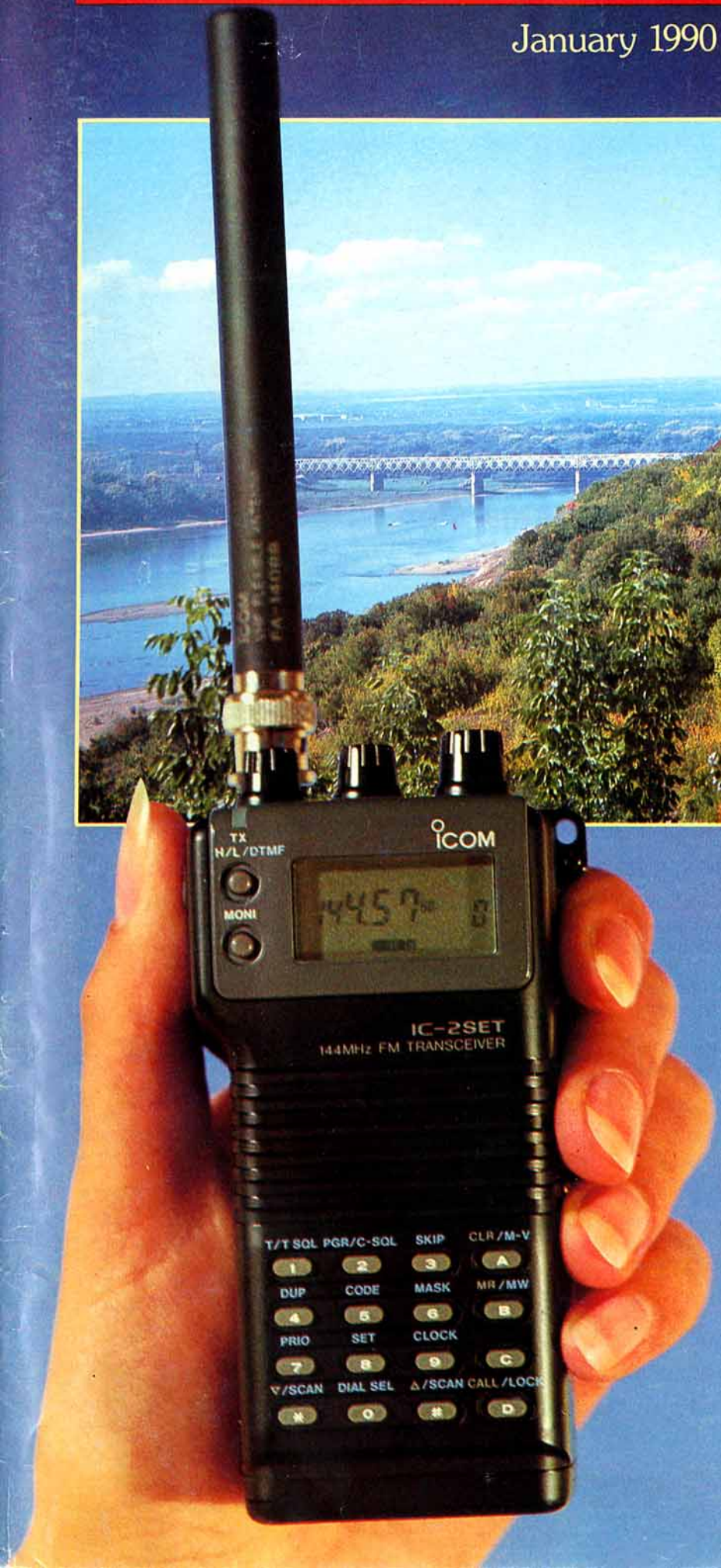
Radio Communication

January 1990



BASHKIRIA – QRV in the USSR

ICOM IC-2SET

Pocketable portable put through its paces

KENWOOD

More of everything - except cost

The new series of FM mobiles from Kenwood really do have more of everything; more power (50W on 2 metres), with three power levels (50W, 10W, 5W); more usable sensitivity (better than 0.16 microvolts for 12dB SINAD); more channel spacings (5, 10, 12.5, 15, 20, 25 kHz); more flexibility using the RC-20 controller and IF-20 interface (up to 4 transceivers from one controller); more memories (20 multi function); and even more bands, because the full range consists of the TM-231E for 2 metres, the TM-431E for 70 centimetres, the TM-531E for 23 centimetres, and finally the TM-701E for dual band 2/70 FM.

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TM-431E	(70cm)	**£318**
TM-531E	(23cm)	**£385**
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Radio Communication

VOLUME 66 No 1 **JANUARY 1990**

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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 Membership Services Department from which full details of Society services may also be obtained.

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Membership application forms available from RSGB HQ

News from the HF Contests Committee

IARU REGION 1 CONFERENCE

Each of the three IARU Regions meet every three years to discuss and agree a wide range of matters and policy relative to the future of amateur radio. Region 1 (Europe, the USSR and Africa) will be meeting in Spain during the week commencing 1 April. The agenda covers many subjects, not least the IARU preparation for the forthcoming ITU WARC conference which will be held early in 1992.

A variety of other subjects are on the agenda including a number of contest related items that have been originated by other IARU Societies and the Region 1 Contest Sub-Group. In common with other RSGB committees, the HFCC will be discussing these proposals and preparing a brief for the RSGB representatives on how to vote at the conference. Some of the papers dealing with HF contests include contest dates, use of a common log and a summary sheet, common adjudication procedures, the use of standardised contest preferred frequencies, possible merging of like contests, SWL events, better liaison between contest organisers, a Regional 1.8MHz contest and many other such items.

At past conferences, contest matters have been discussed in full conference session, a procedure which has been time consuming and has not always provided decisions that are workable, or even acceptable to some of the delegates (eg multi-mode NFD). At this conference, a new procedure will be used and contest matters will initially be discussed by the HF Contest Sub-Group of the IARU Region 1 HF Committee and only those decisions that are agreed by the Sub-Group will go forward as Recommendations to the main body of the conference. The Contest Sub-Group was established at the last Regional conference and comprises contest managers and contest representatives from most of the Societies within Region 1, together with liaison members from ARRL and the other two IARU Regions.

HF CONTEST CHAMPIONSHIP

There has been some comment about the rules and content of this event. The HFCC has taken note of these comments and the suggestions received from a number of the regular participants. The 1990 championship will run from 1 January to 31 December and eleven events will be included. The 'weighting' system has been altered so that the events are more equally balanced. This should help those participants who are forced to miss out on one or more of the events. The revised rules are scheduled to be published in the February issue of *RadCom*.

21MHz CW CONTEST (CLAIMED SCORES)

The leading three UK stations on claimed scores are GW3YDX, who had 717 contacts, GM3OBK with 685 contacts and G3FXB who made 578 QSOs. As for the 21/28MHz event, adjudication is in progress, but with so many logs to check it will be a slow process.

ELECTION OF COUNCIL FOR 1990

The votes cast in the above election were as follows:-

ORDINARY MEMBERS		
R G Barrett, GW8HEZ	2070	
J Bazley, G3HCT	2433	Elected
P L Crosland, G6JNS	1550	
G R Jessop, G6JP	2259	Elected
I J Kyle, GI8AYZ	1189	
T I Lundegard, G3GJW	2198	Elected
ZONE A		
C Reynolds, G8EQZ	236	
I Shaw, G3KWT	302	
G R Smith, G4AJJ	536	Elected
ZONE G		
I D Suart, GM4AUP		Elected Unopposed
INVALID VOTES		
Votes received late	67	
Votes unidentified	267	
Duplicate votes	17	
Invalid categories	16	
Spoilt ballot papers	6	
Not paid up	27	
	400	

New President's Speech

Reproduced below is the text of the speech given by the Society's new President, Frank Hall, GM8BZX, at his Installation Ceremony.

I am naturally very pleased to be taking over as President of the RSGB from 1 January 1990, at a time when the UK economy with its high interest rates is not conducive to leisure activities. Although our own membership is relatively static, many of the amateur radio traders in the UK are not faring as well as the Society. Given the present economic situation and other factors, the Society has recognised that, in the short term, there is a priority to move to a high integrated accounting system at our Headquarters at Potters Bar. I am aware that the two Davids, namely David Evans and David Simmonds, are working hard to implement new software at Headquarters to do this job. The objective is to have a new system up and running as early as possible in the new year. Such a system will enable us to monitor our income and expenditure much more closely, which in turn will allow better management and control, and for the first time ever, will allow the Society to establish the real cost of many of its services. The reason for this activity to get a full integrated accounting system is that without money the RSGB cannot achieve any of its basic objectives.

I have no doubt that 1990 will be an exciting year. On the international front, the year 1992 will have different connotations for different people. In the member countries of the European Community 1992 spells out greater harmonisation. In this context the RSGB can expect to have to grapple with new legislation which will affect radio amateurs. Indeed, there is currently talk of a harmonised European Amateur Radio Licence. In addition the proposed EMC Directive is a major piece of EC legislation which will affect all UK radio amateurs. We expect to see some advantages from this legislation but there will also be some minuses. Indeed, as more and more legislation affects the radio amateur service, the Society will need to put more and more effort into maintaining, as far as it can, the status quo for radio amateurs.

