would be Irish contests, which afford opportunities to work some of the rarer counties in the Republic. Your comments on conditions, operating standards and the quality of signals will always be welcome.

CRITICISMS

To stir things up right away, I must say I think that amended General Contest Rule 16 limiting the use of high-power amplifying devices is a retrograde step. Many groups and individuals have spent countless hours designing, building and perfecting VHF and UHF amplifiers using a pair of 4CX-series tetrodes such as the 250 or 350. These are no longer permitted even though some of the cleanest signals on the bands come from stations using this class of home-constructed amplifier with a properly designed power supply. And this is progress?

station to listen for is GI4RYP, who has 12W and a 4-ele from County Armagh.

144MHz

After the tropospheric fun and games of January, last month was a bit quiet on 144MHz. There were a few weak auroras - GW4FRX (Powys) managed some LAs and UP1BWR on 3 February - but then there was a period of very high winds over much of the UK and, judging by the level of (in)activity, many people had parked their beams into wind and retreated to a nice cosy living room. A number of stations in Scotland lost their antennas, unfortunately - commiserations to all and 'haste ye back'. In another aurora on 12 February the usual Scottish stations were around and working down as far as the West Midlands. Apart from that, no reports of anyone working anything at all exotic were received and most people contacted were too relieved to have kept their antennas aloft to complain about the poor conditions!

By the time this is read, two 144MHz beacons should be back on the air. GB3LER at Lerwick in the Shetlands was taken out of service early in March by its keeper Andy, GM4IPK, for attention to its (lack of) keying. Andy was of course well-known for putting in a colossal 144MHz auroral signal all over the place from his old Edinburgh QTH, and he's having more than his fair share of problems getting antennas up at his new abode; he's planning a 4x 15-ele array but last time he passed by your scribe's QTH he was decidedly peeved about some of the petty difficulties he was encountering. Bottom line is that the well-known callsign won't be heard for a little while but IO99 should then become rather easier to work. Anyone happen to know where there's a ground-post for a heavy-duty 60' Versatower? If so, Andy would be very pleased to hear from you...

The other beacon which should have returned to service by now is the GB3CTC complex, taken out of service on 21 February pending a new antenna system.

And that's about it for 144MHz this month.

Incidentally, is JN46 a blank square on your map? Mine too. Hope is at hand, however - HB9CYY and HB9SLU say they've found a good portable site in EG01 and promise to come on from there for 144MHz tropo. MS operation may also be possible, and one report suggests that they were active during the Quadrantids. Anyone care to activate JN56...?

430MHz

Unfortunately, we have no reports whatever for 430MHz this month. We know for a fact that there's life on this band, so please do tell our new columnist all about what you hear and work on 'seventy'.

FINAL-FINAL

That's it for this month, except to add a free plug for the VHF Convention - don't forget that it's on Sunday 16 April 1989 at Sandown Park. There will also be an informal meeting of VHF DX-chasers on the previous Saturday evening at 7.30pm in the Bear at Esher.

Some items in this month's feature have been 'borrowed' from the "Six Metre & Up DXer" newsletter edited by David Butler, G4ASR and Tim Kirby, G4VXE - many thanks to both for their assistance. The newsletter is available on subscription from RSGB Headquarters (if you'd like to receive it, contact Tim Charles at HQ for details on how to subscribe) and it's well worth having if you want to know who's worked what and who's around to be worked.

SWL

BOB TREACHER BRS32525

LISTENER REPORTS

Robert Small BRS8841 reported an interesting month with the 3W and 4W expeditions and both VK9 trips providing new countries. 28MHz conditions had been particularly good once again with CW providing FM5, OY and 8Q7. On SSB, C53FW (via G3YMM), VK8KO (Groote Elyandt Is), VP2E/WA2BOT, VP5/GOAZT and VS6VU were the pick of the bunch. On 14MHz, Robert monitored a QSO between UA10IL (Franz Josef) and LU1ZC (South Shetland Is) around midnight at the end of January for a particularly interesting north-south logging. On 7MHz, both VK9s were heard, plus BY8AC (op. SMOEMZ), TJ1PS, V29C (via W2GBX) and ZC4JL. Late evening produced some good Caribbean signals on 3.5MHz with VP2M/F2JD, WB3KBZ/VP9 and 8P6JB. 1.8MHz had been quite poor by comparison with only J52US, KP2A and PY1RO of any real note.

From the log sent by Colin Watson, BRS46598, he had not been so active; most of his activity was on 3.5MHz. Some of the more exotic callsigns mentioned were XE1VIC, 6W70G and J79ROJ (via RA4HA).

G6UYY reported much activity at the FM end of 29MHz. He had heard HI3ADI, together with various USA stations. He felt that conditions now were probably as good as in the 1950s when New York taxis could be heard around 50MHz.

Albert Tideswell, BRS48462, reported a good month on 3.5MHz with VK9ZM and VP5/AA5AU heard, taking his band tally to 250/276. Elsewhere RAOAD/JT, FP5DX, HL9TF and PZ1CW were the pick of the DX logged.

Brad Bradbury BRS1066 continues to chase the Oblasts and mentioned UW90Q/UG (via UA90F) and UA0QT (Kotelny Is).

Meanwhile, in Harrogate, David Whitaker BRS25249 also started playing the "Oblast game" and reckons he just needs 10 to complete the set on receive. Tuning around 18MHz, David heard a number of USA stations - they got the band on 1 February - plus VE, ZS and some Europeans. On the QSL scene, cards from T5GG, P40V and JX1UG gave countries 250 on 3.5MHz, 267 on 7MHz and 119 on 1.8MHz respectively.

VHF LISTENING

Unusually, there is some tropo to report. Mick Toms, BRS31976, copied HB9SLU (DG), OE2KMM (GH) and EI9GO (WC) on 144MHz. On 432MHz, many DLs in the 'L' line were heard, together with OE5BRL/5 (HI).

David Whitaker, BRS25429, caught some local ducting across to Scandinavia and mentioned SM7SKH (JO76), SM7FMX (JO65), SM6RWY (JO57) and SM6MUY (JO67), all on 144MHz.

Looking at the 144MHz MS scene, Mick Toms mentioned disappointing Geminids and Quadrantids meteor showers. In the former he caught YT3ET, I5JUX, OH1AF, OH2TI, OK2ZZ and IKOBZY. Only DL5MCG and YU8DM were copies during the latter shower, when gotaways included SM5DIC, ISOOMH and OH7MA.

NEWS FROM 7Q7

Stan Porter, ORS45992, wrote from Malawi, probably for the last time. By the time this is read he should be on his way back home after a very long business stay. Home will actually be CT1 - he's retiring to the sunshine! His 7Q7 QTH is for sale and so is his sailing dinghy, but his CR100/2 will be left with another 7Q7 SWL. 14MHz was Stan's main band, and he spent much time monitoring ZS nets to keep abreast of African goings on. He was beginning to collect WAB squares and already had 600 to his collected. Thanks for all the 7Q7 news, Stan, and we look forward to a few more notes from CT1.

MORE DX NEWS

Highlights for February were the second expedition in quick succession to Vietnam. Many would have worked or heard 3W8DX and 3W8CW: this Russian expedition was very active using 3W0A on SSB and CW, while 3W1A was available for those who are keen on RTTY.

Also active, to whet the appetite, was 4W0PA from the Yemen, who had been especially active on 14MHz. There has been little activity from there in recent years. QSL cards for the lucky ones are via PA3CXC.

At the time of writing rumours abounded about forthcoming trips to J8 (St. Vincent), KP5 (Desecheo Is), ZK1 (Cook Is), VU7 (Laccadive Is), and XF4 (Revilla Gigedo Is). The usual April stories of trips to Albania and the Spratly Group can probably be dismissed.

RSGB DX COMPETITION

In a couple of months time we'll be publishing details of an exciting new competition for RSGB members.

The competition will take the form of a 'treasure hunt' and you will be asked to identify a number of rare DX locations from photographs which will be published in RadCom over a number of months. When you' ve managed to identify all of the locations you will then have to write down the prefix of the country/location as it appears in the latest addition of the RSGB Callbook. Finally, as a tie-breaker, you will be asked to estimate the total distance covered if you were to visit each of the locations in order. The eventual winner will receive a holiday for two - not just any old holiday though, but a holiday with a difference.

We won't give too much away at this stage. Suffice it to say that the holiday will be in a rare DX location. It's far from the madding crowd and about five-and-a-half hours from Gatwick Airport. Just exactly where it is, though, you'll have to wait and see! The accommodation has its own radio shack and, to enable the winner to operate from this choice DX location, a visitor's licence will be arranged as part of the package.

PROPAGATION NEWS FLASH:

BIGGEST AURORA EVER?

As a direct result of a massive X15 flare at 1313 on 6 March (our auroral man Charlie Newton, G2FKZ, says he can't ever remember a larger one), there was a fantastic auroral opening on 13/14 March. We'll obviously have a full write-up in next month's 'Spectrum Analysis' (send your reports to G3FPK) but it's known that stations in the Midlands and on the Welsh border had 144MHz contacts with Jersey, Denmark, Sweden, East and West Germany, France, Switzerland, Austria, Czechoslovakia, Poland, Hungary, Yugoslavia, Romania and Italy. Stations further to the east reported contacts with UR2, UQ2, UC2 and UB5.

On 430MHz Hungary and Yugoslavia were available, and G4RGK worked YO2IS.

On 50 MHz it was all happening as well, with star turns being the Scandinavians - SM6PU had the first confirmed SM-G QSO since their permits were issued.

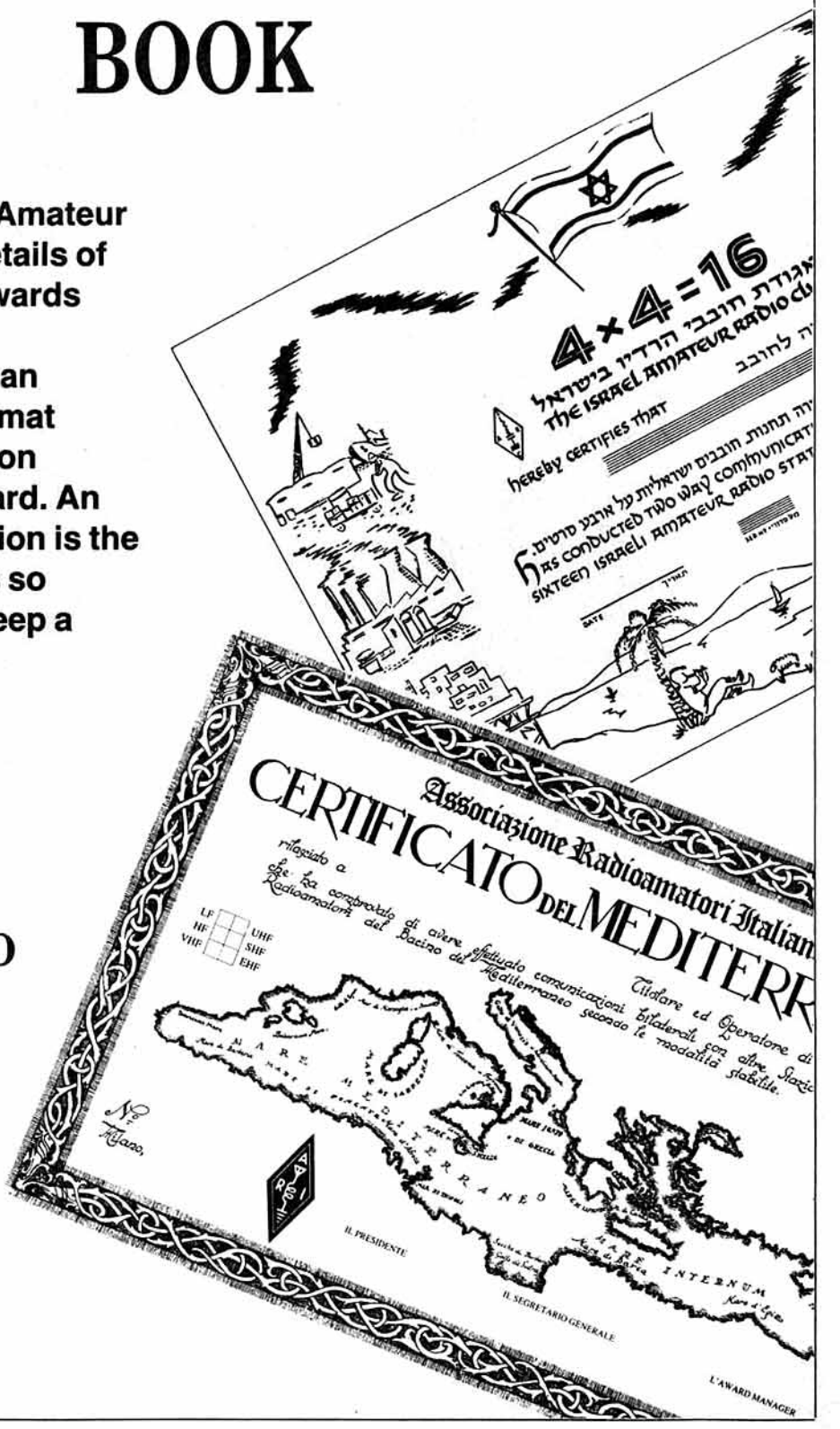
The event began early in the afternoon of 13 March and was in full swing all over the UK by about 1500. It was still going strong at 0330 on 14 March, with sundry Czechs and Italians still 59A on 144MHz.

More next month, with a special analysis by Charlie Newton.

AMATEUR RADIO AWARDS BOOK

THIS NEW EDITION of Amateur Radio Awards gives details of major radio amateur awards throughout the world. Each award is listed in an easy to understand format giving full information on how to achieve the award. An innovation for this edition is the provision of checklists so that the amateur can keep a record of progress.

This book is essential reading for the avid award hunter and the DX chaser alike.



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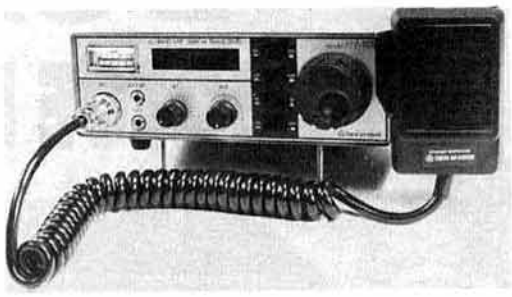

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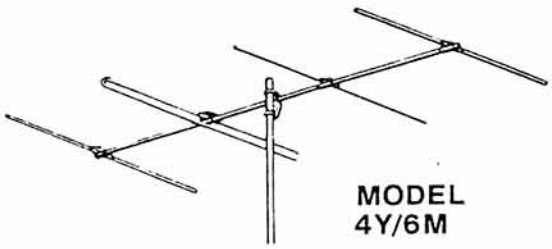

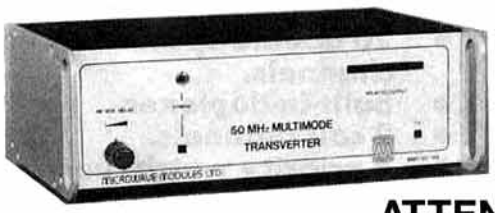

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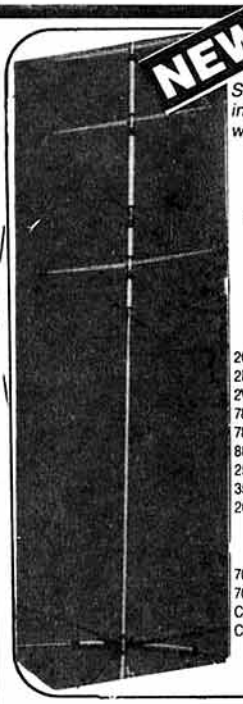

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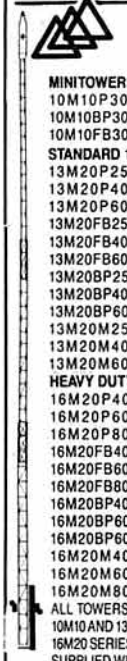

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VISA

TECHNICAL TOPICS

PAT HAWKER G3VA

ELEVATED VERTICALS

In April 1958, in introducing the first *TT*, I wrote: "All we can hope to do (in this new feature) is to survey a few ideas from the technical press; a few hints and tips that have come to our notice; with perhaps an occasional comment thrown in for good measure". *TT* has always aimed at encouraging a spirit of experimentation and novelty rather than purely the continuation of established systems, providing a technical and ideas forum in which nothing is guaranteed, everything subject to trial and error; heresay given priority over technical dogma as seen in the light of the ways in which amateur radio is evolving, for better or for worse. A recognition that most of what we do is rooted in the past but also that physicists today are having to learn to cope with entirely new theories of 'chaos' – those inexplicable situations where even the most fundamental laws are broken or thrown into confusion.

There are two extremely difficult tasks an amateur can set him or herself: (1) To invent something entirely new; and (2) to persuade others that long-established practice, as described in the standard handbooks, may not always be the optimum or even the correct solution. This applies particularly in those areas of radio physics where it is virtually impossible for an amateur to plot or quantify exactly what is happening. Notable examples are radio propagation and antennas, where very large numbers of variables affect the performance. For instance, one cannot easily measure vertical radiation patterns.

An important area in which our ideas may need to change is in the design of elevated vertical antennas, even though the "ground-plane" has a history dating back over 50 years and is currently used successfully by many thousands of amateurs.

It has been noted previously in *TT* that there is still confusion between the true vertical monopole, with its 'infinite' ground plane, the real Earth, often assisted by a large number of buried earth radials or an earth mat, and the elevated ground plane with quarter-wave horizontal or sloping wire radials or rods as a 'non-radiating' artificial earth plane.

In 1981 I revealed, possibly for the first time, that the late Dr George Brown of RCA, who developed the ground-plane antenna in the mid-1930s for 30-40MHz police communications, had told me that his original system had just two radials and that this was later altered to four radials for purely commercial reasons. Similarly, Les Moxon, G6XN has strongly advocated the use of a single short (inductively loaded) counterpoise (radial). If one thinks of the antenna as a *bent dipole*, it becomes evident that the antenna will radiate efficiently with just *one* elevated radial (counterpoise) but in this case there will be a tendency for the outgoing wave to have mixed horizontal/vertical polarisation with its maximum lobe at a relatively high angle to the horizon: nevertheless a perfectly satisfactory arrangement as a general purpose antenna. For DX operation with the desirable low angle of vertical radiation, the trick is to find some method of reducing the radiation from the wire forming the horizontal side of the 'dipole'.

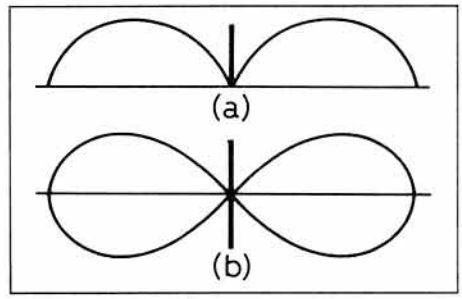


Fig 1. (a) Vertical radiation pattern of a quarter-wave monopole above an infinitely ground plane of perfect conductivity – this can be approached in maritime mobile operation. (b) VRP of half-wave dipole in free space.

Some years ago Canadian engineers W V Tilson and A H Secord in 'The radiation patterns of ground rod antennas' (*Electronics & Communications*, August 1967, pp27-30) showed that the VRP of ground rod antennas varies markedly with changes in element lengths and the degree to which RF currents can be kept off the outer braid of coaxial feed lines. Only in a limited number of cases does it provide its lobe directed towards the horizon to resemble the radiation pattern of a quarter-wave monopole above an infinitely perfectly conducting ground plane, or that of a vertical half-wave dipole in free space, Figs 1 and 2. Professional engineers tend to assume that the lobe of an elevated ground-plane antenna must always be tilted upwards. Tilson and Secord concluded: "It is clear that one cannot merely say that ground rod antenna patterns tilt up and leave it at that. The pattern depends on both the length of monopole and ground rods, and also on how well the currents can be kept off the feed cable. Secondly, when the ▷

HIGH CURRENT 50V PSU

It has been frequently suggested in *TT* that one way of improving the linearity of solidstate RF power amplifiers can be found in the availability of higher-voltage devices, particularly power MOSFET devices. Chris Gare, G3WOS, has been transversing this path but stresses that it does call for a new approach to high-current power supply units. He writes:

"In attempts to improve the linearity of various high-power VHF amplifiers built over the years I have migrated, as the technology has changed, from 12-volt to 28-volt transistors. 1988 brought the need for 50V devices. However, it always seemed to be more difficult to build the PSU than the amplifier itself and this was never more so than building a 50-volt PSU.

"The basic problem is that the ubiquitous 723 has a maximum voltage rating of 40volts and thus cannot be used by itself as in earlier, lower-voltage supplies. Having tried several published designs, including one based on a floating regulator (G3WZT, *Radio Communication*, June 1986, p409), I found none of them entirely satisfactory from the viewpoint of performance. For example, the G3WZT design needs at least 9.5volts across the regulator in order to maintain the regulation. If the supply is to be capable of supplying more than 10A this means 95watts dissipated in the pass transistors alone. I wanted to design a supply that would regulate with Vin(min) at 54 volts at a full load of 15A.

"The problem was solved by translating the regulated 26V output voltage of the 723 up to 50V by means of a 24V zener diode as in Fig 3. The circuit works very well, has excellent regulation and is capable of meeting the above requirement with ease. The 723 supply is regulated to 36V by the use of a simple regulator. My earlier PSUs used *very* large and heavy conventional transformers which took up too much space in the shack and in the car when going portable. This present design uses a 45V-0-45V, 750VA toroid transformer (2.5-in high, 6in. diameter) allowing it to be built into a 5in. high cabinet (available from Airlink Transformers, Unit 6, The Maltings, Station Road, Sawbridgeworth Tel: 0279 724425).

'The design uses a conventional over-voltage detection arrangement (not described) and utilised fold-back over-current protection. The over-current detection circuit needs to use an external BD135 transistor as the internal 723 detection cannot be used."

G3WOS provides a worked example based on the formulae given in the *Motorola Linear Databook* for calculating the value of current foldback components. Unfortunately, recent printing problems with *TT* discourage the inclusion of this example, owing to the possibility of errors creeping in at a late stage, and pressure on space.

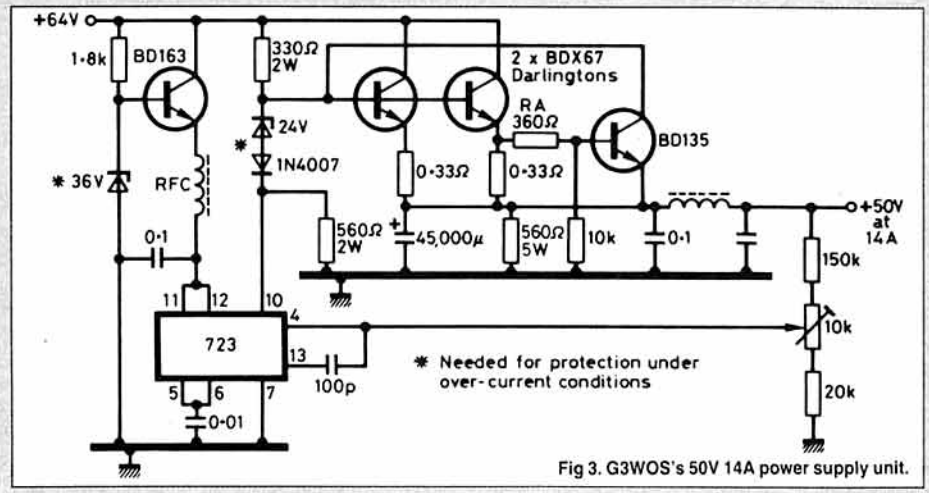


Fig 3. G3WOS's 50V 14A power supply unit.

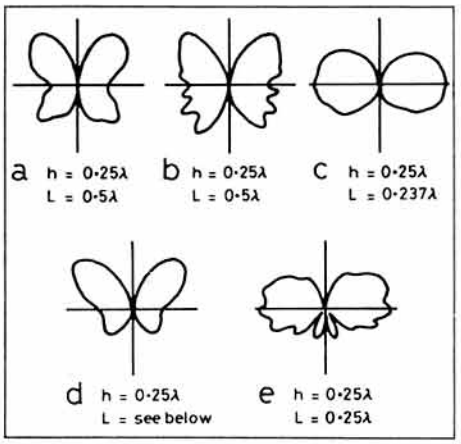


Fig 2. Some typical VRPs of ground rod antennas showing the effect of radial lengths (L) and of chokes on the feedline: (a) with chokes, (b) without chokes, (c) with chokes, (d) circular ground plane of radius 0.03 with chokes, (e) without chokes. (Tilson & Secord, 1967)

monopole radiator is a half-wavelength, the pattern resembles a typical dipole pattern even with no ground rods or chokes present on the feed cable. When a quarter-wave monopole is used with no chokes, suitable patterns may be obtained with ground rod lengths near three-eighths of a wavelength."

TT (March 1981) reported that Les Moxon, G6XN had developed an effective short (loaded) 'counterpoise' technique and this is explained in more detail in his *HF Antennas for all Locations* (RSGB 1982). G6XN was careful not to claim originality since military manuals often show pack sets working into a dipole in which one arm is run just above the ground while *TT* had earlier included notes on using trap verticals by converting them into vertical dipoles and had also shown how loaded 'counterpoises' can be used to remove unwanted RF-voltages from otherwise 'hot' metalwork or chassis in upstair shacks.

At about the same time, Arch Doty, K8CFU and colleagues carried out hundreds of measurements that showed that a few elevated 'radials' perform as well as or better than the 120 or more buried radials traditionally used for medium-wave broadcasting and often advocated for 1.8 and 3.5MHz DX operation despite the cost and effort required in such construction. As noted in *TT*, August 1988 and December 1988, K8CFU's laborious field measurements have been confirmed as the result of computer studies by a team of professional engineers including Al Christman, KB8I (*QST*, August 1988, pp33-42). Both studies have been based on the use of four or more elevated radials. There has also been some interest in the concept of a 'zero-extent' ground-plane antenna using lossy ferrite chokes to absorb energy fed back down the outer of the coaxial feeder (*TT*, March 1988 and November 1987).

But it would seem that the penny has yet to drop. Amateurs the world over continue to spend time, money and energy in improving earth systems for vertical monopoles, vertical arrays and erecting multi-radial systems for their ground-plane antennas. To quote from a recent letter from G6XN, parts of which it is hoped to cover later: "Despite proof of the efficiency and major practical advantages, my advocacy of short radials clearly stood no chance since, as you have related, even the inventor of ground-plane was unable to get away with two radials but had to bow to commercial pressure. To suggest shorter radials and, beyond that, the possible use of only a single radial, provided it is *short* enough, is clearly heresy of the worst kind. It still seems to be universally accepted that a radial length of a quarter-wave is necessary; moreover from *TT* and elsewhere it appears that an enormous amount of effort continues to be misdirected at 'improving' earthed and radial systems which inflict a maximum of inconvenience and inhibit the use of vertical elements for beam arrays. Furthermore multiple quarter-wave radials offer no advantages but instead involve the major disadvantage that the rapid change of impedance close to resonance can cause problems of electrical equalisation of the radials. Short radials are superior also for multiband operation although grounded verticals have the edge in this respect, provided that the extra radiation loss due to ground losses is acceptable.

"Searching for ways to put my case over more effectively, I felt there was a need for more information on bandwidth and other limiting factors including the effect of the height of radials (shortened or not) above ground. A few simple experiments led to what, relative to my limited resources, became a massive research programme digging deeply into fundamental questions. The results have included a few surprises as well as establishing that *over a very wide range there is no significant difference between short and long radials in respect of any important aspect of performance*. This applies regardless of height although the so-called ground-plane, at extremely low height, turns into a completely different kind of antenna, ie, a *genuine* ground plane (monopole), whereas in the normal case, ie, height of radials more than a foot or two, it is a *dipole*. The fact that it is basically a dipole is implicit given that it works in free space where monopoles cannot exist. As I see it the practical distinction between dipole and monopole depends on whether current flows from one pole to the other of the source as it would in free space, or whether it does so at least in part via the ground."

I hope to return to G6XN's letter on another occasion but for the present reproduce his summary of main conclusions relating to "unsymmetrical dipoles":

(1) Ground plane antennas with radials at normal heights are dipoles not monopoles.

(2) Over a wide range there is virtually no difference between short radials with a shared loading coil and quarter-wave radials in respect of any aspect of performance. Bandwidth is reduced by excessive shortening, typically 30% reduction for two 0.08-wave radials or four 0.06-wave radials.

(3) Ground losses for quarter-wave vertical antennas operating with a set of radials and fed at the base are virtually zero at 14MHz for heights more than 4ft and only just over 0.5dB for a height of 2ft. There are no losses in the case of parasitic beam elements of this type.

(4) Variation of such losses with frequency is likely to be negligible but this has not yet been determined.

(5) For a base-fed element the maximum loss resistance for radial heights less than 4inches is in the region of 35ohms for two radials and can probably be halved with four radials. Comparable losses were observed with buried radials (poor soil).

(6) Horizontal dipoles may also be loaded asymetrically, for example a quarter-wave radiator can be fed against the equivalent of a pair of short-loaded radials or even a single short resonant helix. Loading does not affect the current distribution or the height at which ground loss disappears, even if carried to extremes.

HI-C LO-L TANK CIRCUIT FOR TRANSISTOR AMPLIFIERS

QRP enthusiast John Cronk, GW3MEO recently built a very simple 1.8MHz transmitter using a BFY50 bipolar transistor amplifier. He writes:

"This transmitter is so simple that it provided an ideal opportunity to optimise every component and component value. The calculated values for the Class C output stage proved particularly interesting. Values were determined using the well-known recommendation that the tank circuit should have a loaded Q of 12. In this case the values turned out to be 10,000pF (0.01F) for the capacitor and 0.7H for the inductor: Fig 4.

"Since 0.01μF variable capacitors are not to be found in the real world, most transistor tank-circuit designs avoid these extreme values by using a tapped coil (or series resonance) to match the very low impedance of a transistor power amplifier. Yet, in practice these values can be achieved quite easily by using a 0.01μF mica capacitor and a 0.7μH coil provided that the inductor becomes the variable component. Ten turns of 16SWG enamel wire on an Aladdin former with core seem satisfactory.

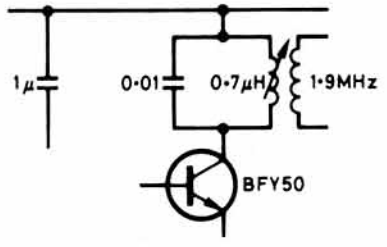


Fig 4. Low-impedance parallel tank circuit for transistor amplifier as used by GW3MEO for a 1.9MHz QRP transmitter.

"It was only while testing this arrangement that I realised that tapping the amplifier down the tank coil does not fully use the flywheel effect of a tank circuit in restoring the pulse-like output of a Class C stage to near sinewave. I use the well-known analogy as the full electrical explanation of the flywheel effect is long-winded and in this case not a good analogy.

"I feel that it is of interest that in spite of this parallel-tuned tank being the conventional arrangement for valve amplifiers, none of the many small solidstate transmitter/transceiver designs that I have come across use such an arrangement. The result of using these unusual but technically correct values is a simple transmitter with such low harmonic output that the usual low-pass/bandpass filter is unnecessary. Remember that to obtain an 80ohm output the coupling link will need more turns than the tank coil to provide a step-up ratio (tank impedance 10ohms). The arrangement has the virtue of being physically small and in keeping with the other components in such a QRP rig."

(7) Horizontal antennas, whether loaded or not, have negligible ground losses above a height of about 0.16-wave.

(8) Comparisons of ground loss information from several sources suggest that it is much less variable than the DX signal performance of vertical antennas and not directly related to it. There is no connection between DC resistance and RF resistance of earths, nor would one expect any, although this point has seldom if ever been discussed in print.

13.8V 5A POWER SUPPLY UNIT

Despite the advantages of using 28V bipolar or 50V MOSFET devices for linear RF power amplifiers, most amateur transceivers are still being designed for use with vehicle supplies, nominally 12V but in practice usually 13.5-13.8V. Dropping the power supplied to the equipment to 12V will generally reduce the RF output power by 10-20% and may severely degrade the intermodulation distortion (IMD) on SSB.

It is thus important, both when operating mobile or when the rig is used as a base or fixed station, to ensure that the power leads between the equipment and the battery/PSU do not introduce a significant voltage drop; heavy gauge wire should always be used. A mains PSU should be well regulated for loads up to the peak current drawn by the equipment and the output voltage capable of adjustment to 13.5-13.8V preferably as measured at the transceiver unit.

In May 1978, *Electronics Australia* described a 'VK Powermate' 5A unit specifically intended for domestic operation of amateur radio and CB transceivers designed for mobile operation from a nominal 12V battery supply. Apparently this unit has enjoyed continued popularity, exceeding that of PSUs of higher and lower power ratings. The result is that the magazine has recently published (EA, October 1988, pp66-71) constructional details of a 'Powermate II' design utilising updated or more economical components. It is claimed that the revamped unit (Fig 7) provides a clean, well-regulated 13.8V DC output at up to 5A continuous. Voltage output, for loads from 0-6A, drops only about 10mV with less than 6mV peak-to-peak ripple with mains voltages from 220 to 260V AC.

The unit has a conventional circuit arrangement with an 18V/6A mains transformer, bridge rectifier, using four low-cost 3A diodes such as the IN5404 or a suitable encapsulated 6A bridge rectifier which tends to cost more than separate diodes. The unit, although running quite warm, is capable of continuously powering a 5A load or supplying 6A for short periods as found with a transmit/receive duty cycle. The author, Jim Rowe, suggests that "to make it capable of delivering 6A continuously, the 3A diodes D1-D4 should be replaced by a suitably rated bridge rectifier preferably mounted on the inside of the rear panel for improved heat dissipation, with the value of C1 and C2 increased to 5.6 or 6.8 millifarads (ie. 680µf) and with a second 2N3055 power transistor with current-sharing resistors preferably each with its own heat sink. The 5A unit uses a finned heat sink section (single-sided) 110 by 33 by 74mm.

A possible additional safeguard would be to incorporate mains-transient suppression using a metal oxide varistor (eg, V275LA20A) as shown for the 'Moorabbin Mark IV' 13V, 20A unit outlined in the January *TT*. The Mark IV has relay-operated over-voltage protection and this has led J R Hooper, G3PCA, to suggest a number of ▷

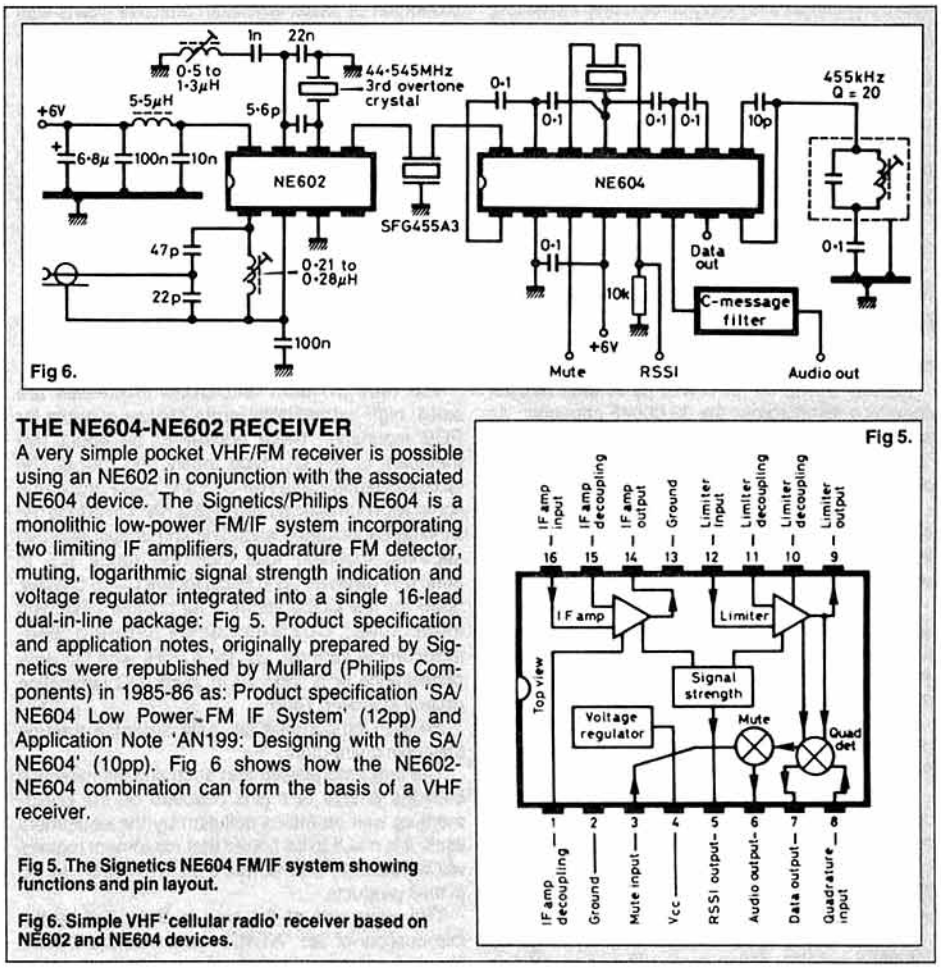


Fig 6.

Fig 5.

THE NE604-NE602 RECEIVER

A very simple pocket VHF/FM receiver is possible using an NE602 in conjunction with the associated NE604 device. The Signetics/Philips NE604 is a monolithic low-power FM/IF system incorporating two limiting IF amplifiers, quadrature FM detector, muting, logarithmic signal strength indication and voltage regulator integrated into a single 16-lead dual-in-line package: Fig 5. Product specification and application notes, originally prepared by Signetics were republished by Mullard (Philips Components) in 1985-86 as: Product specification 'SA/NE604 Low Power FM IF System' (12pp) and Application Note 'AN199: Designing with the SA/NE604' (10pp). Fig 6 shows how the NE602-NE604 combination can form the basis of a VHF receiver.

Fig 5. The Signetics NE604 FM/IF system showing functions and pin layout.

Fig 6. Simple VHF 'cellular radio' receiver based on NE602 and NE604 devices.

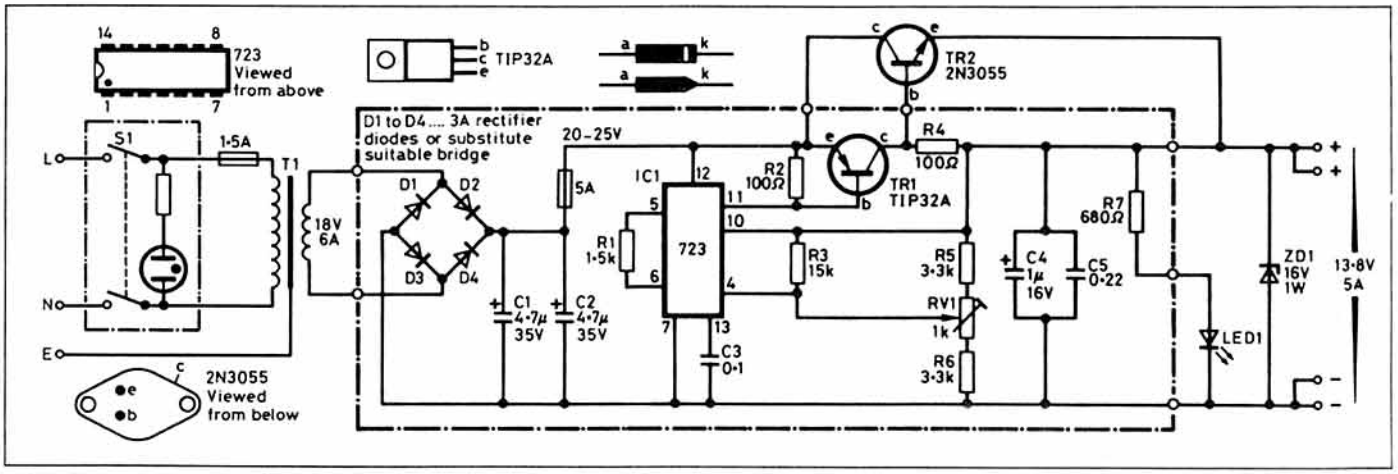


Fig 7. 'Powermate II' 13.8V 5A PSU (*Electronics Australia*).

improvements to this heavy current unit. He writes:

'The circuit arrangement, as shown in the January *TT*, Fig 4, provides very poor regulation, and in the event of a sudden rise in output voltage (eg, short-circuited pass transistor) there is the possibility that a rig connected to it would be damaged before the trip operated. In my view the trip circuit and relay are too slow. My suggestions are:

(1) The 200ohm 10W resistor should be wired directly across the 33,600 μF capacitor.

(2) The OV heavy current line should come directly from the 33,600 μF capacitor taken directly to the output terminal.

(3) The 0V line to the PCB should come directly from the 33,600 μF capacitor.

(4) The 'power on' LED with its 1k feed resistor should be wired across the 33,600μF capacitor. As connected in the original circuit it would now show 'power on' should there be a failure in the regulator circuit.

(5) The voltage sensing should be taken from the output terminals (or remotely from the transceiver input terminals – G3VA) rather than from the wiring or the PCB.

(6) The current meter should be included in the sensing loop to avoid voltage drop at the output (when loaded) due to the resistance of the meter. At 20A or more the voltage drop could be 1V or more depending on the meter.

(7) To be effective, the 1N4004 diode should be directly across the output terminals and not on the PCB.

(8) A capacitor of about to 500 to 1000μF should be wired directly across the output terminals to maintain a low impedance output (but note that this capacitor would not be automatically discharged by the 200ohm 10W bleed resistor when the power is switched off – G3VA).

(9) The relay plus BD139/BD140 overvoltage trip would be too slow acting to save the connected rig should the output rise suddenly (eg, short-circuited 2N3055 etc). G3PCA feels this circuit should be replaced with a 'crowbar and fuse' type of arrangement on the output side of the regulator.

(10) The current sensing line (pins 2-3 on the 723) should go directly to the 3 × 0.1ohm resistors.

With the above changes, the PSU should hold its output voltage to within 0.01V at the full load of 20A and be safe to use with any equipment.

NEW RANGE OF MAINS FILTER CHOKES

One of the most useful weapons in the EMC armoury has always been the use of mains filters to prevent the ingress or egress of RF 'noise' along the mains leads. At one time, such filters often comprised a few AC-rated capacitors and two chokes, each typically comprising 50 to 200 turns of insulated wire wound on a 1inch diameter former, (lengths of broom-handle were often used).

With the ever-increasing amount of RF-vulnerable and RF-emitting domestic appliances, there is a real need for effective mains filtering to be incorporated in a wide range of domestic and office appliances including colour TV receivers, personal computers, VDUs, photocopiers etc, many with 'noisy' switched mode power supplies, as well as for cleaning up the mains supply connected to amateur transceivers etc. Of course, even a high-performance mains-filter cannot overcome the problem of direct radiation from unshielded or poorly-shielded enclosures but there is a very high proportion of cases where an effective mains-filter can overcome the problems of electrical interference and amateur 'disturbance' of domestic appliances.

Philips Components (formerly Mullard Ltd) has recently announced a newly-developed range of high-performance current-compensated ferrite chokes for use in consumer equipment, including CTV sets, monitors, VTRs and CD players, as part of the filter network in the power supply. These chokes can also be used as a general-purpose mains filter choke in professional applications – and would clearly be suitable also for amateur-radio applications. The performance is claimed to equal that of more expensive toroid-based filter chokes.

The new CU15/d3 and CU20/d3 families are small, high-permeability ferrite chokes suitable for PCB mounting. There appear to be about five members of the CU15/d3 family and four of the CU20/d3 family based on U15 and U20 Ferroxcube cores with current-ratings up to 2.5A. To reduce the winding capacitance each winding is split into two sections. Insertion loss over the range 0.5 to 30MHz is given as up to 65dB for the CU15 chokes, 55dB for the CU20 series. The chokes offer high inductance; CU20/de family offering self-inductance ratings up to 47mH with a self-capacitance of around 10 to 25pF. DC resistance usually less than 1ohm.

Philips Components are only available through their own distributors.

The firm emphasises that such chokes minimise both the effects of mains pollution on the equipment as well as mains pollution by the equipment itself. It is much to be hoped that equipment makers will increasingly incorporate effective mains filtering in their products.

The other side of the coin is illustrated by the introduction of an 'ATAC' system made by the Swedish company Cominvest, brought to my notice by Dave Ansten, G1EHF. This device is claimed to prevent 'eavesdropping' of information from computer radiation. It is well known that computer data can be secured by unauthorised interceptors within a few hundred feet of the installation. Military equipment is protected under the 'Tempest' regulations which specify very effective shielding. The ATAC system, on the other hand, seeks to protect the security of information by adding a large number of signals to those emitted from information technology equipment. As G1EHF comments: "So it seems the solution to computer-generated RF rubbish is more RF rubbish!" Let us hope the DTI will in future classify ATAC as illegal transmitting equipment!

DRY JOINTS ILLUSTRATED

The November 1988 *TT* underlined the truism that soldering remains "the basic craft" of electronic construction, emphasising that a continuing bugbear is the 'dry joint' owing to imperfect 'wetting' of the solder which remains 'adhered' to the joint by a layer of undiffused resin.

The October 1988 *Electronics Australia* was able to devote some 5½ pages to 'Soldering: the basics' by Jim Rowe. This described many of the finer points involved in the choice of an iron or the more sophisticated 'soldering stations' with automatic temperature control and digital readout of iron temperature. But the article also gave some useful advice on avoiding dry joints and other common problems. It gave the three golden rules for successful soldering: cleanliness, cleanliness and cleanliness! Fig 8.

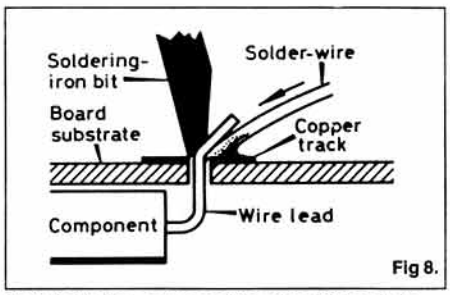


Fig 8. Soldering a component lead to a PCB pad. The iron tip heats the lead and pad directly (*Electronics Australia*).

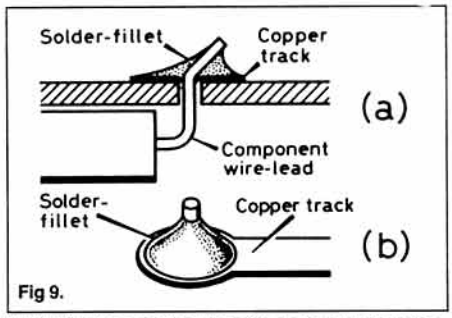


Fig 9. (a) With a good solder joint, the solder meets the metal surfaces at a low angle. (b) The solder forms a smooth fillet all round.

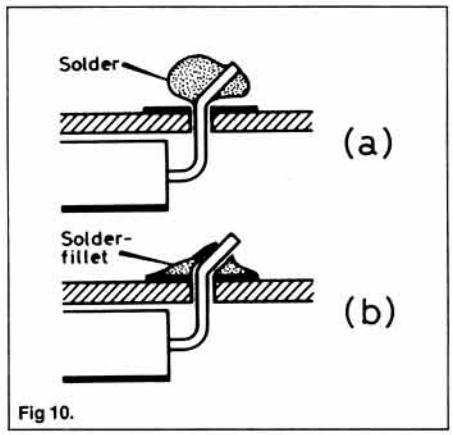


Fig 10. (a) A dry joint where the solder has not wetted the PCB pad. (b) Where the solder has not wetted the component lead.

Jim Rowe also included a section on the difference between good and bad soldered joints:

"How can you tell if you've made a good joint or not? In most cases, just by looking at it.

"A good joint has a smooth solder fillet running all round it, with the solder surfaces meeting those of the component lease and PCB pad at a very small angle (Fig 9). It is this small angle which shows that the solder has properly 'wetted' the other metal surfaces, and bonded to them.

"In contrast, bad joints tend to look rough and matted. Very likely they will also have the characteristics of a 'dry' joint – one where the solder hasn't wetted either one surface or the other, or even both. The 'dryness' shows a much steeper angle between the solder and metal surfaces.

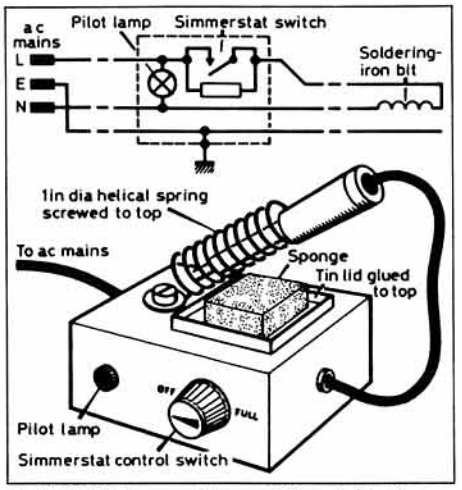


Fig 11. GM1RPJ uses a 'Simmerstat' control to stop overheating his soldering iron during 'stand-by' periods.

"If the solder hasn't properly wetted the PCB pad, but only the component lead, you'll get a small spherical blob shape rather like that shown in Fig 10(a). Conversely if it hasn't wetted the component lead, but only the PCB pad, you'll get a tiny 'groove' around the top of the lead as shown in Fig 10(b). This can be quite subtle and hard to see, so if you're in any doubt it's desirable to reheat and try again – perhaps scraping the metal first to clean it.

"Why is a 'dry' joint bad? Because where there isn't any wetting, there isn't any true bonding either. Even though the joint may seem firm and secure, and perhaps measure as a very low resistance with your multimeter, it won't stay that way.

"Sooner or later, perhaps years later, oxidation will take place and the resistance will rise – possibly going to a full 'open circuit'. Even more likely is that it will start changing resistance with temperature and vibration, causing all manner of weird and wonderful symptoms. Sometimes a dry joint can be hard to spot because the top of the solder can be covered by a thin layer of glassy resin after everything cools. This can make the joint look good even though it's not... Good soldering takes care, as well as practice. Even experts can make dry joints, if they don't watch what they're doing."

David Norrie, GM1RPJ, found that his 25watt soldering iron had a tendency to overheat the bit and burn off the tinned surface when 'standing by'. As he had recently replaced a 'simmerstat' control switch on his electric cooker, and found that one of the two spiral resistive ring was still good, he connected this in series with his soldering iron and found it all worked 'a treat': Fig 11. In use it is turned 'full on' until the solder melts and then turned to the stand-by position except for heavy joints when it has to be turned full on again. The thermostat clicks on and off in the stand-by position. GM1RPJ fitted it in a box about 120 by 80 by 60mm with a spring and tray for the sponge on top.

MORE ON THE NE602 FREQUENCY CHANGER IC

'Complex ICs simplify receivers' (*TT*, January 1989 pp36-7) drew attention to the value of the Siliconix/Philips NE602 integrated double-balanced mixer plus oscillator device as a product detector in simple direct-conversion receivers and also as a very simple VFO or crystal-controlled frequency-converter for either up or down conversion. It may also be recalled that the NE602 was one of the three ICs used in K2BLA's low-cost spectrum analyser (*TT*, April 1988, p262) where it functions as a 0-100MHz mixer and swept oscillator over the range 150-250MHz. In *TT*, November 1988, p871, K2BLA explained that to achieve a reasonably linear oscillator sweep range of 145 to 245MHz he used 'dead bug construction' ie, chips with their 'legs' in the air glued to the board and resulting in extremely short leads. In the data sheets, the NE602 oscillator is specified as suitable for use up to 200MHz and the Gilbert Cell mixer to beyond 500MHz.

Multiple use of this device in low-power RF systems turns up in 'An NE602-based QRP transceiver for 20-meter CW' by Rick Littlefield, K1BQT (*Ham Radio*, January 1989, pp9-12, 14, 17-18). Built as a three-module unit this little rig fits into a 1.75 by 4.0 by 4.0-inch Ten-Tec-type enclosure (external battery or PSU) to provide 5watt RF output between 14.0 and 14.1MHz, semi-QSK T/R switching, provision for adjustable CW off-set and sidetone monitoring. The superhet receiver with a double-tuned bandpass LC filter input has a 10MHz four-crystal ladder filter with the third-module providing an additional four-crystal 10MHz ladder filter and an active audio-filter intended for 'serious CW work'. In effect, the new rig is a further development of K1BQT's 'Travelradio' (*Ham Radio*, June 1987 and see *TT*).

A complete kit of parts, including PCBs and enclosure is available from Radiokit, Box 973, Pelham, New Hampshire 03076, USA, priced in the US at $124.95. A set of PCBs only is priced at $8.95. The new rig uses three NE602 devices: front-end frequency-changer (Fig 4(a)) and '*vxo*' product detector (Fig 4(b)), and one in the transmitter section as a crystal-controlled frequency-changer (9.9985MHz crystal). Although no detailed performance characteristics of this compact rig are given in the article, there seems no reason to suppose that it is not capable of forming a reasonably effective miniature 14MHz CW transceiver.

K1BQT warns that "although billed as a double-balanced mixer, be aware that the NE602 is not "state-of-the-art" for HF (receiver) applications. It's a high-Z device with lots of gain and a third-order intercept of only -15dBm, so it's prone to stray pick-up and occasional (over-load) symptoms of intermodulation distortion. On the other hand, the NE602 has many attributes. It has (for HF) a very low noise figure (lower than 5dB at 45MHz), needs no external local-oscillator circuitry and a minimum of external parts, comes in a small package with low power consumption, and is inexpensive. For the QRP microphile, these are very attractive pluses!'.

Three useful information sheets on the NE602 were produced by Signetics in 1985 and republished by Mullard (now Philips Components) in 1986: (1) 'Designing with the SA/NE602' Application Note AN198 (4pp): (2) 'SA/NE602 double-balanced mixer and oscillator' Product Specification (6pp); and (3) 'AN1982: Applying the oscillator of the NE602 in low-power mixer applications' by Donald Anderson (3pp). As noted above the device provides mixer operation to beyond 500MHz, a versatile oscillator to 200MHz, typical 18dB conversion gain at 45MHz and total current consumption of about 2.4mA. Absolute voltage rating is 9V but optimum performance is achieved with about 6V. The device is available in various packages; the NE602N is 8-pin dual-in-line plastic with a temperature range 0 to +70°C. The SA602- ▷

SIMPLE VHF MODULATED GENERATOR

Construction and modification or alignment of VHF receivers is much facilitated when there is a suitable signal source. In the absence of a good VHF signal generator, even the simplest adjustable and optionally modulated oscillator can be an invaluable aid. Charles Guilbert, F3LG, in 'Un tres simple generateur VHF module' (*Radio-REF*, January 1989, p39) describes just such a device: Fig 12.

TR1 (BF184 or equivalent) forms a VHF oscillator with an RF output of a few milliwatts; the frequency is set by L-Cv where Cv is a 6-25pf trimmer and L is a 'hairpin' inductor, about 25mm high. This provides an adjustable range of about 105 to 200MHz. Other ranges can be achieved by replacing L with a small coil; for example, a coil of 4.5 turns, 1mm wire, diameter 18mm with turns spaced 2mm would give a range of about 37 to 60MHz etc. TR2 (B775, eg, BC547 or similar) is a bridged-T audio oscillator with an output tone adjustable over a range of about 220 to 500Hz. Adjustment of the regenerative (positive feedback) capacitor Ca (3 – 13pF trimmer) is not critical and can be adjusted for maximum output.

Clearly one should not expect such a device to be very stable and the signal will tend to be a mixture of AM and FM but it can be a life saver if nothing better is available and it can still form a useful gadget.

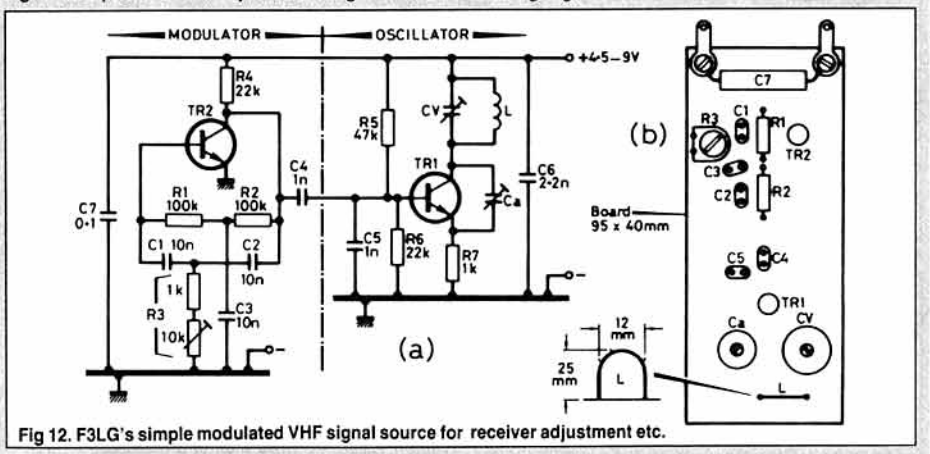


Fig 12. F3LG's simple modulated VHF signal source for receiver adjustment etc.

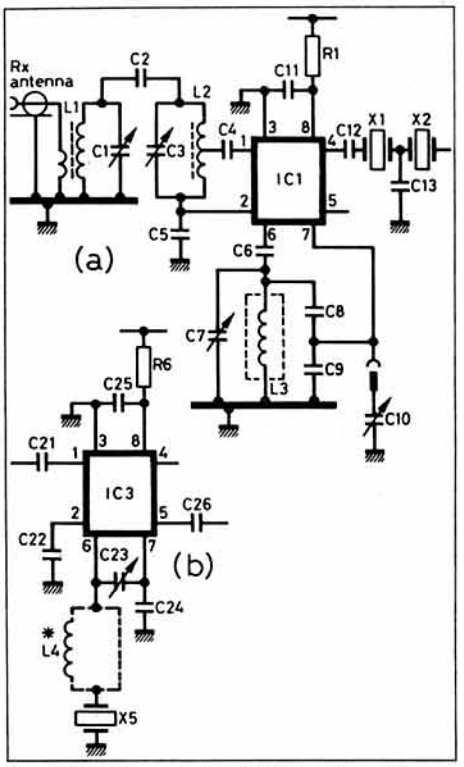


Fig 4. (a) Front-end NE602 mixer/oscillator and (b) NE602 product detector as used in N1BQT's compact 14MHz 5W transceiver.

series is suitable over the (military) temperature range −40 to +85°C. Small outline and cerdip packages are available. Basic pin outlines and oscillator configurations were given in the January *TT*.

As noted by K1BQT, this device is not intended for use in the front-ends of HF receivers having a very wide dynamic range. For such applications the Plessey IC double-balanced mixer type SL6440 would clearly be more suitable but does not include the in-built oscillator that makes the NE602 an attractive device for small-signal HF/VHF applications, where 'state-of-the-art' performance is not a requirement.

MININEC LOOK AT CAPACITIVE LOADING

TT has referred on several occasions to the increasing use of sophisticated computer software to analyse the characteristics of antennas without any requirement actually to construct either a full-scale or a model antenna. One of the best-known techniques is the so-called 'Method of Moments' using various NEC (Numerical Electromagnetic Code) programs. The original NEC programs tend to be rather costly for purely amateur use but, as with the various programs for propagation prediction, simplified versions are being developed. For example, the US Naval Postgraduate School in California has written MININEC for use with readily available personal computers and able to analyse basic wire antennas. While there is no doubt that such computer techniques are providing a valuable new tool for the antenna engineer, there is always the danger of writing off antennas that in the real world may have practical advantages not catered for by the software. One *must* treat computer simulations with caution.

Almost 28 years ago, 'Dud' Charman, G6CJ introduced to radio amateurs the principles and potential applications of dipoles, monopoles and ground planes, and long-wire antennas with their elements 'stretched' by the insertion of capacitance loading at intervals along their length ("Loaded wire aerials" F J H Charman, *RSGB Bulletin*, July 1961 and see also most editions of *Amateur Radio Techniques*). He showed that the capacitors could conveniently be formed using 80ohm flat-twin feeder line for the element cut to form overlapping sections. Later designs in American and Australian publications have tended to use conventional capacitors.

Because most of us have locations of restricted length, there has always been more interest, at least on HF, in antennas of compressed rather than stretched size. Capacitive loading has never attracted a great deal of attention, and when it has, some of the claims made for it have been rather extravagant (compare with those made for the T2FD antenna). In one small respect, the *G6CJ/ART* information is misleading in suggesting that a terminated stretched long-wire has only a single main lobe; in practice the radiation pattern has the usual split lobes of its non-stretched equivalent.

G6CJ showed that a dipole stretched by a factor of two, ie, a half-wave dipole 'stretched' to the span of a full-wave element, has only a modest gain of about 1dB, a similar broadside radiation pattern with slightly reduced beamwidth (56° instead of 78°) and a central resistive feedpoint of about 200ohms rather than the nominal 70ohms of a conventional dipole. It needs a lot of stretching to obtain substantial gain: see Table 1. But as noted in 1961 there are other advantages. A unique feature of stretched antennas is that they can be placed quite close to an unstretched wire without the radiation pattern being distorted by mutual coupling. For example, a 14MHz 'stretched' dipole could be hung directly beneath a conventional 7MHz dipole with both elements providing the radiation pattern of a half-wave dipole. The higher feedpoint can also be beneficial for monopole, Marconi or ground-plane vertical antennas, though stretching does unfortunately call for a very high mast if advantage is to be taken of the much lower ground losses for earthed monopoles, resulting from their higher impedance feed point.

A recent article 'The capacitively loaded dipole antenna – some new findings' by Dick Turrin, W2IMU in the Australian *Amateur Radio* (November 1988) presents the results of analysing a stretched antenna using a MININEC-3 program on an AT&T 6300 PC. He investigated the 7MHz capacitively loaded dipole shown in Fig 4(a) with the following results: The broadside radiation pattern gain was +3.0dBi instead of the +2.1dBi of a standard dipole, giving a gain of 0.84dB with reference to a dipole, a little less than the 1dB of Table 1. Feed-point impedance came out at about 200ohms, the same as given by G6CJ. Bandwidth between the 2:1 VSWR points is about 6.65 to 7.45MHz compared with 6.8 to 7.2MHz for the conventional dipole; a useful but not exceptional improvement. Higher order resonances occur at 12.6, 19.5 and 26.5MHz.

W2IMU comments critically on the factor-two stretched dipole: "This cannot be regarded as a high-performance antenna nor can it be considered an ultra-broadband antenna. In the author's opinion, the physical size and difficulties of including capacitors along a wire antenna do not justify the predicted increase in performance". He notes that in contrast the gain from a 'double Zepp' (two half-waves in phase) is +3.69dBi, about 0.7dB more than the stretched wire of similar overall span and about 1.5dB more than a conventional dipole of half the length.

Clearly if 'gain' is the only consideration, there would be little justification in still regarding capacitive loading as a useful weapon in the antenna armoury. At least in some circumstances. It could prove unwise to write-off entirely capacitive loading, where the capacitors are formed by overlapping, purely on the basis of a MININEC run which largely confirms the earlier performance figures of G6CJ. It seems to me that what W2IMU has done is to underline the credibility of the MININEC program. As he points out: "The MININEC program permits a fairly straightforward and rapid analysis of complex wire antennas using readily available personal computers, a facility which, ten years ago, was virtually impossible'.

His computer has also shown that because of the resulting improved current distribution, an antenna using mixed inductance/capacitance loading with four inductors and six capacitors as in Fig 4(b) would achieve a broadside gain of 3.51dBi, virtually the same as the double Zepp, and a feedpoint impedance very close to 300ohms resistive, making such an arrangement convenient to feed with the low-cost 300-ohm ribbon feeder widely used for TV reception in the USA. □

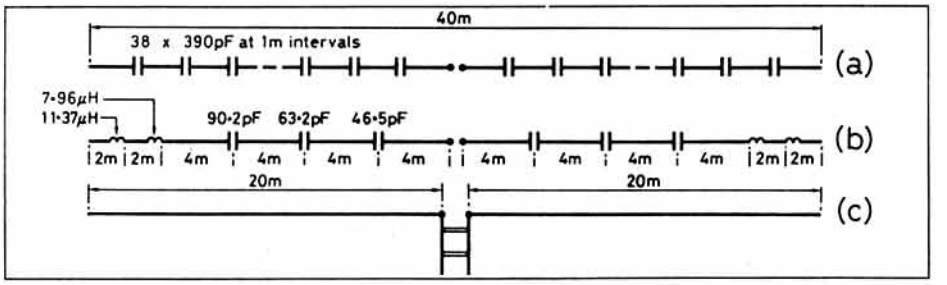


Fig 14. (a) Capacitively loaded 7MHz half-wave dipole as computer-analysed by W2IMU. (b) Combination of inductive and capacitive loading to give rather more broadside gain. (c) Double Zepp (two half-waves in phase, voltage fed with open-wire feeders).

n-factor	C(pF)	No of Sections	½ dipole length (ft)	Input Z Ω	Beam-width	Gain (dBd)
1	—	2×1	33	70	78°	0
2	68	2×6	66	200	56°	1
3	50	2×9	99	400	42°	2·1
4	43	2×12	132	550	32°	3·1

For other bands change C and section length proportional to wavelength eg for 21MHz reduce values by two-thirds. *G6CJ, 1961.*

Table 1. Basic information on 14MHz dipoles Capacitive loading at 5ft 6in intervals.

A 3.5MHz CONVERTER FOR THE RC14

Steve Price GWBWE

INTRODUCTION

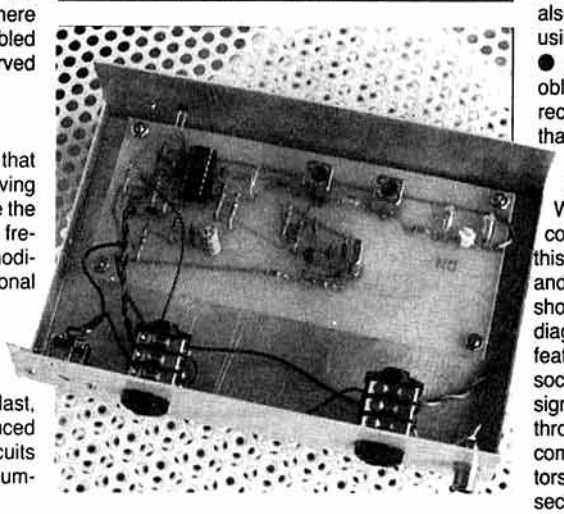
In the June 1987 issue of *RadCom* we published details of the RC14 beginners receiver which is still available in kit form from Cirkit Ltd. This project has proved to be very popular and many newcomers are now experiencing the joys of HF reception for the first time. Because it was conceived as an introduction to the art of home construction, the design of the RC14 avoided the complexities inherent in multi-band and general coverage receivers by being restricted to the 14MHz band. However, after listening on a particular band for some time, it is quite understandable that the new SWL will be itching to find out what the other HF bands have to offer.

The next most popular band after 14MHz is 3.5MHz (often referred to as 'Eighty') and so it was decided to produce a design for 80 metres. It would have been rather difficult to directly modify the RC14 for two-band operation, but fortunately there was an alternative solution which not only enabled the RC14 to be used on 3.5MHz but also preserved its 14MHz capability.

3.5MHZ CONVERTER

The 3.5MHz converter is an ingenious device that is simply inserted between the normal receiving antenna and the RC14. Signals which fall inside the 3.5MHz band are then shifted upwards in frequency by precisely 10.5MHz so that the unmodified RC14 can hear them. As a constructional project the 3.5MHz converter offers the chance to become familiar with a number of components which are not found in the RC14 – a quartz crystal, a light emitting diode (LED), the Toko range of pre-wound inductors and last, but not least, a bipolar transistor. More experienced readers may be aware that the integrated circuits employed in the RC14 actually contain large numbers of such bipolar devices.

The 3.5MHz converter is available as a kit (from Cirkit Ltd. of Broxbourne, Herts) which contains absolutely everything required, including the printed circuit board and a painted, pre-drilled case. Ordering details can be found at the foot of the components list. For readers who do not wish to purchase the kit we are providing full constructional details in this article. . . . But first, a few words about 80 metres.



THE 3.5MHZ BAND

3.5MHz is very different to 14MHz. It covers the frequency range 3.5 to 3.8MHz and so is precisely 300kHz wide. As with 14MHz, you will find CW (morse) within the bottom 100kHz (ie, 3.5 to 3.6MHz) and SSB (speech) above 3.6MHz. However, the similarity with 14MHz ends there!

It would require an entire article to cover everything that you might wish to know about 3.5MHz – however, a great deal can be learnt by just listening on the band. So that what should be an entertaining experience does not turn into a source of bewilderment, here are a few pointers:

- 3.5MHz is a shared band – you will hear a variety of signals (Radio Teletype being common) that do not originate from amateur stations.
- Propagation is generally more local – 3.5MHz is sometimes referred to as an 'inter-G' band with many UK stations chatting to each other. DX will sometimes make an appearance, however.
- Listen for RSGB news broadcasts which are made every Sunday morning on 3.650MHz and also, mainly at weekends, special event stations using the callsign prefix GB.
- QRM (electrical interference) can sometimes obliterate 3.5MHz transmissions. Domestic TV receivers are a major source of such 'hash', and that includes your own TV!

BUILDING THE CONVERTER

Whether you are considering the purchase of the converter kit, or perhaps setting about building this project from scratch, it will prove a worthwhile and hopefully stimulating experience to spend a short time studying its design. Fig 1 shows a block diagram of the converter and the full circuit is featured in Fig 2. Ignoring, for a moment, the jack socket labelled JK1a in Fig 2, it will be seen that signals picked up by the antenna are firstly routed through a fairly complicated band-pass filter which comprises an assortment of capacitors and inductors. The input filter consists of a low-pass pi-type section (C1,2 and L1), followed by two parallel tuned circuits (C3/L2 and C5,6/L5) which are coupled together via L3, C4 and L4. The parallel tuned circuits are adjusted to resonate at frequencies falling within the 3.5MHz band and they will then work together in providing significant attenuation of all frequencies outside the desired band.

The pi section is incorporated to ensure even ▷

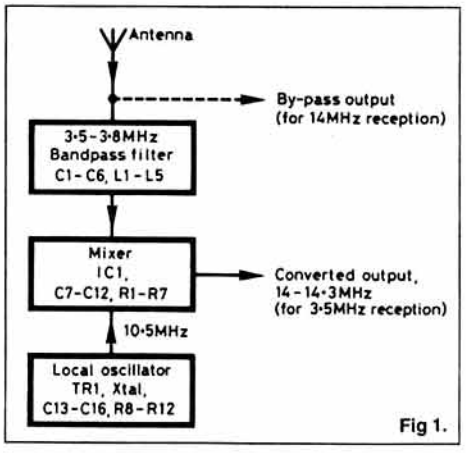


Fig 1. Block diagram of the 3.5MHz converter.

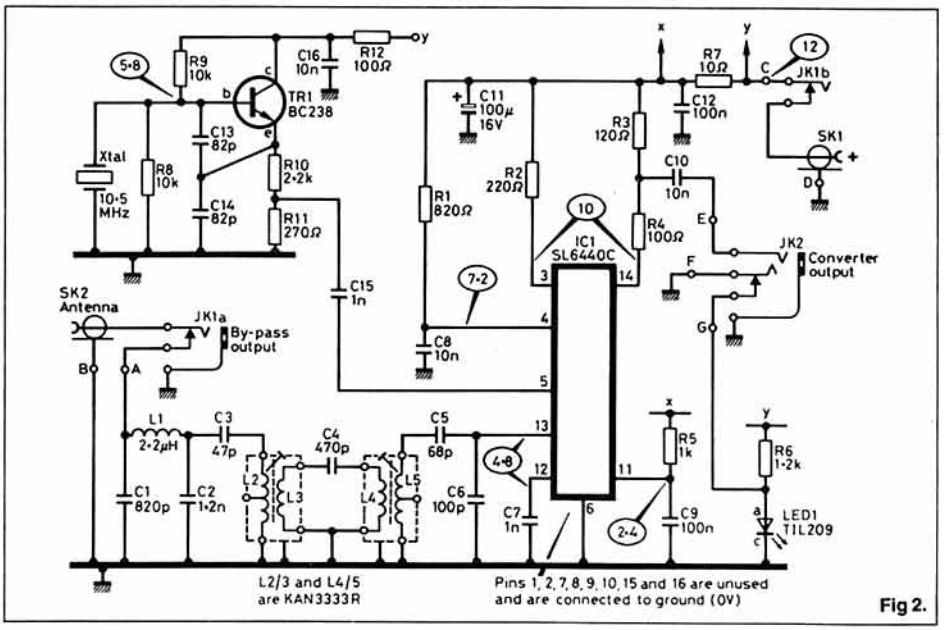


Fig 2. Circuit diagram – voltage measurements (circled) are made with negative meter probe connected to ground/0V.

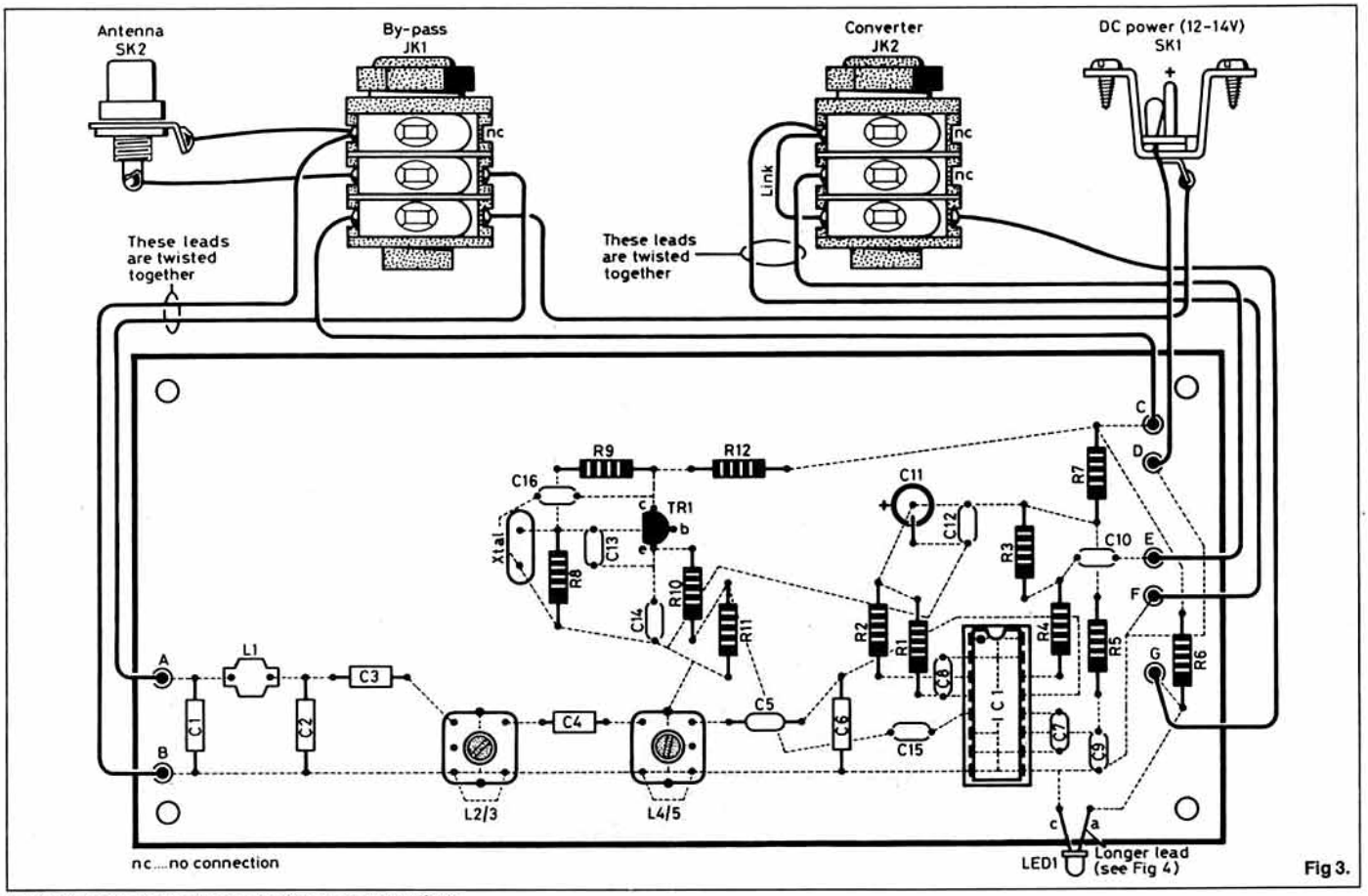


Fig 3. PCB component layout and flying lead connections.

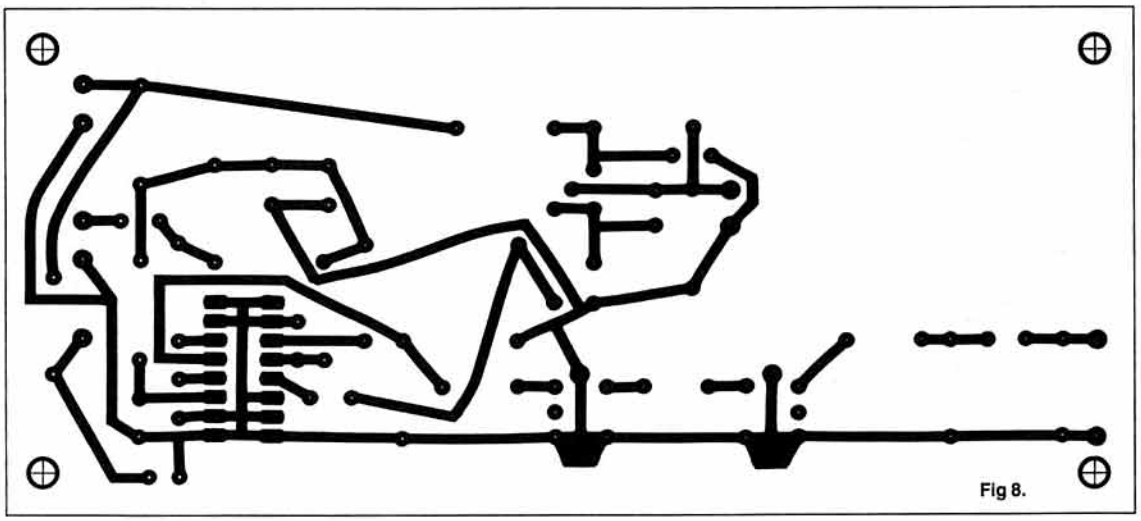
greater rejection of signals having frequencies higher than 3.8MHz – in particular, signals at 14MHz. It is most important that these latter signals are not let through to the converters output, because we might then find ourselves listening to two bands simultaneously!

In order to shift the 3.5MHz signals upwards in frequency the converter employs an integrated circuit mixer type SL6440C (IC1) which is the same as the device used in the front end of the RC14. The filtered 3.5MHz input signals are fed into pin 13 of IC1 and the frequency conversion is achieved by feeding an internally generated signal of 10.500MHz from the local oscillator into pin 5 of the mixer. The local oscillator comprises TR1 (a bipolar transistor) and associated components, the most important of these being a quartz crystal (abbreviated XTAL on the diagrams) which maintains the local oscillator frequency very precisely. The result of mixing these two signals is to produce a 'mirror image' of the 3.5MHz signals which fall within the 14MHz band.

For instance, a transmission at 3.630MHz will be mixed with the 10.500MHz local oscillator signal to produce an up-converted signal on 14.130MHz (3.630 + 10.500 = 14.130). The RC14 then receives these up-converted signals as normal.

The converter output is fed to the RC14 via a jack socket (JK2 – see Fig.2). A special patch lead must therefore be provided which has a jack plug on one end and a phono plug (to match the RC14 antenna socket) on the other. However, if things were left at that then the converter would prove very inconve-

Fig 4. PCB holes are all 1mm diameter except for those intended for the screening can tags of L2/3 and L4/5 which are 1.5mm diameter. Use Fig 3 as a drilling pattern.



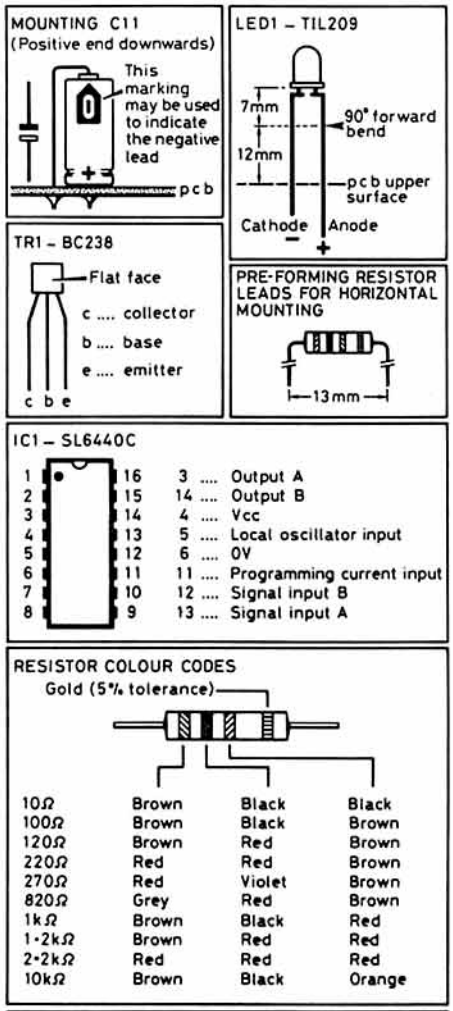


Fig 5. Component information and soldering.

3.5MHZ CONVERTER FOR THE RC14	
Measured Performance	
Conversion Gain:	0dB
14MHz Leakthrough:	–48dB
3rd Order intercept:	+5dBm
6dB Bandwidth:	3.5–4.0MHz

nient to use – imagine that we have been listening on 3.5MHz but now wish to try 14MHz. This would involve unplugging the patch lead from the RC14, and then removing the antenna from the input of the converter so that it can be plugged directly into the receivers antenna socket. Such a complicated band change procedure would quickly become tiresome and so things have been made considerably easier by the addition of a bypass socket JK1, which enables us to have the antenna permanently connected to the converter.