In turn, this extra effort will cost more and will need to be funded. While the peoples of Europe view 1992 with cautious excitement, for radio amateurs all over the world 1992 is seen very much in terms of the next World Radio Administrative Conference. Such conferences are always a turning point for amateur radio. We could gain or lose one of our bands at a stroke, and so the effort involved in preparing for these conferences is vital.

It has been said many times by the Secretary in editorials, but I will say it again, without amateur bands there would be no amateur radio. This basic premise is fundamental to the operation of the RSGB. In accepting this crucial role the RSGB must reaffirm its full support for the IARU, the organisation which links all of the national societies together. The RSGB supports the IARU because of its work in developing and promoting common objectives and because of its work in monitoring international telecommunication conferences and influencing administrations over the advantages of amateur radio. Within the IARU structure, the RSGB is regarded as one of the leading national societies in the world. We have developed a very high standing in world affairs, and RSGB volunteers and staff have attended IARU conferences in each of the three regions of the world. Next year, the RSGB will attend the IARU Conference in Spain in respect of the Region 1 countries, which is regarded as an important prelude to the build-up to the 1992 World Administrative Conference.

The RSGB is regarded very highly in international amateur radio circles. We may not be the biggest national radio society but we often work very closely with the other main national societies in the three regions: for example, the DARC, which is the West German national society, the JARL, which is the Japanese national society and the ARRL, which is the national society of the USA. We salute all of the other national societies which work hard for the common good.

Remaining on an international theme for a moment longer, many of you will know that we are to erect a plaque in Ardrossan this coming Monday. This plaque commemorates the reception of the first amateur radio signals to be heard over the Atlantic in 1921. The plaque is being erected close to the original site used by Paul Godley, and is a co-operative venture between the RSGB and the American Radio Relay League with which we have very close links.

Let me now turn to the home front. It is our duty as a national society to maintain and advance the status quo for radio amateurs. Certainly, during the past five to seven years the RSGB has achieved a record liaison with the UK Licensing Authority which is second to none in the world. We are particularly indebted to the Radio Communications Division of Trade and Industry for the liberalisation which they have agreed to in recent years. Certainly, in many respects, present UK licensing is as progressive as we would wish to see, especially in areas of new technology, for example packet radio, which for the non-technically minded present is a system of sending computer-generated messages by radio. As we leave the decade of the 1980s, perhaps the most outstanding achievement of this decade is the licensing of the 50MHz band for all amateurs in the UK. The 50MHz band has provided exceptional opportunity for propagation research and for amateurs to enjoy their hobby. What is especially delightful to the RSGB is that many European countries have followed the RSGB's lead and now permit their amateurs on this new frequency band.

Apart from the protection and enhancement of amateur radio nationally and internationally, the RSGB has another vital job to perform even closer to home. Over the past few decades, radio amateurs, it seems, have tended to become more isolationist. True, amateur radio is a hobby which often appeals to the loner, the person who wants to be on their own, enjoying all of the things that amateur radio has to offer. However, such an approach is not conducive to the future. Somehow we need to get more of our members active in the local amateur radio community. Goodness knows, there are so many jobs to be done. Making the local community happier about amateur radio will definitely benefit our planning and EMC problems. We must convince more people to pass on the skills that they have acquired to the future generation.

Without newcomers our hobby will die, because as numbers decline we will lose our frequency allocations to other services, many of which are clamouring for extra spectrum space. Getting the local amateur radio environment re-activated is a job for the Society Membership Liaison Committee, and I shall be looking to that Committee and its Chairman, Geoff Smith, next year to provide a very positive lead. More amateurs need to help themselves and answer questions on a local basis without the need to ring up the Society's Administrative Headquarters for answers to what are often straightforward and simple questions. We must improve the status of our local liaison officers so that more help is available to our members at local level.

Finally, let me remind you of the exciting year which we face in 1990. We expect that next year will see the Society's Project YEAR, Youth into Electronics via Amateur Radio advance even further. Project YEAR is seen by the Society's Council as a stimulating project. I mentioned earlier that without new amateurs we will die. Project YEAR has already began to stimulate more awareness of this fact. It is pleasing to note that more and more clubs are beginning to recruit more new members. That is vital for the future well-being of the hobby. Next year we expect to see a Novice Licence issued by the UK Government. The RSGB Council have deliberated long and hard on this issue. We believe that such a licence will be in the very best interests of the hobby. It will allow newcomers, especially the younger newcomers, to enjoy basic low power operation. We hope that once more people have seen for themselves how much amateur radio has to offer, they will go for their full licence.

The Society has many key objectives to tackle next year and I have dealt with some but not all of them.

I would like to thank the members of the Argyll and Bute Council who have been most hospitable to us. We will be formally thanking you in our monthly magazine which is circulated in over 160 countries. We are all pleased to be in this delightful and beautiful part of Scotland.

To our friends and colleagues in the IBA and BBC, a special thank you for allowing us to use some of our sites for our repeater and beacon stations. We are very thankful indeed.

To the DTI, a special thank you for all the support which you continue to give to the amateur radio service which to those of us who are licensed, has a very special place in our hearts.

If I have missed anyone out with my thanks and the thanks of the RSGB, then please excuse the oversight.

MORE DEFENCE NEEDED
– more funding required

All UK radio amateurs should be aware of the importance of 1992 to the future of amateur radio. Two important events take place in 1992. Firstly, there is to be a major World Administrative Radio Conference in Seville, Spain. This ITU Conference could well affect the future of several amateur bands. Secondly, European Community harmonisation will take a further step forward. With that step will be more legislation which will affect radio amateurs - some good, some potentially bad.

Both of the above events will require much more effort from the RSGB to ensure, as far as possible, that any changes which take place do not adversely affect any major aspects of the hobby.

All of the extra work which will be involved in the lead up to 1992 will inevitably cost more money. We will need more meetings with the DTI, more internal meetings and greater participation with other national Societies and the IARU. At the end of the day we hope that the RSGB will be able to send at least one representative to the ITU WVRC itself, as the Society did in 1979.

As we start a new decade it is therefore timely to review the major work that the Society will need to undertake during the next 3-5 years, to take stock, to reaffirm the basic objectives of the organisation and to go forward with renewed enthusiasm.

Membership rates

Whatever work the Society undertakes for the overall benefit of its members, that work has to be paid for. In looking to the future therefore Council has decided that now is the time for membership rates to increase; in fact from 1 March 1990. It will have been 20 months since the last membership increase and thus 20 months of inflation needs to be set on to the existing rate. In the past it has been policy to increase rates by the amount of inflation accumulated each month since the last increase. However, since inflation is rather higher than anticipated and because it is likely to remain high for some time, and bearing in mind the essential and more complex work which needs to be done to preserve the hobby during the next decade, Council has elected to increase the basic subscription rate for home corporate members from £20.50 to £25.00. All other rates will increase by a proportional amount. However, Council has also decided to review all special concessionary membership rates as soon as possible.

Being a member of any Society implies that you want something from the organisation, but equally are prepared to give something as well - every collection of individuals in the World works in this way. Being a member implies that you do support the basic goals of the organisation and in the RSGB there are elections each year to determine the members of the Council whose job it is to decide the policy by which the objectives of the organisation may be achieved. Such policies must be well thought out and take into account a very wide range of national and international issues if they are to be successful.

The Society is particularly aware of the need to keep membership costs as low as possible, and for many years the RSGB fee has been increased at a rate less than inflation. It has, however, become evident that our income is inadequate to support the services required, and that it is essential to secure the Society on a sound financial basis with the routine costs of the organisation funded by the membership fee.

Other sources of income will not only help to maintain services, but hopefully also continue to improve them. Nevertheless if the cost of defending amateur radio proves to be more than expected then Council will need to turn again to members for support.

RSGB Services

Many members, over a thousand of them, have volunteered to provide direct help the Society - its members - in some way. It is not always possible for the Society to offer services only to its members and thus much of the work of the Society benefits the non-member as well. Services such as beacons, repeaters, licence reviews, negotiations for new bands and facilities, Morse testing, intruder watch, the observation service, reciprocal licensing, exhibitions, rallies, some contests, slow morse transmissions, Raynet, GB2RS, etc, benefit everyone. That is why it is so important for every single member to realise that by recruiting another member to the Society it helps to get better value for money and help offset further subscription increases in the future.

To maintain the environment which allows all of the above activities and more to take place, the interests of the amateur need defending on an increasing number of fronts, especially EMC, planning, spectrum abuse and frequency allocation. Society is changing, and the onus for solving many of the new problems is shifting from central government onto the user groups involved. Much of this extra work has fallen on RSGB, and it cannot be borne without support from the membership both in the form of finance and volunteer assistance.

As 1992 approaches, we are just beginning to see some direct effects of the European Community (EC) on amateur radio. It is therefore vital that UK amateurs' interests are represented to the European Parliament. The first steps along this route have been taken by the formation of an IARU working group of EC national societies in 1989.

Amateur radio is a collection of a large number of minority interests. Because of this, it is very easy to form the opinion that "the Society does very little for me". Much of the work we do has results which are not immediately tangible, or of a long term nature, but are nevertheless essential to the well-being of the hobby as a whole. The list of services provided by the RSGB is very long, but we have reproduced it here in order to illustrate the depth and diversity of expertise required in today's climate.