Changing from 3.5MHz to 14MHz now only involves unplugging the patch lead from JK2 (converter output) and plugging it into JK1 (bypass). JK1 (see Fig 2) provides a direct connection to the antenna which is exactly what we require for 14MHz reception. Furthermore, there are cut-out contacts built into JK1 which are used to isolate the input filter and also disconnect the power supply to the converter whenever the bypass socket is in use. The converter output socket JK2 also has cut-out contacts and one of these is wired so that the light emitting diode (LED1), which is arranged to protrude through a hole in the front panel, will illuminate whenever JK2 is in use. This feature provides a positive indication that 3.5MHz has been selected.

CONSTRUCTION

In order to build the converter successfully you will require a few basic tools:

1. A soldering iron of between 15W and 25W rating (no higher unless thermostatically controlled) having a bit diameter no greater than 1.5mm.

2. A small pair of wire cutters.

3. A screwdriver, 100mm long by 4mm blade size is suitable.

4. A small pair of long-nosed pliers.

5. A trimming tool suitable for adjusting the cores of Toko 10k inductors. (NB. This is provided with the kit.)

The first job for those constructors who are not building the kit will be the preparation of the printed circuit board. Fig 4 gives the foil pattern for this plus an explanatory note.

Now proceed as follows:

(1) Using Fig 3 as a guide, mount and solder the IC socket onto the PCB, but do not insert IC1 at this stage. Similarly fit L1 (this component has a light coloured plastic encapsulation and will probably be marked '2R2K'), L2/3, L4/5 and the XTAL (this component is built into a sealed metal can). It does not matter which way round you mount L1 or the XTAL, the same applies to resistors and all the capacitors with the exception of C11. L2/3 and L4/5 can only be seated a certain way round because they both have 3 pins on one side of their base but only 2 pins on the other. Note also that the metal screening cans of L2/3 and L4/5 have two small lugs which will protrude through holes in the PCB – these must be soldered as well.

(2) The resistors R1 – R12 are mounted next. These sit horizontally on the PCB and so their leads must be bent through 90 degrees – see Fig 4 which shows this more clearly and also gives the relevant colour codes. Each pair of holes on the PCB intended for resistors are spaced 13mm apart. As the resistor bodies are only about 7mm long, leads will need to be bent at a point approximately 3mm from the component body. The best way of doing this is to hold the lead being bent in the jaws of a pair of long nosed pliers. After soldering, the leads should be cropped using wire cutters.

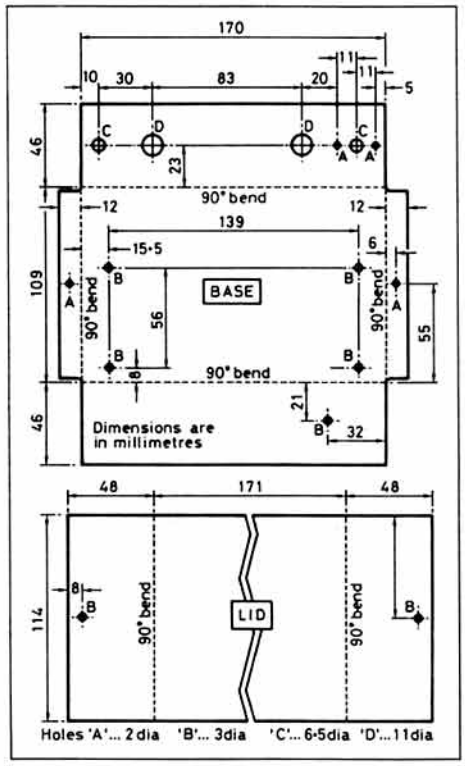


Fig 6. Dimensions of the aluminium case.

(3) The polystyrene capacitors (C1 – C4 and C6) are tubular in shape and have clear plastic bodies through which the silver foil construction may be seen. The value is printed on the outside surface, but not always very clearly. However, a process of elimination should enable you to sort things out. These components vary in size quite significantly and it is easy to assume that the larger ones have the highest values – don't be fooled, this isn't always the case! They are all mounted horizontally.

(4) The ceramic capacitors (ie, all of those remaining except for C11, which is physically very different and much larger) are mounted vertically. The PCB hole spacing for these is 5mm (10mm for C5 to allow for the possible use of a polystyrene type). C9 and C12 will probably have their leads spaced 5mm apart and so can be inserted without bending. The other ceramics however, feature 2.5mm lead spacing and so their leads must be carefully bent outwards prior to mounting. Once again, the values of these components will be printed on their bodies. C5,13 and C14 should present no problem in this respect but the other values may be represented in the following manner: 1nF shown as 102 or 0.001; 10nF shown as 103; 100nF shown as 104. There may also be a suffix letter such as Z or K but this can be ignored.

(5) Using Fig 3 and Fig 5 as a guide, mount the remaining components: C11, TR1 and LED1. Be ▷

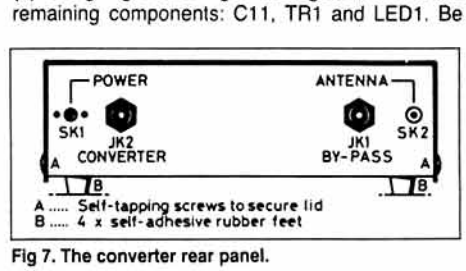


Fig 7. The converter rear panel.

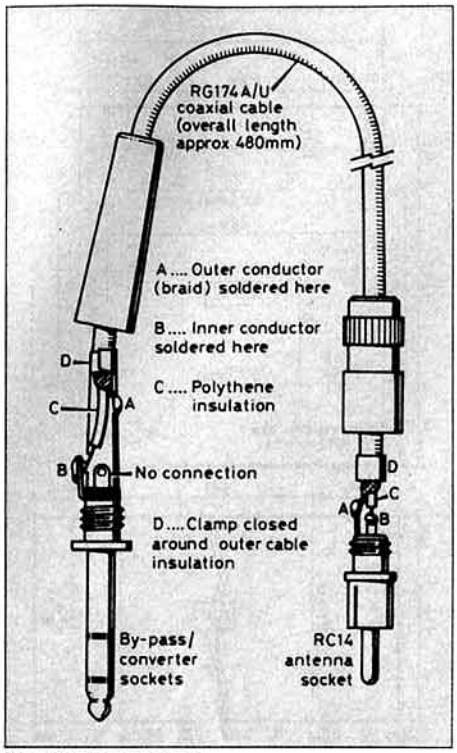


Fig 8. Patch lead details.

careful to get C11 the right way round (positive end downwards, as shown in Fig 5). Look for the flat face on the body of TR1 and mount it with this face towards the XTAL. LED1 is probably the trickiest component to mount as it must be soldered the correct way round and stand proud of the PCB surface to that it can be made to poke through the front panel – kit builders may wish to study the case at this point, but remember that the PCB will be mounted on the pillars provided, thus raising the upper surface of the circuit board nearer the hole.

(6) Now solder lengths of PVC covered connecting cable (referred to as 'flying leads') at points A to G. You will of course need to bare the end of each cable first using wire cutters. Employ logical colour codes – ie, red for positive (C), black for negative (D) and perhaps green for ground (B and F). The flying leads will be excessively long at this stage but they can be cropped later.

(7) Fig 6 features plans of the case lid and base. This should be fabricated in 18 gauge aluminium sheet and the outside spray painted to match the RC14. This item is supplied pre-drilled and painted with the kit.

(8) Final assembly of the converter involves bolting the PCB into the case and then connecting the far end of each flying lead to the appropriate socket as indicated in Fig 3. NB. Remember to use the spacing pillars on the bolts supporting the PCB. You will now be able to see how long each flying lead needs to be, but don't be tempted to shorten these too much. The input leads A and B are twisted together, as are the output leads E and F. JK1 and JK2 are mounted with their solder tags pointing downwards, and you will find that it is far easier to solder the flying leads before bolting the jack sockets into place. Note that there is a link between two of the tags on JK2. This can be made using an off-cut from one of the flying leads. Fig 7 shows the rear panel of the completed converter.

(9) The patch lead which is used to couple the converter to the RC14, is shown in Fig 8. Be careful when stripping the outer insulation from the coaxial cable because it is easy to cut through the braid as well. Also, remember to thread the plug tops onto the cable before soldering!

TESTING AND USE

Adding the finishing touches to the converter will merely consist of sticking the rubber feet onto the underside of its base and inserting IC1 into the DIL IC socket on the PCB. IC1 must be inserted the correct way round – look for the notch in its encapsulation and compare this with Fig 3.

The power supply used for the RC14 can also be used to run the converter. This means that you will need to make up an additional power lead and wire this in parallel with the existing one. Be careful to observe the correct polarity – the positive lead must be wired to the centre connection of the 2.5mm coaxial plug.

The converter may now be powered up for the first time. For those who possess a multimeter, the unit should draw approximately 46mA when operating from a 12V supply and typical DC voltage readings are given in Fig 2. It must be emphasised that these readings serve only as a guide and there are bound to be variations, particularly if a 13.8V supply is used.

Now check that inserting the patch lead into J1 causes the converter to be disconnected from the supply, and that insertion into JK2 results in the illumination of LED1. If you have access to an HF general coverage receiver this can be employed to check that the local oscillator is functioning correctly. Simply tune the receiver to 10.500MHz, select SSB (either LSB or USB) and see if a heterodyne can be found – you may need to connect a short antenna to the receiver in order to hear this clearly. As long as the local oscillator frequency appears to be within plus or minus 2kHz of 10.500MHz then everything is fine.

A simple wire antenna such as that which you may have been using for 14MHz reception will also function on 3.5MHz. However if you followed the recommendations given in the article describing the RC14, it might be a good idea to try and lengthen your antenna somewhat, it's quite OK to bend it as necessary! Try to get the wire as high as possible, you will find that the lengthened antenna will still work as well on 14MHz.

COMPONENTS LIST

RESISTORS

R1	820
R2	220
R3	120
R4,12	100
R5	1k
R6	1k2
R7	10
R8,9	10k
R10	2k2
R11	270

All resistors are 0.25W, 5% carbon film.

CAPACITORS

C1	820p polystyrene
C2	1n2 polystyrene
C3	47p polystyrene
C4	470p polystyrene
C5	68p polystyrene or ceramic
C6	100p polystyrene
C7,15	1n ceramic plate
C8,10,16	10n ceramic plate
C9,12	100n ceramic plate
C11	100µ16V axial electrolytic
C13,14	82p ceramic plate

INDUCTORS

L1	2.2mH – Toko 7BS (Part No. 283AS – 2R2J)
L2/3, L4/5	Toko 10K (Part No.KANK 3333R)

SEMICONDUCTORS

TR1	BC238
IC1	SL6440C
LED1	TIL209 Red LED (or equiv)

GENERAL

XTAL	10.500MHz quartz crystal, HC18V
SK1	2.5mm DC power socket
SK2	Phono socket, single hole mounting
JK1,2	6.3mm stereo jack sockets with cut-out (mute) contacts

2.5mm coaxial plug
PCB and case with lid
0.25" stereo jack plug
phono plug – all metal
16 pin DIL IC socket
0.5m of RG174A/U miniature 50Ω coaxial cable
lengths of multicore solder and PVC covered, stranded wire
4 nuts, bolts and spacing pillars
2 self-tapping screws
4 stick-on feet
trimmer tool (Cirkit Part No. 35-00002)

A complete kit, containing all the items shown in the components list, is available from Cirkit Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: 0992 444111. The total cost of the kit is £24.90 inc. VAT and postage and packing within the UK.

ALIGNMENT

Having sorted out the antenna it's time to put the converter through its paces! Firstly power up the RC14 and connect the patch lead between JK1 and the RC14 antenna socket. With the antenna plugged into the converter it should now be possible to listen normally on 14MHz. This test may not seem very exciting but it serves to prove that the bypass facility operates correctly. Now remove the jack plug from JK1 and insert it into JK2. Provided that the power supply is properly connected, LED1 will illuminate to indicate 3.5MHz operation as explained previously.

Tune the RC14 around the middle of the band until you find a signal – it doesn't matter at this stage what sort of signal you come across; a commercial teletype transmission will do just as well as an amateur QSO. Using the special trimming tool, carefully adjust the cores at the centre of L2/3 – the core is made of an iron composition known as ferrite and is shaped like a grub screw. It should be possible to find a point where the signal becomes noticeably stronger – this is due to the first tuned circuit being brought into resonance with the signal.

Having resonated the first tuned circuit, proceed to adjust the core of L4/5 in a similar fashion. Note, however, that the tuning of L4/5 may not seem as 'sharp', ie, the peak in response to the signal appears less well defined. You may now wish to re-check the peaking of L2/3 because there is bound to be a slight degree of interaction between the two inductors, but do not be tempted to continually re-adjust the cores as they are rather brittle.

The converter is now ready for use and so the lid should be screwed on using self-tapping screws. SSB stations will employ LSB (lower side band) on 3.5MHz whereas it is the convention to use USB (upper side band) on 14MHz. Operation of the RC14 fine tune control may seem strange at first, but you will soon get the hang of it. □

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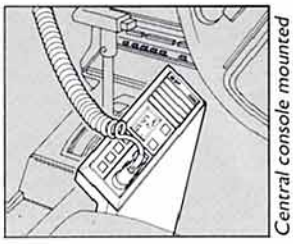
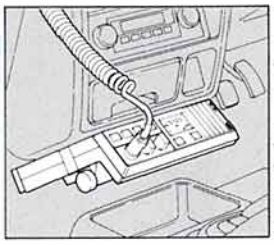
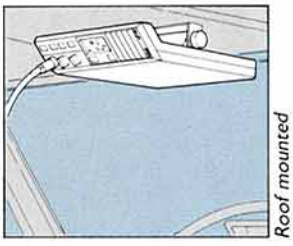


Central console mounted



Under dash (central)



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Lottery winner collects prize

The RSGB's 75th Anniversary Lottery was drawn at the Annual General Meeting in Manchester last December. The lucky winner of the Ford Escort car was 25 year old Sally Gook of Kennelly Walk, Windsor, holder of ticket No. 348263.

Sally, accompanied by her husband Olson, was invited to a reception at RSGB Headquarters on Thursday 9 March, where she was presented with the car by the RSGB's Immediate Past President, Sir Richard Davies, KCVO, G2XM.

Sally is a trained classical singer and a member of the Windsor and Eton Operatic Society, but her full-time job is as a cashier with the National Westminster Bank in Windsor. She bought five tickets from her driving instructor Tony Drye, G0GJP, and is due to take her driving test on 14 April 1989.

Also present at the reception were Dennis Goodwin, Amateur Radio Sales Manager of ICOM UK, Brenda & Bernie Godfrey, proprietors of ARE Communications and Martin Lynch, Sales & Marketing Director of ARE Communications. ARE Communications and ICOM UK were among the many companies who kindly donated prizes to the lottery.

The winner of the second prize – a holiday to the value of £750 – was Mrs Bannister of Leigh-on-Solent. Unfortunately, Mrs Bannister was unable to attend since she was abroad enjoying her prize!

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A CHEBYSHEV LOW PASS FILTER FOR 6M

D. Bowman describes a seven element filter for reducing harmonic emission

Radio amateurs have always been aware of the problems associated with the generation and radiation of harmonic energy. With the allocation of 50MHz in this country it is worthwhile considering the special problems posed by the emission of harmonics from a transmitter operating on the new band.

On the lower HF bands most of the unwanted harmonic energy will be produced on frequencies already allocated to the amateur service. For example, the second, third and fourth harmonics of a 40m transmitter will fall in the 20, 15 and 10m amateur allocations. Other harmonics eg, the 2nd harmonic of 80m transmissions above 3·550MHz fall into areas allocated for international broadcasting. The high power levels used for these services considerably reduce the practical risk of interference, although it should be remembered that low level outputs of a few hundred milliwatts ERP can cause interference in the immediate locality even if the service is being provided by a 250kW broadcast transmitter.

Unfortunately the harmonic energy produced by 50MHz amateur transmissions falls into areas of the radio spectrum where the potential for serious interference is much greater than on any of the lower bands. The greatest danger is interference to the users of 100·0 to 104·0MHz from second harmonic radiation. At present 100 to 102MHz is allocated to the emergency services and the consequences of any interference here are obvious. 102 to 104MHz currently provides an extension for band 2 radio broadcasting while over the next three years the present emergency service users will be relocated on higher VHF frequencies and their place taken by radio broadcasting. For a number of years the government has been proposing the introduction of a third tier of broadcasting namely 'community radio,' the first of these stations being due to become operational in mid-1989. If these low power broadcasters, or even conventional IBA and BBC stations are licensed to use these frequencies it will no longer be the case that harmonic radiation will go unnoticed.

Indeed we must face the possibility of amateurs in urban areas having hundreds of people within a small radius of their QTH all tuned in to the amateur's second harmonic! There would seem to be a case for ensuring radiated harmonic energy is reduced to the lowest achievable level. Extra filtering between the final amplifier and the antenna would be a sensible preventive measure for all 50MHz operators to consider.

FILTER OPTIONS

There are a number of solutions to the problem of harmonic filtering for the six metre band. Bandpass filters using quarter wavelength striplines as described by the ARRL[1] are very effective, offering good rejection of harmonic and spurious outputs above and below the required frequency. The disadvantage is that the high *Q* factor inherent in the design necessitates constant retuning over a band as wide as 50MHz. Alternatives to the bandpass approach include notch and low pass filters and a notch filter design using resonant lengths of coaxial cable has previously been presented by G4TUZ in Technical Topics[2]. This technique reduces even order harmonic radiation (2nd, 4th, 6th, etc.) and probably represents the most cost-effective means of achieving a 30dB reduction in 2nd harmonic energy. Readers are referred to G4TUZ's article for further details.

A third possibility is to design a low pass filter which will provide a high level of attenuation to signals above a certain cut-off frequency – and this will be the approach taken here. The filter is a seven element Chebyshev low pass type in a pi configuration and the theoretical response is given below.

Assuming a passband ripple of 0·01dB

Passband ripple 0·01dB (input VSWR = 1·1:1)		
Harmonic attenuation	2nd	−47dB
	3rd	−74dB
	4th	−93dB
	5th	−107dB

The rejection figures are dB relative to the designed cut-off frequency of the filter.

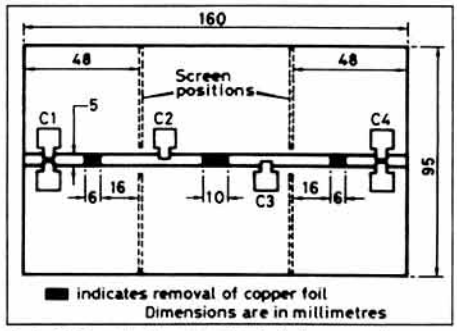


Fig 1. PCB layout. The copper laminate is removed from the shaded areas and the inductors are mounted across the resulting gaps.

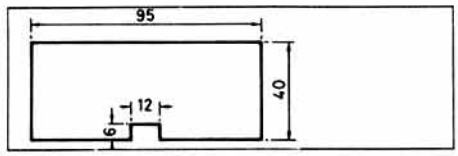


Fig 2. Internal screens. Both screens are mounted centrally around the raised PCB strip and soldered to the ground plane on both sides along their entire length.

In practice the performance is limited by several factors. First, the cut-off frequency has to be somewhat higher than the highest frequency in use so as to allow for errors due to component tolerances and variation in the physical layout of the circuit. Second, the ultimate rejection will be limited to 60-70dB due to stray radiation between individual sections of the filter. Allowing for these limitations, we can still design an easily constructed filter with a predictable performance and this unit has been designed with both component availability and high performance as primary objectives. The cost of components purchased new from retail suppliers is approximately £16.

CONSTRUCTION

The circuit is built on a piece of Eurocard sized (160×100m) single-sided copper laminate. A strip 4-5mm wide is cut from the longest side and glued longitudinally to the centre of the copper laminate with cyanoacrylate (superglue) adhesive – see Fig 1. Three sections of copper have to be removed from this strip. This is best accomplished by cutting through the copper at the required points with a small knife and then heating the unwanted section with a soldering iron, allowing the copper to be lifted away without causing damage to the fibreglass base.

The screens (see Fig 2) can be made from either tin-plate or double-sided copper laminate and these are soldered to the board in the positions shown. The components can be fitted in any order, and the completed board mounted in the base of a diecast box using three 4BA nuts and bolts. Input and output connections are made via SO239 sockets, the lower two mounting holes of which are fitted with 4BA solder tags. These are bent at right angles and soldered directly to the groundplane of the board.

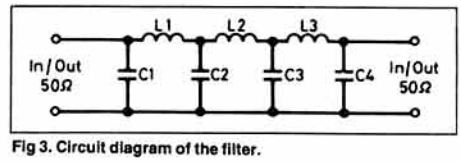


Fig 3. Circuit diagram of the filter.

PERFORMANCE

Purists may object to such crudities as glueing strips of PCB material to a groundplane. However, not only is this a perfectly acceptable breadboarding technique but in this particular circuit it proved superior to a purpose etched PCB. This is because it ensures an even distribution of earth currents throughout the surface of the whole board and conveniently provides exactly the correct height for mounting the cased mica capacitors.

The filter cut-off frequency has been adjusted to 60MHz and although this may appear a little high, it was found during testing that this coincided with minimum insertion loss between 50-52MHz. The response curve was plotted using a Telonic Instruments swept frequency generator and was found to give a textbook response, essentially flat to 58MHz with cut-off occurring at 60MHz. Beyond 60MHz a high level of attenuation was observed up to a frequency of 550MHz, which was the limit of the test equipment used. Attenuation at 100MHz ▷

was measured as better than 35dB, while at 150MHz it was approximately −50dB relative to a 50MHz fundamental.

The Semco capacitors are rated at 350V and should be used in preference to silvered mica – plate ceramic should not be used. The power handling capability of the circuit is limited by the thin strip of PCB material. This will not be a problem for UK amateurs reproducing the circuit. However, in countries where higher powers are permitted, constructors should ensure that resistive losses are kept to a minimum by covering the entire length of the PCs strip with a layer of solder.

COMPONENTS LIST

CAPACITORS
C1,4 44p (2 × 22p in parallel) 350V cased mica
C2,3 100p 350V cased mica
Capacitors available from Cirket Ltd, Broxbourne, Herts.

INDUCTORS
L1,3 4 turns 16SWG tinned copper, 13mm ID, 10mm long with 5mm leads
L2 5 turns 16SWG tinned copper, 9.5mm ID, 12·5mm long with 5mm leads

GENERAL
PCB Eurocard 160×100mm, single-sided copper laminate on 1·6mm epoxy glass. RS Components Code 435-484

Box Diecast Aluminium, 171 × 121 × 55mm. RS Code 509-995
11 × 4BA nuts, bolts and washers
4 × solder tags
2 × SO239 sockets

TESTING AND INSTALLATION

Having completed the construction you will probably need to satisfy your curiosity and test the performance of the filter. Most amateurs will have access to a SWR bridge and 50ohm dummy load; these are the only two items required to perform a series of useful tests. First connect the dummy load to the filter, note that as the Chebyshev is a symmetrical design, either connector can be used as the 'output'. The SWR bridge is then inserted between the transmitter and the filter input and after ensuring all connectors are secure a few watts of RF is passed through the system. The VSWR should be less than 1·2:1 across the entire 6m allocation.

If you wish to confirm the filters low pass action, the test can be repeated using a 2m transmitter as a source of RF. In this case the VSWR will be extremely high as the filter will prevent the higher frequency energy reaching the 50ohm load. Only low power should be used for this test as the transmitter will be severely mismatched and full power may cause damage to the output devices. If you do not have a SWR bridge and 50ohm load then the filter can be checked by assessing its effect on received 6m and 2m signals. When you are satisfied that the filter is operating correctly it can be permanently installed in-line between the transceiver and the antenna.

The Author would like to thank the following for their assistance in the preparation of this article:- K R Renton, G6JMJ of Imperial College, London for performance evaluation. □

References
1 The *ARRL Handbook*, all recent editions.
2 'Coaxial stub filters reduce RFI from 50MHz transmitters' by Paul Boyd, G4TUZ, Technical Topics, October 1987, p750.

AN EXPERIMENTAL HF/MF LOOPSTICK ANTENNA

Richard Q Marris, G2BZQ, presents an antenna suitable for use on amateur bands with frequencies up to 9MHz

The integral loopstick or ferrite rod antenna has been with us for about three decades as an essential part of any domestic MW/LW receiver. However, much less well known is the fact that with careful selection of core materials, it is possible to design an antenna which is suitable for use on the HF amateur bands. In fact designs have been used at frequencies of up to 30MHz and a transmit loopstick has been used quite successfully at my station with a low power 80m CW transmitter. This may go somewhat against accepted opinion – but then all rules are there to be bent or broken!

In the light of previous experiments it was decided to design and produce an efficient experimental loopstick antenna, suitable for use with a typical general coverage receiver. To make such a device as operationally useful as possible (and consequently much more difficult to design!), it was decided that it should be capable of continuous tuning from 545kHz to 9MHz with absolutely no band switching involved. A further design requirement was that the coupling arrangement for the receiver's antenna input should be both low impedance and capable of covering the whole frequency range without switching or adjustment. Finally the antenna had to be sufficiently efficient to be useable with a high RF gain receiver without the need for further preamplification.

CIRCUIT DETAILS

The circuit shown in Fig 1, though simple, is somewhat unusual in consisting of a 190 x 13mm circular cross-section nickel-zinc ferrite rod*, and a three gang, 500pF per section air spaced variable capacitor. The ferrite rod offers a high Q at HF frequencies and in order to cover the desired range two separate tuned circuits are used. The combination of L1 and CV1 serves to cover 545kHz to 2.500MHz while L2,CV2 and CV3 cover 2.150 to 9.375MHz.

The variable capacitor (CV1,2,3) is a large air spaced component, chosen because of its low minimum capacitance compared with miniature types. Its physical size is acceptable in view of the ferrite rods large dimensions. Such three gang, 500pF per section capacitors can be purchased from manufacturers but can be much more economically obtained from old valve receivers. The one used in the prototype is plated brass and was taken from a derelict audio generator chassis originally purchased for only £1! The variable capacitor is prepared for use simply by cleaning it up as required and carefully removing any existing padding capacitors. It may also be necessary to shorten the drive shaft somewhat, in order to accommodate the slow motion drive.

The loopstick is coupled to the receiver by means of two series-wound coils L3 and L4; various other coupling methods were tried but this configuration was found to be the most effective, providing a satisfactory impedance match for either 50 or 70ohm systems. The choice of feeder depends upon the receiver input socketry, and may be RG58 coaxial cable or flat twin – there is nothing to choose between the two in terms of performance. Incidently, twin extension speaker lead is a good source of flat twin as it is both cheap and gives an excellent match.

CONSTRUCTION

Figs 3a,b,c show the construction used on the prototype. Individual designs will vary depending upon the size of the variable capacitor, but the general format should be followed. The three gang variable capacitor should be mounted in an inverted position as it was found during early experiments that there was a hiccup in the tuning on HF as the leading edge of the moving plates (CV2/CV3) reached their nearest point to L2. Such an arrangement also keeps the leads short.

Winding details and sizes for the ferrite rod and coil former assembly are quite critical and Figs 2a,b should be strictly adhered to. Plastic-coated Terry clips are mounted at either end of a piece of wood measuring 190 x 22 x 13mm and the 190 x 13mm diameter ferrite rod fits into these clips. A 75mm length of 16mm outside diameter plastic wall pipe is slipped over one end of the rod. This piping has a bore which is just sufficient to accommodate the ferrite rod and can be obtained from most DIY stores.

Coil winding details can be seen in Fig 2b. L1 is wound directly onto the rod with its ends held with superglue, after which L3 is wound over the centre of L1 and similarly affixed. L2 is wound onto the centre of the 16mm O/D tube, with its ends similarly secured and L4 is wound over the centre of L2. The link between L2 and L3 is taken through two drilled holes in the wood as shown in Fig 3b. The number of turns, wire types and dimensions for all coils are shown in the table. Finally, it is essential to remember that the rod and coil assembly should be mounted clear of any metalwork.

The 'chassis' of the loopstick antenna consists of a piece of single sided circuit board (copper up-

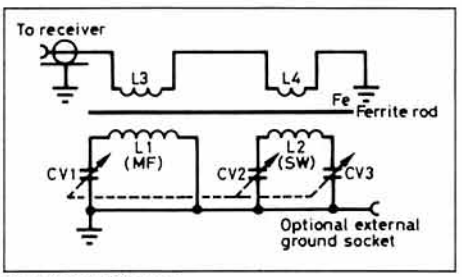


Fig 1. Circuit Diagram

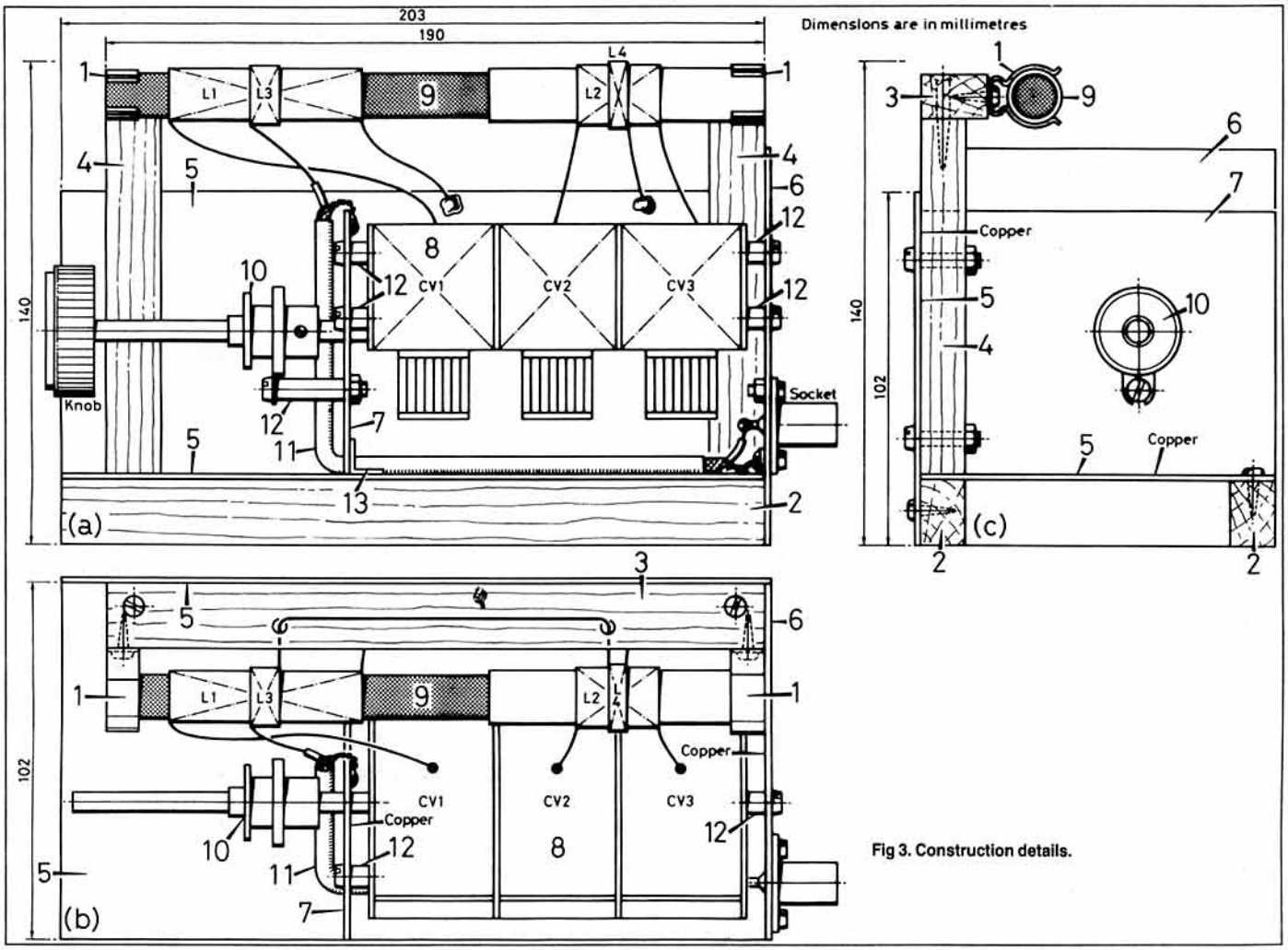


Fig 3. Construction details.

permost) screwed to two lengths of 203 × 19 × 13mm wood. Two plates of similar board measuring 114 × 102mm and 76 × 102mm (cut from 203 × 102mm board) are then mounted to support the inverted variable capacitor. The rear circuit board plate is screwed to the back of the chassis, while the front plate is bracketed as shown. In both cases the copper side should face inwards and should be bonded to the base by soldering once the variable capacitor has been installed. The feeder socket, SKt, is fitted to the rear board, after which a further piece of 203 × 102mm circuit board is screwed to the left hand side of the assembly and bonded at the corners to the other boards.

All ground connections from the coils and variable capacitor are soldered to the nearest board with the shortest possible leads. All coils should have about 25mm clearance between them and the variable capacitor metalwork and circuit boards.

OPERATION

Operation is simple! The variable capacitor should be rotated for maximum signal on the receiver when its narrow bandwidth at the resonant frequency will be found to assist with QRM reduction. Furthermore the antenna is highly directional, and should be rotated for maximum signal strength; a slight rotation to the left or right will eliminate or reduce both QRM and QRN including household electrical noise. A simple turntable was fabricated for use with the prototype but this is by no means essential.

The signal pick-up is remarkable and DX can be readily heard on the amateur bands. Although the signal strength will be found to be down compared with a conventional antenna, the overall noise level is so much reduced that weaker signals are more intelligible.

When using a high RF gain receiver a preamplifier has not been found to be necessary. Lower gain receivers do require the use of a wideband pre-amplifier and these can be obtained ready built or homebrewed from published circuits. Contrary to what might be expected, this loopstick has even been found to be very effective in the 40 metre band without a preamplifier.

*Ferrite rod: Type R61-050-750 190 × 13mm diam. (7.5 × 0.5") From: Amidon Associates, 12033 Otsego Street, North Hollywood, California 91607, USA. □

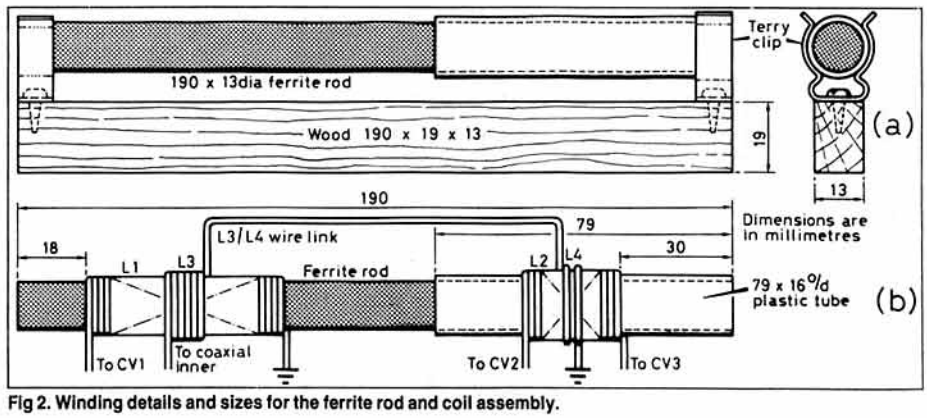
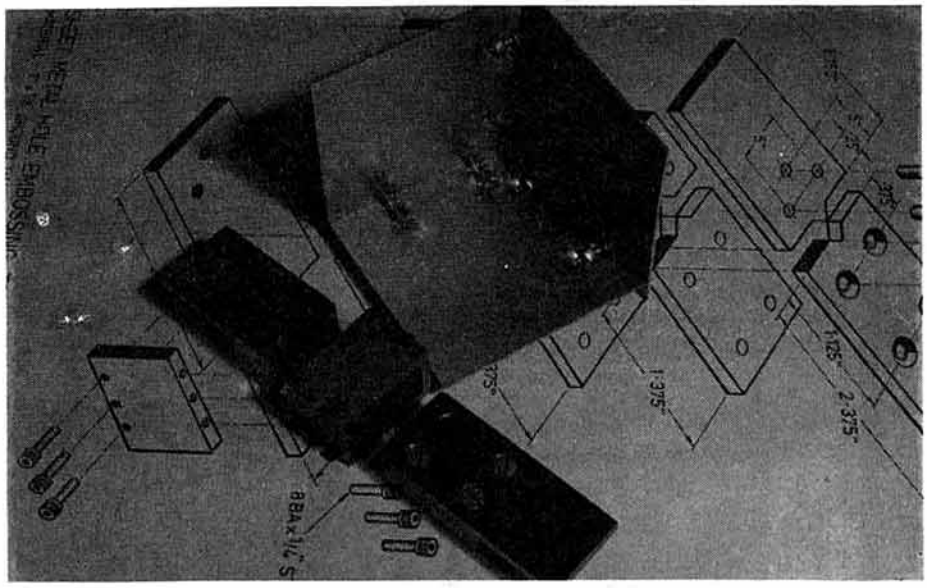


Fig 2. Winding details and sizes for the ferrite rod and coil assembly.



Cabinet Constructor

A simple tool designed to give your home-brew construction the professional look

by T Kirk, G3OMK

It's a simple tool which I designed to facilitate the rapid and more professional manufacture of cabinets, boxes and screens, without requiring a lot of accurate metal bending normally associated with this type of work. The jig-cum-press forms holes along the edge of any metal panel to accept self tapping screws about 0.1" diameter (depending on metal thickness) and with an engagement length of about 0.5". The photograph illustrates how a cabinet can be fabricated using this technique.

Making the tool is not difficult; the skills and equipment required are to be found in most home workshops.

CONSTRUCTION

The tool is made, with the exception of the screws, from an 18" length of 1" wide by 0.125" thick ground gauge plate, which is a tough but workable steel capable of being hardened and tempered if required. It is not necessary to harden the finished tool, unless you plan to form mild steel, but if facilities to do this are available they may be applied to improve the durability of the working edges.

Scribe a line down the centre of the 1" width for the full length of the plate. This is the datum line and should be accurately positioned. Avoid any further scratching of the ground surfaces of the plate as this finish has been selected to save work.

The Vee point items may be made as a set, by clamping them together, after cutting the blanks slightly longer and trimming to size later. It is essential to ensure that the tip of each Vee point is on the centre line, but the angle is not too critical. The fully shaped points should be polished with an oilstone to obtain square burr-free sharp edges along each face of the point. The edges of each point are the working parts of the tool and should be made with care.

The Vee notches are less critical and do not have to be a perfect mating fit with the points. In practice it is better for these notches to be slightly oversize, for they only provide a space for the formed metal to flow into and do not play any effective part in the shape of this form.

It is essential that the flat faces on both sides of the notch and point ends of each set of plates are square, parallel and level with each other.

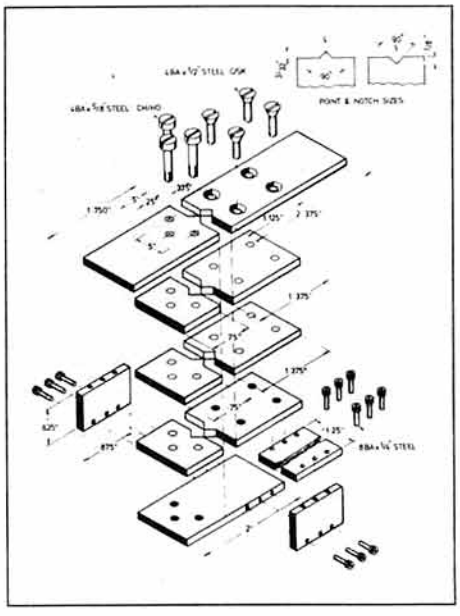
Mark out and drill tapping-size holes as shown on each top plate only, and use these as a template to drill the remaining holes on each plate. Each set should be aligned and matched-up as shown, then clamped and drilled. After this operation the holes in each bottom plate should be tapped 4BA and the holes in the remaining plates opened up to 4BA clearance. The holes on the outside face of the top plate of the sliding section should be countersunk deep enough to ensure that the heads of the 4BA steel countersunk screws are flush to under-flush with this face. It is in order and good practice to lightly countersink every hole to remove burrs, thereby making assembly easier.

The side and top plate bearings for the sliding part of the tool should slide in the bearing but with the minimum of side-to-side or up-and-down play; failure to get this right can ruin the action of the tool in use. Drilling and tapping 8BA size holes can be tricky, particularly in steel. It is possible to use self-tapping screws or drive screws in place of the 8BA screws but they must not be greater than 0.093" diameter or, on fitting, the surrounding metal will bulge and prevent the slide working properly.

Before final assembly the over-length items should be trimmed to size and it is neater if these edges are also square and level.

OPERATION

To use the tool place it between the jaws of a 4" vice and support it on the vice by the extended top plates. The metal to be 'holed' should be rested on the base of the tool and the marked hole position aligned with the tip of the visible point. Close the vice, with very little effort, until each face of the working end of the tool is in contact with the metal sheet. It is pointless squeezing the tool with excessive pressure from the vice as this will only ruin the tool and the formed hole. The vice can then be opened and the 'holed' metal sheet gently prised away from the points of the tool. This method of releasing the formed metal sheet could be improved upon, but the tool becomes more complex to make and as a spot of oil on the working faces eases the problem, the extra complexity does not seem worthwhile.



CONCLUSION

The tool will perform well on most of the softer metals such as aluminium, annealed copper and brass, in thicknesses up to 0.0625" (16SWG). It is not recommended for use on steel sheet, although it will work provided the points are hardened correctly.

This method of hole production has been used for experimental work where many repeated screwings and unscrewings are required. So far this has had no detrimental effect on the formed holes.

Once, owing to a shortage of self-tapping screws, normal tapping was tried and it worked very well using a 6BA taper tap. A 5BA size would be better, but there are not many screws about in this size!

The tool was originally an experiment to see whether the idea would work. Unlike many of my experiments this one worked so well that I'm sure that no home constructor's tool kit should be without one – hence this short article!

I obtained the Ground Gauge plate and the screws from K R Whiston Ltd, New Mills, Stockport, SK12 4PT. □

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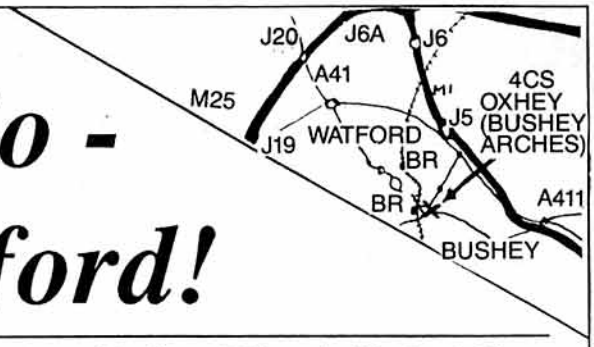

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NEW FROM USA: The Pile up Penetrator LK 500ZC linear amplifier. Some of the features: Full QSK, HF tank coil and Centralab bandswitch are silver plated, Hypersil plate transformer and separate filament transformer. Computer grade capacitors. Amateur continous duty in all modes. ALO: Auto Lock Out ceases amp operation if mistuned or over current appears on the pair of two 3-500z valves. Full coverage WARC Bands. 2 speed fan. **RF output:** SSB 1.5KW PEP continous. CW 1.2KW average continous. SSTV & RTTY 1KW average, 1.5KW PEP. Call now or write for full spec literature.

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FT 767 70cm	YAESU
FL 7000 Lin Amp	YAESU
FT 23R	YAESU
FT 73R	YAESU
FT 790R	YAESU
FT 690R	YAESU
FT 290R	YAESU
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FT 712RH	YAESU
FRG 8800	YAESU
FRG 9600	YAESU
FT 736 2M 70cm 1.2Ghz	YAESU

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RALLIES

Roy, G6OKB, has informed me of two rallies where he is running an ATV station. One is at Maidstone on 28 May; callsign is G8TRF on 70 and 23cm TV. The other is Waldershore Park near Dover on 24 and 25 June – this will be running 70cm TV.

The BATC rally will be at a new venue this year as it has outgrown the Post House Hotel at Crick. It will be on 30 April at the Coventry Crest Hotel, Coventry, which is adjacent to Junction 2 on the M6.

The VHF convention is on 16 April at Sandown Park as usual. The Home Counties ATV group and BATC will both be there. G4CRJ and myself will be lecturing on TV repeaters and providing a live demonstration of GB3HV, the local TV repeater.

June is also the month when the HCATVG is involved with the Middlesex show from the police marquee at Hillingdon. We always put on a public demonstration ATV station. It is likely to fall on the last weekend in the month.

SCOTLAND ATV

GM3WML has sent me a letter about activity in the Fort William area in Scotland. He's very pleased to have opened the new year with his first 23cm contact. Having spent the best part of Christmas in his shack, much to the displeasure of senior management, the domestic TV was dominated by shack shots from the bottom of the garden, just to prove that he hadn't been wasting his time down there. Then he had to decide who to work for real. As Scotland is populated with the odd mountain or two, it's necessary to go portable to obtain any distant contacts. GM3WML invited Dick, GM8AZS, over from Elgin for the new year, which proved to be a great drain on liquid resources, but on the 2 January pictures were received for the first time from Glen Nevis only 4 miles away, but it is a start. Other activity in the area is on 70cm with GM4OPU, GM4PWR, GM1YGV and GM6YQA to name a few. They are mainly on at the weekends, Sunday night being ATV night. GM3WML offers anyone passing through the area with some gear this summer a warm welcome.

23cm AERIALS

I have recently received one of four 65 element German SHF Design Aerials from BNOS Electronics in Essex. I replaced the four JVL quad loops with one aerial; results are very encouraging with signal strength equivalent to the four. When the SWR was monitored at the aerial it was around 1·15 to 1 from 1250 to 1320, which is excellent. The results follow closely the theoretical gain curve for boom length/number of elements throughout the frequency range. Reception of the High Wycombe TV repeater has been used as a reference signal – this uses flat plate UHF Compendium aerials. A strange thing is that the signals between G3MPS at Farnham and myself have shown a deterioration with the new single aerial, yet narrow band beacons and the repeater show an improvement. Maybe there is a difference between a quad loop working a truly horizontal element aerial and loop to loop. The major difficulty with these aerials, however, is obtaining them in the first place down the chain from Germany.

HIGH DEFINITION TV – LEMON OR USEFUL?

While the principles of new 1200-line systems appear good, in comparison with the present 625, their virtues are very often demonstrated on grade I high resolution monitors.
Unfortunately this is well outside home budgets – to the tune of thousands of pounds. Is there, in that event, any benefit to be had from running 1200 lines?

Let's look at the normal, current system. The channel 4 test card contains some frequency gratings which demonstrate the ability of the receiver to resolve the signal being transmitted. The smallest spaced gratings equate to 5·25MHz which is the upper limit (5·5MHz) of the broadcast specification. Since the advent of in-line gun tubes, manufacturers opted to fit them in preference to older shadow mask tubes. The difference can easily seen by looking closely at the illuminated tube. Older shadow-mask tubes have colour dots, while the in-line gun tubes have colour blocks instead.

Advantages are a brighter picture and the need for fewer components for picture alignment. Although the picture is bright, this tends to mask a loss of definition. Compare the colour block size with the 5·25MHz bars and you will see that they are smaller than the block size, which means that it is impossible to display the full spec picture with these tubes, unless you have one larger than 30 inches. Even FST sets have done nothing to resolve this problem. Some fine pitch tubes are available (less than 0·67mm pitch) but at a very high price.

So we cannot even display properly a picture that is currently transmitted, let alone do justice to an improved resolution system!

What other problems are there? One is picture flicker. This can be solved at the receiver by using a frame store and displaying the same picture twice. Another is the colour circuits not knowing what to do when, say, a checked jacket is pictured. Certainly this has improved using modern chips and filters, but I believe that our current system still has a long way to go as far as the display medium is concerned

Having said this, is it not all in vain? The Bloggs of this world go into a shop and buy the telly for the cabinet, knobs and the nice soft picture! They probably also use a set-top aerial as well, with a nice snowy picture and the colour control at maximum. Why should manufacturers bother!

THE BLACK HOLE – ANSWERS FROM G3NAQ

The essence of G3NAQ's response to the black hole phenomenon is as follows. In a standard atmosphere (no weather) signals will travel in line of sight plus one third distance. Signals will arrive via atmospheric refraction, diffraction and forward tropo scatter. The refractive index of air depends on temperature T (degrees Kelvin), pressure in mb, and e which is water vapour pressure in mb. The latter is available from percentage humidity tables. The following formula applies:

$n = I + [(P + 4810 \times e/T)/T] \times 77{\cdot}6 \times 10$ to power minus 6

For the standard atmosphere n decreases by 79 parts per kM. Also, we are saying that at different heights the refractive index will change, and so cause refraction. Under certain atmospheric conditions signals can be super-refracted which is caused by greater refraction change as height increases.

If, however, the refractive index decreases with height then signals will be bent upwards and virtually disappear on the ground. This seems to take place when the temperature gradient with height is small, ie, in calm, cool, clear conditions, as previously referred to as the black hole. Under these conditions it is very gratifying to realise that all those hard fought-for watts are keeping the man in the moon warm!

So if it's good, work the DX; if it's a black hole, have an early night. Oh, and no. I am definitely not sitting on the roof at night with barometer and thermometer on a long pole for anyone!

TELEVISION CONTESTS

Dates for the next contests are as shown below:

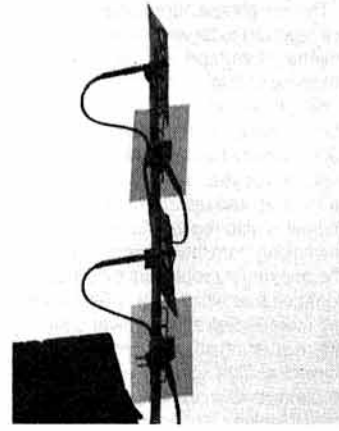
Contest protocol: Sending stations call CQ on 144.750. Responding stations call in and wait for the sending station to allot a working 2metre frequency. The sending station puts a 4-figure number card on the TV band. The responding station totals the numbers and gives a picture grade report along with a serial number and locator. The sending/receiving is then reversed. A typical contest picture is shown below.

BRIGHTON TV REPEATER

This repeater has been doing very well along the coast, being seen in Southampton at G1APD and G4PXH. G4PXH should be a better signal into it now, having (a) made his 23cm 200watt linear work properly and (b) put a switch position in for 1249 on his synthesiser. No one seems to get colour unless the repeater is a p4.5, whereas the High Wycombe one is in colour at p2. I wonder what the problem is here?

THE HIGH WYCOME REPEATER

A quick note is due here about the four flat plate aerials providing maximum signal coverage to the south and east south east. These aerials have a 45° −3dB beamwidth and seem very stable in various weather conditions. See the photo, below.



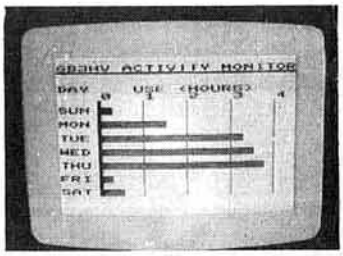
Mayday Microwave	1 May 1	0001 to 2359 local	24cm and above
Summer Fun	10-11 June	1800 Sat to 1200 Sun GMT	FSTV all bands
IARU ATV	9-10 Sept	1800 Sat to 1200 Sun GMT	FSTV all bands (international)
Slow-scan TV	12 Nov	0001 to 2359 local	Slow scan FSTV all bands
Winter ATV	9-10 Dec	1800 to 1200 Sun GMT	FSTV all bands

SATELLITES

RON BROADBENT G3AAJ
94 Herongate Road, Wanstead Park,
London E12 5EQ. 01-989 6741

We have recently added the activity monitor (see photo) which appears to be having the desired effect. Users try to push the bars over further in a competitive spirit.

The other picture shows one of the beacon pages displaying our activity program as far as has been confirmed.



The monitor recently installed at the High Wycombe repeater.

GB3CT UPGRADES FROM G4TVC

The repeater on transmit comprises a G8CMQ transmitter driving into an LMW PA. The group wishes to upgrade the CMQ transmitter with the latest mode de moi. They would also like to afford a 20watt PA, but funds will not stretch that far.

The receiver is a Wood & Douglas system with a Microwave Modules bipolar preamp. The logic is classed as rather out of date, and a new system will be based on a Teleton computer.

The aerials are Alford slots which are reported to be very unreliable in weather of any sort, and we've always got some of that!

G4TVC reports that although 15 stations have 70cm and six have 23cm, activity has been rather poor over the last year, so let's put Crawley on the map and restart the weekly net. Interest is also registered in repeater interlinking from the Crawley area. The one major problem is the Pease Pottage radar which is only 5km away, and there is also a high power chain 'spare' running office hours at TEE Gatwick at 3km. Despite all of these problems thrown up, the group is always looking for new members and support.

HELP

144.750MHz is the ATV calling frequency for help, advice, and talkback; see you there.

Apart from routine goings on with Oscar 13 and Oscar 10, February has been rather uneventful for satellite watchers. I have had no reports of stunning DX being worked via any of the birds, and hardly anyone has reported use of the RS10/11 or JAS 1 satellites. Most people have commented that Oscar 13 is never available at the time they want to use their equipment, and they seem pretty loath to make the effort even to think of using the low orbiters. I wonder why? Those same folk appear to spend hours listening and then trying to get a QSO with MIR, which is only in sight at most 10 minutes in any one place on the globe. Would anyone who uses these LEOs please let me know what kind of activity they find during the month?

Two subjects which have been given a lot of verbage on the air, and by mail, are MIR QSOs (U4MIR) and the decay rate of OSCAR 9 (UOSAT 1). As far as can be ascertained, no transmissions were made by any of the crew of the MIR space craft on 2m from 28 December 1988 until approximately 14 February 1989. A few days after that date I received a call to say that a "QSO" had been made by one of our AMSAT-UK members on the South Coast while the MIR was at very low angle to the West. There was no QRM of any kind and the operator was calling CQ on a seemingly dead band. Our UK friend gave a quick "U4MIR de G6SXD," and got a "You are 5 and 9." And that was that. As soon as the S/C got to TCA (time of closest approach), the band was filling up with DLs and others; vast amounts of RF were pumped into the frequency, and no more contact was able to be made on that QSO.

Since that date many UK folk have heard and worked U4MIR, who seems to have acquired the correct manner of using an amateur radio transceiver; by this I mean as a tool for conversation and pleasantries in a relaxed way and not as if he was on to his navigational command station using clipped, straight to the point talkback. No doubt as the weeks go by he (they?) will be able to respond to previous QSOs to the same person and both parties will get to know a little about each other, which, as some of us used to believe, is what amateur radio is all about. Here endeth the first lesson...

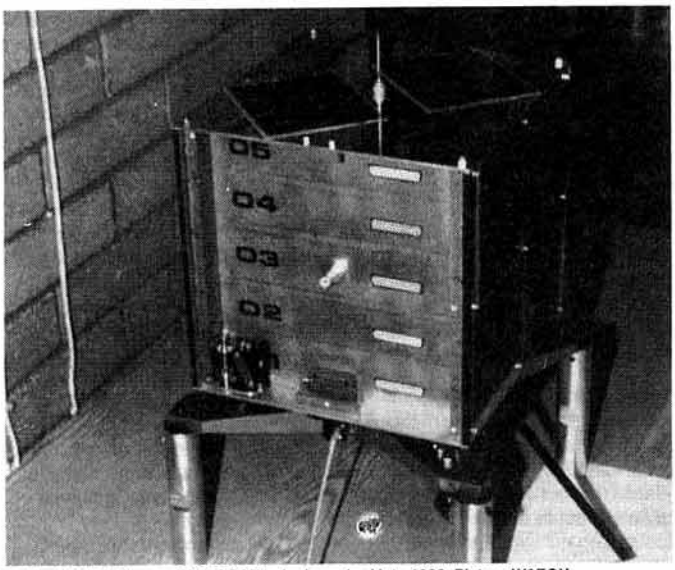
The next item that's occupying great chunks of time 'on air' is the demise of our own satellite OSCAR 9. So when will it fall out of the sky and cause international relations to crumble?; cities to be burnt to the ground?; and a wailing and weeping from some members of the community of space watchers? Well, this bird has been up aloft for just over seven years, with a few problems just before launch and some since. It has done sterling service with the experiments that were built into it.

Suffice to say one or two of the experiments did not come to fruition, such as the Gradient Boom which did not get pushed out to its full extent of some 17 feet, but got stuck about 3 feet out from the orifice. No real beacon mode transmissions were therefore able to be made on 7, 14, 21, and 28MHz. This was a disappointment to the many amateurs who carry out propagation experiments. UOSAT 1/OSCAR 9 would have been a very useful tool for this activity, and I believe that this would have enabled some of the more technically minded, who keep track of conditions on our bands, to become involved in the space side of our hobby, and so advise the rest of us about actual and potential band conditions.

At the time of writing this in early March, OSCAR 9 is descending at a rate of 300 metres per day. This is caused by Sunspot activity, and the dreaded drag caused by particles up there. Various predictions have been made about the re-entry date/time. The latest 'official' date is early October 1989, but as is usual with radio amateurs, thank the Lord, they don't believe a word the 'officials' say. This has prompted a sort of competition, without a name, on when exactly this piece of ironwear, sorry Aluminium-wear, will enter the earth atmosphere. As some will have seen on the UOSAT Bulletins, the University of Surrey have said that they will donate one of their special UOSAT Team sweat shirts to the nearest predicted date/time of re-entry received at least one month prior to the happening. All such predictions should be sent to me at AMSAT-UK, LONDON, E12 5EQ, and not to Craig at the U of S as was first put out on the UOSAT bulletin. I visited the UOSAT team this week and arranged the change-over. This will save them extra work at a time when minutes are needed if they are to get the new UOSAT-D and E up into the blue void yonder.

So send all predictions to AMSAT-UK. Anyone can have a go. Prizes at this date are the above sweat shirt, and AMSAT-UK will also put up any piece of software that we sell for the BBC, IBM, or C64, and two T-shirts as seen at the AMSAT-UK Colloquium. The winner takes his pick, and runners-up get sent the various items in rotation. No mail can be entered into. Any other persons or traders who wish to be involved with prizes just send 'em to me at the above address.

Question: how do you make a prediction of a falling object from space? Answer: with great difficulty. There is, however, a practical method which most of us used for some time before we all had number-crunchers. Find out first if the FM receiver on which you hear UOSATs is calibrated correctly. If it isn't, calibrate it and/or mark the dial *exactly* on 145.825MHz. As a test, next time you hear UOSAT 1 keep an eye on your FM deviation meter, but do not move from the 145.825MHz frequency. You will notice that the deviation meter moves from outer scale reading to centre reading and then to outer again. At the point of exact time of closest



Model of AMSAT's new MICROSAT to be launched late 1989. Picture W3EGY.

GEORGE DOBBS G3RJV
St. Aiden's Vicarage, 498 Manchester Road, Rochdale OL11 3HE.

SATELLITE SCHEDULE

Satellite: ao13
Station: G3AAJ

DAY — HOUR - UTC

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
4/01	J	J	J	B	B	B	B	-	-	-	-	-	-	-	-	O	B	-	-	-	-	-	-	-	-
4/02	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/03	B	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/04	-	-	-	-	-	O	O	O	O	O	O	O	B	B	B	B	B	B	B	B	B	B	B	-	-
4/05	-	-	O	O	O	O	O	O	O	O	O	B	B	B	B	B	B	B	B	B	B	B	B	B	O
4/06	O	O	O	O	O	O	O	B	B	B	B	B	B	B	B	J	J	J	J	J	B	B	B	O	O
4/07	O	O	O	O	B	B	B	B	B	B	J	J	J	J	B	B	B	B	B	-	-	-	-	O	O
4/08	O	B	B	B	B	B	B	J	J	J	J	B	B	B	B	B	-	-	-	-	-	-	-	O	O
4/09	B	B	B	B	J	J	J	J	B	B	B	B	B	-	-	-	-	-	-	-	-	-	O	O	O
4/10	B	J	J	J	J	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-	-	O	O	O	B
4/11	J	J	J	B	B	B	B	B	-	-	-	-	-	-	-	B	B	B	B	B	B	B	B	J	J
4/12	J	B	B	B	B	-	-	-	-	-	O	O	B	-	-	-	-	-	-	-	-	-	-	-	-
4/13	B	B	B	-	-	-	-	-	O	O	O	O	O	B	B	B	B	B	J	J	J	J	B	B	B
4/14	-	-	-	-	-	-	-	O	O	O	O	O	O	B	B	B	B	B	B	B	-	-	-	-	-
4/15	-	-	-	O	O	O	O	O	O	O	O	B	B	B	B	B	B	B	-	-	-	-	-	-	-
4/16	O	O	O	O	O	O	O	O	O	B	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-
4/17	O	O	O	O	O	B	B	B	B	B	B	J	J	J	J	B	B	B	B	B	-	-	-	-	-
4/18	O	B	B	B	B	B	B	B	J	J	J	J	B	B	B	B	B	B	-	-	-	-	-	-	-
4/19	B	B	B	B	B	J	J	J	J	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-
4/20	B	B	J	J	J	J	B	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-	-	-
4/21	J	J	J	J	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/22	J	J	B	B	B	B	B	-	-	-	-	-	-	B	B	B	B	B	B	-	-	-	-	-	-
4/23	B	B	B	B	-	-	-	-	-	-	O	B	B	B	-	-	B	J	J	J	J	J	B	B	B
4/24	-	-	-	-	-	-	-	-	O	O	O	O	O	O	B	B	B	B	B	B	B	B	B	B	-
4/25	-	-	-	-	-	O	O	O	O	O	O	O	O	B	B	B	B	B	B	B	B	B	B	-	-
4/26	-	O	O	O	O	O	O	O	O	O	B	B	B	B	B	B	B	B	-	-	-	-	-	-	-
4/27	O	O	O	O	O	O	B	B	B	B	B	B	J	J	J	J	B	B	B	B	-	-	-	-	-
4/28	O	O	O	B	B	B	B	B	B	J	J	J	J	B	B	B	B	B	B	-	-	-	-	-	-
4/29	B	B	B	B	B	B	J	J	J	J	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-
4/30	B	B	B	B	J	J	J	J	B	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

HOUR - LOCAL

- - - - = Out of range
B=MODE B working
J=MODE JL working
O=Satellite is on solar recharge – do not use.

approach, your FM meter will be at exact centre reading. Note the exact GMT in minutes and seconds when this occurs. Mark this time on a graph, or graph paper, as a date/time against period of travel; ie, the period that the S/C takes to do one orbit of the earth in accordance to your receiver's centre-reading FM meter. If you now plot as many passes of the spacecraft as possible you will begin to see a pattern of behaviour that will enable you to predict an event some time ahead. You will, in fact, be able to ascertain with great accuracy the next time UOSAT 1 will be at TCA at your QTH. Knowing this, and because you have already an enquiring mind and found out the height and the extent of earth atmosphere, you will be able to send in your first prediction.

We require the following with your prediction:

Name and Address (not QTHR etc, or "you know me – Fred").

Receiver used.

Predicted decay date/time.

The method you used to find same.

What prize would you like if you win. You are restricted to five entries, in accordance with the one-month rule. *Please* write this information on a QSL card or a postcard.

By the time you read this the ZRO Tests for OSCAR 13 will have gone by. These tests are a series of *low* power ground station transmissions put into the satellite at precise times and dates to enable us to ascertain the 'goodness' of our receiver systems on 145MHz. The tests are started at an arbitrary figure of output from a ground station in USA, and over a given period. Morse code groups at 10WPM are sent, on a frequency of 145.840MHz. These transmissions are then gradually reduced in output to the equivalent of a handheld of about 200mW into a quarter wave antenna. Points are awarded for each series of level outputs that are received correctly.

More on this at a later date, because by the time you read this the tests will have been made (4/5 March). I will give out this information on the AMSAT-UK nets whenever appropriate. Is there anyone in Europe who could carry out similar tests on OSCAR 13? There must be somebody in the UK or Europe with the right brains who can do this? It does, of course, need dedication, good equipment, and an accurate means of attenuation of output power. Suggestions to AMSAT-UK address as above. Maybe some of the present big noises on Oscar 13 could give a little of their hours of time on this bird to provide a useful service for the rest of us. Think on dear friends.

I have not yet been able to include the G4IQQ chart ref Perigee of AO-13 over the period, as promised last month. Is there anyone who wishes to produce a similar one every month? What I have just submitted to the RSGB is a new style of chart which may be of more use to the casual reader/users of AO-13. This is a limited software package which I am able now to release to interested parties at small cost to help swell the funds, and help build your satellites.

Short notes as we go to press: this year it looks as if we will have eight satellites being launched, which implies that it's going to be a bit crowded up on two metres. More later, as it happens.

On UOSAT-Delta the store and forward packet transponder is nearly finished at Surrey, and I was impressed with the work they are putting into the two UOSATs now on the stocks. Launch is now to be in to the October time frame.

OSCAR 10. Use when you hear it ON but not when you hear the Beacon on 145.009MHz FM'ing. Listen to the AO-13 Beacon on RTTY, CW or PSK for updates on this satellite. If you hear it FM'ing *KEEP OFF*.

OSCAR 13. At time of writing it has an operation schedule as follows: Mode B 100-150 MA. Mode L 160-200 MA. Mode B 200-255 MA. Off 000-100 MA. Along 210. ALat 005 but this may change by the time we get into print. Listen on the Nets for exact info. Again this will be on the PSK, RTTY, and CW Beacon on 145.812MHz. To this end we have another supply of the very fine OSCAR 13 PSK Demodulator PCBs now arrived in stock. An SASE to me will get you a Catalogue and a price list of all the goodies for satellite users.

UOSAT 2 (Oscar 11). As some will already know, this bird sometimes has a break in transmission of Bulletin while over the UK. It is not U of S doing a command uplink; in all probability it is the DL station who now has the DCE Command capability, and is downloading your messages from the other side of the world. On that score you can now continue to send messages via Packet DCE to your friends in VK again. Graham, VK5AGR, tells me that he and the P and TT in VK have come to an 'arrangement' about his greetings traffic and his licence. Enough said.

Finally, I had a call today asking if I could put the caller onto the Secretary of AMSAT-UK! The address is at the top of the page. As I am a very shy old man I failed to let readers know of this and it has caused some confusion to some non-satellite folk. Sorry.

That's about all, except to say Good Satelliteering, and what about some feedback to me about this column? Ron, G3AAJ.

THE QRP WINTER SPORTS 1988/89

It's an annual event: it's always held between Boxing Day and New Year's Day, and as may QRP operators as possible come on the HF Bands in an attempt to work fellow QRP operators. Gus Taylor, G8PG, reports that evidence from logs received so far, the last Winter Sports was the most successful ever.

It is known that 35 countries were active on QRP, plus SM6YF/MM working from the MC Tosca en route from the UK to Charleston NC. But the unsung heroes of such events are always the little men working with limited antennas from poor locations. Two examples are G4KKI and EI4DZ. Located in the heart of Manchester, Bill, G4KKI, used his half-sized G5RV antenna to good effect to make a lot of two way QRP contacts. Noel, EI4DZ, despite his very low back garden loop pushed the tally for two-way QRP countries worked up to twenty. These two operators put pay to the idea that it is impossible to use QRP from restrictive locations. Amateur radio is all about compromise and it is the "in spite of's" that make it so exciting.

An outstanding set of contacts was made by Randy, AA2U and Chris, G4BUE. They had two-way QRP contacts on all seven bands between 3.5 and 28MHz currently available in the USA, plus a cross-band contact with Chris on 18MHz and Randy on 14MHz. Others known to have had two-way QRP trans-Atlantic contacts on 3.5MHz include G3PDL, GM30XX and G4JFN. G3PDL got his three watts across on 1.8MHz, but the W was using QRO. Even the dreaded 7MHz band produced two-way trans-Atlantic contacts for G4JFN and G3XJS, but the best QSO for the latter was on 14,060 when he raised VK7CW. VK7CW was initially using 100watts to a mobile whip antenna, but then reduced power to four watts, still on the whip, and the QSO continued with four watts at the VK end and one watt at the UK end. Who needs a linear?

Several UK QRP operators worked Dave, VS6VT, but as the computer forecast, the path was far from good. A further hazard to DX working at the VS end were the "Honkers Horrors", the local name for inshore fishing boats using CB rigs and badly adjusted 1kW linears. These often blot out 28MHz and take 21MHz out as well. A pleasant surprise was the appearance of FOC member Stan, EA6ZY, running three watts from Ibiza and giving many operators their first two-way QRP contact with EA6. His ▷

three watts brought him a great many excellent contacts, and as he says, "I think this is my first time on QRP since World War Two, but it will certainly not be the last!'.

THE YEOVIL QRP CONVENTION 1989

The highly successful Yeovil QRP Convention is to be held again this year on Sunday 7 May at the Preston Centre, Monks Dale, Yeovil, beginning at 9am. There will be lectures, plenty of traders and the usual supply of food and drinks. Further details may be had from Dave Bailey, Secretary of the Yeovil Amateur Radio Club, 7 Thatcham Close, Yeovil, Somerset, BA21 3BS.

To lead up to the QRP Convention, the Yeovil Amateur Radio Club have announced a QRP FUN RUN:

Calls:
GB2LOW from the Club HQ
G3GC (QTHR)
G3CQR (QTHR)
When: At any time between 2100 GMT on Friday 28 April to 2300 GMT on Friday 5 May 1989.
Freq: 3560kHz and 7030kHz +10kHz
Rules: Contacts must be between QRP Stations (less than five watts RF output). Any of the three FUN RUN calls listed above must be worked FIRST to start scoring on each band.
Scoring: Contacts with G3GC and G3CQR will be worth 20 points and with GB2LOW 50 points. After working a starter fun run station each QRP QSO will score five points until a second fun run station is worked after which they are worth 10 points. After working the third station they are worth 15 points. This rule applies individually to both bands. The overall score is the addition of the two band scores.
Exchange: RST, Power Output, QTH, Name and G QRP Number.
Entry: Separately list for each band all the call signs, commencing with a fun run station, together with the information in the EXCHANGE and the points claimed. Bring your entry with you to the convention on Sunday 7 May. Awards will be made on that day for the highest scores on each band and for the best total score.

If you are not fortunate enough to attend the Convention, then send your entry to G3QR (QTHR) to arrive not later than 31 May to qualify for the postal award. Working GB2LOW operating at the Convention will score an extra 50 points.

OTHER QRP CONTESTS
16 April: RSGB Low Power Fixed (see RadCom Feb/Mar)
16 July: RSGB Low Power Field Day (see RadCom May)
8 April: QRP ARCI Spring QSO Party
28 May 28: QRP ARCI Hoot-Owl CW Sprint
9 July: QRP ARCI Summer Homebrew Spring – CV
1 May: AGCW-DL QRP/QRP Party

For details of the American QRP ARCI events and the German AGCW contest, please send an SASE to G3RJV.

THE EUROPEAN CW ASSOCIATION

The new representative for the G QRP Club on EUCW is Angie Sitton, GOHGA, who replaces Colin Turner, G3VTT.

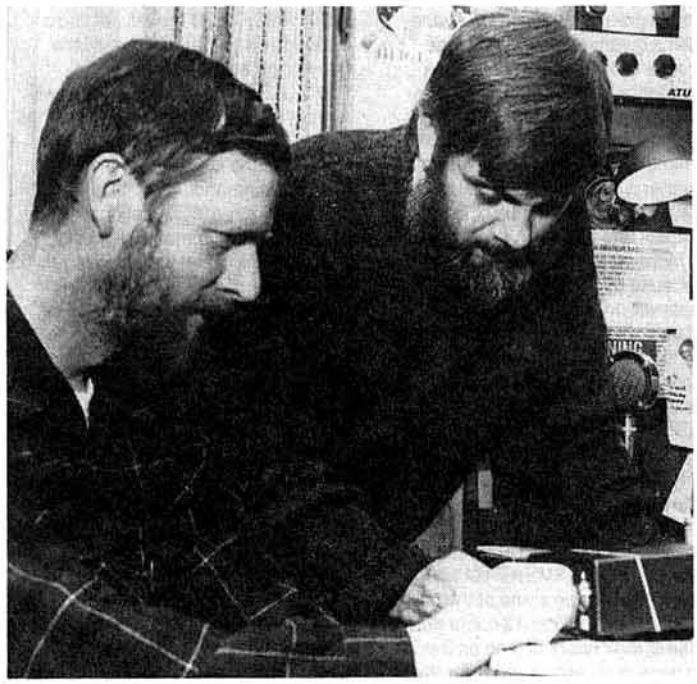
Tony Smith, G4FAI, an avid QRP operator and current Chairman of the European CW Association mentions, in his latest bulletin, a new EUCW NET. The net is held on Tuesdays at 2000, Central European Time, on 3555kHz plus or minus QRM. Some stations QSY to side frequencies for longer contacts. This net is informal and all amateurs are welcome to check in.

The EUCW STRAIGHT KEY DAY will beheld on the Swedish 'midsummer day', Saturday 24 June. It is not a contest, so put aside your electronic keyer and relax with a hand key. Use frequencies between 3540-3570, 7020-7040, 14040-14070kHz or anywhere in the 10MHz band. If you make at least five QSOs, you may vote for the best hand style or fist you work, one for each of three you consider best. The 'Straight Key Award' will be sent, free of charge, to every operator who receives at least two votes. Send your log and votes to Daniel Klintman, SM7RXD, Adjunktsgatan 3D, S-214 56 Malmoe, Sweden, before 18 July 1989.

DOYEN OF QRP CONSTRUCTION VISITS THE UK

Every so often a circuit design appears in the amateur radio literature that is simply 'just right'. Such a design has been the "Optimised QRP Transceiver" by Roy Lewallen, W7EL, which originally appeared in QST and SPRAT, the Journal of The G QRP Club. Since that time I have seen the circuit revived in Australian, New Zealand, Hungarian and, most recently, German magazines. Last October on a business trip to the UK and West Germany, Roy was able to take time to visit me for a few days, bringing the prototype transceiver. Several members of the G QRP Club gathered to meet Roy and exchange ideas on homebuilt equipment.

A postscript to this visit is that on his return home, Roy had one of his suitcases stolen. It happened to be the suitcase which held his famous Optimised Transceiver. Sadly, Roy gave up the transceiver as lost. A few days later the police rang him to collect the transceiver and a homemade wattmeter. These had been found loose on the floor at the airport, probably abandoned by the thief. They had been identified by a maintenance man, from Roy's callsign written on the equipment. Perhaps the thief thought he had found a bomb? ... perhaps we all ought to identify our equipment?



Roy Lewallen (left) designer of the 'Optimised QRP Transceiver' at a meeting of the G QRP club

BOB TREACHER BRS32525
93 Elibank Road, Eltham, London SE9 1QJ

HOW TO USE THE QSL BUREAU

Once you have obtained your brand new QSL card, the last thing you want to do is annoy the QSL bureau manager. I have said enough about what should appear on the front of your card, so let me now highlight what should appear on the back. Thanks for information received from G3DCC.

First, the callsign of the station you are sending the card to should be put clearly on either the top left or top right hand corner (which side will probably depend on whether you are left or right handed!).

Second, sort your cards REVERSE side upwards. You should put any 'G' cards at the top of the bundle, starting from G1 through to G0. The UK cards should run, G, GB, GD, GI, GJ, GM, GU and GW all in numero-alpha order.

Then come all the 'foreign' cards, EXCEPT for those for the USA. Once again, put them in numero-alpha order, with number prefixes coming after the letter prefixes. The '1' before '0' is important especially when sorting cards for the Dutch.

Finally come the cards for the USA. These should be in order of call area, mixing up A, K, N and W prefixes with each call area in numero-alpha order.

So you will see that it is really quite easy, but you would be amazed at the mistakes which occur. I hope that these few rules will benefit a number of listeners, and I am sure it will help G3DRN who has the thankless task of sorting them before they leave these shores for their DX locations.

HF CONTESTS FOR THE SWL

Last month I mentioned the VHF events which are open to listeners. Now that the HF Contests Committee has fixed the format for several events on HF, I can provide more details of those Society contests which will count for this year's Championship. The first 1.8MHz, 7MHz CW and Commonwealth contests have already passed, but these remain:

Contest	Date
SSB County Round Up	20 May
CW County Round Up	21 May
RSGB SWL	8/9 July
21/28MHz SSB	8 October
21MHz CW	15 October
Club Calls Contest	11 November
Second 1.8MHz CW	18/19 November

Readers will see that 'Region Roundup' has been renamed 'County Roundup' and that there will be both SSB and CW sections. As for the demise of 7MHz SSB, it has been agreed that a new contest should be

reinstated for 1990 which will be biased more towards international participation, with perhaps an ITU zone multiplier and the use of either 20m or 80m in addition to 40m. The rules have still to be framed, so watch 'Contest News' and this column for more news. Malcolm Harrington BRS20249 and I will be devising the SWL section rules.

MORE ABOUT VERTICALS

My January "Antenna Slot" prompted G3ZPF to write with some alternative views. He felt that the use of a quarterwave vertical with a simple ground stake could give quite poor results, and suggested that a better idea might be to mount it at eaves level and hand one radial for each band down vertically below it, effectively forming a vertical dipole.

If radials are used, no more than two are needed if the vertical is elevated. It appears that G3VA has, in 'Technical Topics', exploded the myth that a minimum of four radials were required when a vertical was elevated. A final point was that, to work really well, a vertical needs lots of buried radials.

G3ZPF offered his own ideas for a good SWL antenna – a trap dipole. He referred to the January 1986 'Technical Topics' which gave constructional details for each of the bands.

HEARD ALL BRITAIN

As promised in the January column, here's an update on SWL happenings on the HAB front.

This year's events include an LF SSB contest on 21 May and 144MHz SSB on 18 June. Full rules of HAB contests and log sheets are available from G6TNV.

As for which SWL's have done what in HAB, GW6JNE has provided these details on the highest awards issued so far. No BRS numbers are given, so apologies for that.

Frank Pankhurst 3900 areas – mixed SSB
Frank Pankhurst 3900 areas – 80m SSB
Ernie Beckett 3700 areas – mixed SSB
Albert Tideswell 3700 areas – mixed SSB
Chris Gibbs 3600 areas – 80m SSB
Tony Holmes 3500 areas – 80m mixed

HAB Diamond awards have been awarded to Roger Sheppard, Brian Russell and Maurice Williams. Future information on HAB awards will be provided as they are issued. Anyone interested in finding out more about the HAB award scheme can always look for the WAB/HAB stand at up and coming rallies. At the time of going to press, it appeared that 14 May would see the Drayton Rally, and 21 May the Harrogate Rally. Check with G4UXU, the Rally Manager, to see that the dates are still current before setting off.

DX-TV

A growing number of listeners are obtaining a Band I TV and are using them to get early warnings of Sporadic-E propagation on 50 and 144MHz.

The Sporadic-E season normally starts in early May and runs through to mid-August. There are sometimes other openings outside of these months, for example, a minor spell of activity in mid-April and in mid-December.

The ionosphere's E layer is about 70 miles above the earth and although reflective to short wave signals, is generally transparent to VHF signals. Reflection of VHF signals from the E layer occurs when ionised clouds are present. There can be no precise forecast of when this will happen, and so they seem to occur at random. Band I signals can be reflected over distances of up to 1500 miles in a single hop. The higher the intensity of ionisation, the higher the reflected signal frequency. Band II radio signals will also be affected by this propagation, and tuning around 88MHz during most days in June will often result in some European broadcast station being heard on a simple dipole.

Signal reflections will vary during an opening. This is because the reflective clouds will vary both in number and in speed. During some openings, interference can be severe: this is because the skip changes, bringing in signals from different parts of Europe within minutes of each other. Some conditions can last for several hours, some just last for a few minutes.

As Sporadic-E signals tend to be very strong, a simple dipole will suffice for reception. Two fixed dipoles at right angles will allow total coverage. Those who want to "do it properly" can make a two element wideband beam and even rotate it. The antenna does not have to be very high either, as signals tend to arrive at a virtually horizontal angle. When conditions are favourable, signals can be copied from the Middle East or Asiatic Russia.

A 625-line receiver with VHF coverage is best for monitoring DX-TV. The Yoko F1 is used at my QTH. The advantage with these 'export' TVs is that you will be able to watch the picture and listen to the sound. Alternatively, you could obtain an 'up-converter', like the one marketed by Labgear, and use a UHF receiver, but it is an advantage to use a TV with a rotary tuner, as opposed to one with push buttons.

With a really good opening you can watch signals from as many as 10 countries fighting with each other for prominence on any one channel, but you will need to know which vision channels to monitor:


The shack of Brian Russell BRS33915.

E2	48.25MHz	IB/E4	62.25MHz
R1/E2a	49.75MHz	R3	77.25MHz
IA	53.75MHz	IC	82.25MHz
E3	55.25MHz	R4	85.25MHz
R2	59.25MHz	R5	93.25MHz

The 'E' channels are used in Western Europe (except France). 'I' channels are used in Italy, and 'R' channels are used in Eastern Europe.

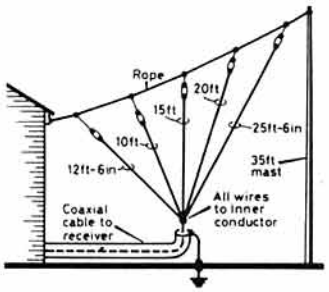
There are several good books on the subject. *A TV-DXers Handbook* by Roger Bunney will give you more information to get started, the *TV-Bildkatalog, Europa* by Norbert Kaiser will help you identify the pictures once you start watching.

If anyone has anything to offer on DX-TV during the summer, I shall be pleased to include it in the column.

ANTENNA SLOT

Last month I mentioned that I would take a look at a Vee-beam and a Rhombic. As the average SWL is unlikely to have sufficient space for such antennas, I have decided to look at something a little different – The 'fan' vertical (see diagram below).

It is possible to obtain coverage from 3.5MHz to 28MHz using a 'fan' vertical. Half-dipole antennas are arranged in the form of a fan and are connected in parallel at their lowest end. It should be connected to the receiver by a length of 50ohm coax. The outer shield of the coax is grounded at the antenna end by a short length of pipe driven into the ground. The inner conductor of the coax is attached to the junction point of the fan wires. It is relatively non-directional and, I am told, can be susceptible to man-made noises and ignition interference. However, several listeners have told me that they use the system with good results, which implies that it is a case of experimenting to see how it performs with you.