Morse testing, Special Event Station callsigns, letters of variation - packet, repeaters, beacons, licence revision, RLO scheme, EMC advice, planning advice, spectrum abuse, representation to DTI, representation at IARU, representation at WARC, books, RadCom, QSL bureau, insurance, Project YEAR, EC EMC directive, exhibitions and rallies, GB2RS news, propagation information, operating awards, technical advice, members ads, contests and news sheets.

RadCom is often thought of as being the only significant benefit of RSGB membership. It is therefore an interesting exercise to compare the RSGB membership fee with that of a subscription to other amateur radio magazines, bearing in mind that these provide few other services in addition to the magazine. Viz:-

Amateur Radio	£2.95 per month (£35.40 pa)
Wireless World	£1.95 per month (£23.40 pa)
Elektor	£1.70 per month (£20.40 pa)
Practical Wireless	£1.60 per month (£19.20 pa)
Shortwave Magazine	£1.60 per month (£19.20 pa)
Ham Radio Today	£1.50 per month (£18.00 pa)
Electronics Today International	£1.50 per month (£18.00 pa)

(NB Some of these publications are more expensive by post)

When all the other RSGB services are taken into account, it is obvious that the Society provides a great deal more than just a magazine, but for a similar cost. It is also worth noting that RadCom typically has 30-50% more pages than many of the magazines listed above, with each page containing a greater number of words and thus more information.

The facilities available to the amateur service are a privilege, and members must be prepared to pay a realistic cost for maintaining and defending our interests.

Callsigns on a plate

On 20 November 1989 the Minister of Transport (and local MP for Potters Bar) Cecil Parkinson announced details of the sale of so-called 'cherished number plates' for motor vehicles. Government legislation to permit the sale of personalized number plates has been delayed; it had been hoped that G plates with numbers lower than 20 would be released late last year, but mid-1990 is now the most likely time for the sale.

It's obvious that the possibility of radio amateurs obtaining their callsigns on number plates will come to pass later this year. The RSGB is currently in discussion with the DVLC, and we hope to be able to make a further announcement on this topic in a forthcoming edition of *RadCom*. In the meantime, it looks as though number plates in the series G1-G8 plus three letters will be on offer; unfortunately the number 0 and the letters I, Q and Z can't be included and neither will country prefixes such as GW, GM, etc at this stage.

Verdict - a step in the right direction, but we'd like to see further liberalization to permit all callsigns to be used as number plates in the future. At press time we had no information on costs, although they'll obviously have to be reasonable if the scheme is to prove popular. Watch this space...

RLO removed

At a meeting held on the 23rd of November 1989, the elected RSGB Council decided to terminate the position of Mr Ian Abel, G3ZHI, as liaison officer for South Yorkshire with immediate effect. This followed meetings and correspondence with Mr Abel in which Council conveyed its concern about a conflict between his work as an RLO and his other public activities. This related especially to his packet radio messages. Council also recognized that Mr Abel had made a genuine contribution as an RLO to the Society's work and has thanked him for it. Council requested that this information was publicised via packet radio and GB2RS.

This action causes a vacancy for the post, which will be advertised shortly. In the meantime, anyone interested should contact the Zone A Council member, Mr Geoffrey Smith, G4AJJ. His address is Greenacres, Sawdon, Scarborough, North Yorkshire YO13 9DY, and his telephone number is 0723 85212.

This Rwandan 'ambulance' typifies the problems facing local health workers

Hearts of Gold

On 12 May last year Ken Kirk-Bailey was tuning around 21MHz looking for some DX when he heard a call for medical assistance from 9X5KP in Rwanda. This call, and Ken's response, began what was to be a prolonged sequence of skeds, calls and monitoring involving amateur radio stations on three continents.

TRANS-GLOBAL HELP-LINE

9X5KP is located at Mugonero Bush Hospital in the north-west of the Republic of Rwanda in central Africa and was being operated by the hospital's administrator, Colin Richardson. Colin explained that the hospital's autoclave - an item of equipment used to sterilize surgical equipment - had broken down and no spares were available. The autoclave had been manufactured in the USA, and Colin asked Ken to see whether assistance could be obtained from America; a sked was made for two hours hence. Ken then began calling for stations in the New York area and Bill, W9DDP - an engineer from Chicago - answered. After having heard the story, Bill pointed out that it was Friday afternoon and that the chance of finding the part before Monday was remote; however, he would make some telephone calls and then, if all else failed, make the part himself!

A series of skeds and further calls followed and amongst those who appeared on the frequency was Smitty, W6ZJU. Smitty explained that he was a member of the Medical Radio Ham (MARCO) network and that he would try and find an autoclave and also an X-ray unit since the one at Mugonero had broken down some years previously.

APPEAL FUND

Meanwhile Bill, W9DDP, spent the weekend making a gasket and it was despatched by air mail to Rwanda. It arrived three weeks later and fitted perfectly - the autoclave was back in business. But the story was only beginning. Ken asked whether there was anything else he could do to help. It turned out that Samson, a young Rwandese boy, urgently needed hole-in-the-heart surgery but there were no facilities for it to be done. There was a chance that a French surgeon would perform the operation, charging only for air fares and hospitalization - could any money be raised? Ken made numerous calls to charities but without success - so he invited the local TV station to come to his shack and hear the story. It duly went out on the local news bulletin, but even this produced no results. A whole-page spread in the local newspaper did the trick, however, and the Rwanda Union Mission Appeal Fund was opened. To date the Fund has collected £5750, together with $4000-worth of medical equipment. Samson has had his operation and is apparently '. . .leaping about like a gazelle'.

Following his operation Samson was '...leaping around like a Gazelle'. *(Photos courtesy BBC)*

TV DEBUT

As a result of all this, Ken appeared on the popular BBC Television programme 'Hearts of Gold' late last year and the 'Bush Hospitals Foundation' has been set up. This is a registered charity which is actively pursuing fund-raising; it is actively recruiting radio amateurs who can help with donations, raise cash, collect supplies or equipment or arrange collection or shipment. If you can help, write to Bush Hospital Foundation, PO Box 338, St Helier, Jersey, Channel Islands or ring 0534 83772/24119.

What a super story - well done Ken!

Dataspace 89

During the final five days of the hottest July of the century, the RSGB and AMSAT-UK jointly held Dataspace '89. The venue was the University of Surrey, and a great deal of practical support was kindly given by the UoSAT team based there.

This was the first occasion on which a combined event had been held and it proved to be most successful. Dataspace '89 actually consisted of:

- The second annual Satellite Meeting
- The second RSGB Data Symposium
- The fourth AMSAT-UK Colloquium
- The first 'Satellites in Education' Day

The decision to combine the Data Symposium and the satellite colloquium was taken for a number of reasons but mainly because the two interest groups had a great deal in common. Not only was an entire day of talks devoted to the use of data transmission on amateur satellites, but it was acknowledged that there was a pressing need for international liaison within and between each field of interest.

More than 200 people attended the event from over 20 countries, ▷

including Japan, South Africa, the USA, Brazil and the USSR. The list of those from overseas included not only radio amateurs but also university lecturers and their students - underlining the educational benefits of amateur radio.

Lectures and meetings took place in several of the well-appointed lecture theatres at the University, one of which was (mercifully) air-conditioned. Amongst the subjects discussed were band-planning, the ethics of using amateur bands for non-amateur purposes, the future of the UK packet network, real-time uses for packet, digital signal processing, new satellites under construction (including those in India, Italy and Eastern Europe), a proposal to put a beacon on the moon and a report on the Skitrek polar expedition which was illustrated with slides. A guest speaker on the combined satellite/data day was Tony Seabrook, G3ZQB, who gave delegates a fascinating insight into the way the Greenwich Time Signal works and how the signals ultimately emerge from the loudspeakers of our radio sets.

In addition to the lecture sessions, there were trade stands, a DTI information kiosk and sundry book stalls. Two radio stations were operational (using special-event callsigns) and the conducted tour of the UoSAT control station was as popular as ever.

Part of the success of any international conference is a function of the social aspects of it. Most of those attending took advantage of the on-campus accommodation available - or at least used the University's restaurant facilities - so there was plenty of opportunity for delegates to get to know one another over a meal or the proverbial pint and to compare notes. On the Saturday evening Ron Broadbent, G3AAJ, hosted the now-traditional junk sale. Apart from all sorts of items for which 'junk' was perhaps too kind a word, there were some real bargains to be had - and the raffle prize consisted of a superb astronomical telescope.

All in all, Dataspace '89 was enjoyed so much by those who attended that another is projected for next year. See you there! *Proceedings of Dataspace '89 are available from RSGB HQ at £11.00 plus postage at the 900 gramme rate.*

CQ all 11 Sqns

Mr E G Knight of RAFARS tells us that 11 (F) Sqn RAF, which currently operates the Tornado F3 out of RAF Leeming in North Yorkshire, will be celebrating its Diamond Jubilee in 1990 and that RAFARS has been lucky enough to obtain the special callsign GB11SQN for use during the weekend 20-22 July 1990. Operation will take place on 3.5, 7, 14 and 21MHz, together with SSM and FM on 144MHz. Former members of 11 Sqn who are attending the festivities and wish to assist with the running of the station are invited to contact G4NVD, QTHR.

The Squadron has invited every other '11 Sqn' in the world's air forces to join in the celebrations, and it is hoped that there will be some amateur radio operators amongst them. Operators from the local RAFARS branch will also be assisting. A special QSL card will be available.

More information from G4NVD.

Slow-scanning to the States on 50MHz

As reported in 'Spectrum Analysis' in this issue, Paul Turner, G4IJE, made what may well be the first-ever 50MHz SSTV contact with the USA at 1320 on 22 November 1989. This super pic shows what Paul received from Dave Faucher, WA1UQC (FN31) on 50.23MHz. Dave was running 300W to a 6-ele Yagi at 50ft and a Robot 1200C scan converter. Paul used a TS660 and homebrew RGB framestore; all the SSTV signal processing was done via a BBC micro. Well done, both.

We hear that two-way SSTV contacts also took place over the following two days between Dave and G3NOX, G1LXI and G4IJE, with what amounted to a four-way SSTV 'net' at one stage!

Esperanto on the air

Barry Foreman, G0EXS, the British representative of the 'Internacia Ligo de Esperantistaj Radio Amatoroj' tells us that GB0UKE duly took to the air from the 1989 International Conference of Esperanto in Brighton (see page 11 of the July 1989 *RadCom).* The chosen callsign had nothing whatsoever to do with George Formby but represented 'Universala Kongreso de Esperanto'.

A total of 183 contacts were made, including 35 in Esperanto. The station was set-up and operated by ILERA members, and contacts included one with the president of ILERA - Gennadi Jaskov, who lives in Central Siberia - and also one with the secretary, Laci Matusinka, in Hungary. The Conference was attended by 2,400 people from 54 countries - and not a single interpreter was present, since of course none was necessary! In fact GB0UKE was installed in the 'Interpreter's Rest Room' since this is not required at an Esperanto conference.

Barry Foreman's address is 10 Wilmington Close, Brighton BN1 8JE, and he will be pleased to reply to any enquiries about Esperanto and membership of ILERA.

14/28MHz Beacon Project

In order to assess the accuracy of HF propagation predictions, the Propagation Studies Committee of the RSGB is seeking volunteers (SWLs as well as licensed operators) who are willing and able to provide regular and extended reception reports on the audibility of the world-wide network of amateur beacons which transmit in the 14 and - especially - the 28MHz bands.

Details of the observations required, together with a supply of reception report log-sheets, can be obtained by sending a large SAE to Dr C P Conduit, G4KCZ, at 1 Nutmead Close, Bexley, Kent DA5 2DT.

Awards news

Ian Cornes, G4OUT, the VHF/UHF awards manager, has been busy again. On 25 October he issued 1296 Standard Transmitting Award number 81 to John Hunter, G3IMV. Together with John's 144MHz Senior Award no.12 and 430MHz Senior Award no.139, this qualified him for RSGB Supreme Award number 75. John also updated his confirmed 144MHz squares total and has received the first certificate for 350/45, 375/45 and 400/50 squares/countries.

Two 'firsts' were issued to Neil Carr, G0JHC, for 30 countries on 50MHz and 75 squares on 50MHz. Another 'first' went to Jack Brooker, MBE, G3JMB/P in the shape of a 10GHz/10 squares award and John Stace, G3CCH, took another for 125 squares on 50MHz. Finally, Allan Wyatt became the second recipient of a 10GHz/10 squares award when his application arrived four days after G3JMB's claim!

Certificates have also been issued to the following:

50MHz 10 countries (two-way):
P D Roberts, GW6AYM (24)
50MHz 10 countries (two-way):
S J Green, G1INK (25)
50MHz 30 countries (two-way):
J Stace, G3CCH (2)
50MHz 50 squares:
B Jackson, G1YNR (6)
50MHz 25 countries:
C Hinton, G1TCH (8)
144MHz Standard Transmitting:
A S Challen, G6DTW (772)
144MHz Senior Transmitting:
R Reynolds, G6WEM (287)
430MHz Standard Transmitting:
M Dickinson, G0DTI/P (244)
430MHz Standard Transmitting:
A S Challen, G6DTW (245)
144MHz 125 squares/20 countries:
J M Hoban, G0EVT (41)
144MHz 150 squares/20 countries:
J M Hoban, G0EVT (25)
430MHz 40 squares/10 countries:
P Arnold, G4NPH (56)

A nice-looking certificate featuring the Boeing E-3 Sentry AWACS aircraft arrived on the editorial mat the other day. This turned out to be the 'Worked RAF Waddington Club Members Award' which is apparently "...designed to promote the club and encourage on-the-air activity between club members and all other radio amateurs". The award is available to all licensed amateurs and SWLs who have heard or made simplex contacts with 25 club members on or after 6 November 1989. To claim the award, log extracts should be sent to the club secretary, Dave Bloomfield, G0KUC, at 8 Sunningdale Drive, Boston, Lincs PE21 8HZ. Extracts must include callsign, date, time, frequency, mode and the club membership number of the station worked. Submissions must be verified by two licensed amateurs. The award costs £1, and a list of RAF Waddington club members is available from G0KUC on receipt of an SAE. Let's hope the E-3 doesn't go the same way as the AWACS Nimrod and they have to reprint all the certificates...

Dave adds that the Club meets every Thursday at 1900 and all are welcome - more info from himself at the address above.

Radio at the Norman Lockyer Observatory

The Norman Lockyer Observatory on Salcombe Hill, Sidmouth, Devon has been purchased by the East Devon District Council, and after restoration it will be developed as a leisure and educational centre. The official opening ceremony was performed by Dr Patrick Moore on 28 October 1989.

Day-to-day running of the site will be carried out by the Sidmouth & District Astronomical Society and the Sidmouth Amateur Radio Society, G0AXC, as joint trustees. Sidmouth ARS has use of a meeting/lecture room in a newly-built block on the site, together with sole use of the radio room. A 30' tower has been erected for their antennas.

At the opening ceremony, Dr Moore showed great interest in the amateur radio facilities as well as the astronomical equipment. The RSGB was represented by Peter Chadwick, G3RZP, the Zone D Council member. Unfortunately, storm-force winds on the day meant that the tower had to be kept lowered and very little operation was possible.

Sidmouth ARS is very fortunate in having the use of these premises in a prime location 500'asl and will be pleased to welcome all interested amateurs - especially those on holiday in the area - at their meetings on alternate Tuesday evenings. For more information about the club, contact the secretary, Paul Kent, G1EEK, at 42 Peasland Road, Sidmouth.

(Above) Dr Moore unveils the plaque at the observatory. (Below) The co-sited Sidmouth ARS shack.

New home for old club

After no less than forty years at its previous venue, Stoke-on-Trent Amateur Radio Society (SoTARS) has now re-located to the Rose and Crown public house in Etruria. Meetings now take place on Fridays at 7.30pm. The club is currently preparing a list of future activities, and would like to invite both long-standing and prospective members to visit them in the new location. For more information, contact Dave Wroe, G1MLU, on 0782 639476.

QSL bureau news

The new sub-manager for GI2, GI3, GI4, GI5, GI6 and GI8 Class A callsigns is Mr A Higgins, GI3YMT, 1 Cairnshill Park, Cairnshill Road, Belfast BT8 4RG. Mr Higgins took over as of 1 December 1989 following the retirement of Mr R Parsons, GI3HXV, after many years of excellent service.

Eric Simpson, G3GRX, writes "Having taken over the G3EAA-G3HZZ sub-bureau a couple of months ago, may I make a few observations? Having been on the air for 43 years, I realize the importance of QSL cards - although to some they are a nuisance they can do without. Some points worth bearing in mind are:

1. If you collect QSLs, please keep a supply of SAEs at your sub-bureau.
2. Please keep the envelopes up-to-date with the current postage (I have some envelopes with 9p stamps on them...)
3. I have more than 1400 QSL cards on hand waiting for owners. After six months, I regret that they will have to be disposed of in order to make some room. Some are a collector's delight.
4. Please do NOT send me your outgoing cards; I have received three batches in the past week. I have to spend postage in doing what you should have done - sending them to G3DRN.
5. If you do not wish to receive cards, please let the appropriate sub-bureau know so that those addressed to your station can be discarded on the first sort.
6. All sub-bureau volunteers would appreciate a little co-operation to make the job easier!

I know that these things are regular moans from those who are concerned with the QSL Bureau, but I hope a reminder from time to time will make life a little easier all round."

Amateur licence fees frozen again

For the third year running, the annual fee for an amateur radio licence remains unchanged at £12. This is at a time when fees for a variety of other radio services - notably in the aeronautical and fixed services, together with PMR - have been increased. According to a DTI press notice dated 1 November 1989, in which the DTI announced the new fees for all types of radio licence, the amounts involved are set at levels which aim to produce sufficient income to "...cover relevant costs". The fee changes reflect the Government's objective of encouraging efficient use of the radio spectrum by more fully reflecting the cost of spectrum used.

Our licence charge seems highly reasonable when it's compared with that for your local friendly Transmitting Earth Station - a cool £22,000 per annum. Even a humble Fixed Radio Relay Link licence will involve somewhere between £150 and £575 worth of QSB in the wallet. Not bad when you consider the enormous range of frequencies and facilities available to the likes of us. In actual fact, the amateur licences (A, B and Repeater/Beacon) are by far the cheapest of all those issued, apart from the CB licence which also costs £12 but only offers one mode on one band.