PEN PICTURE

To get a better idea of some of our listeners, I have decided to run a series of 'pen pictures'. If any SWL has a long and interesting listening career, simply put the story into a few hundred words and I will do the rest.

Let us start with Brian Russell (pic above) BRS33915, who has recently been licensed as G1WBI.

He started listening in 1970 with a Trio 9R59DS. Thinking that this receiver left a little to be desired, he moved up market with a JR310 which cost him £85. This was later fitted with a narrow filter and has provided all the DX logged, together with an 80m sloper (¼ wave to ground at 45 degrees) and 40m and 10m delta loops at 35 feet AGL.

The early '70's provided most of Brian's highlights including 3Y – Bouvet Is and A51 – Bhutan. By 1982 he had heard all of the then 318 countries on SSB except ZA and 7O. Brian then started chasing WAB squares, and with still no sign of ZA and 7O decided to take the RAE. October 1987 brought G1WBI on to the bands, but he is still trying to master the CW! He currently uses a trusty FT290R on 144Hz and will gladly QSL any SWL report he receives.

Brian acts as the European, African and Middle East agent for the W6GO QSL List and has had a pleasant 9 year association with the QSL List to date.

FINALE

With the new style column at an end for this month, there is just room to ask for news, views, comment, photos, details of your 'pet' antenna for publication in June. Mail should reach me no later than 10 April.

MICROWAVES

MIKE DIXON G3PFR
'Woodstock', Gazebank, Norley, Warrington, Cheshire WA6 8LL.

YET MORE ON BANDPLANS AND LICENCE

One thing I didn't make too clear in the February review of bandplanning was the real difference between attended and unattended personal callsign operation. If you read the new licence conditions superficially, it would seem that personal callsign beacons and control are not allowed at all on the 1.3GHz band and in parts of the 10GHz band. True – *if unattended*.

In the case of an attended beacon, it is desirable that the licensee is regularly monitoring the band/frequency where the device is being operated. Indeed it would be quite reasonable to expect a reply or response, say to a beacon transmission, on or very close to the frequency in use. Therefore, check that frequency with frequency! Do this at no longer intervals than 15 minutes (when you *must* send your callsign anyway) and probably five minutes is more appropriate. The main use of attended beacon transmissions is in the setting up of skeds or contacts over difficult paths or to help a fellow amateur by providing a known signal for equipment alignment where no formal beacon is receivable. Such operation relieves the chore of manually making identified transmissions while you or the other station wait for signals to 'come up' under marginal path conditions, much as you might do on an MS sked.

If you hear a personal callsign beacon on 1.3GHz (there shouldn't be any need to contemplate attended operation on 10GHz, since unattended operation is permitted in most of it), I'm sure that the owner – provided he or she is not in your 'back yard' – would welcome a reply and report on the frequency. Then you could either stay where you are or move down lower, around the usual 'centre of activity' frequencies where yet more stations might hear your QSO. This seems to me to be a useful means of generating more activity and at the same time allowing you to do something else in the shack (such as writing to me or the Newsletters editors, QTHR!), while waiting for conditions to improve over that difficult path.

It shouldn't be too difficult for the average resourceful amateur to arrange a switched (maybe computer controlled) monitoring schedule to allow automatic but attended operation. Once signals are heard, then full, normal manual operation can take over. Maybe there is a future for a synthesised speech ident generator as well as the highly successful G4FRE CW keyer?

While talking about beacons, I'm pleased to tell you that the first 3.4GHz narrowband beacon, GB3OHM in Birmingham, came on air on 4 February. Its frequency is 3456.90MHz and it runs 1.4W (at the antenna) to a single, temporary, Alford Slot. Any reports would be most welcome and should be sent to Matthew Twyman, G6KOA, QTHR.

THE MILLIMETRE BANDS

There is a DTI document entitled *The use of the Radio Frequency Spectrum above 30GHz – a Consultative Document*, Radio Communications Division, ISBN 1-870837-00-46, which makes interesting reading for microwavers as it outlines the characteristics and possible uses of frequencies above 30GHz. It details current assignments from 30GHz to 275GHz and outlines possible uses from 275GHz right up to 400GHz!

Much of the millimetre spectrum is associated with space and astronomical uses but it is interesting to note that frequencies around 31-32GHz are provisionally reserved for 'private user' purposes eg, public telephone operating organisations, while 37 to 39.5GHz is designated for 'civil use'. Even more interesting to amateurs is the fact that 47.2 to 49.2GHz is reserved for TV outside broadcast links and feeder links to satellites. Now that has to be good news because maybe, just maybe, we might feel the benefits of commercial 'spin-off'. There has been little or no amateur work on the 47 to 47.2GHz amateur band in the UK because of the difficulty in obtaining, or the enormous price of, equipment for this part of the spectrum. Similarly 74 to 75.5GHz – our primary band – is 75.5 to 76GHz and it is stated that secondary amateur allocations might be available between 76 and 81GHz. There may be an ISM band between 116 and 126GHz; we have already been told that case-by-case authorisation might be granted for 120GHz. And so it goes up to and including the other 'WARC'79' bands. Encouraging news indeed for those of us who have been waiting for suitable components to become available. Once these uses start to be exploited commercially, then we can expect to start to make some progress towards activating at least the lower millimetre bands! The next item will, perhaps, underline the effects that such 'spin-off' can have.

SUCCESSFUL USE OF KU-BAND LNB

In response to my request for information as to whether anyone had been experimenting with inexpensive Sat-TV block converters, Colin, G4EML, wrote a useful letter about his experiences with such devices. He 'came across' an LNB125C (General Instruments) at a rally and as it was made for 12.5GHz rather than the present frequencies, it was sold off cheaply. Examination showed it to consist of a two-FET amplifier, diode mixer and DRO set at 10.8GHz. There appeared to be little filtering but a mass of matching stubs between the amplifier and the mixer. Tried on 10GHz, the results were very poor. Colin went on "...the reason for this became obvious when the circular input waveguide was measured....it had a cutoff frequency of about 11.3GHz. No wonder it didn't work too well at 10GHz!"

He then dismantled the whole unit and reassembled it onto a piece of WG16. This had a dramatic effect...'Even without any further work, the unit then outperformed my existing WB gear by quite a few dB". An evening spent "tweaking", using a G4COM noise source, resulted in a receiver some 9dB better than his carefully optimised WB gear. Incidentally, the post-mixer amplifier, intended to operate between 900 and 1700MHz, still had appreciable gain as low as 100MHz – cutting the tracks which formed the inductors of a high-pass filter increased this low frequency gain greatly.

His initial RX trials used an FRG9600 scanning receiver as the IF but then continued on using a dedicated 400 to 850MHz unit based on a TV tuner converting down to 39MHz and then to 10.7MHz with 50kHz ceramic filters fitted. The 10GHz tuning range is 10000 to 10450MHz and field tests have given full quieting with signals which were barely detectable on the old WB system. A second LNB (different type?) was modified for SMA input, rather than WG input and used 'remote', appears to be yielding very similar results.

This is encouragement indeed for others to have a go at the less sophisticated and less costly 'miditech' approach recently advocated here!

I've recently noted that at least one 'high street' TV chain is offering the outdoor unit (dish and LNB) for 'Astra' for purchase at under £80, with the indoor tuner-to-baseband output set-top unit for hire. I wonder whether they'd just sell the front end on its own? Since talking to others, such devices may now be available from several sources at between £25 and £60 pounds (ex VAT). This seems to me to be a very good price to pay for what is potentially a 'hot' front end for miditech equipment for the 10GHz band.

EMC MATTERS

HILARY CLAYTONSMITH G4JKS
115 Marshalswick Lane, St Albans, Herts. AL1 4UU.

SOMETHING NEW

Through this new column the RSGB's EMC Committee plans to bring you news, views, and comments on the subject which is becoming increasingly important as we surround ourselves with electronic wizardry, labour-saving devices and computers. Although persuading electronic equipment to live compatibly together is not a new phenomenon, the sheer volume of products available now means that the likelihood of *you* being touched by EMC-related problems is much greater. One consolation is that manufacturers lately have begun to appreciate the extent of their responsibilities; their increased awareness can only benefit us all in the long run. For details of the EEC EMC directive, see news section.

SOCIAL CURSE OR OPPORTUNITY

Most of us probably think of EMC as a curse; an unwanted technical problem that must be solved. However, an EMC case presents opportunities for Amateur Radio as well. It's worth remembering that most people make their first (and often only) contact with Amateur Radio through an EMC case. If Amateur Radio is to prosper, it needs to be seen by people around us as a worthwhile interest.

Often when we tackle EMC problems, it makes more demands on our social skills than our technical ones and makes us ask ourselves the question of how do we appear to our own community? Do our neighbours regard us as responsible people pursuing a worthwhile interest, or, on the other hand, are we just 'someone who tinkers with radios'. The EMC Committee receives a large number of pleas for help every year. Sadly, many of the cases that are unable to be resolved successfully are those where the Radio Amateur has not presented Amateur Radio well to the community. All of these cases illustrate that being prepared certainly makes success more likely, even though it is no sure guarantee. More importantly, our hobby could emerge with more recruits rather than more enemies.

To help the membership be prepared, we published the *Breakthrough* leaflet in April 1987 *RadCom* (SAE to HQ if you don't have a copy). Why not read it again? It's a sobering thought that the way we handle our next EMC case could make, or break the reputation of Amateur Radio.

ON THE FILTER FRONT

Last July the RSGB introduced a new 6-section filter, HPF6, to cope with breakthrough from LF right through to the 432MHz bands. When we designed the parameters for the new filter we decided that a rejection of at least 25dB was necessary, especially as the notch filter did not give much more than 20dB attenuation on 432MHz. Although the HPF6 does not filter the outer, it gives a typical attenuation of 35 to 40dB on the inner at 432MHz. A Band 4 TV antenna is quite good at picking up the 432MHz band and therefore it is vital to filter this band out, if it is to be used in the vicinity. The HPF6 should do the job very well, it is also an excellent one for removing all the lower bands from the inner. It should give a reduction of about 70dB on 144MHz and a lot more on all the lower bands.

There are, unfortunately, some occasions when you cannot spend a lot of time at the complainant's premises, and therefore you have to take steps to use a filter which will work reliably for all the bands you want to keep out of the apparatus. Sometimes, a combination of several different filters will give good rejection, but the time taken in experimentation is too much for the complainant. In all probability you will use a combination of filters which cost not much less than the HPF6, although you may also need to add a braid-breaker to the system if HF has to be removed.

The HPF6 has sold well during its first 8 months, and is readily available from RSGB HQ for £14.12 (counter) or £14.75 (by post) to members. You never know when you might need one at short notice so why not have one ready in case that sudden, unforeseen, problem arises.

EMC ENQUIRIES

The EMC Committee is always on hand to offer advice to members on all matters relating to breakthrough. Any readers experiencing TVI/BCI problems are advised to write directly to the EMC Committee Chairman, Dan Bernard, G4RLE, 11 Byrd Close, Purbrook, Portsmouth, PO7 5UX. Sending letters to RSGB HQ could delay any response because all mail has to be re-directed.

The more useful the information in your letters the easier it will be to assess the situation and provide constructive help. The following information is vital to us:

1) Which frequencies/modes cause trouble?
2) A diagram showing:
   a) the position of transmitter and antennas with description, including power used and antenna gain;
   b) position of affected equipment and antennas;
   c) approximate distances involved;
   d) direction from which affected TV signals are received.
3) Has the DTI/RIS (or other authority) been involved? Give details in chronological order.
4) What action has been taken? – details please.
5) Supply copies of all correspondence to date. These will be returned on request.
6) Have you checked your equipment is clean?
7) Have you fitted low-pass filters?
8) Has any part of your/your neighbours' equipment changed recently?
9) Make/Model number of affected equipment.
10) Describe your relations with your neighbours!

EMC ADVISORS SCHEME

Last year we announced our intentions to set up a scheme to provide Amateurs with an improved EMC service. After much discussion and effort this has now been approved.

The scheme has two main objectives: (1) to provide Amateurs with a local point of contact for EMC-related problems. (2) To provide advice on the resolution of EMC problems.

The scheme will initially be set up utilising the existing RSGB Zones and headed by a Zonal Co-ordinator. They will canvas their Zones for suitable candidates to act as EMC Advisors covering specific areas within that Zone. Both Zonal Coordinator and EMC advisor will only be required to provide advice; they will not become involved in physical aspects of EMC investigations. This means that Amateurs will not be able to obtain on-site inspections, advice etc, as the Society cannot, alas, afford to finance that type of scheme. However, if an Amateur/Advisor believes that a visit would be beneficial, then the Amateur seeking help will be required to pay for travelling expenses etc. However, we believe that the majority of cases can be dealt with over the telephone.

Full details of the scheme, names of Zonal Coordinators, areas covered etc, will be published in a future *RadCom*.

The Committee recognises the need to improve the service, particularly with the increase in new technology and the regulations due to come into force. We intend to make it successful for the benefit of you, the member.

I would like to hear from you on any topic related to EMC which you think may be of interest to the committee – this was the reason for wanting a column, to give up to date information.

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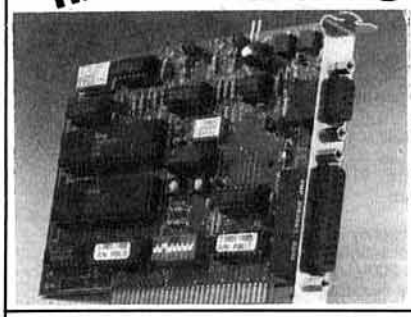

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RING TO DISCUSS YOUR REQUIREMENTS

CONTEST NEWS

RULES

VHF NATIONAL FIELD DAY 1989 RULES

This year 50MHz is included for the first time in VHF NFD. There will be an all mode 50MHz session on the Saturday in place of the previous 70MHz CW session. The Sunday 70MHz session will also be all mode. This should help keep the overall number of operators needed at the same level as before. 50MHz and 70MHz will count as separate bands when calculating the overall score. Please comment on the success of this format when you submit your entries.

Stations wishing to take part in this year's VHF NFD must register their site by **1 June** at the very latest, see rule 2.

SWL entries will be very welcome and will count towards the VHF Listener's Championship.

The general rules will be published in *RadCom* January 1989 will apply except as modified by these rules.

1 Duration. 1400GMT 1 July to 1400GMT 2 July 1989

2 Site Notification. Each group intending to compete must send details of the site to be used to: VHF Contests Committee, c/o J H Quarmby G3XDY, 12 Chestnut Close, Rushmere St Andrew, Ipswich IP5 7 ED, to arrive no later than 1 June 1989. The details required are: the name and address of the person resposible for the entry, the name of the group, the callsigns to be used on each band, the section (open or restricted), the locator and national grid reference of the site, and sufficient access information for an inspector to locate the site (preferably a sketch map). A stamped addressed post card should be included if confirmation of receipt is required.

3 Bands. Up to four separate stations may operate simultaneously on the 50, 70, 144, 432, 1296MHz and 2320MHz bands. Single band entries for 144MHz will not be accepted. Only one station can score or give points on each band. The 50MHz section will take place in the period 1400-2200GMT, and the 70MHz section during the period 0600-1400GMT, with close down between 2200GMT and 0600GMT. The same callsign must be used on 1·3GHz and 2·3GHz, with no simultaneous operation on these two bands.

4 Operators. Any RSGB member or group of members operating from the British Isles (excluding Eire) may enter. Groups operating from the same site may combine their scores subject to rules 3 and 5.

5 Stations. All the stations forming one entry must operate from within a circle of 1km radius centred on the operating position of any of the stations. All equipment, including antennas, must be installed on site not more than 24hrs before the contest, and the site must not be used by the entrant for transmitting activities during the five days prior to the contest. Only portable accommodation can be used to house the stations. Power for all equipment must be derived from an on site generator or battery. The public mains supply may not be used.

6 Scoring. Contacts will be scored by the radial ring system. Scores on 1·3GHz and 2·3GHz will be added together to give a final microwave score. The overall score will be determined as per general rule 10 using the final 50MHz, 70MHz, 144MHz, 432MHz, and microwave scores.

7 Contest exchanges.
(a) On 50 MHz and 70MHz QTH information must be exchanged. It must be given in a different form on each band.
(b) On 144, 432, 1296, and 2320MHz QTH information need not be exchanged.
(c) Contacts with stations whose callsigns appear on any of the group's cover sheets will not count for points.

8 Sections. There will be two sections:
(R) Restricted section:
(i) The power output of any band must not exceed 25W PEP at the transmitter.
(ii) The height of any antenna must not exceed 10 metres above ground level.
(iii) Only one antenna per band may be used (eg no stacked, bayed or colinear arrays, or switching between two or more antennas). A slot fed Yagi or Quad antenna is permitted. Dish or Backfire antennas must not exceed 2m diameter.
(iv) 2·3GHz contacts will not count for points in this section.
(O) Open section: as per general rules.

9 Inspections. All stations are subject to inspection by members of the VHF Contests Committee or nominated representatives. Should the inspector be unable to locate the site due to inadequate or incorrect information, the entry will be disallowed. In the event of a last minute change it is the responsibility of the group to make suitable arrangements for the inspector to find the site. The inspector must be given immediate access to all parts of the site with the right to stay as long as desired, and the ability to return at any time during the contest.

10 Entries.
(a) All entries must be postmarked no later than 24 July 1989.
(b) Entries must be addressed to: VHF Contests Committee, c/o J H Quarmby G3XDY, 12 Chestnut Close, Rushmere St Andrew, Ipswich IP5 7ED.

11 Awards. The Surrey Trophy will be awarded to the overall winner of the Open section, the Arthur Watts Trophy to the overall winner on the Restricted section, the Tartan Trophy to the leading Scottish entry in the Open section, the Scottish Trophy to the leading Scottish entry in the Restricted section, and certificates will be awarded to the winners and runners-up on all bands in each section, and to the leading stations in each country.

432MHz LOW POWER AND SWL CONTEST RULES

0900-1500GMT 6 August 1989

The general rules published in *RadCom* January 1989, will apply. There will be four sections, section F for station using FM only, section S for all mode single operator fixed stations, section O for all other transmitting stations, and section L for listeners.

County/country multipliers will be used (general rule 14).

Output power must not exceed 15W PEP at the transmitter.

Only a single antenna may be used (eg no stacked, bayed, or colinear arrays, or switching between two or more antennas). A slot fed Yagi or Quad antenna is permitted. Dish or Backfire antennas must not exceed 2m diameter.

A certificate will also be awarded to the highest placed single operator station licensed for less than one year. Please state the date of issue of your licence if you wish to compete for this award.

All entries and check logs to: VHF Contests Committee, c/o C Easton, G8TFI, Highlands, Townsend, Nympsfield, Glos.

COUNTY ROUNDUP

Receiving Section

Rules as for the transmitting section, published in March *RadCom*, except as below.

1 Eligible entrants: SWLs must be a member of the RSGB. Holders of transmitting licences for frequencies above 30MHz may also submit an entry to the Receiving Section.

2 Scoring/multipliers: Listeners may only log stations participating in the contest. Scoring and mutlipliers as for the transmitting section.

3 Logs: Log sheet columns to be headed: Date/time GMT; callsign of station heard; callsign of station being worked, RS(T) and serial number sent by station heard; multiplier (if new); points claimed. A summary sheet listing the multipliers heard must be included. In the column for 'station being worked', the same callsign may only appear once in every three contacts logged, except when the county of the station 'heard' constitutes a new multiplier.

4 Declaration: Each log must be accompanied by a signed and dated declaration that 'the station was operated within the rules of the contest, and that I do not hold a licence to transmit on frequencies below 30MHz.

CONTESTS

Helvetia Contest

1300 29 April – 1300 30 April.

CW and SSB, 1.8 to 28MHz (no SSB on 1.8MHz). Mixed mode, single and multi-operator, and listener sections. Exchange RS/T plus serial QSO number (from 001). Swiss stations will send two letters to indicate their Canton. Each QSO counts three points. A station may only be worked once on each band, either on CW or on SSB. The multiplier is one point per canton worked on each band. Use separate log sheets for each band. Stations with more than 1% of duplicate contacts will be disqualified. Enclose the usual summary sheet and declaration and mail before 31 May 1989 to Walter Schmutz, HB9AGA, Gantrischweg 1, CH-3114 Oberwichtrach, Switzerland. (There are 26 cantons and their abbreviations are AG, AI, AR, BE, BL, BS, FR, GE, GL, GR, JU, LU, NE, NW, OW, SG, SH, SO, SZ, TG, TI, UR, VD, VS, ZG, and ZH.)

This contest is a good opportunity to work rare cantons – some of which have no resident amateurs – for the beautiful Helvetia Award (see Awards.) In the **1988 Helvetia Contest** G4IQM scored 10,074 points, G5LP 9,660, G3ESF 8,580, G3LIK 8,424, and GM4WEX 2,331. RS87156 scored 9,792 points and was the only UK listener listed.

SP DX CONTEST

1500 1 April – 2400 2 April

CW only. 1.8 to 28MHz. On 3.5MHz and 14MHz the contest-preferred segments 3.5-3.56 and 14.0-14.06MHz must be used. Exchanges are RST plus serial QSO number (from 001), Polish stations will send RST and a two letter code indicating their province. Each QSO with Poland counts three points. Each province counts as a multiplier – once only irrespective of band – a maximum of 49. There are single-operator single and multi-band and multi-operator multi-band, and listener sections. Send logs not later than 30 April to SP DX Contest Committee, PO Box 320, 00-950, Warsaw, Poland. (Apologies for the late appearance of these rules – they were not received until 7 February and therefore missed the March column).

G3FKM

AGCW-DL QRP/QRP Party

1300 – 1900 1 May

Confined to the segments 3.510 – 3.560MHz and 7.010 – 7.040MHz, CW only. Licensed amateurs and listeners. Class A – up to 10W input, B – up to 20W input. Exchange RST, QSO number, and class. One point per QSO with own country, two with others. Each QSO with a Class A station counts double. Stations may be worked only once per band. Listener logs must show both callsigns plus at least one complete report. The multipliers are DXCC countries on each band. Post entry before 31 May to Fritz Bach jun, DK1OU, Eichendorffstr.15, D-4787 Geseke, FR Germany.

RESULTS

THIRD IARU HF WORLD CHAMPIONSHIP

Results of the Third IARU HF World Championship appeared in February QST. In the single-operator CW section **G4OBK** was top UK score with 686,964 points. **GM3CFS** scored 131,494, G3ESF 123,328, G4ZFE

57,555, G6NK 16,280, and G4ZME 4,256. In the phone section **GB6AR** scored 71,332, **GM4WEW** 20,089, and **GW0AJI** 17,945. Only entry in the multi-operator section was **G6OI** with 104,896 points. RSGB HQ station **GB75DX** (operated by G4s BWP and GIR) scored 1,395,250 points and came seventh in the order of HQ stations – one position above W1AW which made 1,391,529 points.

In the 1988 **European DX Contest (phone)** there was no entry from the UK in the All-Band category. In the High-Band list **GW3NYY** scored 26124 points and **GM3BCL** 21600. In the European SWL list **G7AOU** scored 16868 points.

G3FXB has been suffering – first at the hands of CQ Magazine who caused some confusion between his score in the 1987 CQWWDX phone and CW contests, and then by me! In fact Al scored 610,426 points in the CW Section from 1724 QSOs in the 14MHz single-band category – making his the second highest score in Europe. *G3FKM*

144MHz FIXED, AFS, & SWL CONTEST RESULTS

This year's contest was well supported as usual, although propogation was nothing special for most stations. Stations on the East coast found some useful improvement to northern Germany which enabled then to build thier scores and take leading positions in the tables. Elsewhere a few found conditions reasonable on a North-South axis, but nothing exceptional.

There were few bad signals in evidence judging by the logs, and most entrants have now paid heed to completing the paperwork carefully, including the Zonal information. The new SWL section was poorly supported, and will be dropped unless the 1989 event shows several more entries.

Most entrants seem very happy with the format of this contest, and it will therefore continue with similar rules in 1989.

Congratulations go to all the zonal certificate winners, marked with asterisks in the tables, with particular mention to the overall winner in the Multi-Operator section, G4ANT, and leading Single Operator G4SWX. The leading club is the Martlesham DX and Contest Group, represented by G4SWX, G4PIQ, G4WFR, G0GVI, and G3ZNU. Mick Toms, BRS31976, takes the SWL award.

G3XDY

SWL SECTION

Pos	Listener	Score	QSOs	Loc
1	BRS31976	431	83	01HO *

Checklogs gratefully acknowledged from: G0CLP/P, G2FWX, G0KQA, GJ6CSY, PE1EWR, GW1XUD, G0KIO/A

Disqualified: G6HQI General rule 3.

144MHz FIXED & AFS RESULTS –

MULTI OPERATOR SECTION

Pos	Call	Score	QSOs	Loc	Zone
1	G4ANT	3826	347	O2QQ	C*
2	G4SIV	3075	303	92TR	B*
3	GM0FRT	2730	162	87WB	G*
4	GD4IOM	2674	225	74QD	A*
5	G4ZAP	2378	295	93BV	A
6	G6APZ	2067	320	93DC	B
7	G3NTS	1584	262	91UM	C
8	G4RFR	1527	235	90AS	D
9	G4VBG	1480	147	94FW	A
10	G6KZP	1362	272	91RP	D
11	G0EXC	1285	211	82SG	B
12	G0EMH	1178	214	81UX	D
13	G3OLX	957	232	91VH	C
14	G0AJQ	885	143	83NU	A
15	G0CPE	845	195	91PF	C
16	G1XJO	779	172	92KK	B
17	G1SWH	770	134	83QD	A
18	GW4EZW	758	150	81MO	E*
19	G3WSC	737	159	91VD	C
20	G4TBR	720	182	91QQ	D
21	G4DDW	699	165	92KK	B
22	G0ECC	613	81	70OJ	D
23	G3UBR	611	159	91SM	-
24	G1YNR	609	115	93QN	B
25	G4OWM	583	154	91WI	C
26	G1KAR	499	74	00DU	C
27	G7AAB	441	61	84DB	-
28	G0BWB	411	106	93DO	A
29	G7ANH	373	58	01PX	-
30	G1SIP	363	98	91UI	C
31	G6LCS	362	78	83UK	A
32	G3YWI	356	96	93CP	A
33	G3IUB	344	84	92AK	B
34	G7ABU	332	82	81UJ	D
35	G1SEW	332	94	82XI	B
36	G7ATB	328	82	92JI	B
37	G6OI	300	76	82WK	B
38	G0HSA	283	67	93GI	A
39	G3PIA	275	102	91IO	D
40	G1FBC	236	71	93BP	-
41	G4KFP	209	71	93DR	A
42	G7BXH	205	53	93CO	A
43	G0BLF	139	45	91VI	C

SINGLE OPERATOR SECTION

Pos	Call	Score	QSOs	Loc	Zone
1	G4SWX	3152	326	02PB	C*
2	G4PIQ	2941	316	01MU	C
3	G0ERS	2762	345	90KU	D*
4	G4WFR	2731	246	01OV	C
5	G3XBY	2629	351	92DG	B*
6	G4ASR	2597	308	81MX	B
7	G3NNG	2435	370	91EP	D
8	G3NAQ	1500	266	91HL	D
9	G4ARI	1420	265	92IQ	B
10	G8APB	1356	230	83WD	B
11	G4VRY	1334	201	93GS	A*
12	G6RFL	1264	183	93CR	A
13	G4TZM	1202	154	01LU	C
14	G4UXC	1144	217	92BC	B
15	GM0GMD	974	76	86AE	G*
16	G6IAT	971	183	91TV	B
17	G0GAG	927	161	93JD	B
18	GM4TMS	921	84	86BC	G
19	G6DER	910	159	93GN	A
20	G0HWL	854	172	91OG	D
21	G1HLT	853	157	93KD	B
22	G0EMS	852	162	82XC	B
23	G0GRI	824	132	81WG	D
24	G4EQD	798	135	93QN	B
25	G1SGB	779	129	91IJ	A
26	G0GLB	762	158	91IQ	D
27	G4DFI	742	127	01BL	C
28	G0EJK	730	136	83QO	A
29	G8NRP	719	167	91IQ	D
30	G0FDX	704	109	83OP	A
31	G0CYB	702	151	93JD	B

144MHz AFS RESULTS

Pos	Club	Score	Callsigns					Zone
1	Martlesham DX & CG	9513	G4SWX	G4PIQ	G4WFR	G0GVI	G3ZNU	C*
2	Derbyshire Hills CG	7398	G4ZAP	G6APZ	G6RFL	G6DER	G1SGB	A*
3	Harwell ARS "A"	6024	G3NNG	G3NAQ	G8NRP	G0GLB	G7BVP	D*
4	Vale of Evesham RAC	4930	G0EXC	G0EMH	G4UXC	G0EMS	G1UUX	B*
5	Central Lancs ARC "A"	3392	G1SWH	G0EJK	G0FDX	G4OBK	G1AHM	A
6	S Manchester RC "A"	3313	G8APB	G4JLG	G3ZDM	G1GLS	G6LCS	A
7	Wakefield & DRS	3181	G4VRY	G1WRS	G3WWF	G1XYT	G0ISJ	A
8	Rugby ATS "A"	3143	G1XJO	G4DDW	G4EPA	G8LYB	G1XVV	B
9	Five Bells Group	3075	G4SIV					B
10	Stirling & D ARS	2894	GM0GMD	GM4TMS	GM0GDL	GM0HZI		G*
11	Sutton & Cheam RS	2887	G3OLX	G0CPE	G4OWM	G1SIP	G0BLF	C
12	Aberdeen VHF G	2730	GM0FRT					G
13	Isle of Man ARSCG	2674	GD4IOM					A
14	Crawley ARC	2644	G3WSC	G3GRO	G4MKW	G0IXF	G4UMJ	C
15	Hereford ARS	2597	G4ASR					B
16	Washington ARC	2488	G4VBG	G0EHV	G6UJJ			A
17	Chesham & DARS	2481	G6KZP	G4TBR	G4OST	G1XET		D
18	Flight Refuelling ARS	2192	G4RFR	G1DWQ	G6MXL			D
19	Mansfield ARS	2063	G0GAG	G0CYB	G1WWN	G4GNC		B
20	Ariel RG	1917	G3NTS	G8BBC	G7BBC			C
21	Scunthorpe ARC	1895	G4EQD	G1YNR	G8XFY	G1ZGO		B
22	Farnborough & DRS	1845	G0HWL	G0GCI	G8ATK	G0HNA		D
23	Harwell ARS "B"	1493	G4HLX	G2HIF	G6NTN	G3PIA		D
24	Chippenham & DARC	1487	G0GRI	G0HAS				D
25	Macclesfield & DRS	1418	G1MWS	G1NTR	G0DMV	G7AFE	G1UWJ	A
26	Denby Dale ARS	1417	G0BWB	G3YWI	G1FBC	G4KFP	G7BXH	A
27	Salop ARS	1400	G1SPU	G3NSY	G4YKX	G0EIY		B
28	Aylesbury Vale RS	1331	G0GMB	G6YNF	G3YLC	G1ZSM		D
29	Reigate ATS	1317	G8JXV	G3YSX	G1WIS	G1LNT	G1HLY	C
30	Bredhurst R & TS	1010	G6YLW	G1HTA	G1LKE	G1UXA		C
31	Mid Sussex ARS	915	G3JMB	G1TCH	G0APZ			C
32	Bromsgrove & D ARC	902	G0BLT	G0HPH	G3NBW	G3VGG	G4IVJ	B
33	Rugby ATS "B"	761	G7ATB	G8HYU	G4APD	G7BNI		B
34	Newport ARS	758	GW4EZW					E*
35	Cray Valley RS	742	G4DFI					C
36	Edinburgh & D ARS	673	GM4HAM					G
37	Central Lancs ARC "B"	623	G1PKE	G7CCE				A
38	English China Clays	613	G0ECC					D
39	Brunel University ARS	611	G3VBR					
40	Colchester RA	610	G0EGX					C
41	Sheffield ARC	562	G0HSA	G4ZJN	G1VOV			A
42	S Manchester RC "B"	509	G4NTY	G3FNM	G3SVW	G4MYB	G0BJK	A
43	Southdown ARS	499	G1KAR					C
44	Maidenhead & D ARC	466	G3TWG	G8XYN				D
45	Univ of Lancaster ARS	441	G7AAB					
46	Mid Cheshire ARA	410	G6HXU					A
47	Felixstowe & D ARS	373	G7ANH					
48	Birmingham Univ RS	344	G3IUB					B
49	Bracon	332	G1SEW					B
50	Stourbridge & D ARS	300	G6OI					B
51	Salisbury R & E S	257	G4LDR					D
52	S Manchester RC "C"	19	G4BZO					A

Pos	Call	Score	QSOs	Loc	Zone
32	G1WRS	682	121	93FQ	A
33	G1WRS	682	59	85JW	G
34	G4EPA	669	126	92KI	B
35	G0HAS	663	144	91BN	D
36	G4OBK	645	109	83RQ	A
37	G8LYB	639	137	92JI	B
38	G1SPU	628	118	82PQ	B
39	G0EHV	616	68	94FW	A
40	GM0GDL	612	57	86CD	G
41	G0EGX	610	111	01IT	C
42	G3YDY	608	126	01FQ	-
43	G7BVP	608	119	91GO	D
44	G4JLG	606	115	83TM	A
45	G3GRO	585	135	91VC	C
46	G3WWF	581	122	93GS	A
47	G4HLX	545	122	91FP	D
48	G1AHM	543	92	83OP	A
49	G6YNF	537	115	91OT	D
50	G3ZDM	536	114	83UK	A
51	G8ZRE	532	108	83NE	A
52	G1DWQ	525	102	90AT	D
53	G0GCI	509	147	91OF	C
54	G0GMB	496	147	92NB	D
55	G4MKW	496	112	91VB	C
56	G1PKE	487	90	83QP	A
57	G0IXF	484	128	91VC	C
58	G1UUX	471	118	82BC	B
59	G0BLT	457	106	82XH	B
60	G1GLS	453	95	83TJ	A
61	G1MWS	451	115	83WG	A
62	G6YLW	451	75	01HT	C
63	G8XFY	434	76	93RN	B
64	G3JMB	428	78	91WA	C
65	G3NSY	425	81	82NP	
66	G4NBS	425	70	02AF	B
67	G8ATK	414	101	910F	C
68	G6HXU	410	87	83RF	A
69	G0GVI	408	105	01LW	C
70	G1NTR	403	90	83WG	A
71	G8JXV	401	97	91VE	C
72	G7ARK	398	88	91SV	B
73	G6FQZ	392	124	91JR	D
74	G6UJJ	392	37	94FV	A
75	GM0HZI	387	55	86AC	G
76	G3YSX	375	113	91WF	C
77	G1XVV	357	88	92KJ	B
78	G4UMJ	342	80	91VC	C
79	G0DMV	341	88	83WF	A
80	G2HIF	339	82	91GO	D
81	G6NTN	334	74	91IO	D
82	G1WIS	317	90	91WG	C
83	G8BBC	312	104	91VM	C
84	G1XYT	296	79	93HT	A
85	G4YKX	296	66	82OS	B
86	G4NTY	295	82	83TM	A
87	G0ISJ	288	65	93FQ	A
88	G3ZNU	281	45	02DD	C
89	G1WWN	272	64	93JD	B
90	G1NRY	267	60	91UO	C
91	G4LDR	257	45	91CD	D
92	G4ZJN	255	57	93FL	A
93	G1TCH	250	51	90WW	C
94	G0HDZ	245	45	01BS	C
95	G1HTA	242	35	01HL	C
96	G3TWG	241	66	91PN	
97	G0APZ	237	64	90WW	C
98	G4OST	233	82	91RP	D
99	GU0JCI	225	22	89QL	D
100	G8XYN	230	75	91OM	D
101	G8HYU	217	44	92KI	B
102	G6GAU	214	45	02MB	C
103	G1LKE	206	42	01HI	C
104	G3YLC	197	53	92MA	D
105	G0HPH	189	49	82XJ	B
106	GW4ZUL	187	63	81MO	E*
107	G1LNT	183	68	91WG	C
108	G1XET	166	75	91MN	D
109	G4GNC	162	65	93JE	B
110	G7AFE	156	52	83XG	A
111	G6MXL	140	23	80XR	D
112	G7CCE	136	40	83PQ	A
113	G4APD	119	37	92JI	B
114	G1DRG	111	25	93LX	
115	G1UXA	111	27	01FJ	C
116	G4MBW	110	40	82XI	B
117	G1ZSM	101	38	91NX	D
118	G7BNI	97	23	92HJ	B
119	G3FNM	93	46	83UJ	A
120	G1ZJT	90	42	93ER	A
121	G3VGG	82	32	82XH	B
122	G0HNA	68	29	91PG	D
123	G1UWJ	67	17	83WG	A
124	G4IVJ	64	38	92AJ	B
125	G1ZGO	54	16	93QO	B
126	G3SVW	52	26	83UJ	A
127	G0EIY	51	15	82OR	B
128	G4MYB	48	14	83TJ	-
129	G1HLY	41	25	91VE	-
130	G2DHV	39	13	01BK	-
131	G7AOV	25	13	91SK	-
132	G1VOV	24	10	93FJ	A
133	G0BJK	21	19	83UK	A
134	G7BBC	21	17	91VM	C
135	G4BZO	19	17	83WK	A

21MHz CW RESULTS

Adjudicating this Contest was a pleasure – the log keeping was of a very high standard and many contestants had included a computer list in alphabetical order of stations worked with serial number given and received which made some of the checking very much easier.

As you can see some of the scores in the 'Top Ten' are very close indeed.

In response to many requests a lot more detail has been given. Please note that the QSO and multiplier lists are *claimed*, the score is the computed score after checking. The table showing multipliers worked was extracted from the top ten logs. It is rewarding to read comments from the 'bottom half' of the results who obviously thoroughly enjoyed participating with the knowledge quote 'cannot compete with the big boys' but it was very nice to be a wanted station for a change'.

The Committee is pleased to report a big increase in activity and more important a big increase in logs submitted, especially the entry from overseas with 217 logs compared with 121 last year.

The overseas tabulation this year is listed in continents so that individual stations can easily compare their listing with countries within their continent.

G3HCT/G3KDB

UK

Pos	Call	Claimed Qso's	Claimed Mults	Final Score	Equipment	Ant
1	GW3YDX	717	87	184527	TS930	3 el Yagi
2	G3FXB	677	84	166824	R4C/T4XC	4 el Quad
3	G4BUO	628	90	166590	Omni D	TET H33SP
4	G4WQN	607	89	161268	FT757	KT34A
5	G40BK	658	82	161130	TS930	4 el Yagi
6	G3LET	570	88	149160	FT One	7MHz GP
7	G3MXJ	621	83	149151	TS830	TH6DXX
8	G3RTE	629	78	145782	TS930	2 el Quad
9	GW4IOI	606	80	144480	FT901	TH3
10	G4CNY	643	76	141636	TR7	2 el Quad
11	G4EDG	551	85	138096	TS830	DX33
12	G3UFY	540	82	126960	Corsair	4 el Yagi
13	G4ODV	483	79	114234	TS530	3 el Yagi
14	G3TBK	463	78	106491	FT102	TA33
15	GM3YEH	514	68	103314	IC751	4 el Yagi
16	G0CLP	440	67	83655	IC730	3 el Yagi
17	GD3RFH	403	68	82008	Heath 5400	3 el Yagi
18	GW4UOL/A	374	69	76797	TS930	58' Wire
19	G3SWH	366	67	73365	FT101ZD	Inv Vee
20	G3GLL	347	67	69747	IC751A	3 el Yagi
21	G2QT	324	70	67830	1030	4 el Quad
22	G5MY	338	62	66924	Corsair	2 el Yagi
23	G3NKS	310	71	66030	Corsair	132' Wire
24	G4ZFE	303	65	58890	FT101ZD	1/2 Wave
25	G3VYI	296	68	57816	FT200	132' Wire
26	G4KGK	309	60	54900	FT902	3 el Yagi
27	G4ZOB	293	61	53436	Home Brew	2 el Yagi
28	G3SJX	293	60	52740	Corsair	DX33
29	G4UZN	284	61	51972	TS830	Dipole
30	G0CKP	286	59	50268	IC735	4 el Mini Beam
31	G4DQW	259	64	49536	TS440	GP
32	G3APN	229	66	45144	–	–
33	G4XRX	253	59	44781	FT102	Rot Dipole
34	G0EHO	232	58	40368	Corsair	G5RV
35	G0IVZ	273	49	39168	TS130	3 el Wire Yagi
36	GM3CSF	208	56	33990	TS530	3/4 Wave
37	G3ESF	191	59	33630	TS830	G5RV
38	G3LHJ	196	57	33174	TS530	TA33Jr
39	G3BPM	197	47	26772	TR7	264' Wire
40	G0CGB	174	50	25650	TS830	7MHz Dipole
41	G4IQM	166	51	25398	TS180	7MHz Dipole
42	G0CEL/A	166	44	20511	TS520	Trap Dipole
43	G4OOT	165	42	20538	HW101	HQ1
44	G4FDC	131	45	17685	TS120V	Loop
45	G3AWR	116	49	17052	TS940	66' Inv L
46	G6QQ	122	41	15006	IC735	R3 Vert
47	G4XTM	125	38	14136	FT201	Quad
48	G4RHS	90	41	11070	IC740	Dipole
49	G3MPB	83	32	7968	TS930	Dipole
50	G3DPX	77	34	7854	TS930	GP
51	G3NKC	75	31	6975	FT101ZD	200' Wire
52	G2HDR	71	31	6210	FT101E	Trap Vert
53	G4ZJB	71	29	6177	–	–
54	G4ZME	55	30	4950	Argosy	Butternut
55	G4PTE	68	17	3417	IC761	HF5
56	G3WRR	47	24	3384	FT102	50' Wire

21 MHz RESULTS

UK Listener

Pos	Call	Score
1	BRS 1066	26406
2	BRS 52868	17331

North America

Pos	Call	Score
1	N2KW	7344
2	K3ZO	6210
3	W1/G3WPH	4365
4	K2UPD	3996
5	VE3KK	3024
6	WJ20	2982
7	WB00	2580
8	VO7AW	2412
9	W9HE	2079
10	NM2Y	1980
11	WA4SSB	1440
12	VE3NYT	1080
13	N0FFZ	888
14	KX7J	864
15	VE5AAD	783
16	KA9IMK	651
17	W7GB	600
18	W3FQE	480
19	N3CZB	342
20	WB4UBD	330
21	KI0G	288
22	KA7FEF	156

South America

Pos	Call	Score
1	PY2OU	1872

Oceiana

Pos	Call	Score
1	AX4XA	1260
2	VK2DID	972
3	ZL2TX	936
4	VK8AV	864
5	VK4XW	768

Africa

Pos	Call	Score
2	EA5BS/EA8	3315
3	C53GS	1560
4	EA8AGF	1350
5	CN8FC	810

Asia

Pos	Call	Score
1	UJ8JA	6630
2	RA9JM	5895
3	UL7CW	5805
4	UA9CMQ	5130
5	RI8BT	4635
6	UA9MX	4230
7	JA8YBY	4095
8	VS6UO	3906
9	UA9XHT	3432
10	UL7BX	3135
11	JA7YAB	2310
12	JR7OMD/2	1944
13	YB2CTW	1815
14	JA9CWJ	1716
15	JA1BNW	1680
16	UM8MZ	1590
17	UA0LJ	1518
18	UA9BQ	1485
19	UZ9UWK	1410
20	JE4CIL	1353
21	UI9ACP	1200
22	JE3ZFS	1134
23	JA1CSB	1110
24	JA1IRH	1053
25	UA9MEK	1032
26	UA9URF	999
27	JA1WYQ	888
28	JA3EA	870
29	JA4YPE / JH8GEU	816
31	YB2FEA	756
32	UA0UAG	720
33	JA1KI	630
34	JA3AA	621
35	JA8HBO	306
36	JH6TYD	288
37	JA4ESR	252
38	JA0DNS / JO1QZI	216
40	JH9ETC	165
41	JG3EHD	144
42	JA9WNQ / JA0BPY	72
44	JE80JD	42
45	JH1AOU	36

Asia/North America Qrp.