Stockport club

We seem to have inadvertantly given the Stockport Radio Society a bad time in these pages recently.

For the record, we'd like to make it clear that *the Stockport Radio Society meets at 7.45pm at the Dialstone Centre, Lisburne Lane, Offerton, Stockport on the second and fourth Wednesdays in each month. More information can be obtained from John Verity, G4ECI, on 061-439 3831.* This replaces any information we've published in previous issues about the Stockport club, and we apologize to their members for getting it wrong.

OK1CZ visits BRATS

Petra Doudera, OK1CZ - who is an RSGB member and runner-up in the Christmas Quiz a couple of years ago - recently visited the UK as a guest of G3VTT. He was invited to spend an evening with members of the Bredhurst Receiving and Transmitting Society at their Parkwood Community Centre meeting-place. Petra is a leading Czech QRP operator and is also well-known in FOC and DXCW circles. He played a major role in forming the OK-QRP Group and arranges G-OK low-power tests for the G-QRP Club.

In recent years Petra has obtained an FT101, which he has extensively modified to improve its performance. For portable operation in the mountains to the north of the country near the Polish border, Petra has built a 600mW direct-conversion transceiver; this is used for regular QRP contacts with the UK.

At the end of the meeting Petra was presented with a pair of headphones and a digital clock, along with a year's subscription to *Ham Radio Today (some mistake surely - Ed).* Bredhurst club secretary G0KSY added "...From all members of BRATS, we send our best wishes to him and his family, it was our privilege to have met a true representative of amateur radio." And so say all of us.

Getting the Best from GB2RS

Come Wednesday morning, we sometimes start entertaining dark and unworthy suspicions to the effect that those who send in information for inclusion in the weekly GB2RS broadcasts don't ever listen to the content of any of them. As this is being written, I'm looking at a transcript of a rambling message left on the GB2RS answering machine about a rally taking place somewhere in a corner of England. It absorbs three-quarters of a page of A4, and to broadcast it all would a) take about four minutes b) send the listeners to sleep and c) leave no space in the main news for anything else.

Actually, the GB2RS telephone line is really only for *urgent* last-minute news like a change of venue, or some other dramatic happening such as a major auroral opening on the previous Tuesday evening. It's far better - and makes our lives ever so much easier - if club secretaries send in their programme on paper well in advance. That way we can programme it well in advance and there's less chance of it being missed.

Can we re-state a few ground rules about the GB2RS broadcasts and how to get material on them?

1) Club news is always read out by area and in a standardized format. The format is designed to be as intelligible as possible on a noisy frequency and to make use of the brain's ability to fill in gaps if it has a good idea of what's coming. So the information always appears in the same form, viz.

'Steeple Bumpstead Amateur Radio Society meets at 7.30pm in the Tumbledown Hotel, Queer Street for a talk on widget manufacture by G2XYZ. More information is available from G9WXY on 0123 45678'

Occasionally we'll add that this is a change to the advertised programme or a change of venue or something similar. Ideally, that's also the format we'd like the club news in as well - especially if you really must use the answering machine to tell us about a perfectly routine club meeting. We'd much rather you didn't do that, as we've said - *please* let us have a few lines in writing, or even down the fax, telex or E-mail.

We'd also be delighted (and relieved) if those who send in cards and other news items would grasp the fact that practising clairvoyants are a bit thin on the ground in south-east England. We need to know WHEN, WHERE and at WHAT TIME your meeting takes place - and it also helps if we know which club is having the event you're telling us about. You'd be astonished if we reproduced in these pages some of the cards which get sent in. Missing venues, missing times, missing dates - and, believe it or not, sometimes people even forget to tell us which club they're writing on behalf of!

The other thing is that it's no good at all having a PRO or secretary who isn't on the phone or who won't take calls. We want to be able to say in the broadcast 'More information is available from G9WXY on 0123 456789'. It's a total waste of time merely saying that information is available from G9WXY, since hardly anyone will know who he or she is and where they can be found. Equally, we might need to be able to get hold of G9WXY ourselves to check up on some point that's been missed from the card. If we can't, another news item gets left out of the broadcast - and that's when the fur starts to fly.

This factor, incidentally, is behind some of the complaints we get about why your club's information didn't feature in a particular broadcast. There was a case recently when we received a blistering letter from a northern club's PRO demanding to know why their item hadn't been included. It accused us of everything from censoring news originating from clubs north of Watford to total incompetence, and apparently the club's members were preparing to resign *en masse* from the Society in protest. When we dug up the yellow card, we found that:

a) the person concerned hadn't actually told us which club it was that was meeting in an unspecified venue at 7.30pm on a particular Tuesday evening

b) he hadn't given a name or contact from which we could have divined the missing information

c) we'd even tried to read the postmark on the card and match the handwriting to some we'd seen before - with no success. Since the event in question had been a construction contest, there also wasn't the name or callsign of a speaker or lecturer for us to check with.

The moral is, please make sure you do your bit before you take a swipe at us for not doing ours.

2) We broadcast most real news we receive, but because of the pressure on time it's often necessary to be ruthless about what information we can transmit. For instance, a school recently sent in a feature about its amateur radio station, which was very interesting - but the writer asked whether we would consider including it in GB2RS. If he'd ever bothered to listen to a broadcast, it would have been obvious that the answer was no - it's a news broadcast, and we already have a job getting all the club news into it. Same with special-event stations. You might get a one-liner in the main news but - unless it's highly unusual or very special - there simply isn't room in the broadcast for a minute's-worth of great detail about why you're running GB2ZZZ, who is in charge of it, what bands you may or may not be on and where people can get QSLs from, etc, etc.

3) We often get hopeful club secretaries asking us to mention a club event on three or four different broadcasts, and they get peeved when we only transmit it once - usually the week before the event. The rule is that club news is only transmitted once, as indeed is almost all news; there are exceptions (at the Editor's discretion) but these usually only relate to ongoing events, major rallies and conventions or other big stories.

4) The Editor also reserves the right not to broadcast the fact that the Steeple Bumpstead Amateur Radio Club is having a natter night or a social evening - or whatever the local euphemism for getting together and not doing very much apart from having a pint or two happens to be. We'll be delighted to tell the world that you're having a talk about something, visiting somewhere or having Morse or RAE classes, but there simply isn't the broadcast time available to do anything else. As a matter of fact, it's quite surprising to see how many clubs seem to have a programme consisting of nothing except Natter Nights or Free and Easy Evenings week after week. Why not try and find a local lecturer, or even poach someone from the next club? How about a construction evening, now that winter's nearly here? Or even an indoor foxhunt - we took part in one at a club a few months ago and it was a riot from start to finish.

5) PLEASE - please - try and have a bit of forethought when it comes to sending material for transmission. It takes hours and hours to transcribe the text off the answering machine, and it's far more cost-effective from our point of view if our hard-pressed staff could do other things with that time. Do try and send in any information on paper - or by fax, telex or whatever - rather than rambling away for ages down a crackly telephone line.

6) Finally - before you send in your next item for GB2RS, take a listen to a Sunday broadcast and see how we go about it - then send in the information in a similar format. You'll earn our undying gratitude and avoid a lot of confusion!

Want DUBUS?

Ken Hatton, G4IZW, is the UK agent for the thoroughly excellent DUBUS magazine - you know you're getting somewhere on VHF and UHF when your callsign makes it into their columns - and he advises us that subscriptions for 1990 are now due. However, Ken says "We are only able to guarantee delivery of DUBUS when subscriptions are paid on or before 31 January in any year" so write straight away if you're interested. DUBUS now has a new format, which embodies many more English-language items, and the presentation is quite a bit better.

Subscriptions cost £8.75 including UK delivery - send a cheque for this amount made payable to K Hatton (Account 2) at Hamilton House, Boat Road, Bellingham, Hexham, Northumberland NE48 2AP. Please enclose an SAE if a reply or receipt is required.

Icom equipment goes walkies

A plaintive fax message from Icom (UK) on 9 November last year said "Recently it has become apparent that persons unknown have decided that Icom equipment is worth owning. This is a very commendable decision. Unfortunately, they also decided that paying for it was not on the agenda.

"Stolen from the Icom stand at the Leicester Show: IC-2SET s/n 835001082 and IC-4SE s/n 802001021.

"Stolen from a car at the Leicester Show: IC-2400 s/n 783001034.

"Stolen from Raycom, West Midlands: IC-4SET s/n 809001049, IC2SE s/nos 785003925, 785003926, 785003930, IC-32SE s/nos 718003874, 718003939.

"If any readers have been offered any of the above transceivers or have purchased them privately, please check the serial numbers against the list above. I am sure the legal owners would be grateful."

Anyone who comes across any of the above is invited to contact Dennis Goodwin of Icom UK - telephone 0227 363859, fax 0227 360155 or telex 965179 (ICOM G).

Running a special event station?

Some minor changes concerning applications for special-event station callsigns came into effect on 1 December 1989. Anyone intending to operate an SES after that date is advised to obtain a new-style application form. Please send an SAE to RSGB Headquarters, marking your envelope 'MSD (SES)'.