Pos	Call	Score
1	UA9FGJ	5712
2	KZ1L	2520
3	WA0QII	2088
4	UA9AFS	1830
5	UA9SG	1728
6	VE3OOL	1617
7	UH8EAG	1215
8	VS6WD	1050
9	VE8RCS	972
10	W6YVK	225
11	RA9XDO	36

Europe

Pos	Call	Score
1	RB5IM	12540
2	LZ1KDP	9225
3	EA6ZY	8910
4	LZ2AX	8619
5	UA1DZ	8262
6	RV6AC	7722
7	9H1GI	7446
8	UA1ANP	6681
9	LZ1KVZ	6624
10	YU1BEF	6300
11	UA6LLT	6090
12	UA6LMW	5985
13	UA1ZD	5952
14	UV1AS	5940
15	UB4QWW / RB5TU	5922
17	HA0IH	5880
18	UY5ZP	5760
19	UR2QA	5418
20	UA3VBU	5376
21	RA3ZC	5250
22	RA3PZ	5166
23	UA4PUW	4725
24	UC1AWK	4641
25	4N7EC	4454
26	LZ2RF	4452
27	UC2DQ	4446
28	UB5BZ	4284
29	RB5QW	4272
30	LZ2BV	4158
31	UB5FCN	3822
32	RB5VW	3738
33	UP1BYL	3690
34	LZ1CW	3654
35	OK1TW	3600
36	UA4PNT	3354
37	UC2ADR	3276
38	OK1DFF	3198
39	RA1AE	3132
40	UV6HFK / YU7SF	3120
42	UB5VCX	3069
43	UQ2GMR	3042
44	OH3BU	3003
45	HA6NL	2970
46	4N2Y	2952
47	YO2AQB	2904
48	UP3BY	2760
49	UB4JZV	2730
50	RA4LZ	2520
51	OH6RC	2508
52	IK3CXA	2475
53	UC2OBB	2442
54	UP0BA	2176
55	UB0QZ	2052
56	UP2PBM	2046
57	UB5ITU	2013
58	OK1KZ	1914
59	UW6AJ	1800
60	SP5JXK	1770
61	YU7KM	1755
62	UY5TE	1740
63	OK2KLI	1680
64	OK2KUB	1677
65	OK3CDZ / UC2WBI	1650
67	OK2BHQ	1440
68	OK1KQH	1410
69	OH7NGM	1395
70	UB5EVN	1368
71	RA1TE	1350
72	RB5VJ	1215
73	OH2PM	1200
74	PA0INA	1188
75	RB5WA	1176
76	IK4GNK	1125
77	Y22WF	1110
78	OZ4RS	1026
79	OK1KCF	1000
80	UQ2PP	960
81	UR2QD	840
82	LA1IE	738
83	I6NUX	696
84	UT4UWL	651
85	UB5WCV	558
86	OK3TEW	546
87	SM7BWG	525
88	YO8MF	522
89	UC2AS	480
90	OI8AY	420
91	I1VTX	315
92	LA9RFA	288
93	Y38XL	126
94	FD1NLX	105

Europe Qrp

Pos	Call	Score
1	OK2BMA	4410
2	YT5G	4200
3	G0AEV/CT1	3738
4	UA3XGM	2520
5	OK1CZ	2046
6	UB4LCB	2013
7	UQ2GSW	1860
8	UA4WCK	1500
9	UA3XEH	1430
10	EA7AAW	1113
11	RA1QDK	918
12	YO2CMI	693
13	UB5AJP	585
14	UA6HNH	216

Rest of World Listener

Pos	Call	Score
1	UA3-127-376	7548
2	UA9-145-421	4815
3	UA9-090-601	3735
4	LZ1-M333	3705
5	UO5-039-267	3150
6	ORS 89020/ZS	3024
7	UA3-121-2251	3003
8	UA9-145-197	2145
9	VO1SK-SWL	2046
10	NL 8992	1134
11	UC1-188-10-6	648

Check logs received: G2AFV, G3CXM, G4IPW,GI5TR, HA4XX, HA5AAR, LZ1MC, OK1US, UA1OID, UA3TAM, UA4HVW, UA6ECU, UA6HPT.

UK QRP

Pos	Call	Claimed Qso's	Claimed Mults	Final Score	Equipment	Ant
1	G4ARI	229	52	35360	Sugiyama 9W	1/4 wave Vert
2	G4ELZ	191	49	27342	FT301D 9W	3 el Yagi
3	G4EWU	140	46	19320	FT401 5W	TB3
4	G4NIJ	114	39	12519	FT707 2W	Indoor Dipole
5	G3IQF	81	40	9720	SS105S 10W	132' Inv L
6	GW3SB	82	31	7626	Century 9·5W	W3EOP
7	G4SXE	69	28	5796	Argosy 5W	End Fed
8	GM4HQF	59	31	5487	Corsair 5W	Dipole
9	G0HGA	34	18	1836	TS130V 5W	1/2 Wave Vert

Multiplier Table

07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19
UJ8	EA8	Y	VO	CT1	YB	WO	VE7	VE2	ZS1	XE	VR6
UA9	OK	UC2	UF6	W3	VE3	UQ2	ZC4	TF	VE2	EI	HK
YU	PY	LU	UA2	HL	W9	Z23	OZ	EA	9H1	CN8	VE4
UA	VK4	YO	UH8	W4	W8	W7	VE5	VE8	CT1	SM	XE
LZ	UL7	CN8	HA	W2	UG6	C5	W6	TI	PA0	CO	KH6
JA0	W5	F	VK8	W1	OE	VE7	W7	VE5	VE4	VE1	–
VS6	JA7	UR	LA	LA	PA0	W3	VE1	C5	PY	–	–
UI8	ZL3	UD6	KH2	EA8	KP4	VE8	TI	SM	UO5	–	–
JA2	VK2	VO1	VK2	VK8	EA	ZC4	CN8	–	8P6	–	–
JA1	UD6	DL	JA5	UG6	SM	OE	VE2	–	EL	–	–
JA6	SP	ZL1	YB	EL	F	KP4	TF	–	–	–	–
W6	DL	KH2	W1	W8	W3	VO7	BV	–	–	–	–
UB5	ZL1	CT1	EA6	VO1	Y	–	VE8	–	–	–	–
JA4	KL7	EA6	W4	UH8	LA	–	–	–	–	–	–
SV	HB9	UP2	EA	VK1	–	–	–	–	–	–	–
JA3	SV	UG6	W2	–	–	–	–	–	–	–	–
JA9	UP2	YO	–	–	–	–	–	–	–	–	–
EA6	VS6	UF6	–	–	–	–	–	–	–	–	–
JA8	HA										
JA5	YO										
5N2	VK6										
OH	UR2										
UR2	JA4										
9H1	JA2										
VK6	5N2										
UP2	I										
UM8	VK3										
I	UQ2										
HB9											
ZL2											

2ND 1·8MHz CONTEST 1988 RESULTS

The decision to change the date of this contest caused a few problems to say the least. European stations were heard calling CQ RSGB contest during the previous weekend and inevitably were missing on the actual day.

HFCC has agreed that the date will remain as the third weekend in November and several other countries are expected to hold 1·8MHz contests with common date and rules, similar to the route that NFD has taken. Hopefully this will avoid the situation where some Europeans were only wanting to work OE in preference to G stations, additionally activity should increase whilst relieving one weekend from contest activity.

Self-training and positive attitudes are but two of the many facets of the competitive spirit. Camaraderie and friendship are also self-evident, your adjudicator gains much pleasure in congratulating Mick Hickling, G4WQN, as the winner of this year's event. The long discussions on transmit and separate receive antennas certainly paid off. No doubt I will get my revenge!

Conditions were average, but at least the appearance of GJ, D44, J52 and W helped to make up for the lack of European and Russian activity.

Several of the top stations are now favouring inverted L antennas with apex around 60 feet high. The Beverage appeared in three logs and is particularly useful when trying to cope with the higher noise levels experienced from end-fed antennas.

Many thanks to all entrants who sent in comments. The current four-hour duration is preferred and will be maintained during future events.

Subject to Council approval, G4WQN will receive the Victor Desmond trophy. *G3SJJ*

BRITISH ISLES

Pos	Call	Valid QSOs	Bonus QSOs	Total pts
1	G4WQN*	160	61	785
2	G4BUO*	150	58	739
3	G4BWP*	153	56	733
4	GW4IOI (GW3NYY)	147	58	731
5	G3JKS/A	136	58	698
6	G4OBK	120	55	635
7	GM4AZZ (GM4ZRR)	133	50	630
8	G3LET	114	53	607
9	G3PDL	106	52	578
10	G3KZR	99	47	532
11	G4KGG	96	47	516
12	G4HTD	88	48	504
13	G5MY	89	47	502
14	G3ZGC/A	88	47	498
15	G3VYI	87	47	496
16	G4WYG	89	45	492
17	G2MJ	78	47	469
18	GM4SID	78	47	466
19	G3SJJ	77	46	461
20	G3NKC	80	41	445
21	G3MCX	74	42	432
22	G3YLC	71	44	430
23	G3JJZ	76	39	423
25	G4IUZ	83	43	421
26	G3RXP	77	37	413
27	GM3PFQ	67	38	388
28	G4EBK	69	35	381
29	G3XTT	62	38	376
30	G2FSR	58	38	364
31	G4ELZ	63	34	359
32	GM3UM	53	35	334
33	G3WRR	53	34	329
34	G3ULN	51	34	323
35	G0CGB	54	31	315
36	G3FVW	44	28	261
37	G3HKO	40	28	252
38	G3SKC	41	25	248
39	G4HSD	38	26	243
40	G3ZRZ	35	25	228
41	G3GMS	31	22	203
42	G0JNZ	31	24	200

SWL SECTION

Pos	Call	Valid QSOs	Bonus QSOs	Total pts
1	BRS1066	67	44	421

Check-logs received with thanks from GM3NCS, G3IGW, G4ICP.

* = certificate winner.

OVERSEAS

Pos	Call	Valid QSOs	Bonus QSOs	Total pts
1	EI5DI*	58	30	324
2	UQ2GFU	37	21	212
3	RA1CW	30	18	180
4	EA6ZY	15	13	106
5	OE1NDW	10	9	75
6	UR2RME	11	4	52
7	UZ3DWX	6	6	48
8	PA0MVM	4	4	32

1988 1·3/2GHz Cumulative Contest Results

It was encouraging that eight participants were new call-signs sending in entries compared with 1987, although some were active in 1986. 55 stations from six countries were noted from the logs to be supporting activity on 1·3GHz.

G8ATK and G8JVM were monitored promoting 2·3GHz activity in the adjudicators area although no contacts were completed. If this is happening in other areas it is good to see that stations are still building and testing equipment for the microwave bands, but adverse comments were received from some on the lack of of activity. Maybe time spent on 2·3GHz makes 1·3GHz look quiet. As in previous years the participation during the last two sessions declined once stations had three counting periods.

It is regretable that more stations that took part did not send in entries. Last years fixed station winner on 23cm, GI4OPH, gave many stations their best DX, but no entry was received. G1KDF, G4MRS, G40IH, G6LZZ, and GD6ICR were all out portable in October, but in the end all entries were from fixed stations.

PA0EZ, PA0WWM, and PE1EWR were on, also ON and GW. The majority of stations passed no comment on conditions or propagation, and accepted the band for what it is during the Autumn/Winter months. Sessions one and three produced the best results. The entry from G6CSY with just 800mW was welcomed.

Congratulations and certificates go to G4MGR, G4NBS, G8IFT, and G4ZTR. *G8HHI*

OVERALL TWO BAND RESULTS

Fixed Station/Single Operator

Pos	Call	1·3GHz	2·3GHz	Total Points
1	G8IFT	2973	3000	5973
2	G4ZTR	2192	1893	4085
3	G8ZQB	2119	1229	3348
4	G4NBS	3000	-	3000
5	G8ULU	2219	-	2219
6	G8GDZ	2044	-	2044
7	G8NEY	1785	-	1785
8	G6HKM	1647	-	1647
9	G1KDF	1192	-	1192
10	G8ATK	601	-	601
11	G6CSY	330	-	330

Check logs received with thanks from G3GIM and GIKDF/P (session 1).

1·3GHz Fixed Station

Single Operator

Pos	Call	Pts	Loc	Pwr (w)	Ant	Best DX	km
1	G4NBS	3000	02AF	4	4×23EL	GI4OPH	447
2	G8IFT	2973	82XJ	150	4×23EL	GI4OPH	330
3	G8ULU	2219	02NI	10	4×23EL	G4MGR	361
4	G4ZTR	2192	01LV	100	55EL	GI4OPH	519
5	G8ZQB	2119	92JN	50	27EL loop	GI4OPH	358
6	G8GDZ	2044	92AK	100	4×23EL	GI4OPH	331
7	G8NEY	1785	81VK	100	55EL	GI4OPH	409
8	G6HKM	1647	01FT	10	43EL	GI4OPH	499
9	G8KDF	1192	83NN	32	4×23EL	G4FUF	320
10	G8ATK	601	91OF	100	15/15	G8CRN	191
11	G6CSY	330	01BJ	0·8	23EL	G4MGR	307

1·3GHz Fixed Station – All Other Sections

Pos	Call	Pts	Loc	Pwr (w)	Ant	Best DX	km
1	G4MGR	3000	83KH	150	23EL	G3GJM	379

2·3GHz Fixed Station – Single Operator

Pos	Call	Pts	Loc	Pwr (w)	Ant	Best DX	km
1	G8IFT	3000	82RJ	15	4ft dish	G4FUF	201
2	G4ZTR	1893	01LV	5	66EL	G3ZTR	253
3	G8ZQB	1229	92JN	4	27EL	G8JHL	129

CONTESTS CALENDAR

RSGB HF CONTESTS

2 Apr	Ropoco 1 (Mar89)
9 Apr	50MHz Fixed (Jan 89)
10 Apr	28MHz Cumulative CW/SSB (Mar89)
16 Apr	Low Power Fixed (Feb 89)
18 Apr	28MHz Cumulative CW/SSB (Mar89)
26 Apr	28MHz Cumulative CW/SSB (Mar89)
4 May	28MHz Cumulative CW/SSB (Mar89)
12 May	28MHz Cumulative CW/SSB (Mar89)
21 May	Region Roundup
3,4 Jun	NFD/Region 1 CW Field Day (Feb89)
24,25 Jun	Summer 1·8MHz (Apr89)
8,9 Jul	SWL (May89)
16 Jul	Low Power Field Day (May89)
6 Aug	Ropoco 2 (Jun89)
20 Aug	Hopscotch
2,3 Sep	SSB Field Day (Jul89)
8 Oct	21/28MHz Phone (Jul89)
9 Oct	28MHz Cumulative
15 Oct	21MHz CW
17 Oct	28MHz Cumulative
25 Oct	28MHz Cumulative
2 Nov	28MHz Cumulative
10 Nov	28MHz Cumulative
11 Nov	1·8MHz SSB Clubs
11 Nov	Club Calls Contest 'CCC' – all modes & SWL (Sep89)
18,19 Nov	Second 1·8 MHz CW (Sep89)

Region Roundup and Hopscotch are under review and may be replaced with similar type events. Please watch RadCom for further information

RSGB VHF CONTESTS

9 Apr	50MHz Fixed (Jan89)
15 Apr	Spring VHF/UHF RTTY (Feb89)
16 Apr	10GHz Cumulative (Mar89)
23 Apr	70MHz Fixed (Feb89)
6,7 May	432MHz-24GHz Trophy Contests & SWL (Mar89)
13 May	24GHz Cumulative (Mar89)
14 May	10GHz Cumulative (Mar89)
27,28 May	144MHz & SWL (Mar89)
18 Jun	50MHz Trophy & SWL (Mar89)
24,25 Jun	10GHz Cumulative (Mar89)
1,2 Jul	70MHz Cumulative
1,2 Jul	VHF NFD
8 Jul	24GHz Cumulative (Mar89)
16 Jul	10GHz Cumulative (Mar89)
5 Aug	144MHz Low Power & SWL
6 Aug	432MHz Low Power & SWL
13 Aug	10GHz Cumulative (Mar89)
2,3 Sep	144MHz Trophy/IARU VHF & SWL
9 Sep	24GHz Cumulative (Mar89)
10 Sep	10GHz Cumulative
17 Sep	70MHz Trophy & SWL
7,8 Oct	432MHz-24GHz/IARU UHF/SHF
13 Oct	432MHz Cumulative
21 Oct	1·3/2·3GHz Cumulative
29 Oct	432MHz Cumulative
4,5 Nov	144MHz CW
6 Nov	1·3/2·3GHz Cumulative
14 Nov	432MHz Cumulative
22 Nov	1·3/2·3GHz Cumulative
30 Nov	432MHz Cumulative
3 Dec	144MHz Fixed & AFS & SWL
8 Dec	1·3/2·3GHz Cumulative
9 Dec	50MHz CW
10 Dec	70MHz CW

OTHER CONTESTS

1,2 APR	SP DX Contest, CW Only (Apr 89)
29,30 Apr	Helvetia,CW,SSB Contest (Apr 89)
1 May	AGCW-DL QRP/QRP Party (Apr 89)

First Tuesday each month 144MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

First Thursday each month 432MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

First Monday each month Microwave Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

Dates of publication of rules in RadCom are shown in parentheses

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IARU Region 1 Beacon List	£0.44	£0.37
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PRICES. These include postage, packing, and VAT (where applicable) and are subject to change without notice.

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FROM CW . . . TO SATELLITES

Three new titles have recently been added to the range of books stocked by RSGB.

CW into Foreign Languages is published in Canada by VE3EIM and VE3MGY. It contains handy amateur radio type phrases in English translated into ten different languages so that you can talk to operators on the key in their own tongue. You only have to read and send the translated words, not pronounce them, so it's much easier than learning the languages themselves. Learn how to say 'My Antenna is a Quad' and numerous other phrases in Spanish, Russian, German, French, Dutch, Slovak, Hungarian, Norwegian, Swedish, and Polish. There is also a useful directory showing the languages spoken in each country of the world. CW into Foreign Languages costs **£4.95** to RSGB members by post.

All About VHF Amateur Radio is a new book from RPI in the USA. It contains ten chapters and covers information on propagation at VHF, repeater theory and operation, moonbounce, amateur satellite communication, feed lines, antenna theory and construction, the effects and causes of interference at VHF, and much more. All About VHF Amateur Radio contains 168 pages and costs **£6.95** to RSGB members by post.

Our third new item is a booklet by M. Mansfield, G6AWD, called **An Introduction to Weather Satellite Reception**. If you are thinking of taking up this fascinating aspect of radio DXing, this booklet will give you all the information you need to get you off the ground. You can obtain a copy of this 28-page booklet for **£2.15** to RSGB members by post.

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QSL CARDS. Try me for quality and price. SAE for samples. A. W. Bailey (G3YNI). Brean Down Press, 78 Alfred Street, Weston-Super-Mare, Avon BS23 1PP.

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G2VF D.I.Y. LOOP ANTENNAS, ATU, Pre Amp, Field strength meter. SAE details. Photo copy HRO Manual £4.00. Rylands, 39 Parkside Avenue, Southampton SO1 9AF.

QSL CARDS. Gloss or tinted cards. SAE for samples to Twrog Press, Penybont, Gellilydan, Blaenau, Ffestiniog, Gwynedd.

GWM RADIO LIMITED, 40-42 PORTLAND ROAD, WORTHING, WEST SUSSEX BN11 1QN. Tel 0903-34897. Pye Westminster W15FM low bank O.K. for 4m units only £25.00. Pye PF2UB units with speaker/Mic no Batts. O.K. for 70 cms £25.00. Pye PF28 low band FM units with speaker/mic No batts O.K. for 4m £25.00. Pye Olympic M201 VHF high band A.M. units only £25.00. ITT AM7 Mid-band units (107MHz TX 139 MHz RX) Ideal for modification to Air/Glider band. Units only £15.00. Power-one international series type HB15-1.5A output 15 V.D.C. at 1.5A as new boxed with spec sheet open frame PSU only £15.00. GOould Econdflex type EX5-20/N open frame – switch mode output 5V at 20A as new boxed with spec sheet only £30.00. All prices include VAT and post and packing.

SITEK offer Ex-MOD Tx Rx equipment including Racal RA17, RA17L, MA79, Marconi HS27, HR 28 (D11 set), Eddystone 730/40, R210, C12. 80ft Galvanised steel, telescopic, tiltover lattice tower with rotator housing and electric winch. £950.00. Carriage arranged at cost. TEl: 066689-307 (Leighterton, Glos) for details.

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6146B QRT? quality and output down (New batch just returned to suppliers as 'unsellable'). Some old stock Sylvania – a very good batch, full output and no noises on receive – while they last £33.00 matched pair. – 6KD6 Green Banded £36.00 pair p.p. – 6JS6C N.E.C. £38.00 pair p.p. – 12 BY7A N.E.C. £22.00, 12BY7A G.E. £7.00 p.p. – G3LLL.

G3LLL C.W. FILTERS ETC. FT101ZO, 902, 707, 107, XF8. 9HCN also XF8.2 HCN for FT102, all £40.00 p.p. – FM Units FT101ZD MK3 £45.00 p.p. – Toshiba 2sc2290 outputs FT707 etc £48.00 p.p. – Black Star Counters 2.4GHZ £335.00 p.p. 600 MHz £145.00 p.p. – FT101 MK1-E upgrade kits S.A.E. – Datong A.S.P. wired FT707/757/747 £82.80 p.p. Yaesu J Beam Drae stocked. Holdings Amateur Electronics, 45 Johnston Street, Blackburn BB2 1EF (0254) 59595. Closed Thursdays.

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QSL CARDS clear plastic hanging display wallets. Hold 20 large size cards. Pack of 3 £2.60. Viola Plastics, 36 Croft Road, Hastings, Sussex.

MOSLEY ANTENNAE – All the famous British Manufactured Antennae, direct from us including spares/replacements. Mustang, Elan, TA-33Jnr etc., Full Details shown in our Handbook, price £1.25 refunded upon purchase of Antennae. Mosley Electronics, 196 Norwich Road, New Costessey, Norwich NR5 0EX (Administrative address only).

TRAPS FOR D.I.Y. TRIBANDER BEAMS & ANTI-T.V.1. TRAP DIPOLES. Aerial D.I.Y. Bits, Baluns, Data. 28pSAE. Aerial Guide £1.00. G2DYM, Uplowman, Devon, EX16 7PH (03986) 215.

QSL CARDS. 100 mixed 75th anniversary RadCom covers overprinted in Gold Foil with: Call sign, name and address. £9.00 inclusive. A collectors item from Leeside Printers, 21 Lenacre lane, Whitfield, Dover, Kent.

SERVICE MANUALS, Pye PMR equipment, Eddystone Receivers, Marconi Test Gear, Most amateur Radio. LSAE enquiries and FREE catalogue. Mauriton (RC), 8 Cherrytree Road, Chinnor, Oxon OX9 4QY (0844) 51694.

PROCOMM (UK) – Used amateur radio equipment bought for CASH, part exchange welcome. SAE for stock listing. 102 Larkhill Road, Abingdon, Oxfordshire. 0235-32653 (Callers by appointment).

POLYPROPYLENE GUYROPE – Don't waste money on small quantities – Buy a big coil! 220 metres 4mm £12.50, 6mm £17.50. Plus £2.50 postage. Cheques – 'Rope-Link', Cadance, Battle Road, Heathfield, Sussex TN21 9DR.

RSGB AMATEUR RADIO INSURANCE SCHEME

"ALL RISKS" INSURANCE for portable/mobile/base station amateur radio and ancillary equipment. A service for RSGB members only. Also public liability and equipment insurance for affiliated clubs and societies. Details and leaflets from Sarah Baylis or Jenny Lovell, Amateur Radio Insurance Services Ltd, 4a Russell Hill Road, Purley, Surrey CR2 2LA. Tel: 01-660 0820 or Fax: 01-660 9222.

COMPUTER SOFTWARE HARDWARE

G4UXD's MORSE TUTOR (RadCom June/86): IBM/Amstrad-PCs, BBC's. Adjustable speed, delay, letter frequency; 100 tests, attach key, etc! £7.95 disc. SAE details, D. Brandon, 1 Woodland Road, CHESTER CH4 8LB.

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PROTECT YOURSELF FROM STAGGERING repair costs. A.R.M.S. will settle your bill in full. It costs nothing to get the facts, it could cost a packet not to. . . Remember, the Amateur Radio Maintenance Service contrct starts where insurance leaves off. Details from Amateur Radio Maintenance Service, FREEPOST, Ormskirk, Lancs L39 3A. No stamp required.

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FLYING FROM GATWICK? Stay at Mill Lodge Guest House. 4 minutes from airport. Transport available. Telephone (0293) 771170.

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HERSONISSOS, CRETE, IRMA Apts. Owners SV9ABG (Manos) and SV9ANA (Irene), s/c apts, For details: Lancaster Holidays, II G House, 2 Cromwell Avenue, Bromley, Kent BR2 9AQ.

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HEATHKIT UK spares and service centre. Cedar Electronics, Unit 12, Station Drive Bredon, Tewkesbury, Gloucestershire. Telephone (0684) 73127.

MAIDSTONE (Y.M.C.A.) RADIO RALLY, 28th May, Trade Stand Bookings Tel: 0622-890167 (G1AOQ) Now! Overnight parking and other information. G6FZD 50709.

PATENTS, TRADE MARKS AND DESIGNS. Literature on request. Kings Patent Agency Limited, Established 1886. Ferringdon Road, London EC1M 3JB. Telephone 01-248 6161. Telex 882805 and Fax 01-831 9306.

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The current rate is £2.30 for 40 words or less: advertisements containing more than 40 words will cost an additional £2.30 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

FOR SALE

● ICOM IC290E 2m multimode mobile tcvr. Scanning, 5 memories, 2 VFO's. Digital frequency display. ICHMI mic for remote tuning, manual and accessories inc mobile mounting bracket: £285. G3WMO QTHR. 01-363 5814.

● SONY ICF2001 multimode RX: £90. MSX 64k computer with games: £100. KW2000A with ATU etc: £140. KW Eezi-match with top band: £40. Revex W510 swr/pwr bridge: £45. Bill Ball, G4RSA not QTHR. 46 Loftos Ave, Blackpool, FY4 3EZ. 0253 49317.

● ICOM IC735 tcvr: £650. Yaesu FT757GX tcvr: £560. Yaesu FC757AT ATU: £240 ono. All in VGC. No scratches or marks. Mint, boxed, manuals. All complete, hardly used. Howard, G0HZH QTHR. (Suffolk) 0394 460474.

● ICOM IC202 SSB TX/RX: £100. NB 70cm tvtr 28MHz IF: £40. MM 2m 100W linear: £75. New Drae VHF wavemeter: £20. Grant, G4ILI QTHR. 0452 855339.

● TS430S FM fitted: AM/SSB/CW filters fitted: £650. Boxed. G4NYZ QTHR. (Redditch) 0527 45800.

● FT101ZD Mk3, WARC, FM, mic, fan, DC/DC cvtr. FV101Z (VFO), SP901: £520. Datong FL1 filter: £40. Tele-reader CWR680: £80. Datong Woodpecker blanker: £35. Full set G whips 160-10 inc base and extension: £75. Homebrew PSU 15A: £20. G4NYZ QTHR. (Redditch) 0527 45800.

● FULL station. Going QRT. HF Icom 751. Icom system PS30. Icom AT100 auto ATU. Icom SM6 desk mic. Icom HM12 scan mic. 40ft tower, 400 rotator with head bearing TB3 Mk2 ant. 2m FT480R multi. Reece pwr/swr. Colinear ant. plus 10A PSU. Yaesu YH55 phones and two key. All first class, boxed with manuals: £1600. G0EWV QTHR. (Bolton) 0204 28904 eve.

● FT726R by Yaesu, c/w 2m, 70cm and satellite modules. All in good.cond. with manuals and orig. packing: £750 ovno. MMB 48ele multi-beam by Jaybeam, in first class condition. Ideal for Oscar: £25. G1VTE. 0928 710426.

● YAESU FT736 2-6-70 boxed: £1100. Lowe HF125 rcvr, boxed: £280. Mick, G6OWX QTHR. 01-691 2040.

● SONY ICF2010 air/FM/LW/MW/SW synthesised rcvr, 32 memories, LSB-USB synchronus detection, wide, narrow filters, scanning, keypad knob tuning, digital display timer-clock. Exc. RX: £230 ono. G4KVX QTHR. (Havant) 0705 464191.

● KENWOOD 430S auto tuner, spkr, PSU, filters, SB200 linear. All as new. Just serviced by Lowes: £1600. No rubber cheques. Baby forces sale. G4XPL not QTHR. 29 Trenance Ave, Newquay, Cornwall, TR7 2HH.

● ICOM ICAT500. Full automatic antenna tuner, mint cond, orig. boxed with inst. manual and all orig. accessory cables. Big saving on new one: £279. Could arrange carr. Will haggle. GI4TSK QTHR. 0247 872707.

● TRIO TS711E basestation 2m, mint, boxed with mic: £580. Kenwood TM221E 2m mobile tcvr, 45W, boxed, mic, mount: £200. Standard C78 70cm tcvr, boxed, case, rubber-duck: £115. Hitachi V202F scope 20MHz with trolley: £125. G4RKO not QTHR. (Newbury) 0635 60263.

● TENOR sax. Swap for HF radio gear or sell: £160. Casio 403 four octave 25 voice etc. full-size keyboard, swap for ham gear or sell: £200. GW3COI QTHR. (Abersoch) 075881 2675.

● HF linear Henry 2KD, 18mths old. Going abroad, must sell: £1000. G4SGQ. 0902 41033.

● OMEGA kit. 160-10m. All modules to 3W stage. Front panel inc. Requires modules to be wired together: £225 ono. Icom IC4E, complete: £150. Graeme. (Orpington) 0689 27047 eve.

● DISH antenna 12ft dia. aluminium. 0.25 F/D believed 18GHz accuracy: £100. Flight refuelling ARS. G0API QTHR. 0202 691649.

● HAMEG double beam 20MHz scope, model HM203-4 c/w x1 and x10 probes: £200 ono. Micronta LCD auto range digital multimeter, model 22-195: £50 ono. Both instruments as new and c/w handbooks. G4GXK. 0752 847705.

● CUE†DEE 17432AN 70cm antenna, new: £29. Black Star 600MHz frequency counter: £95. Yaesu keyer unit B: £10. Yaesu MD1B8 base mic, new: £56. IC5 AMT1 Amtor/RTTY unit with BBC driver Eprom: £85. Paul, G4XHF QTHR. 0293 515201.

● KW 2000A HF tcvr, c/w matching PSU and spkr. Supplied with circuits and maintenance manual and mic. VGC and appearance. 100W output: £175. G4BLI QTHR. 0752 401437.

● QUAD for 15 and 10m 2ele boomless type. No room this QTH: £35. 10m multimode tcvrs, Superstar 360. One: £80. One: £50. Would swap for HF rig KW2000A, G2DAF WHY? P/Ex etc. GW4BCD QTHR. 065671 8963.

● LINER 2 2m SSB 10W rig: £65 ono. Mike, G0JMI QTHR. (Alton) 0420 84755.

● TS930S, spkr, mic, 500Hz, 270Hz xtal filters. Rig recently checked by Lowe. 2 new PA transistors and rcvr re-aligned. Cost £2000. Sale price: £1275. (Essex) 04023 73366.

● YAESU FL2001Z linear amp: £475. BNOS PSU 12/25A: £100. IC505 50MHz tcvr with 5ele Tonna: £350, Capco SPC300 ATU: £150. Star Master CMOS memory keyer: £50. All exc.cond. G0ACS. (Northampton) 0604 770718.

● TRIO TS820 and VFO820: £495. TR9000 plus BO9 base: £280. TR9500 plus BO9 base: £245. ST5 RTTY terminal: £40. Kantronics KPC2 with GW1D: £110. Creed teleprinter: £20. G0DYL QTHR. 061-945 2561.

● 4CX250B 2m PA fully metered and protected plus Collins EHT unit 2m tvtr plus M/head BF981 RF amp: £280. 40A 13.8V PSU: £70. 28-50MHz tvtr 25W O/P plus 2ele beam: £70. 14ele parabeam: £30. 16ele ZL: £20. VIC20, 16k plus RTTY CW TX/RX and Zargon chess. Plus lots of games: £75. 14in colour TC DX rcvr, B1, B111 UHF: £60. 100W HF ATU: £20. ITT UHF Starphone on RB2: £40. Rotator plus support beaming and aluminium poles: £65. G4MXC QTHR. 0536 201697.

● CREED 7ERP and associated 6S series tape transmitter. Both in exc. order. Any offer? G3WZ QTHR. (Whiteparish, Wilts) 0794 884488.

● BBC computer with DFS, ROM card, ROMs/software: £200. Dual disk unit (40tr), much software: £125. Vega 215, 8-band SW radio: £35. Wood and Douglas amateur TV TX/RX. Aligned by makers: £80. Sony professional B/W video camera: £80. G6ASA (Oxford) 0865 863333.

● EPSOM RX80F/T plus dot matrix printer. Centronics parallel interface. Factory fitted RS232C intelligent serial interface. Tractor paper feed. Used only at home. Mint cond. All inst. Orig. packing. Buyer collects from Sutton: £150. G4OUW not QTHR. 01-642 7184 after 6pm.

● ELECTONIC Developments 2m linear: £100. 2 Century data Winchester 20Mb disk drives: £20 each. Very large/heavy 2m halo: £5. Taylor valve tester 45A: £15. Texas silent 700: £25. Buyer inspects and collects. G0DLF. 0604 831061.

● FLAT for sale. Peaceful sunny and spacious with one bedroom, garden and own parking space in North London, N4. Lounge/kitchen 23x12ft, gas/electric heaters. Close to buses and Finsbury Pk tube, Much HF/DX worked. £68,000. Owner emigrating. G3ZZD. 01-348 9780.

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● XTALS 7304, 7150 in holders, 7201 7100 boxed: £2.50 each. Pre-war holder: 50p. Manuals for Wilcox Gay VFO ET4332B and AR88D: £2 each. plus 50p postage each item. G3JCL QTHR.

● FT790R with case, nicads and charger. Manual, VGC: £225. Also mobile mounting bracket for FT290R or FT790R: £20. Also linear for 70cm 30W for FT790R: £75. Prefer buyer to collect. G0KIQ. 0625 611942.

● TB2 2ele HF tri-bander: £125. DB4 4ele 6/4m dual-band yagi: £75. MZ80K 48k computer, printer and disk drives: £150. Braun SE600DIG 2m multimode: £175. Richard. 0703 255631 day 0703 813922 eve.

● YAESU FT790 multimode c/w nicads and case: £250 ovno. Icom 720A FM plug-in board, never used: £30 ono. G1HKD QTHR. (Gainsboro) 0427 5779 eve.

● FT290R, nicads and charger: £225. 16ele Tonna 2m: £15. FT208R and charger: £130 ono. G0GIL QTHR. 0926 451764 day 0926 429927 eve.

● FT902DM with filters: £570. DL1000 1k dummy load: £20. LF30A Kenwood lowpass filter: £10. Hi-mound paddle: £7.50. AMT1 Amtor/RTTY/CW: £150. Software for Commodore 64: £25. Please no time wasters. G4LXN QTHR. (Chipping Sodbury, Avon) 0454 318528.

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● YAESU FR50B/FL50B 50W tcvr. Ideal low cost HF rig: £75. (London) 01-359 8867 day.

● IBM PC 640k, serial/parallel ports, Hercules graphics, 10Mb disk plus 5.25x360k and 3.5x720k floppies. Mono monitor, exc.cond. The genuine article: £895 or offers. Many spares/extras available. Includes DOS 3.2, manuals etc. Cadwell, G8TDL QTHR. 0734 788110.

● MML 70cm 100W linear 10W input, mint cond. Never used: £275. MMT 432/144 tvtr, VGC: £80. QTHR. 091-584 3563.

● BRAND new Bird 43 hide case with 5E, 25C elements, unused: £350 ono. Brian, G4SDL not QTHR. 061-746 8189 after 6pm.

● KW2000E tcvr VGC with all spare valves, manual. Would exch for good packet TNC: £250 ono. Buyer collect from G0HKP, Hall Cottage, Church Hill, Monks Eleigh, Ipswich, Suffolk. 0449 740164 eve.

● JAYBEAM 16ele yagis, 4 of: £20 each, as new. Airband rcvr DR600, 6-channels, all are scanned, LCD readout. Exc. sensitivity: £100. GW4RWR. (Rhys) 074571 2550.

● YAESU FTV707 tvtr 2m. VGC. c/w leads, manual: £125 or exch for FT757 auto ATU, cash adjustment. G0VID QTHR. (Merseyside) 051-931 1942 after 6pm.

● TRIO 9130 2m multimode 5/25W. Boxed, manual, bracket, mic. VGC: £340. 10ele parabeam rotator, complete, VGC: £40. Bargain lot: £360. Yaesu FT77 8-band tcvr. Mint cond. Boxed, FM CW filter. Marker. Fitted mic, manual: £390 ono. GW0KDM (Gwynedd) 0758 740171.

● AR88LF in clean orig.cond. Recently re-valved and re-aligned. Includes set of orig. valves: £60. G8WPI QTHR.

● FT101ZD Mk3, CW filter, good cond. 9-bands, very little use only: £475. TS770 dual-band VHF/UHF tcvr basestation multimode. Consider part exch for FT290R or: £475. Martyn, G0CZD QTHR. (Telford) 0952 770568.

● FT107M HF tcvr: £525. ATU HC200: £75. FT7B HF tcvr 80-10m: £245. 5-band vertical: £25. John, G0FGC QTHR, 33 Hicks Close, Warwick, CV34 5NO. Every letter answered.

● 2M station Icom 290D FM SSB: £350. SM8 desk mic: £50. BNOS 12/25A PSU: £120. Complete unit: £500. Will sell separately. Exc.cond. Only 1yr old. 01-578 9405 between 5 and 9pm.

● FT225RD Mutek exc.cond: £480. Racal RA17 with RA98D plus manuals, cased, mint: £250 ono. BBC model 7 with memory expansion, twin 40/80 drives with Novex colour monitor. Loads of books, disks and much more: £385. Masterson. (London) 01-980 3283.