New products

First off the heap, **Qualitas Radio** of 23 Dark Lane, Hollywood, Birmingham B47 5BS, sent in a leaflet about some high-performance VHF/UHF GaAsFET preamplifiers made by Landwehr Electronic GmbH of West Germany, for which they're the UK agents. The 145MA and 145MAS are for 144MHz and feature noise figures typically less than 0.5 and 0.35dB respectively, with gains between 17 and 20dB and a 3rd-order input intercept point of -3dBm. Both handle 750W of through power. The 430MHz version, the 435MA, has a typical noise figure of less than 0.9dB and gain of between 16 and 19dB, again with a third-order input intercept of -3dBm; power handling is 350W. All are waterproofed to IP65 (see last month's 'In Practice' if you've forgotten about IP ratings) and use proper N-type connectors. The write-up of various aspects of preamp performance and stability in the accompanying literature is well worth a read, even if you don't buy the product as a result! Prices quoted in the literature, which we received early last November, are £113.36 for the 145MA, £130.88 for the 145MAS and £135.81 for the 435MA, all plus £3 for carriage and packing - but we wouldn't mind betting that they'll have gone up a touch by the time you read this, since the pound was going in for deep QSB against the Deutschmark as this was written. Qualitas Radio are on 021-430 7267.

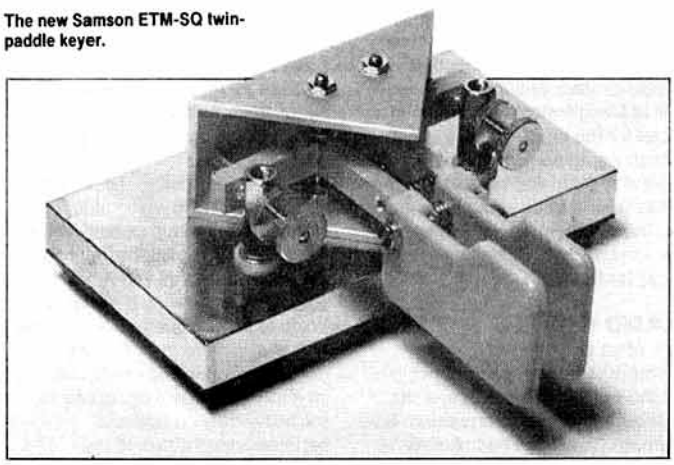
We seem to have found our way on to the mailing list of the **CushCraft Corporation**, which is nice. CushCraft is an American company which makes a wide range of HF, VHF and UHF antennas; we're not sure who the current UK agents are (it could be HRS, although we couldn't get through to them to find out) but their products are always well worth a look. They've just introduced the D3W rotatable dipole for the WARC bands, which apparently "...features high-Q traps, heavy wall tubing and rugged stainless steel hardware for years of enjoyment. It is rated for 2kW PEP, is 34 feet long and weighs 11lb. The antenna easily mounts on any mast from 1½ to 2" in diameter". Their other new product is the 'Ten-3' three-element 28MHz Yagi which "...offers 8dB forward gain and 25dB front-to-back ratio ...it has an 8ft boom and the ReddiMatch system provides a 50Ω feed for a standard PL259 connector. The antenna is rated for 2kW PEP". Try HRS Electronics - otherwise CushCraft are at PO Box 4680, 48 Perimeter Road, Manchester, NH 03108. Telephone 0101 603 627 7877 from the UK.

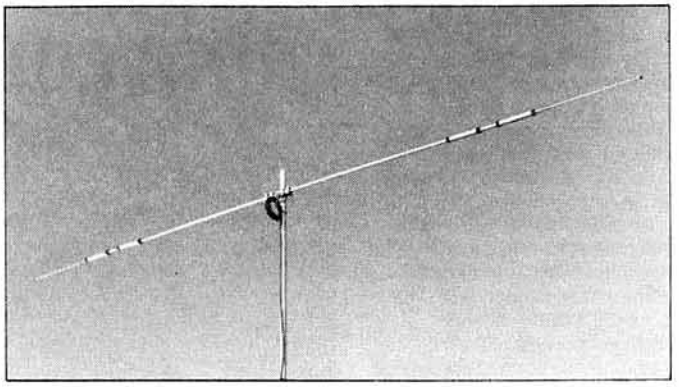
Cap.Co Electronics have introduced three new products recently - the SPC-100 antenna tuning unit, the AS-305 antenna switching unit and the AMA-200 HF/VHF receiving antenna. The latter is said to cover 1.8 to 180MHz with no gaps and occupies a space of 1.7" × 7"; it costs £125. Cap.Co are at Unit 6, Peel Road Industrial Centre, Peel Road, West Pimbo, Skelmersdale, Lancs WN8 9PT and you can ring them on 0695 27948.

Samson electronic keyers are very well known and also highly reliable and durable - we've had an ancient ETM-2b in the editorial shack for the past fifteen years or so and it's given yeoman service despite heavy use and the occasional thrashing on CW contests. The sole agent for them in the UK nowadays is Frank Watts, G5BM, who's been an RSGB member for more than fifty years and advertises regularly in the classified ads section of *RadCom*. Samson keyers are made by Funkgerate M Samson of West Germany, who have been manufacturing them for 24 years; the firm is run by Hermann Samson, DJ2BW, who is a well-known and active FOC member.

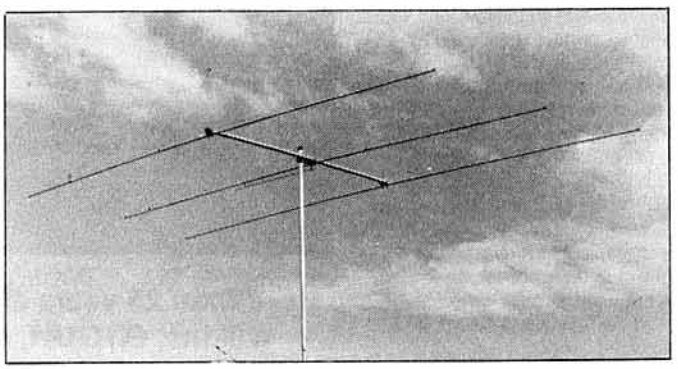
The latest Samson product is the ETM-SQ twin-paddle key, which features individually adjustable solid-silver contacts for gap setting. Frank tells us that "...The key assembly is mounted on a heavy plated solid steel base, giving a total weight of slightly more than 1½lb. Paddle spring tension is adjustable, and steel point pivot and cup bearings result in extremely low friction, giving a very light 'touch' in operation. In addition, the steel cups are adjustable to take up possible eventual wear." The ETM-SQ costs £35.00 plus £2.70 postage and insurance and is available from Frank Watts at Woodland View, Birches Lane, Newent, Glos GL18 1DN - you can ring him on 0531 820960. We've asked him for more info on the rest of the Samson range, incidentally, so look out for that next month.

The new Samson ETM-SQ twin-paddle keyer.





Cushcraft's new D3W WARC dipole (above) and 28MHz 3-GLE YAGI.



We made a bijou blunderette last time when we said that we hadn't heard of **Bricomm.** I was cuffed smartly about the head by the Editor, who pointed out that they'd regularly exhibited at rallies (including our own Woburn) and had been in existence for a number of years. The proprietor, G3ZUM, also wrote in to say much the same thing! He said "Lest other members may not know of what my company produces, here is a brief resume:

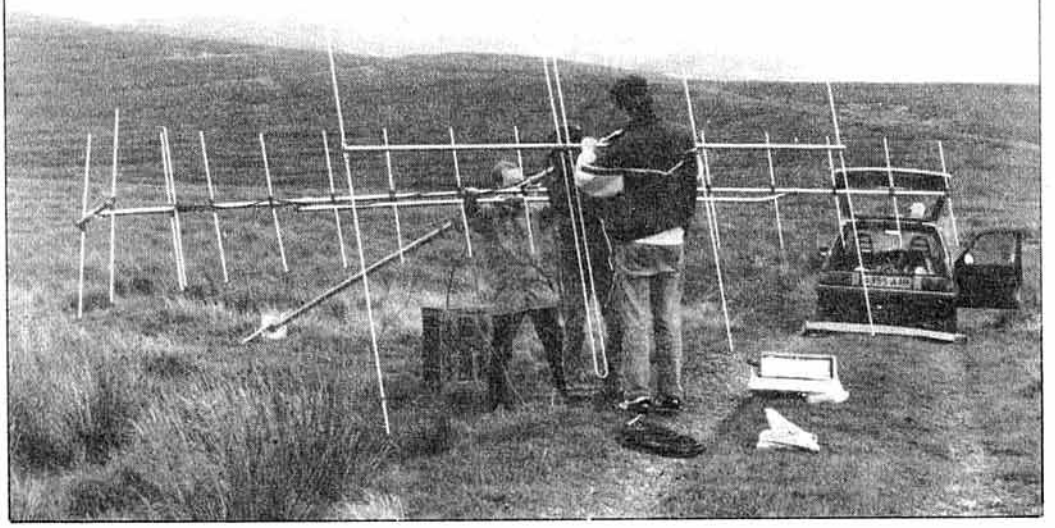
"HF wire antennas - G5RVs, trap dipoles, Windoms Antenna traps for 3.7 and 7.1MHz Antenna accessories - centrepieces, 1:1 and 4:1 baluns, wire, insulators, feeders, anti-TVI filters and polypropylene rope. A quiet, safe tuning aid (not a noise bridge type), low-noise masthead preamplifiers and controllers."

"Perhaps you would be kind enough to include a further item in New Products."

Done, sir, and we're sorry we didn't recogize you before. We've also been offered a copy of the 'Swisslog' software which we mentioned last time for review, which we've gratefully accepted and which we'll be reporting on in a few months' time - assuming that our ancient 4.77MHz XT will cope with it without exploding, that is!

Another piece of interesting software is PC-Monitor - a control program for the IBM PC and the Yaesu FRG-8800 receiver, which is now available from G4SGI. In this, the RS-232 port of the PC (either COM1 or COM2) is used to send commands to the FRG-8800, using the latter's optional FIF-232 interface. The program allows 1000 'commented' memory channels to be read into memory and scrolled manually or automatically. Tuning is either via direct keyboard frequency or by using the arrow keys. A logbook and 'numerous other facilities' are provided. Cost is £25.00. There's also a 'Database of HF radio stations' available, which contains more than 1400 entries and is 'compatible with PC-File+ 2.0'. The press release says that "...The database allows selected stations to be recalled so that (for instance) only HF broadcasters active at 1800 UTC in English are listed. Other selections are possible..." The database costs £15.00, and PC-File 2.0 is also available at £5.00. G4SGI also does some interesting-sounding logbook software for both amateurs and SWLs. Contact G4SGI, who is Simon Collings, at 'Southwold' Harnham Lane, Withington, Cheltenham, Glos GL54 4DD.

NINE COUNTIES DXPEDITION



More than 25 years after the original nine counties event, Richard Wilkins, G1GUH, and cohorts from Birmingham University followed in their forebears' footsteps.

Birmingham University Radio Society ('Radsoc' to its friends) is fortunate amongst similar groups, in that it enjoys both a well-equipped shack and a healthy membership. A range of trips and events are organised, but recently the undergraduate members were looking for something 'different' to do, when we came across an article [1] published following a VHF DXpedition undertaken by Society members in September 1962. The trip took GM3IUB/P through operation from nine of the old counties on the border between England and Scotland.

A repeat of some of this expedition was suggested, and with just a few months dominated by exams left, a group of four members committed themselves. Three of the team were undergraduates; myself, G1GUH, the Club Chairperson, Carlton, G7DVW, the Treasurer and Ken, G7DWV, the Secretary. The line-up was completed by Andy, G1ZTX, the immediate past chairperson. None of us were born at the time of the original trip, back when full AM or CW were the usual modes on 2 metres.

After exams, everyone soon dispersed around the country, either going home or to vacation jobs. As a result, the trip was co-ordinated by fax machine and telephone. Such a short planning phase kept up our motivation but led to some problems; oh well, maybe next year...

The Society has enough gear to form the nucleus of a good 2m station; this was the only band used by the original trip, but we were keen to try 6m, and we are indebted to John, G4MTG, for the use of his 6m equipment. The 2m station consisted of our trustworthy Yaesu FT221R (with Mutek front end), followed by a Microwave Modules 100 Watt linear. On 6m we used an IC202S to drive a MEON transverter with homebrew linear. Jaybeam, who also provided aerials for the original trip, generously loaned us 16 element and 4 element Yagis, for 2 and 6 respectively. These performed extremely well and did not appear to suffer at all from being assembled and disassembled more times in one week than the average antenna is in its whole life. In fact we liked the 2m Yagi so much that we have since bought it, to replace our old 8 element portable beam.

All the other gear needed was collected together during the month before the trip, and flight cases and insurance were arranged.

Being a student group has many advantages, such as a three-month summer vacation, but relative youth also has disadvantages, including the inability to hire suitable transport, such as a minibus. This meant that the expedition was undertaken in two hatchback cars, each insured for only one driver.

FOUR-GUY ARRANGEMENT

About a week before departure, we all met up again in Birmingham. This session resulted in a review of the portable mast equipment after a guy line became detached during our tests, resulting in the mast coming down rather fast! The old metal wire guys which tended to tangle, were replaced with synthetic rope guys, and following advice from G4FPI, the opportunity was taken to go from a three-guy rig to a four-guy arrangement. Using four lines allows the mast to be raised so easily that we kicked ourselves for not having thought of it before. The significance being that three of the lines can be in position and their lengths set, prior to lifting, the fourth guy being used to raise the mast. The other modification was fitting a loop of chain to the mast base, which could be pegged to act as a crude but effective hinge. The whole mast with beams could now be raised by one person, the hinge stopping the base from slipping. Simple when you know how!

The DXpedition properly began when we met up on Friday 25 August at my University flat; we all felt a little shocked that everything had actually come together. The next morning we set off early enough to get out of the city and onto the M6 without being delayed by the work going on to prepare for Birmingham's Super Prix weekend. One of our team had a family event in Manchester to attend, so we planned to find a reasonable radio site and camp; however, the National Park on the Yorkshire/Derbyshire border does not permit camping away from sites, and so with only one vehicle for that evening we had to camp and operate from a camp site. Unfortunately, the chosen site was screened by mountains, and just a handful of contacts were made before the mast had to be lowered at 11pm in order to comply with the site regulations. The location did, however, have good points, and we were all amused when a camper, who had been studying the 16 ele, commented on the lengths some people will go to in order to see *Neighbours!*

Next day, with both cars once again, we set off for the first site from the '62 trip. Bootle Fell looked very promising, and after a quick look we went to find a camp site, having decided that all our radio sites were going to be too exposed to camp at. A pleasant site near the sea was found and it was here that an unexpected problem arose. The tent had been borrowed as a 'five-man tent' from a local scouting group contact, and it had seemed full at Manchester with Carlton in a hotel for the night. Whilst five cub-scouts could perhaps have slept across it, there was no way that four adults could sleep along its length. So from then on, whenever we camped, somebody had the back of a car for the night.

LAND RIGHTS

It is often emphasized that the amateur radio licence does not give us the right to operate from a site without the owner's permission, but perhaps naively we had planned to find, say, a public view point car park, as the Bootle Fell area is in a National Park.

However, there were no National Park notice boards, and as many tourists were pulling off the road, we did the same. This location seems to be doomed for Radsoc, as on the '62 trip the PA stage had failed here; on this occasion we were visited after about an hour by a very irate gentleman, who I suspect had come across less than well-behaved amateurs in the past. He advised us that we had to leave at once as he, and twenty-five other commoners, had exclusive land use rights, dating back many centuries. We later found out that this would have been very hard to discover from Birmingham, and that had we done so, to gain permission needed the unanimous agreement of the commoners who only meet once a year. Clearly, prospective DXpeditioners can't start planning too soon. We will certainly give this aspect more thought next year.

After some rather heated discussion, Andy's skill as a negotiator won the day and an agreement to 'turn a blind eye' was reached.

So G8IUB/P took to the air again. Many good QSOs were made, including one with a station on the Isle of Wight, but Bootle Fell had not finished with us yet. After packing away we could not get the Volvo to start. It is a source of some embarrassement to us that we (three electronic engineers and a physicist) could not rig up one of the heavy duty commercial batteries which powered the

station, to start the Volvo, which was only suffering a flat battery. At 3am our ingenuity was rather thin on the ground, and as the Volvo's position prevented a push start, we all squashed into the Metro and went back to the camp site, returning the following morning witha set of borrowed tractor jump leads.

The next site, at the foot of the Mull of Galloway Lighthouse, took us over the border into Scotland. The site is about as far south as one could set up a radio station in Scotland, but to get there we had to drive around the Solway Firth. This day really showed the disadvantage of not being able to change over drivers as both Carlton and I really felt the strain; for this reason, and because the radio site and camp site were both good, we decided to stay for two nights. The weather on the first night was not good; the rain was... wet, but the wind caused us real problems. It made the beams move so that we lost stations in what at first was thought to be deep QSB! It also made the generator hard to re-fuel. We had put the generator near the cliff edge, away from the cars in order to keep the noise down, this being a very exposed position; when it ran out in the small hours, more petrol went on me than in the tank.

To compensate, conditions were quite good, with the tail end of an aurora when we began. By 1am we had worked a satisfying number of stations, including QRP operators in the south of England. As we packed away the fog began to drop, and with the rain worsening we put the more robust gear over the lighthouse wall without dismantling it, and headed carefully back to the shelter of the camp with the more delicate gear. To round the night off, I cut my hand open whilst moving the gear so that I could get room to sleep in the car.

POWER PROBLEMS

The day without travel was not wasted. Firstly, we all caught up on sleep. The 50MHz gear had been tested on a bench PSU in Birmingham but had been all but useless on the trip thus far because the RF sensing circuit was playing up and making the transverter drop in and out, chopping up all but the most continuous of speech. A little experimenting revealed that the unit worked quite happily on 13.8 Volts, but did not like the 12 Volts provided by the commercial batteries which we used to power all the rigs. We had four of these, two of which were used each night, the other two being re-charged by a pair of chargers supplied from the generator.