● TRIO R2000 plus VC10 VHF cvtr. Exc.cond: £525. Trio TR7200G VHF FM mobile, 1W plus 10W fully xtalled, also exc.cond: £80. Bill, G6PDF QTHR. 0582 668716.

● YAESU FT708R, 70cm handheld, plus spkr/mic with NC8 PSU/charger: £175 ono. Microline 80 dot matrix printer with Centronics parallel interface: £60 ono. G1BWW. (Beds) 0462 711722 Answerphone.

● YAESU FRG7700 SW rcvr in mint cond. Full coverage 500kHz-30MHz, c/w memory unit fitted. Genuine offer at: £190. So no time wasters please! G1BLB QTHR in current callbook.

● RACAL RA17L superb example. Cabinet mounted: £150 ono. Also standard C58 2m multimode with leather case and mobile mount: £250 ono. Carr.extra. G4ODD not QTHR. (Tuxford) 0777 871915.

● SONY ICF7600D rcvr, mint cond. Silent key sale: £105 ono. BC221: £15. Plus carr. G2DLT QTHR. 0283 701187.

● DIGITAL scanner DFI1000. Convert your own pictures for fax or DTP. c/w all software inc scan and DR halo: £70. G3NDO. 0705 465121.

● SOLARTRON double beam scope CT436 c/w test leads and inst. manual. Clean cond, tested, working OK: £65. HF5V vertical antenna HF 80-10m: £35. Buyer collects or carr.extra. G1EYL QTHR. (Dronfield) 0246 415667 after 5pm.

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● SUPERB Homebrew linear using 2 3/500Z Eimac triodes 3.5/30MHz. Can be seen working. Prefer buyer to view and collect or arrange carr. Sensible offers please. Also mint Yaesu YO101 monitor scope if required: £90. GW4IQA QTHR.

● TECHNICS SXK500 digital electronic keyboard. 4.5 octaves fully polyphonic. Rhythm/percussion/special FX. Key transposer, inbuilt sequencer, composer functions. Editing facilities. Midi in/out. All sounds digitised recordings. C/w stand/footswitch. Unwanted Xmas present. Costs new £700. Sell: £550. GM4GTU QTHR. 0224 743039.

● CANON 7x50 quality binoculars, mint cond. Leather case: £45. Coinshooter Mk3 metal detector, induction balance, triplet coil, bandspread tuning, temp. compensation, water immersible. VGC: £30. Steve, GM4GTU QTHR. 0224 743039 anytime.

● ALPHA 76A linear amp. The best, as new. Trio 440 as new. (Derby) 0332 833684.

● TV scope, exc.cond: £50. Rack mounting 405/625 TV tuner, video and audio outputs: £10. Eddystone 770R VHF rcvr, 19-165MHz: £40. Eddystone 770U, 150-500MHz: £40. G4BVQ. 061-225 4618.

● TONO 9100E CW RTTY Amtor terminal c/w orange VDU and serial interface printer. The lot: £699. Bob, G3PWJ QTHR. 0384 373250.

● C13 complete, stations A41 sets. Lots of other bits. G8ALM QTHR.

● AZDEN PCS5000. 2m FM mobile 5/25W complete, mic mobile mount. H/book, mint cond, boxed. Plus Heatherlite mobile scanning mic. 1/4W magmount ant: £150. G3CDC QTHR. 0949 43346.

● SILENT key G4ATA. FT101ZD, Diawa CNA1001 automatic ATU, Mosley TA33JR, Ham Int'l Concorde multimode full coverage 10m, Pac-Comm TNC220, Commodore C64, 1541d/d, MPS803 printer. Consider p/ex good 2m M/M base. Offers. G1UDF QTHR. 0484 722168 day 0924 252787 eve.

● ALTRON 35ft 3-section telescopic mast rotator, Jaybeam TB3 plus cables: £475 ono. Yaesu FT101ZD 10-band WARC: £450 ono. G3HTT QTHR. 0278 423698.

● YAESU FC700 ATU. 150W PEP. VGC with new bands: £60 ono. Also EP80 PSU for FT480R, FT290 etc: £25 ono. 200W all-band amp 5W in, 10W in Zetagi 132: £60 ono. G1RWF. (Glos) 0242 520346.

● YAESU FT207R 2m keyboard controlled handheld with 2 nicads, charger, case antenna. Boxed, exc.cond: £95 ono. G2FQG. (Maidenhead) 0628 27302.

● EDDYSTONE 770R VHF coverage. Working order: £65. Zycomm FM25/12 suit conversion to

144MHz: £30. HRO 4-gang tuning capacitor and dial: £10. Denis Jones. 051-652 7454 day 051-342 7880 eve.

● FT757GXI plus FP757HD heavy duty PSU: £700. (757II and PSU now costs £1100 and offers only small improvement on already exc. Mk1). FC757AT auto ATU: £225. All boxed in 1st class cond. with leads and manuals. G4JLU QTHR. 01-954 9180.

● BNOS 70cm linear LPM 10/50 mint: £140. Icom 735 mint with SM8: £700. G0EJK QTHR. (Blackburn) 0254 673184.

● FL2500 1500W linear: £350. AR240 2m handheld: £100. JVC GRC11 VHS(c) camcorder: £500. Telequipment DB scope: £30. Heathkit stereo valve amp: £15. Connoisseur HQ20 quality mono amp: £15. All in exc.cond and PWO. G3WIF QTHR. (Bristol) 0272 293738.

● HRO with PSU and coils covering .35-.73, .48-.96,.9-2.05, 1.7-4.0, 7.0-14.4, 14.0-30.0MHz, 50-100, 100-200, 180-430 KC's: £55 ono. Digital voltmeter Solatron LM1426, manual: £15 ono. Printer, Data Dynamics 360: £10. G6LNU QTHR. 02357 68453.

● PROFESSIONAL sig.gen Adret (Racal) type 740A, fully digital, 560MHz, IEEE remote control, 50Wrev, all modes, inc full W/S manual, mfg 1984, like Marconi 2018 only bettr, phone for details: £1200. TR751E plus VSI and mobile bracket, inc Lowe passport: £500. ICR71E inc FL44A, EX257, CK70, FL63A, CR64 (check dealer prices these options) ie NBFM, 12V, full house expensive quartz fitted, but no noisy digital additions, with full W/S manual: £650. Item 1 ex-Plessey 1988, items 2/3 faultless to date, barely used, and with orig. boxes. Everything as new, my receipts supplied. Chris, G8JFJ not QTHR. (Horndean) 0705 596836 eve-w/e.

● COLLINS KWM2A c/w PM2 PSU with Samsonite carrying case. Only: £675 which inc. the Collins DC PSU and mobile mount! Also a mint unused Microwave Modules 2001 cvtr: £99, and a MFJ484 8-memory CW keyer, really makes life easy: £75. Several Waters coax switches and Dowkey relays, prices reasonable. Please call and arrange to try them out into a dummy load as I can't use them on the HF bands. 73 de G6IPU. 0223 328092.

● FT730 mobile radio good cond: £140 ono. Alu mast 30ft tower comprising 3 10ft sections. Good cond. Buyer collects. None of the items above sold till RadCom advert appears. Johnny. (Gainsboro) 0427 5266.

● COLLECTORS item. National Co. Malden Mass. NC240S Comms. Rcvr c/w orig. separate PSU, circuit diagram and info. Unique cast aluminium linear coil turret. 200kHz-18MHz in 6-bands, overhauled very clean: £75. G3ISD QTHR.

● TRIO TS820S 160-10m 150W: £450. Trio TS130S 80-10m CW filter 100W: £450. Drake TR7 all-bands gen.cov RX 1.5-30MHz 150W: £900. All exc.cond. Prices ono. G3YXX QTHR. (Guildford) 0483 233503.

● SHACK clearout. Heathkit SW717 RX. Mint: £35. 1934 Sky Buddy, mint: £65. R1475 with PSU: £35. Homelab HF sig.gen: £20. Many transformers, scope, tubes, valves, Grampian 25W PA amp, mint: £25. All items plus carr. Geoff Fowle. 0202 698142.

● FT780R 70cm multimode, FP80A PSU, Welz SP45M swr/pwr meter, 28ele multibeam, complete 70cm station. Suit new licencee. Would exch. the lot for FRG9600 scanner. Cash also considered or WHY of interest. 0266 45527 anytime.

● TS830S exc.cond fitted 270Hz. CW filter. YD148 desk mic and SEM transmatch fitted Easitune. Also inc. DFC230 remote VFO requires some attention: £725. GM4YAU QTHR. 0241 79155.

● TECHNICS U60R electronic organ. 2 keyboards, pedal keyboard, orchestral conductor, 12 rhythm sections auto play chord, symphonic arpeggio, orchestral presets, harmonic coupler, percussive presets etc. Privately owned since new. Exc.cond: £1000 ono. G1YDC QTHR. 091-284 1187.

● FT780R 70cm 10W multimode. exc.cond: £265. Welz 1.8-500MHz swr/pwr meter 20-1kW. As new: £75. Yaesu YM38 desk mic suit 480/780: £25. Trio JR599 RX: £95. Super VFO 3 xtal filters 1.8-30MHz plus 2m Yaesu HF-2m counter, YC355D: £60. G8JXS QTHR. 0684 295505.

● (1526) MPS807 Commodore printer with manual and repair manual. Perfect working condition. Comes with Easy Script WP: £110 ovno. Bell and Howell 16mm optical sound projector. TQI. GWO: £45. Tony, G4KDZ QTHR. 0375 378783.

● KW1000 linear fully self contained with PU and swr indicator: £275. Yaesu FT200: £90. Nevada TM1000 ant. tuning unit: £90. Could exch. for VHF equip. G2HIO. 0332 834228.

● CLARK military mast PU12 37ft with kit: £200. Racal military mast tactical MA716 28ft pneumatic telescopic: £160. Pair Jaybeam PB18/70cm with Tonna pwr splitter/matcher: £36. Sony ICF PRO80 rcvr as new: £300. G6CUQ. 052789 2282.

● R216 RX c/w AC and DC units, 20-155MHz. CW/AM/FM. 1/5MHz calibrator, all connectors, all manuals, phones, spkr: £75. Heathkit VVM as new, manual: £15. RadComs 1975/86. G4DID QTHR. 0737 554130.

● TRIO TS940S MC60 mic, SP930 all VGC: £1500. or PX for TS430S must be VGC. Power Pull tower winch 12V DC: £50. 2 HRO MX rec coils PSU's: £40 each. (Haywards Heath) 0444 458390.

● REDIFON R408 RX solid-state variable bandwidth xtal filter, Very selective rcvr VLF-28MHz: £250. Drake SSR1 RX: £80. Telereader CD660 RTTY/CW/etc-TV decoder: £180. Autek Active Audio filter: £30. BJ200II scanner: £160. Revcone RS3000: £170. ARR88LF: £45. Stereo casseiver 25wpc: £75. 0834 3057.

● FT102 HF tcvr with FM board, CW filter, mic, boxed with full inst. Good as new: £550. Possible delivery. GW4URC. (Cardiff) 0222 794190.

● FT102 tcvr, Shure 444D mic, HK704 key, FF501DX low-pass filter, Marconi Atalanta rcvr, PSU for rcvr. Offers to the Secretary BPSS.SC, Blyth Power Station, Bedlington, Northumberland.

● YAESU FT757X 1yr old, little used, exc.cond: £570. Yaesu FRG7 HF RX digital mod: £120 ono. 2 10FM trcr: £40 each. G0DLP QTHR. 0737 553920.

● LINEAR MML 144/100 10W in, 100W out: £95 ono. Met 6ele cross yagi: £25. Heathkit monitor scope SB610: £60 ono. Icom 1050 29.6MHz FM: £30. B35 pwr amp 29.6MHz: £20. Martin Wills, G3ZZS. (Plymouth) 0752 707550.

● FT790R Yaesu 70cm all-mode tcvr. Brand new in orig. packing and c/w all accessories as supplied plus high capacity nicads and Yaesu charger: £260 ovno. Prefer buyer, inspects, tests and collects. G8OSA, not QTHR. (Benfleet) 0268 755341.

● YAESU FT227R 2m tcvr with mic and PSU if req'd: £90. Yaesu FT980 HF tcvr: £900 ono. Desk mic MD1B8: £39. Video monitor RGB CM8533: £120. Rotator AR22R with 150ft cable: £90. G3CPG. 0905 820374.

● FT727R dual-band handheld with NC15 charger. 7mths old, little used, immac.cond, cost £500 accept: £400. G6DCH QTHR. 0293 775702 eve.

● OFFERS Pye Reece/Mace Maritime AM TX/rcvr gen.cov. 0872 44247 day 0726 72072.

● BEAM TET 2ele tribander: £75 ono or WHY. Buyer collects. Roger GW4OFQ, Haulfryn, Henfwlch Rd, Carmathen, SA33 6AE.

● FT757GX: £595. FT221R 2m tcvr: £285. Atlas 210X HF tcvr mobile or base: £250. 20A PSU: £30. ATU MJF Super: £30. G3LIV RTTY moden: £25. Hitachi colour camera with VHS video recorder: £500. All ono. G3XMA QTHR. (Coventry) 0203 410208.

● FT101ZD Mk3 FM, fan, hand mic, handbook, orig. packing. New driver and PA valves 1988: £425. Prefer buyer inspect and collect or carr.extra. G2FXS QTHR. (Tyneside) 091-257 2852.

● DATONG PCI: £75. 144/28 2m cvtr: £15. MML432/50 linear: £65. MML 144/100S: £75. LCR bridge: £12. YC355D DFM: £45. MMW DFM plus probe: £50. Pre-scaler 1500MHz: £35. RS lead acid charger 5A: £40. Brian G8ESK. 0274 497438.

● ICOM IC240 2m FM, 5/8 whip ant, magmount, car bracket, GWO: £120. Windsor 30A scope, old valve type. Working: £15. Avo sig.gen, old but OK. No leads: £15. G4HBU QTHR. (Bristol) 0272 611093 eve-w/e.

● TRIO TS830S, re-advertised due to time wasters, full w/shop manual, 500Hz filter, spare BY7A, plus pair 6146B new: £750. Buyers collect. G4UTQ QTHR. 0670 824454 after 5.30pm.

● WIRELESS World, 23 bound vols, March 52-Dec 72. Radio Constructor, 10 vols, Aug 51-July 61. Practical Wireless, 6 vols, 1951-56. Practical Television, 5 vols 52-56 all inc, bound, exc. cond. Loose copies Practical Amateur Wireless, Popular Wireless 36-37, 7 copies. Practical Wireless 47-71 (incomplete) 87 copies. Service manuals, Navy h/book Wireless Telegraphy I and II 1938, Army Signal Training II 1935, RAF Electrical and Radio Notes for Wireless Operators 1939. Offers. Purchasers collect. G4HHH QTHR. (Whitby) 0947 880245.

● PROTOTYPE Manitron monochrome monitor 18in line 20.24kHz frame 72Hz, unused: £35 ono. Datong cvtr PC1 tunes 50kHz-30MHz. Feed your 2m rig for high performance HF reception: £95 ono. Jon G0ITQ. (Sevenoaks) 0732 456553.

● RACAL 9903 counter: £100. 70m H100 coax: £30. Large quantity aluminium tubing etc for HF monobanders. Phone for details. Revox G36 reel-to-reel tape deck, tapes, NAB spools: £75. Linsley-Hood cassette: £15. Dale G3VMK. 0602 736149.

● TRIO TS711E 2m base, mint cond, hardly used: £625. Genuine reason for selling. Reg, G1REG not QTHR. 01-540 3959.

● FREQUENCY counter by Test-Lab, 10Hz-30MHz, HF, 10-150MHz VHF, brand new, unused: £60 inc PSU. G4COY. (Liverpool) 051-260 9192.

● ICOM 02E 2m handheld c/w spkr/mic, BP3 nicad pack, BC26E charger, BP8 high power nicad pack (800mAH), BC16E charger, CP1 mobile charge line/pwr cable, ant, h/book etc. Hardly used: £250 cash. Don. 0297 35131.

● TR9000 multimode VHF, PS20, BO9 systems base, VGC: £300. BNOS 144-10-100: £115 or both for £375. Cash no offers. Bryan, GW0FHL not QTHR. 024481 3204 after 6pm.

● MM tvtr 2-10m. Ideal for new Class A. Surplus to shack requirements: £60. G0EZB QTHR. 0939 250087.

● TANDY PRO2021 basestation scanner, 200 channels with SEM wideband preamp. As new cond. with orig.packing: £150. Peter G0JWV. (Truro) 0872 501656 after 6pm.

● GOING QRT, FT290 2m multimode portable inc charger, carrycase, helical: £225. FT401 HF TX: £170. TR7800 2m FM: £160. MFJ 1270B TNC, unused: £85. (Chelmsford) 0245 491756 after 7pm.

● FOR Drake TR7/R7 extender card sets: £30. SL300 filter 300Hz: £25. Jumper board: £20. All brand new. George. 0875 52317.

● TRIO TS180S, PS30, SP180, VFO180, Rolls Royce HF TX/RX. Will settle for: £650 ono. Not going QRT but other interests means not used enough. May consider older cheaper rig part exch. Try me!. G4HBU QTHR. (Bristol) 0272 611093 eve-w/e.

● TS900 Kenwood rare TX crvr plus VFO 900 additional remote VFO and PS900 PSU. KW600 linear 80-10m complete HF station. 1st class order. On-air demo given: £900. May split if required. G3AAJ QTHR. 01-989 6741.

● KENWOOD 940S: £1850. Yaesu FL2100Z: £550 ono. Yaesu 902 DM ATU: £150 ono. 2x3-500Z new, boxed: £150. Yaesu FRG8800 with 2m: £550 ono. 2xDNT new freq. CBS: £35 each. DNT 10m: £55. Satcom Scan 40: £70. TM 56 VHF FM 2m rcvr: £60 ono. H/D tower and post 65ft: £350. Rotator G250, boxed, unused: £50 ono. 1000m 213.65p a metre. Going QRT. 0268 752522 after 7pm.

● POWER tools. Blind man giving up. Chain saw, power saw planer, jobber. Taylor. (Salisbury) 0722 780396.

● FT290 Alinco 60W linear, new nicads, charger, m/mount case: £325. G0IQF. 01-907 7977.

● KENWOOD TS830M boxed: £720. Matching AT230: £130. Sommerkamp FL1000 HF linear 4x6JS6C: £325. Heathkit OS2 scope VGC: £25. AW1U audio wattmeter: £20. Akai 4000DS r-to-r recorder, VGC: £50. Tandy STA720 hi-fi tuner amp 30WPC: £50. G3UCE QTHR. (Heysham) 0524 822125.

● RTTY TX/RX MM4000 with keyboard and 12V PSU: £110. FRDX500 amateur bands RX: £100. Liner 2 2m SSB TX/RX extended freq. coverage and preamp: £65. Solatron CD1212 scope 40MHz single 24MHz dual trace: £75. All exc.cond with manuals. G4WAS QTHR. 0902 475057.

● TONNA antennas. For 2m 2x17ele: £70. 13ele: £25. 2x15ele Cue-Dee yagi's: £100. 6m tvtr using 2m IF 2-10W input with 5ele yagi: £100. Steve, G1SGB QTHR. 0709 540753.

● RCVR Realistic DX302 0-30MHz: £150 ono. Rotator, box AR22R heavy-duty: £40. Tiger linear 26-30MHz 250/500W SSB: £150. Uniden 200 tcvr 40-channel xtal filtered: £45. Realistic tcvr 40-channel: £30. Pwr meter 1kW USWR ATU: £40. G0JKG not QTHR. (Sheffield) 0742 377672.

● PANASONIC RF4800 gen.cov. com. rcvr. Exc. bargain: £100. KW Vespa Mk2 sideband transmitter h/book circuit: £75. Bowden, 6 Beamont Ct, 159 St. Annes Rd East, Lytham St. Annes, FY8 3HP.

● MARCONI sig.gen type TF801A, 10-300MHz: £25. Record model 52 7in quick release woodworkers bench vice: £25. Durst B30 35mm enlarger, lens, filter drawer, H/B electronic timer/switch: £50. Buyers collect/arrange. Mike, G4GGC QTHR. (Suffolk) 0787 71842.

● R2000 gen.cov rcvr with integral VHF cvtr 100kHz-30MHz, 119-180MHz. 10-memories, scanning. Multimode. Boxed c/w manual. £450. Antennas available. Ritson, 14 Dunsdale Rd, Holywell, Whitley Bay, Tyne and Wear, NE25 ONG. 091-265 6550 day 091-237 1963 eve.

● EVERYTHING must go! Linear amps, ATU's parts to build powerful amps, equip. racks, trolleys. Large collection LP records, guaranteed mint. Copy sale lists from Mike. 03306 613 after 7.30pm.

● FT290R Mutek, nicads, charger, case, rubber duck ant: £210. G4IKK (Buxton) 0298 5094 eve.

● YAESU FL2100 linear amp. Good cond: £275. G4IME QTHR, 12 Holcombe Rd, Tottington, Bury, Lancs. 020488 5964.

● TS700G 2m home base: £375. Microwave Modules 144/50S linear: £70. FT690/2: £340. 6m linear 10W output: £25. M. Belcher G1SSL. 0235 819038.

● COMMODORE 64 computer, 1451 disk drive, MPS801 printer: £80 each. Commodore 128 computer: £125. David G0JGX. 0282 694352 day 05395 60453 eve.

● VHF station IC251E Mutek: £450. BNOS 12A PSU: £60. MML144 100S amp: £110. AR40 rotator: £50. 8ele Jaybeam quad plus coax: £28. 3-way switch (ant): £15. Notch filter, new: £5 or: £680 the lot. G6YAS QTHR. 0964 613928 after 6pm.

WANTED

● FOR Icom handheld, spkr, mic HM46 or HM9 desk charger, battery pack BP7. Norman, G4RYS QTHR. (Leeds) 0532 663846.

● HELP! GCSE computer studies needs printer for ZX Spectrum or interface or perhaps you could do printouts for me? Also wanted: for conversion to 10m Cobra 148GTLDX Superstar 360FM any 11m SSB rig to convert. Steve, G1YLP QTHR. (Cheltenham) 0242 680248.

● Cobra 148GTLDX Superstar 360FM, Beatles/Apple rarities, 15-20A PSU WHY? CBs for conversion? Steve, G1YLP QTHR. (Cheltenham) 0242 680248.

● PROP-PITCH selsyns etc. T4X transmitter. G3VZT. 0603 745027 eve.

● POWER supply for Codar AT5 TX 180-80m mains PSU type 250S. No HB unless pristine cond. Genuine article preferred. Also any info on mods etc or service handbook preferred. G0GPA QTHR. 12 Ingram Cres, Dunscroft, Doncaster. 0302 841530.

● EARLY wireless/crystal sets, horn speakers, valves, old books, catalogues, bound volumes Wireless World wanted. Also interested in American Comm. RX's. Jim Taylor, G4ERU, 5 Luther Road, Winton, Bournemouth. 0202 510400.

● HAMMALUND SP600RX. Good cond. Exch for GEC BRT400 RX. Racal RA1772 RX. Anything considered, any condition. Cash waiting. Please help Racal nut! Also bandspread coils for HRO. G6XNC. 01-462 4461.

● AP1086 (RAF stores ref nos). All sections particularly 10-10A to 10Z. Also Air publications relating to radio, radar, and navigation equip, such as Babs, Oboe, Loran, Gee, H2S, Rebecca-Eureka system etc. Also would purchase post-war to current magnetrons, klystrons, T/R cells and special types of EEV valves. Exc. price offered. Martin Gee, 17 Foxley Close, Mountford Estate, Ferncliff Rd, Hackney, London, E8 2JN. 01-254 9083 or 01-790 2846.

● STEREO reel-to-reel tape recorder. Akai 400DS or similar. Must be VGC. Dave. 01-790 3123 eve. Gold 86:TRB011, pager 2729804.

● 3/4 bedroom semi or detached family house within 1hr road commuting time from Central Glasgow. To rent/purchase by 25yr licensed professionally employed amateur. Should be near good primary school. Company move. G3SEP. 3 Collingwood Rise, Camberley, Surrey, GU15 1NB.

● FC102 ATU for FT102. Also Codar AT5 TX. Please write stating price and condition to: R. Godwin, Hopworthy Moor Cottage, Holsworthy, Devon, EX22 6XX.

● H/BOOK, circuit or any details, buy, copy but not steal, Philips camera type LDH0050/03 NC8925-005-00301 V220 50Hz. G3CXI QTHR. 024267 3834.

● PRESTEL alphanumeric ext. keyboard for STC Novatel. Must have asterik and hash key response. Also Hewlett Packard or robust working laser parallel printer. Tony Mothew, 141A High Road, Loughton, Essex. 01-502 1934 or Fax 01-508 6865 day.

● COPY of circuit diagram for display unit/PLL control unit. PCB's for FT780R or loan of manual. GI8OLV QTHR.

● GRID Gridcase or Gridlite portable computer urgently wanted. Also any accessories or Grid compass software. Have Grid compass laptop (as used in space shuttle) with 10Mb hard disk. For sale when Gridcase or Gridlite replacement purchased. Bob. (Redditch) 0527 64885.

● GERMAN ex-service equip. for museum purposes. Working or not. WS No.11, WS No.18, WS No.65. For sale or swap Collins 51JY, Siemens 6C RX. Will collect. OZ8RO. Vejdammen 5, DK-2840 Holte, Denmark. 010-452 801875.

● INK-NAME of supplier of slow drying ink for pen recorder. Liquid not biro. As used in barometers etc. G4BTV QTHR. (Fareham) 0329 235164.

● FT575 WHY? G4ANP not QTHR. (Doncaster) 0302 722450 or 787353.

● SYSTEM software for HP9000 series. Model 520/9020B. Basic 2.0 language system 97050B and Basic 2D-3D graphics 97052B. G3GEV QTHR. 0322 341646.

● KW1000. Good price will be paid. Also Versatower 30ft. G. Ellison, PO Box 376, Perry Barr, Birmingham, B42 2TB. 021-356 7144.

● SHARP MZ80B. Help! Basic manual required for copying Basic version SB-5510. Help on making backup of Basic cassette. Any software for amateur radio RTTY etc. Any help much appreciated. Monitor version SB-1550.Thank you. Jim, GM1JWW QTHR. 0592 757017.

● KW Q multiplier. Max, G4BOV QTHR. (Maidenhead) 0628 35698.

● RADIO and television leaflets from any period for historical display in the Wireless Museum. Radio catalogues, books, magazines, service sheets. Pre- ▷

war or wartime Radio Times. List of radio amateur before 1914. G3KPO QTHR. (Ryde) 0983 67665.

● 10-24GHZ stations. VFO120 and SP130. Graeme. (Orpington) 0689 27047 eve.

● ICOM 730, preferably with filters and PSU. Must be in good cond. and full working order. G0AQJ QTHR. 09074 2617.

● BELCOM LS102L. 10m multimode required in good working condition and reasonable price. G4TDJ QTHR. (Falmouth) 0326 250078.

● MANUAL for HP pwr meter model 430C. Also wanted a Shimizu SS105S QRP HF tcvr. G0CPN QTHR. 05827 3770.

● YAESU FT7, FT75 tcvr. Would consider faulty rig or non-working FT707. Reasonable prices only. Would consider part exch. with FT290R. G0DLF. 0604 831061.

● YAESU FT230 2m tcvr. Must be unmodified and in mint cond. G3VBW QTHR. (Southampton) 0703 472584.

● PSU 10/12A minimum. Also swr meter, range to 440MHz. (Nottingham) 0602 606589.

● TRIO 430S with CW and SSB filters, plus manual. All in VGC. G3ASE QTHR. 0480 63129. TL37.

● CW filter for Trio YG455C1 or YG455CN1. G3XRJ. 0736 871285.

● HELP. Need DC/DC cvtr and lead for Yaseu FT101ZD. Will soon leave UK to cruise on boat. Will not be able to use radio as only 12V available. Please write G1ZCW not QTHR. Illusion, Falmouth Marina, North Parade, Falmouth, Cornwall.

● KENWOOD TS140 with 7mths warranty: £750. Hately dipoles for 15 and 20m: £7. Nikon 301 SLR with zoom and ERC, new: £170 or part exch for HF rig or rcvr. QTHR. 061-320 6941.

● ORIGINAL packing boxes and associated packing materials for Trio/Kenwood TS940S and Trio/Kenwood SP940 spkr. Price and delivery or collect negotiable (needed for transportation). 021-730 2001.

● DATONG ASP automatic RF speech processor. Steve. 0224 743039.

● CIRCUIT and alignment details for Pye reporter MF6AM to 4m. Expenses paid.

● TR9130 mobile mounting bracket. Orig. lost with crashed car. G0GOR QTHR. (Bristol) 0272 672114.

● £75 offered for memory module for FRG7700 must be in working cond. I will pay postage. (N.Ireland) 0762 324855.

● MARCONI Marine. Copies of the Mariner sought to authenticate radio room replica being built. Still looking for Oceanspan etc. Also does anybody have a mains transformer or PSU module for EMI RE301 tape recorder. Norman, G4YXX QTHR. 0963 32389.

● VALVES 4CX250B, also SK610 sockets and blowers, single items or discarded linear projects. Also Mutek UHF preamp type GLNA432. Peter G7BNU. (Bradford) 0274 573233.

● SUITCASE radio B2 and A Mk3 wanted. Also any clandestine type radios, manuals in any cond. for spares or restoration. (For small collection). G4OFO. 01-949 2317.

● HELP! HF5 ant. about £25 or near will collect or pay postage anywhere in radius Weymouth, Salisbury, Portsmouth. Andy. (Lymington) 0590 73476.

● 70cm handheld preferably synthesised also matching Yaesu linear to suit FT790R. Dave, G4ZDT QTHR. 0953 607594.

● I need the following mags to complete my sets: SW mag. March 54, Sept 54. QST, June 60. CQ, March 61, June 62. SW Listener, Nov 46, May 47, July-Oct 47, Apr 48, Sept 48. SW News, most 1946, Dec 47, Apr 48. Radio Amateur, most 1952 and 53. Good price paid for copies in reasonable cond. Write G3VDL QTHR or tel. (Devon) 064723 451.

● MILITARY radios, radar, clothing or anything interesting in military equip. especially vigilant launch box. Pan tilt system for camera, must be 12V operated. Small 12V video camera B/W or colour. G6CUQ. 052789 2282.

● HALLICRAFTERS Sky Buddy, also National NCX5 or similar tcvr. G0ABW QTHR. (Cambs) 07677 371.

● YAESU FT221R multimode. Will exch Trio 9000, no mobile use. 0872 44247 day 0727 72072.

● PURCHASE or copy Canon MSX V20 computer manual, not basic manual but hardware info. G4BSH QTHR.

● 587BLY Pye Compac for experiments any cond. Also companion RX for my MK119 TX. This RX is housed in a waterproof die cast case size 11x5x6in and covers 1.5MHz to 20MHz. G3JQL QTHR. 091-386 1116.

● AR88, EC10, EB35, HR0 Drake R4. Roger not QTHR. 0275 20002.

● RACAL RA1772 rcvr or similar with first IF 35.4MHz. G3NCR. 01-567 8771.

● BIRD Thruline ele. Racal rcvrs, mobile tower/trailer. Mike 03306 613 after 7.30pm.

● REQUIRE urgently, RV75 remote VFO and P75 PSU. George. 0875 52317.

● TS780. Also PCB for, or part completed GW4BWE versa filter. G4LOO. (Beds) 0462 811591 after 6pm.

HELPLINESHELPLINESHELPLINESHELPLINESH

COLOUR CODES REVEALED

We've just received a letter from G3VPZ who, if you remember, was trying to find out the colour coding sequence of a link cable for his FT200. We're pleased to say that he now has the correct sequence and all is working OK. He'd like to thank the dozen or so amateurs who telephoned him with the information.

CQ ESPERANTO

Ray Exley, G4IUE, would like to know if there is an Esperanto Group or Net which is used by UK amateurs (anyone remember the GB2RS April Fool story some years ago? – Ed). If not, he wonders if anyone is interested in helping to form such a group with the aim of forming a UK net. Such nets exist on the continent and elsewhere but Ray has not heard any G stations using this universal language. Interested? Please contact Ray at:
63 Eastholme Drive, Rawcliffe, York YO3 6SZ

SIG-GEN INFO WANTED

Derek, G8ECI (Lincs), is looking for information on a Marconi Instruments signal generator Model 1066B which covers 10-470MHz. If anyone can help, please write to him QTHR or telephone 0507 86793.

CQ IY4M

GM0ATQ has written with a request for information regarding the command procedures, etc, for the IY4M robot beacon on 28.194MHz. He's being trying for some time to get it to do something (anything!) once he's connected to it. He has heard it giving RST/Log etc to others but can't get a peep out of it himself. Anyone know what he's doing wrong? Sorry we've no telephone number for this one but we understand he's QTHR.

NTSC – NEVER TWICE THE SAME COLOUR?

It's an old joke but there's a grain of truth in there somewhere: however, we digress. Bill Moorwood, G3CAQ has recently completed a video recording which G4DFE has taken with him on a trip to VK. Bill would like to make a similar video of UK amateur activity which he can send to amateurs in the USA. Unfortunately, he doesn't have access to any NTSC equipment and hence this request via Helplines. Is there anyone with NTSC video recording equipment who is likely to be in the Wolverhampton area during April or May, and would be willing to shoot some video of local amateur activities? Alternatively, is there anyone who can convert VHS (C format) to NTSC if Bill shoots his own video? We know of one or two US amateurs who are serving in the USAF here in the UK. Perhaps they have access to both systems and could help Bill out with this problem...

Not content with making videos, Bill is also trying to arrange a reunion of ex-RAF Wireless Mechanics who served during the period 1942-1947 and, in particular, ex-Glasgow RTC of 1942/43, No.7 RS South Kensington 1943, 322 MU and 56 SP India. Bill will sift through any information sent to him and forward it on to other interested parties. Information on Mr T R Nisbet, ex-GM3SW would be particularly appreciated. Well, that certainly gives you plenty to think about and if you can help Bill in any way he can be contacted on tel: 09074-3873, or write QTHR.

OPERATION RALEIGH – RADIO OPERATORS WANTED

Radio amateurs are invited to join Operation Raleigh as Communications Officers for a number of expeditions taking place this year. The expeditions will be of 11 to 12 weeks duration to such faraway places as Australia (north Queensland), Zimbabwe and Chile.

Anyone who is interested in taking part (and it's no holiday!), should contact:
David Hopkins, G1TFT, 10 Prince Street, Hull HU1 2LJ Tel: 0482-210763

THANKS FOR ALL THE STAMPS

John, G4YDM, has written to us again thanking everyone who has sent stamps to him. You may remember that John is hoping to collect 1.5 million stamps to raise enough money to buy equipment for amateurs who may be less fortunate than ourselves. So far John is a third of the way towards his target, having begun collecting back in early 1987. He's written to us again both to say a big thank you to everyone who has helped and to answer a question which many have asked – "can I send foreign stamps?". The answer is YES, any stamps, used or mint, British or foreign, a bagful or just one or two will be very gratefully accepted and if you can't remember the address, here it is again:
John Allsopp, G4YDM, 30 Manor Park, Concorde Village, District 11, Washington, Tyne & Wear NE37 2BT.

SWAP-SHOP

Avril Fowler, of NW London, has written to say, "I have an anorak which I no longer use and would like to swap it for an FT290 transceiver." *Do any other readers have something which they no longer have a use for and would like to swap it for something else? If so, please write to us marking your envelope – "I have something which I no longer have a use for and would like to swap it for something else."*

I'VE FOUND THE NiCad CHARGER

Now here's a funny one. Alan Salisbury, GW8KSF, has written the following, "Could the person who bought the Kenpro KT200EE 2m handheld from GW8KSF please get in touch again, QTHR, as I've just found the NiCad charger that should have been sent to you..... SORRY! I think your QTH was in Cumbria but cannot remember any other details."

UNIVERSITY SOCIETY NET – 2

Many replies were received following an item which appeared in 'Helplines' last year asking whether any university societies were interested in forming a net to interchange news etc. All those who showed interest were sent provisional operating times and frequencies, and the net now seems to be running quite successfully. If there are any other university or polytechnic amateur radio societies who would like to participate, the net details are as follows:

Call "CQ UniNet" at 2pm local time on Wednesday afternoons on 7095 kHz SSB (40m) or 144.725 MHz FM (2m).

There must be quite a number of university/polytechnic societies capable of packet radio operation, and this would seem to be yet another good way of exchanging information. If your Uni/Poly station has packet capability, messages can be sent to Keith, G7AFQ @ GB7HSN so that he can compile a list of all societies/interested parties for 'mail-shots'.

WHERE'S MY MARCONI AWARD?

Dick, G2BRR has written to say that he's received a parcel of fifty Marconi Awards from Mario, I5DEX which were incorrectly addressed to the old International Short Wave League address in Lydney. The parcel was damaged but the contents are in very good condition.

Since these were sent in bulk to an address which has nothing to do with the award, Dick cannot be expected to pay to have them forwarded. However, if the following people would like to send a large strong 13"x10" envelope and 50p to Dick he'd be happy to forward your certificate to you:

BRS44266, BRS87061, G0AKE, G0ENW, G0EUF, G0FEH, G0GPD, G0GSP, G2AKK, G2BOX, G2GM, G3DKO, G3ESF, G3IRM, G3MCP, G3NOB, G3NWG, G3PHW, G3VCN, G3VDL, G3VNW, G3WPF, G3ZBA, G4EZA, G4HAP, G4HJA, G4IJW, G4MLN, G4MSK, G4MVA, G4OAT, G4OOT, G4SSH, G4UTV, G4UTY, G4UZN, G4ZBI, G4ZYQ, G6HL, G6ZO, G8GG, G8NT, G8PG, GW4LFO, GW4PUC.

It is possible that those listed may already have sent IRCs or money to I5DEX for return postage but there is little that Dick or anyone can do about that now.

VS1AE – WHERE ARE YOU?

G3RRD has written asking if anyone knows the whereabouts of VS1AE who served with the RAF in Singapore during 1946-47. If you can help please contact:
Mr D W Marmont, G3RRD, Woodcot, St Chloe, Amberley, Stroud, Glos. GL5 5AP.
PS. G3RRD would also like to thank those who responded to his request for a supplier of the GE D-44C6 transistor. Many readers responded and he's now managed to get hold of some.

WHAT SHALL WE DO WITH THOSE BP TOKENS?

David Cauldwell, GI0HOW, has contacted us with the answer...

'I am currently gathering together unwanted trading stamps or petrol gift tokens such as, BP Lifestyle, Shell Air Miles, Green Shield, Texaco Star etc, in fact any gift tokens or trading stamps. The idea behind this is to trade these items in with the relevant companies for equipment which will be donated to the new Amateur and Radio Blind Club.

'You may ask yourself how this is possible.... well in the case of the BP Lifestyle we can trade them in directly with British Petroleum for specified equipment of our choice. In the case of other brands what we have to do is to trade them in for gifts which we in turn use as raffle prizes and which in turn brings in money which can be used to purchase equipment. Since many motorists find that they have lots of these tokens sculling around in the car which they seldom trade in, this is an excellent source of un-tapped revenue which can be used to obtain equipment for those less fortunate members of our hobby.

'So far, in GI, the response has been quite successful and although we haven't yet got enough to obtain any equipment, things are actually looking quite good. However, with the help of the amateur population within the whole of the UK, we think we can do quite well with this project.

'Just another thought before I go. Maybe some readers own petrol filling stations or garages; if so maybe they would consider putting a small container in the shop to collect the tokens that customers don't take."

Well, it's certainly a novel idea and, if supported in the same way as the recent appeal for postage stamps, should produce the goods. So, if you have 'loadsatokens' which you're not intending to trade in, please send them off to David at:
59 Connsbrook Avenue, Belfast, BT4 1JW
You can also contact him by telephoning 0232 471370.

'Helplines' is designed to help put people in touch with each other. If you have a problem, it's more than likely there's someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell the rest of us. 'Helplines' is here to help you and to give you the opportunity of helping others. Write to us marking your envelope "Helplines – News Bulletin" and we'll do what we can to get the message out. But above all, please let us know what success you had!

CLUB NEWS

DEADLINE - Items for inclusion in the JUNE issue must be sent to HQ marked "Club News - DIARY" to be received by Tuesday 25 APRIL latest.

If news is received by the published deadline, it will 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.

AVON:
* Bath & DARC - 5, AGM.
* Bristol ARC - *NEW SECRETARY* Barry Robbins, GOCFM tel: Bristol 600603. 6, VHF night on the air, Special Event Station GB8XXV; 13, Computers; 20, wine tasting; 27, VHF field day discussion.
* Bristol RSGB Group - 24, talk "A Local Amateur Video Evening" by Jean Fletcher, GOAWX.
* South Bristol ARC - 5, lecture "Sky-Diving" by Mike, G3OUK; 12, 70cms activity evening; 19, practice Morse Tests under exam conditions; 26, 10 metre activity evening.
* Thornbury & DARC - 5, AGM; 19, project evening.
* Weston-Super-Mare RS - 5, RAE course commences for December 89 exam, at Worle Community Centre, Lawrence Road, Worle, starting 7pm. Details from John Wills, GOKBT, tel: 0934-514429.

BEDFORDSHIRE:
* Bedford & DARS - 4, talk "Fire Prevention" by Bedfordshire Fire Service; 11, talk "CW Procedures" No.6 (final session) by Charles G4MEW.
* Dunstable Downs RC - 1, bowling at Stevenage; 14, lecture "China" by P. Bolton, G4ZJF; 29, Wolfsburg amateurs' visit.

BERKSHIRE:
* Burnham Beeches RC - 3, Berkshire Repeater Group; 17, visit to West Drayton Air Traffic Control; 29/30, Spring DX picnic.
* Reading ARC - 13, talk "Role of the Local Regional Officer" by Dave Chislet (G4XDU); 27, HF NFD organisation evening.

BUCKINGHAMSHIRE:
* Aylesbury Vale RS - *NEW SECRETARY* Martyn Baker, GOGMB, tel: 09 08 260088 (9am - 5pm).
* High Wycombe ARC - *NEW* meets every second Thursday of the month at Unit 2, Fryers Works, Abercrombe Avenue, High Wycombe. Details G2DRT.

CENTRAL:
* Falkirk & DRS - *REFORMED* Details Bill Ferguson, GM6VCV tel: 0324-2244.
* Stirling & DARS - *NEW SECRETARY* Brian Mulleady, GM1PVG tel: 0324-36235.

CHANNEL ISLANDS:
* Guernsey ARS - *NEW SECRETARY* Peter Bannier, GU4SXM.

CHESHIRE:
* Chester & DRS - 11, computer aided design for radio amateurs; 18, talk by RAIBC rep; 25, matching units and filters.

CLWYD:
* Conwy Valley ARC - *TEMPORARY SECRETARY* GW4NNL, tel: 0492-530725. 6, talk by Dr David Last, GW3MZY.

DERBYSHIRE:
* Buxton RAs - *NEW VENUE* Leewood Hotel, Buxton. Details G4IHO tel: 0298-5006. 4, talk "GB3HH/SF" by G3RKL and magic lantern show.
* Derby & DARS - 5, junk sale; 12, illustrated talk "Noise" by Tony Adams of N.E.I.; 19, night on the air; 26, talks "The Westmorland VHF Group" and "The Royal Omani Amateur Radio Society" by G3FDW.

DEVON:
* Exeter ARS - 10, inter club quiz.
* Exmoor RC - *NEW SECRETARY* Nigel Puttick, G4PGW tel: 07697-607. *NEW VENUE* The Old Chapel, North Molton, 7.30pm 1st/3rd Thursday.
* Taunton & DARC - *NEW SECRETARY* Peter Robinson, GOEYR tel: 0823-275973.
* Torbay ARS - 29, AGM.

DORSET:
* Bournemouth RS - *NEW ORGANISER* Clive, G6MYT tel: 0202-422441.
* Flight Refuelling ARS - *NEW SECRETARY* Graham, G3VMO tel: 0202-886151. 2, construction competition; 9, talk "Radio in the Thirties" by Gerry, G2KV; 16, talk "Drilling for Black Gold" by Russ, G4CVX; 23, talk "Direction Finding" by John, G6AZV.
* South Dorset RS - 4, AGM.

Co.DURHAM:
* Houghton-le-Spring ARC - *CHANGE OF VENUE/DAY* Now meets on Thursdays at 8pm in Fencehouses Comrades Club, Eastfield House, behind Station Avenue North, Fencehouses, Houghton-le-Spring. Details Foster, GOABF tel: 091-584 4673.

ESSEX:
* Braintree & DARS - 3, construction contest; 17, talk "Home Brew Antennas & Kit Construction" by Mike, G4ZPE.
* Chelmsford ARS - 4, talk "Computers - Some Amateur Uses" by G2HPF.
* Loughton & DARS - 7, AGM and presentation of shield for best DF set; 21, RSGB film night.

GLOUCESTERSHIRE:
* Gloucester ARS - 5, construction contest.

GRAMPIAN:
* Aberdeen ARS - 7, junk sale; 14, talk "Radio Astronomy" by Alistair Flett.

GREATER LONDON:
* Acton, Brentford & Chiswick ARC - 18, discussion "RF power measurements".
* Echelford ARS - *NEW VENUE/SECRETARY* Staines Congregational Church, Kingston Road, Staines, Middx. Details GOJSP, 114 Peterfield Ave, Staines, Middx. 10, AGM; 24, talk "NBFM Rig Alignment" by Robin Hewes, G3TDR.
* Harrow ARS - 7, activity night; 14, junk sale; 21, activity night.
* Southgate ARC - 13, grand surplus equipment sale; 27, introducing Youth into Amateur Radio.
* Wimbledon & DARS - *RECENT NEW SECRETARY* Nick Lawlor G6AJY, tel: 01-330 2703. 14, surplus equipment sale; 28, Desert Island Radio competition.

GREATER MANCHESTER:
* South Manchester RC - 7, talk "Optical Fibres" by T. Hopkins, G8TYY; 14, talk "Computer Networks" by T. Hewitt, GW3YFD; 21, home built equipment contest; 28, Spring DF (8pm start).
* Stockport RS - 12, talk "Boolean Algebra and Circuit Design" by Bill Hayes, G4RLD; 26, mini lecture "Contests" by G4ECI/night on the air.

GWENT:
* Chepstow & DARS - *NEW SECRETARY* Dan Taylor GWOECH, tel: 0291-424725.

GWYNEDD:
* Dragon ARC - *NEW SECRETARY* Tony Rees, GWOFMQ tel: 0248-600963. 3, talk & demonstration "I wonder what he has in store for us this time" by Steve Price, GW4BWE.
* Meirion ARS - *NEW SECRETARY* Brian GW4KDP.

HAMPSHIRE:
* Andover RAC - *NEW SECRETARY* G8ALR tel: 0264-23741.
* Basingstoke ARC - *NEW SECRETARY* David Deane, G3ZOI tel: 0734-332777. 3, talk by local Crime Prevention Officer.
* Fareham & DARC - 5, junk sale; 19, talk "The Old Days of Radio" by Len Newnham, G6NZ.
* Farnborough & DARS - *NEW PRO* GOHNA tel: 0252-519773. 12, bring and buy sale.
* Horndean & DARS - *NEW SECRETARY* Mr F Charrett, G3COO, 8 Mavis Crescent, Havant, Hants, PO9 2AE. 6, talk "Pathfinders" by G3VPO.
* Itchen Valley ARC - 28, talk "The Fire Brigade" by GOHAE.
* Rowner & DARS - *NEW SECRETARY* G6WGN tel: 0705-261977.
* Southampton ARS - *NEW SECRETARY* Malcolm Troy, G1UWL tel: 0703-701770.
* Three Counties ARC - 12, talk "Railway Signalling" by member of Network South East; 26, AGM.
* Winchester ARC - 21, talk "Satellites" by David Hinchcliffe).

HEREFORD & WORCESTER:
* Bromsgrove ARS - 11, test equipment and its use in amateur radio; 25, night on the air 6m.
* Malvern Hills ARC - 11, talk "Operation Raleigh Part 2" by John Layton, G4AAL.
* Vale of Evesham ARC - 6, talk "Sporadic 'E' and Meteor Scatter Propagation" by G3NAQ.
* Wythall RC - 4, committee meeting; 18 rig check demonstration; 25, night on the air.

HERTFORDSHIRE:
* Cheshunt & DARC - *NEW SECRETARY* Roger, G4OAA tel: 0992-464795. 5, talk "HF Aerials - basics" by Dennis, G3TIK; 19, construction contest.
* Welwyn-Hatfield ARC - 3, shack and kit security; 17, night on the air.

ISLE OF MAN:
* Isle of Man ARS - *NEW SECRETARY* June Wrigley, 20 Fairy Hill Close, Ballafesson, Port Erin, Isle of Man, tel: 0624-834257.

ISLE OF WIGHT:
* Binstead ARS - *NEW ADDRESS FOR SECRETARY* Mr D.F. Barnes, Flat 17, Rose Court, Melville Street, Ryde PO33 3AT.

JERSEY:
* Jersey ARS - *NEW SECRETARY* David Reid, GJOBZF.

KENT:
* Edenbridge ARS - 5, net night; 12., fox hunt (car); 26 shack visit.
* Felixstowe & DARS - 3, AGM; 16, DF hunt - Neville (GOJVU) and Fiona (G7ANH) Pattinson.
* Sevenoaks & DARS - *NEW* Meetings 7.30pm on 3rd Monday of each month at Emergency Control Centre, Sevenoaks DC Offices. Secretary: Barry Leggett, G7CIC tel: 0732-741222 ext.245.
* SE Kent (YMCA) ARC - 5, AGM.

LANCASHIRE:
* Central Lancs ARC - 17, talk and slide show "Raynet and The Lockerbie Tragedy" by Fred Charnley, G4RPW; 24, committee meeting.
* Eccles & DARS - 4, talk "A 20 metre transceiver" by GOKLF.
* Fylde ARS - *NEW VENUE* South Shore Lawn Tennis Club, Midgeland Lane, Blackpool, second and fourth Thursdays. 13, visit by RSGB Regional Liaison Officer.
* Southport & DARC - 17, home brew competition.
* Thornton Cleveleys ARS - 10, talk "Computer Fraud" by A. Reilly, G6KOE; 16, Open Day - TCARS 20th birthday; 24, talk "Computer Aided Design" by Jen Ward, G8YOK.

LEICESTERSHIRE:
* Leicester RS - 3, HF/VHF night on the air; 10, HF/VHF activity night; 17, VHF contest review, VHF NFD preliminary planning meeting; 24, constructors competition.
* Melton Mowbray ARS - 21, annual construction contest.

LINCOLNSHIRE:
* Grantham RC - *NEWS SECRETARY* John, G8WWJ tel: 0476-65743. 18, home-brew equipment demonstration by members.

MERSEYSIDE:
* Liverpool & DARS - *NEW SECRETARY* Lynn Bromsgrove, G1EXJ tel: 051-486 5745. 4, quiz with Cordon, G3DVW; 11, activity night/construction/night on the air; 18, talk "Technical Topics" by Jim G4DKQ, 25, surplus equipment sale.
* Wirral ARS - *NEW SECRETARY* Alex Seed, G3FOO 5, talk "Radio Controlled Models" by New Brighton Radio Control Club; 19, equipment sale.

MID GLAMORGAN:
* Bridgend & DARC - *NEW SECRETARY* D.E.George, GW1OUP tel: 0656-723508.

NORFOLK:
* Norfolk ARC - 5, AGM; 12, talk "Sporadic E - some new results" by Jim Bacon, G3YLA; 26, home construction contest.
* Yarmouth RC - 6, talk "Early Sound Recordings" by G3NHU; 13, sale of used equipment.

NORTH YORKSHIRE:
* Hornsea RC - 5, talk "Audio Visual" by G4YTV; 12, talk "Addu Atoll" by Harry, SWL.

NORTHAMPTONSHIRE:
* Northampton RC - 6, discussion led by Simon, G1IRG; 13, talk "QRP" by Norman, G4LQF; 27, talk "WAB" by Dave, G4VIO.

NOTTINGHAMSHIRE:
* Mansfield ARS - *NEW VENUE* Westfield Folk House, Westfield Lane, Mansfield, second and fourth Fridays at 7.30pm. 14, Guest speaker; 28, inter-club quiz.

OXFORDSHIRE:
* Harwell ARS - 18, talk "Top Band DF" by G3JLE.
* Oxford & DARS - 27, discussion "Licensing & other matters" with G4HLX, local RLO.

EVENTS DIARY

SHROPSHIRE:
* Telford & DARS - 5, AGM; 12, talk/demonstration by AR retailer; 19, HF NFD preparation; 26, talk "Electronic Ignition" by G4LSA.

SOMERSET:
* Yeovil ARC - 6, talk "Greyline Propagation" by G3MYM.

SOUTH GLAMORGAN:
* British Telecom ARS - 12, talk "Worked All Britain" by Mr. Dennis Sartin.

SOUTH YORKSHIRE:
* Barnsley & DARC - 10, talk "Tomorrow's Technology" by Martin, G3ZXZ; 24, talk "Crime Prevention" by member of the Police Force.
* Doncaster ARC - *NEW SECRETARY* G8XKI (QTHR) tel: 0302-832138.
* Rotherham & DARS - Informal meetings at the Comedian public house, St.Anns Road, Rotherham, Wednesday of each month. Mike, G8NVX tel: 0709-852711.

STAFFORDSHIRE:
* Stafford & DARS - 11, noise bridge construction; 18, DTI videos; 25, equipment construction.

SUFFOLK:
* Ipswich RC - 12, demonstration of latest AR equipment by Arrow Electronics Ltd; 26 AGM.

SURREY:
* Coulsdon ATS - 7, quiz v Wimbledon & DARS at St.Andrew's Church Hall, Herbert Rd, Wimbledon, SW19; 10, talk "Direction Finding on 160+2 Metres" by A.C. Wadsworth, C.Eng, MIEE, G3NPF.
* Dorking & DRS - 25, illustrated talk "Introduction to Packet Radio" by Stewart, G3YSX.
* Reigate ATS - 18, AGM.
* Sutton & Cheam RS - 15, Annual Dinner at Stoneleigh Hotel, Stoneleigh; 21, junk sale.

WARWICKSHIRE:
* Rugby ATS - 18, AGM.
* Stratford-upon-Avon & DARC - 10, visit - RAF Croughton; 17, 80M QRP club project - Mike, G3OOQ.

WEST MIDLANDS:
* Coventry ARS - 7, mini lectures; 14, night on the air & Morse tuition; 21, cheese and wine; 28, night on the air & Morse tuition.
* Sutton Coldfield RS - *NEW SECRETARY* Tony Quy, G0FEO, 17 Fircroft, Kingsbury Park, Kingsbury, W.Mids.
* Wolverhampton ARS - 11, talk "Aerials for the Small Back Garden" by Tom, G3BA; 18, club project; 25, night on the air.

WEST SUSSEX:
* Chichester & DARC - 4, AGM.
* Horsham ARC - 6, talk "Cellular Telephone Systems" by John Pitty, G4PEO.
* Mid-Sussex ARS - 13, junk sale; 20, night on the air; 27, talk "23cm - this is it" by Eric, G3RXJ.

WEST YORKSHIRE:
* Denby Dale ARS - 5, talk "Micro Ovens" by G6ZUA; 12, surplus sale; 19, talk "Coffee" by G7BXD; 22, Ceilidh (fancy dress) £3.00 inc supper.
* Keighley ARS - 11, visit by Bradford club; 25, junk sale.
* Spen Valley ARS - 6, AGM; 20, surplus equipment sale.
* Todmorden & DARS - 17, talk "Construction .. PCB's" by G0AEC.

MOBILE RALLIES

This is a list of all rallies, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

2 APRIL
* White Rose Rally - Leeds University. Usual traders and attractions. Details A.S Kessler, G4DXA, PO Box 73, Leeds, LS1 5AR.
* North Cornwall Radio Rally - Sports Hall, Launceston College. Details Mary tel: 0566-5632.

16 APRIL
* RSGB VHF CONVENTION - Sandown Park Racecourse, Esher, Surrey. Usual trade stands, lecture programme, large RSGB bookstall and committee stands, refreshments, bar, ample car parking. This year there will be a Members' Mart (similar to Woburn) with a small number of tables available to non-trader members for the disposal of amateur radio and allied items - cost £4.00/table/hour. Tables can be pre-booked by sending a cheque made out to 'RSGB', to Martin Shardlow, G3SZJ (QTHR). Details RSGB HQ or see advertisment in this issue.

23 APRIL
* Swansea ARS Rally - Leisure Centre, A4067 Swansea to Mumbles road. Opens 10.30am, trade stands, bring & buy, bookstall, HF demonstration station, bar and refreshments. Talk-in on S22 and via RB6 by GB2SWR. Details Roger GW4HSH tel: 0792-404422.
* Marske-by-the-Sea Rally - Marske Community Centre, High Street, Marske, nr Saltburn, E.Cleveland. Details Allen, G7CBR tel: 0642-480055.

30 APRIL
* BATC Rally - The Crest Hotel, junction 2 of the M6 motorway. Small entrance fee must be charged to comply with local Sunday trading regulations. Opens 10am, trade stands, components stands, everything for the keen ATV enthusiast, lectures and construction displays. Details Trevor, G8CJS tel: 0532-670115.
* 6th Anglo-Scottish Rally - *CHANGE OF DATE* Tait Hall, Kelso. Details Bruce GM4UIB.

MAY - The Swindon & DARC regrets that it will not be running the Swindon Rally this year.

1 MAY
* Mid-Cheshire ARS Rally - Civic Hall, Winsford. Opens 11am (10.30 for disabled). Full catering and ample car parking. Details David, G4XUV tel: 0606-77787.

7 MAY
* Southend & District Mobile Rally - Roachway Youth Centre, Rochford, Essex. Doors open 10am. Details Ted G4TUO tel: 0702-202129.
* Yeovil QRP Convention - Preston Centre, Monks Dale, Yeovil. Doors open 9am, traders, two lectures, refreshments. Details Dave, G1MNM.

14 MAY
* Drayton Manor Mobile Radio Rally - Drayton Manor Park, Tamworth, Staffs. On A4091, 1 mile from A5 junction. Opens 11am, usual traders, flea market, park facilities for family, refreshments, bars. Talk-in on S22 and 70cm. Details Norman G8BHE, tel: 021-422 9787.

21 MAY
* 32nd Northern Mobile Rally - Great Yorkshire Showground, Harrogate, North Yorkshire. Usual large number of traders, bring & buy stall, craft stalls, refreshments and bar. Enrty via Railway Road, off Harrogate - Wetherby road, 2 miles from town centre. Details Harry, G3CQQ tel: 0943-602118.
* British Telecom ARS Rally - BT HQ, Coryton, Cardiff. Opens 10.30am, traders, bring & buy, refreshmants and bar. £1 admission (half-price children/OAPs). Ample parking and easy access 100 yards from M4 junc 32. Details Martyn Jenkins, tel: 0222-379634 (office).
* Parkanaur Rally - Silverwood Hotel, Lurgan, Co.Armagh. Opens 12 noon. Usual trade stands, bring & buy, bookstall, QSL bureau. Talk-in on S22. Details Jim, GI1YGS tel: 0762-851179.

28 MAY
* 13th East Suffolk Wireless Revival - Civil Service Sportsground, Bucklesham, nr. Ipswich. Opens 10am, usual traders and attractions. Well suited for family day out. Free parking. Details Jack, G4IFF tel: 0473-464047.
* Maidstone (YMCA) Radio Rally - Sports Centre, Melrose Close, Maidstone. Usual traders and attractions, snack bar and beer tent. Details G6FZD tel: 0622-50709.
* Plymouth RC Mobile Rally - Plymstock School, Church Road, Plymstock, Plymouth. Opens 10am, usual traders, demonstrations, refreshments and raffle. Large free car park, talk-in on S22. Details Joe, G1RXR tel: 0752-509855.

29 MAY
* Doncaster Radio Rally - Bircotes Sports Centre, near Bawtry, Doncaster. Details Audrey Wilson tel: 0302-721259 or 0302-857526. Write: 23 Florence Avenue, Balby, Doncaster.

4 JUNE
* Spalding & DARS Mobile Rally - Springfields Arena, Spalding. Usual traders, free entry to gardens. Talk-in on S22 and 70cm. Details T. Kettlewell, G4TWR.

11 JUNE
* Elvaston Castle Mobile Rally - Elvaston Country Park near Derby. In excess of 120 trade stands, bring & buy, flea market, craft marquee, full on-site catering, children's entertainment, arena atractions. House and gardens for family. Car parking 50p (levied by Elvaston Castle). Details John G4PZY tel: 0332-767994. Trade Peter G3WFU tel: 0332-700265 evenings.
* 29th RNARS Mobile Rally - HMS Mercury, Petersfield, Hants. Opens 10am, trade stands, special interest, repeater group and local club stands, bring & buy stall, local radio (County Sound) stand, craft exhibition, many other atractions for adults and children. Talk-in on 2m and 70cm. Details Cliff, G4UJR tel: 0703-557469.
* Norfolk Raynet Rally - Barford Village Hall (7 miles E of Norwich, NGR: TG 113 078). Opens 10.30am, trade stands, car-boot sale, refreshments etc. Details Tim, G4CTT.
* Mid-Lanark ARS Open Day - Community Education Centre, Newarthill, by Motherwell. Usual traders, bring & buy stall, demonstrations of packet radio, RTTY and QRP, lectures, presentation of EHI Trophy, refreshment facilities. Talk-in on S22. Venue is situated on A723, 1.5 miles south of M8/A73 interchange. Details David, GM1SSA tel: Holytown 732403.

18 JUNE
* Denby Dale ARS Rally - Shelley High School, 5 miles SE of Huddersfield, W.Yorks. Details Gerald Edinburgh tel: 0484-602905.

25 JUNE
* 32nd Longleat Mobile Rally - Longleat Park, nr. Warminster, Wilts. RSGB stand, large bring & buy, extensive trade display, specialist clubs and societies, beer tent, several food stands, family entertainment. On-site cmaping available for weekend. Details Shaun, G8VPG tel: 0225-873098.

IN BRIEF - More details later.

9 JULY
* Worcester & DARC Droitwich Strawberry Rally - High School, Droitwich. Details Derek Batchelor tel: 0905-641733.

15 JULY
* Cornish RAC Rally - Richard Lander School, Truro. Details Rolf Little tel: 0872-72554.

16 JULY
* Sussex Amateur Radio & Computer Fair - Brighton Racecourse, Sussex. Details Bob, G1IOS tel: 0798-43841.
* Pontefract Racecourse Rally & Fair - *CHANGE OF DATE* Details Colin G0AAO tel: 0977-43101.

23 JULY
* Anglian Mobile Rally - Highwoods Sports & Leisure Centre, Severalls Lane, Colchester. Details Jeremy, G0KEH tel: 0206-384829 (evenings/weekends).
* McMichael '89 Rally - Haymill Centre, Burnham, Slough. Details Bob, G0BTY tel: 0494-29868.

28/29/30 JULY
* DATASPACE '89 (incorporating the 4th AMSAT-UK Colloquium and the 2nd RSGB Data Symposium) - University of Surrey, Guildford. Details Ron Broadbent, G3AAJ tel: 01-989 6741. **(See advertisement elsewhere in this issue)**

30 JULY
* Scarborough ARS Rally - The Spa, Scarborough. Details Ian, G4UQP tel: 0723-376847.
* Hilderstone Radio Rally - Hilderstone College, St.Peters, Broadstairs, Kent. Details Ron, G3TAJ tel: 0304-812723.

6 AUGUST
* RSGB NATIONAL MOBILE RALLY - Woburn Abbey, Bedfordshire. Details Norman Miller, G3MVV tel: 0277-225563 daytime.

13 AUGUST
* Flight Refuelling Hamfest '89 - Flight Refuelling Sports Ground, Wimborne, Dorset. Details John G0APJ tel: 0202-691649 or Rob G6DUN tel: 0202-479038.
* Derby Radio Rally - Lower Bemrose School, St.Albans Road, Derby. Details Martin, G3SZJ tel: 0332-556875.

20 AUGUST
* Red Rose Summer Rally - Bolton Sports & Exhibition Centre. Details Dave, G1IOO tel: 0204-24104 evenings.

27 AUGUST
* Torbay Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ (QTHR). NO APPLICATIONS UNTIL AFTER MAY 1989 PLEASE
* Galashiels & DARS Open Day - Focus Centre, Galashiels. Details John, GM0AMB.
* BARTG Rally - Sandown Park Racecourse, Esher, Surrey. Details Peter, G8VXY tel: 021-453 2676.

3 SEPTEMBER
* 22nd Preston ARS Rally - University of Lancaster. Details Godfrey, G3DWO tel: 0772-53810.
* Telford Amateur Radio Rally - Telford Exhibition Centre. Details Martyn, G3UKV tel: 0952-255416.

10 SEPTEMBER
* Lincoln Hamfest '89 - Lincolnshire Showground. Details John, G8VGF tel: 0522-25760.

* Vange ARS Rally - Nicholas School, Basildon. Details G4NVT tel: 0268-43025 or Mrs Thompson tel: 0268-552606.
* 6th National Amateur Car Boot Sale - The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade, Beds. Details Tony GOCOQ tel: 0582-508259 (24hrs). Permission to 'fly-in' tel: Northill 288.

16 SEPTEMBER
* Scottish National Convention - Fife Sports Institute. Details John, GM4ALA tel: 0592-742763.
* Wight Wireless Rally - Wirless Museum, Arreton Manor, nr Newport, IOW. Details Douglas, G3KPO tel: 0983-67665.

17 SEPTEMBER
* Peterborough R & ES Mobile Rally - Wirrina Sports Centre, Peterborough. Details G4PYP tel: 0733-230412, evenings.

24 SEPTEMBER
* Harlow Mobile Rally - Harlow Sports Centre. Details G4MIS tel: 0279-722622 evenings or G4KVR tel: 0279-22365 daytime.

1 OCTOBER
* Great Lumley ARES Rally - Great Lumley Community Centre, Chester-le-Street, Co.Durham. Details Barry G1JDP tel: 091-388 5936.

8 OCTOBER
* Armagh Rally - Drumsill House Hotel. Details J A Murphy, 18 Ogle Street, Armagh City, Co.Armagh, tel: 0861-522153, after 5.30pm.

4/5 NOVEMBER
* North Wales Amateur Radio & Electronics Rally - Aberconwy Centre, Llandudno. Details Siggy, GWODYH tel: 0492-517875 (evenings/weekends).

19 NOVEMBER
* West Manchester RC Winter Rally - Bolton Sports & Exhibition Centre. Details Dave, G1100 tel: 0204-24104 evenings.
* Birmingham Mini-Mobile Rally - (Venue to be advised) Details Norman, GBBHE tel: 021-422 9787.
* Bridgend & DARC Radio Rally - Bridgend Recreation Centre, Angel Street, Bridgend, Mid-Glamorgan. Details GW4YKL tel: 0443-226198.

3 DECEMBER
* Verulam ARC Christmas Rally - St.Albans. Details Hilary G4JKS tel: 0727-59318. Trade bookings tel: Watford 52959.

10 DECEMBER
* Leeds & DARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, nr Leeds. Details G Stubbs tel: 0532-585801.

4 MARCH 1990 (Provisional)
* The Great Northern Rally (Trafford Rally) - G-MEX Centre, Manchester. Details Graham, G1IJK tel: 061-748 9804.

OTHER EVENTS

14 MAY
* RSGB HF-DF Qualifying Event (Banbury ARS). Competitors require OS Sheet 151, 1:50,000 series Stratford-upon-Avon. Assemble at 1300 BST for 1320 start. Location, Drayton School, A422, Banbury, Oxon. Anyone requiring teas should contact Graham Nicholls, G4DLB tel: 0295-65492 before 7 May.

GB CALLS

The list below shows ALL the special event stations licensed for operation during this month and early next month, (as at press date)

It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days.

1 APRIL:
GBOCDK - Fort Gilkicker.
GBOCDM - Fort Monkton.
GBOCDN - Grid: SZ 295 849.
GBOIMD - Old Telegraph Station, IOW.
GB2MAR - Marconi Radio Club, Hants.
GB2OWM - Orkney Wireless Museum, S.Ronaldsay.
GB4ACF - Grid: SE 301 712.
3 APRIL:
GB2TCC - Thornton Cleveleys, Blackpool.
4 APRIL:
GBOCDX - Grid: SZ 339 879.
GB2USJ - Lancaster University.
5 APRIL:
GB1CDA - Fort Blockhouse, Gosport, Hants.
6 APRIL:
GB8HHC - Haywards Heath College, W.Sussex.
GB8XXV - Bristol ARC 25th Anniversary.
7 APRIL:
GB4ASC - Avon Scouts, Bristol.
8 APRIL:
GB2MRA - Manx Radio Anniversary, IOM.
9 APRIL:
GB4HMS - HMS Warrior 1860, Portsmouth.
10 APRIL:
GBOCDS - Grid: SU 628 069.
GB1CDS -Grid: SU 628 069.
GB2WAB - Grid: SD 339 451.
GB4SSP - Bilton High School, Coventry.
GB8ACF - Army Cadet Force, N.Yorks.
12 APRIL:
GB1CDJ - Round Tower, Portsmouth.
GB1CDK - Fort Gilkicker, Hants.
GB1CDM - Fort Monkton, Hants.
GB1CDQ - Square Tower, Portsmouth.
GB1CDS - Fort Southwick, Hants.
GB1CDW - Fort Widley, Hants.
13 APRIL:
GB2SOM - Mulbarton Scouts, Norwich.
14 APRIL:
GBOSGH - St.Georges Hospital, London SW17.
GB2RCC - Nuneaton, Warks.
GB2TVC - Thames Valley College, Berks.
15 APRIL:
GB2IRC - Ipswich RC, East Bergholt.
GB6CDS - Netley Castle.
16 APRIL:
GB2VHF - RSGB VHF Convention, Esher, Surrey.
18 APRIL:
GB2ESG - Epping Scout Group HQ.
19 APRIL:
GB2AGS - Hatfield, Woodhouse, Doncaster.
20 APRIL:
GB2IMD - International Marconi Day, N.Ireland.
GB4QRS - Quainton Railway Centre, Aylesbury.
21 APRIL:
GB2EYC - Devonshire Hall, Manchester.
GB4BKA - National Agricultural Centre, Warks.
GB4IMD - International Marconi Day, Helston.
22 APRIL:
GBOCDO - Southsea Castle, Hants.
GB8ACF - Army Cadet Force, N.Yorks.
23 APRIL:
GBOCDW - Fort Widley.
GB2SWR - Swansea Wireless Rally.
GB4SG - St.George, W.Sussex.
27 APRIL:
GBOIOS - Isle of Sark, CI.
GB2RCC - Grid: SP 938 359
28 APRIL:
GB2DWR - Athol Distillery, Scotland.
GB2LOW - QRP Convention, Yeovil.
29 APRIL:
GB2ARC - Chippenham, Wilts.
GB4ECF - Equity & Law Life Assurance Plc, Bucks.
1 MAY:
GB2YSC - YMCA Sports Centre, Maidstone.
GB4BTS - BT Technical Centre, Stone, Staffs.
GB4HVP - Historic Vehicle Parade, W.Mids.
GB6BH - Barlborough Hall.
3 MAY:
GB1CDA - Fort Blockhouse.
4 MAY:
GBOXXV - Bristol ARC 25th Anniversary.
6 MAY:
GB2BHS - Balshaw's High School, Preston.
GB2LOW - QRP Convention, Yeovil.
GB4CDS - Netley Castle.
GB4DHS - Duffryn High School, Newport, Gwent.
7 MAY:
GB4HMS - HMS Warrior 1860, Portsmouth.

the last ...

SWAMPED BY HIGH POWER SSB ON THE RESPECTABLE WARC BANDS

I have recently wandered on to the much neglected 12 and 17m bands (WARCS to you..) in an attempt to improve my shaky morse. Imagine my surprise to find that all the world can now use SSB. Except us, of course – we are told that anything more than 10watts into a dipole will cause untold harm to the primary user. However I cannot but think that swarms of noisy continentals using SSB at full whack while we keep our respectful distance serves little purpose. And what about the ludicrous "gentleman's agreement" for no SSB on 10MHz? Again the continent allows full SSB. I'm sorry, but I think we in the UK are getting the short straw again. I am all for abiding by the rules, when they make sense (and even when they don't if my licence depends on it), but would someone please have a quiet word with the DTI about restrictions which *ipso facto* are now outdated. *J Boot, G4NJH*

BUILD – OR BE DEPRIVED

I read with interest the letter in February RadCom from Mr Maceke, G4LXN, regarding the present day commercialisation of our hobby and his desire to build his own equipment.

I share his concern and believe that it is by building and experimenting that we stand to learn and gain most – after all, the amateur licence is issued in order that we further our understanding of radio. Those who choose not to build any part of their station are depriving themselves of the tremendous satisfaction of using (and learning from) homebrew equipment. In the long term, if we all become 'appliance operators' the prospects for amateur radio and the privileges it enjoys are bleak, for there will be little discernible difference between the amateur bands and those used by CB operators.

Therefore, every encouragement should be given by bodies such as the RSGB to Mr Maceke and others who are keen to use their soldering irons, and get on the bands with homebrew equipment. Unfortunately, the RSGB does not seem to provide such guidance by way of suitable, simple constructional ideas, either in RadCom or its other publications. Although RadCom has recently contained some excellent HF transceiver projects, as Mr Maceke says, they are a little beyond the capabilities of the inexperienced constructor.

Mr Maceke should take heart though, and not go QRT, because there are plenty of ideas and circuits available to him. For example, there is a very good range of kits marketed by companies such as Howes (many of their rigs can be heard on the bands) which will provide a relatively straightforward route to successful homebrewing. In addition I commend the G QRP Club to anybody interested in basic but effective circuits. Their regular journal, and other publications, are packed with ideas, and its large membership includes many very able constructors who are keen to share ideas and offer guidance (G4HYY is the membership secretary).

Homebrewing need not be confined to QRP equipment, of course, but for those who may think that QRP rigs will not prove very effective, perhaps I can offer some encouragement by saying that using no more than 3 watts of CW, I worked 172 countries during 1988. The fun and satisfaction in doing so came from the fact that I was using a homebrew transceiver and not a commercial rig – and that was after the fun of building it! *P Barville, G3XJS*

THERE IS A POSITIVE SIDE TO CONTESTS

Recent correspondence regarding contests highlights the negative attitudes existing in amateur radio today. I do not propose to comment on specific points as the writers show a common lack of knowledge of contesting and indeed of amateur radio in general; instead I would like to indicate the positive aspects of contests through my own experience of some 25 years of licensed operating and almost as long as interest in serious contesting.

The original intention of the Amateur Radio Licence, that of self training, is no more evident than in the competitive spirit engendered by contest operating. The research involved prior to an event has lead me into the interesting field of propagation, where I followed the growth of knowledge on the grey line theory and have taken this into learning computer programming to enable me to predict band openings to various areas of the world.

One of the most fascinating subjects within our hobby is that of antennas. The pursuance if climbing the contest ladder has given me considerable insight into which antenna might be more suitable for a given frequency and distance. For instance, the old adage that the higher the better is no longer written in my notebook. I have followed with interest the development of the delta loop and the sloper and Mr Beverage may have gained some satisfaction at my experiments with his excellent receive antenna in a bid to overcome my high local noise level.

The increase in my operating skill over the years has benefited me not only in contesting but in everyday contacts.The camaraderie and friendship involved has been effectively demonstrated during my business travels around the UK over the past few years. *JC Burbanks, G3SJJ*

HOW TO TRANSCEIVE IN DATA MODES USING A COMPUTER

The following information may help Bob Connell, G4JQY, (Lastword Feb 89) or other members.

I use an Amstrad PCW8512 with an AEA PK-232 multimode data controller (see full page advert in RadCom). SSTV (slow scan television) requires different equipment.

To use a PCW8256 or PCW8512 with a modem (modulator-demodulator) or TNC (terminal node controller) such as the PK232 requires that the PCW be fitted with an Amstrad CPS8256 RS232C serial interface unit so that it can communicate with the TNC through the RS232C serial port (data interface). The CPS8256 also provides a centronics parallel interface output for another printer in addition to the PCW's own printer.

The AEA PK232 is comprehensive but does not include (1) a 12V DC power supply for mains use or (2) a lead for the RS232C serial port link which will have to be purchased or made up in accordance with the instructions supplied.

There was a review of the PK232 in 'Practical Wireless', November 1987 issue and there are excellent chapters on digital basics and digital communications in the *ARRL 1989 Handbook* available from RSGB sales. A communications program running under the CP/M Plus (control program/microcomputer) operating system has to be loaded to allow the PCW to be used as a terminal for a modem or TNC.

Suitable programs are either MAIL232.COM as supplied with the PCW or Database Software's OFFICE.COM and COMMS.COM from 'Mini Office Professional' suite of programs for the PCW8256/8512 or PCW9512. Suffix identifies a System File and is used if required.

Unfortunately these programs do not default to the RS232C parameters required by the PK232 which means that the parameters have to be set every time a program is loaded. However COMMS.COM does provide a preset system option of Microlink/Gold 1200/1200 which is suitable for the PK232 and also a 'type ahead' facility which MAIL232.COM does not provide. The PK232 'ECHO' and 'FLOW' commands are set to Off for COMMS.COM/OFFICE.COM and to On for MAIL232.COM.

I have modified the RS232C parameters in MAIL232.COM and saved the modified program as PK232.COM thanks to instructions received from David, G4MAU. If anyone would like a copy of PK232.COM, then he should send me a CF-2 disc with his own copy of CP/M Plus on it but not filled up with utility programs. *R J Connell, G4JQY*

I have long admired *RadCom* not only for the excellence of its technical articles but also for the standard of writing. But what do we see on page 69 of the latest issue – "it's" with an apostrophe when it's a possessive pronoun. I do hope this is not a decline in standards. *D Wear, G4DPJ*

Not guilty – we bow humbly and pass the buck to the advertising agency that supplied the colour film direct to the printer, past the eleventh hour . . .! – Ed.

DON'T SIDE-SWIPE TRAIN SPOTTERS...

With reference to the letter of J P Bortowski, GW0FPY, in the February issue I would just like to point out that, as a lowly Class B operator and train spotter, train spotting is not "something simple for simple minds". I am a student at the University of Leicester reading for a BSc in Physics with Astrophysics and have nine '0' levels grade A and three 'A' level grade A. Thus I somewhat resent being called "simple minded." Perhaps what puts people off CW is the attitude of some (not all, of course) of the people who use it to those of us (amateurs or not) in the rest of the world with our own hobbies and pastimes.

I A Steele, G1RIX

...NOR BEANO READERS

I was sorry to see in a previous issue of RadCom that PNP Dope compared your illustrious journal to the Beano. As a regular reader I can only deplore this comparison. The Beano is a most intellectual publication. *J S Linfoot, G0CPP*

... word

ICOM

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IC-735 Compact HF.

As predicted the Icom IC-735 has rapidly gained the reputation it deserves. This compact transceiver is ideal for mobile, portable or base station operation. It has a general coverage receiver from 0.1Mhz to 30Mhz with superb sensitivity in all modes, SSB, CW, AM and FM. Spectacular specifications are also achieved on RF Intercept, Dynamic Range, Reciprocal Mixing and I.F. Blocking. As HF conditions improve over the next few years it is equipment like the IC-735 that will provide clear reception even under the worst pile-ups.

The IC-735 has a built-in receiver attenuator, pre-amp, noise blanker and RIT passband tuning and a sharp IF notch filter ensures clear reception. The twin VFO's and 12 memories can store mode and frequency. Scanning functions include programme scan, memory scan and frequency scan. The HM12 scanning microphone is supplied.

RF output is approximately 100 watts and can be continuously adjusted down to 10 watts. The IC-735 is one of the first HF transceivers to use a liquid crystal display, which is easily visible under difficult conditions. Controls that require rare adjustment are situated behind the front cover but are immediately accessible.

Options include the PS-55 AC Power Supply, AT150 Automatic Antenna Tuner, AH2a Automatic Antenna Tuner, SM6 and SM8 Desk Mics, SP7 External Loudspeaker. Why not find out more about the IC-735 contact your local ICOM dealer or contact ICOM (UK) LIMITED.

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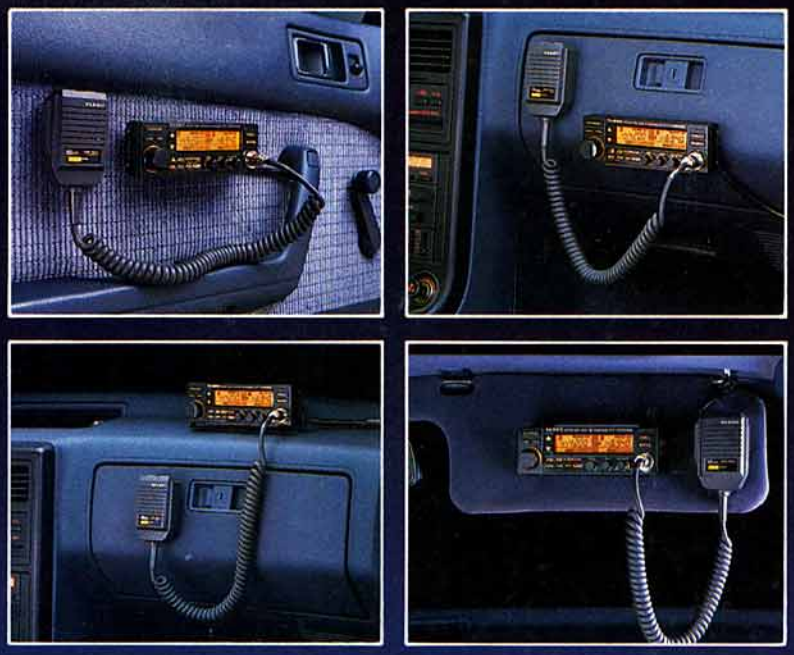

FT-4700RH control head
(1 15/16" x 5 7/8" x 1")

Introducing Yaesu's FT-4700RH dual-band mobile. Choose Yaesu's FT-4700RH, and you open the door to a lot of tight spaces.

While other dual banders just won't fit in today's small cars, the FT-4700RH utilizes a versatile "remote head" design. So you can mount the "brains" on your dash, visor, or door, and hide the "muscle" under your seat. Optional YSK4700 required for remote operation.

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