The problem with the transverter was solved by float charging one of the batteries when we were transmitting on 6m in order to keep the Volts up a little. The reason for using batteries in the first place was that it provided a clean supply to the rigs, which were all 12 (or 13.8) Volts anyway, so it eliminated the need for a PSU which would have left us without power if it had failed. In short, we could have operated for a day even if, say, the generator had failed. This strategy worked well, except that the bad weather on the first night at Galloway prevented us from charging the batteries we had flattened at Bootle Fell. The camp site owner kindly gave us the free use of a couple of 13A sockets in one of the empty caravans. So, by late afternoon, the big batteries and the Nicads for our hand-helds were all fully charged. Indeed this happened faster than we expected. When we put a voltmeter on the sockets in the caravan, the mains supply was over 280 Volts. All the other gear was looked over during that day. In contrast with the 6m gear, the 2m station was behaving fine, even on low voltages. When Andy had received a comment that we were drifting a little the night before, a voltmeter was produced and the on-load voltage was down to 5 Volts! After this we always had a meter in parallel with the batteries during operation.

The weather on the second night at Galloway was better. By now we had a number of stations who were working us every night. For the first time we were able to use 6m seriously.

Todhole Hill, showing the station being set up (opp page) and in operation (below). Calm conditions allowed both aerials to be used.

A NIGHT OFF

The next day the objective was Lowther Hill, but access problems arose and we phoned one of our regular contacts, G4MTR, to get the word put out that we were having a night off. Cheers Don. Nobody was sorry to head back to a comfy bed and breakfast after a couple of hours in the local pub.

A chat with the local police yielded a good alternative site, quite close to that used by the '62 trip, and so Thursday saw us setting up at Todholes Hill, south-west of Lanark. A good number of QSOs were made under flat conditions including many contacts with friends from earlier in the week.

We moved further east for Friday's site, on the Lammermuir Hills, south-east of Edinburgh. The only problem here was finding a convenient camp site. Eventually, having asked the farmer for permission to operate from his land, we asked if we could camp there too. We really hit lucky, because the farm holiday cottage was empty, and this was both pleasant and cheap. Operation was successful as well. One highlight was contacts with two members of the '62 trip, one of whom had been an SWL at the time, and had since got his licence. Having phoned most of the '62 trip to invite them on the air, it was rather embarassing for me when the station I told off for attempting to get through the pile-up by sending his call in morse over the top of a weak phone station, proved to be G3NAQ, another operator from the original expedition!

So, regretfully we closed down for the last time in Scotland and headed back to the cottage to watch James Whale on TV and warm up with mugs of tea.

HEADING SOUTH AGAIN

The next day we headed south again, setting up camp at the same spot near to Manchester, as we had at the start of the week. This time, however, we had both cars and so we headed up into the hills, to a car park near the BBC Holme Moss transmitting station. This should have been a great site, and with a contest on there were certainly loads of stations on the air. It is sad that more people cannot follow the simple advice given in *RadCom*, regarding the linearity of PA stages. As a DXpedition station, we felt it important to have a very clean signal, and we owe thanks to our equipment manager, G8HTH, back in Birmingham, who set the gear up to considerably under-drive the linears. Unfortunately, some of the contest stations had not been so cautious and the band was full of splatter from people too far away to be over-driving our receiver. This hash prevented us working some QRP stations and stopped any station from being able to achieve the feat of contacting us at every location.

On a happier note, we were able to give away points to many contest stations, including the King Edward's School Club, who are based just a stone's throw from our club room in the University Guild of Students.

We arrived home on Sunday, having put about 1200 miles on each of the cars. Despite some bad weather, it was a superb week; we had never set out to work loads of exotic stuff or even to operate contest style. Except for the busiest times, we enjoyed brief chats with all our contacts. In particular, the thanks from our regular contacts made it well worthwhile. Plans for another moving trip in Summer 1990 are already underway, as is our search for gear and better transport for it. See you on the air.

Special thanks to Jaybeam antennas, G4MTG, G4MTR, G4FPI, the other members of Birmingham University Radio Society and the hundreds of you who were interested enough to talk to us.

REFERENCE

[1] *The Short Wave Magazine*, December 1962, 'With GM3IUB/P Through Nine Counties' by T C Jones, G3OAD.

Ronald Cowan, GM4SRL, looks back at Lockerbie and Raynet's role in one of aviation's most tragic events.

LOCKERBIE – Raynet's response

I was doing my last-minute Christmas shopping in Makro, Glasgow, when my Air Call pager went off. The message was 'PHONE AZEEM... URGENT' Azeem being my deputy controller. Leaving my trolley in the aisle, I headed for the car and was told "There is a plane down on the A74". There were no other details yet available, so Azeem and I alerted our Group by calling on the four local repeaters and then I phoned Strathclyde Regional Headquarters to see if there was a message for me from the Principal EPO, John MacVicar. No message had been left, but when I arrived home I rang Strathclyde Police HQ and asked for the Duty Communications Superintendent. "Yes, there is a plane down, it is in Dumfries and Galloway, not Strathclyde, but yes, you will be needed". Similar operations had been happening in Dumfries and Galloway, and Alex Anderson and his team were already heading for Regional Headquarters in Dumfries and for Lockerbie itself.

I tried to telephone Alex. He would have already left, but his number was unobtainable (he lives in Gatehouse-of-Fleet, well away from Lockerbie). I then phoned the Scottish zonal representative, Eric Garrington, GM3RFA, and we discussed whether or not we should go down 'uninvited'. We decided that the answer was 'yes' and the Strathclyde Group was called out, although I decided to leave the other groups in Strathclyde at that time.

OPERATION BEGINS

We met at Bothwell on the M74 at 2200 hrs and followed an ambulance down the M74 and A74 to Lockerbie. We had kept in touch with the outside world via the GB3CS repeater for as long as we could, and then continued to work on the output frequency until we arrived in Lockerbie in case there were pockets of reception which we could use. The 3.5MHz net was already operating under the control of Geoff Griffiths, G3STG. There had been no need for a call-out system for the 80m net since television had already done it for us! Unfortunately, there were to be no survivors and the HF link to the USA was not to be needed.

I can still vividly remember my first impressions as I arrived in Lockerbie. There were rows and rows of ambulances, fire hoses were stretched across the roads and groups of people had gathered in the street. A smell of burning hung over the town. We met up with three members of the Dumfries & Galloway Group, and it was decided that three of us would remain and the others – on the instructions of the EPO – would head for Dumfries and Galloway Regional Headquarters.

We had communications between Lockerbie and Dumfries via a third station, and we worked to improve the link. Soon we were moved from the town hall to Lockerbie Academy, which was to be our 'home' for the next ten days, and we set up our station in the woodworking room of the technical block. That night we passed messages to and from the EPO in Dumfries and handled traffic for the Scottish Ambulance Service.

Following an early-morning briefing meeting, we were asked by the police to set up several bases in the Academy and to provide operators for the search areas. Our operators in Dumfries were asked to come to Lockerbie. One of the immediate technical problems in such a confined area was desensitization, and Adrian Beale, GM1FML, and his team did a marvellous job in engineering a system using talk-through boxes on 144 and 430MHz.

TELEPHONE PROBLEMS

Offers of help were coming in from all over Britain, but we had problems as a result of the lack of telephone lines. For the first two days we did not have a telephone of our own, relying instead on my transportable Vodafone; unfortunately this sometimes took fifteen minutes to find a free channel. Help came from the other groups in Strathclyde, from other Scottish groups and also from English and Welsh groups. The response was overwhelming, and on most days we had to turn down volunteers for the next days' work.

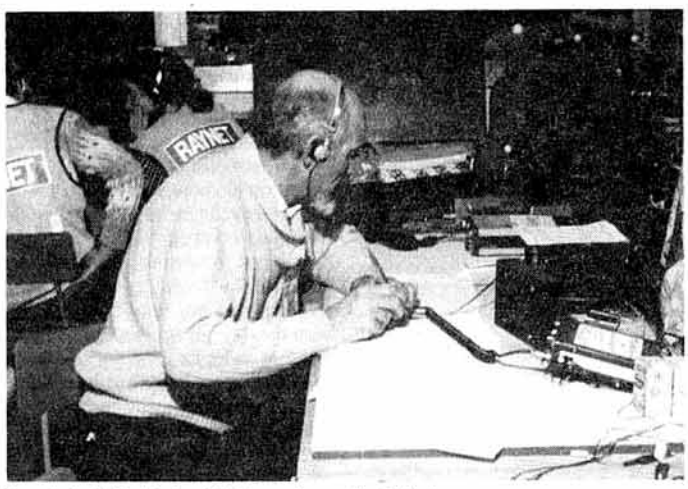
We did have communication problems – as was only to be expected – but each one was rapidly overcome by the engineering team. Battery power for talk-through boxes was a problem since we used far more power than we expected; this was not surprising since we were providing communications on two channels from 0830 until about 1700 hrs and sometimes much later. These were not only for the EPO and police search teams but also for the Air Accident Investigation Unit, the Search and Rescue Dogs and police dog teams, the Salvation Army, the underwater search units, the Red Cross and the rescue helicopters. It is, of course, not within our licensing conditions to operate aeronautical mobile, but as the request had been made we did so following a call to the chairman of the Raynet committee. We later went to a meeting at the DTI in London and cleared our actions with them.

The conditions in which we were working, particularly in two of the search areas, were very unpleasant and should not be described here. I can still remember morale taking a drop when we were told that we would be needed on Christmas Day; that was one thing which we had not expected. In the event we worked two shifts, and had a smashing Christmas lunch – with turkey and all the trimmings – provided by the WRVS.

Altogether, over seven thousand man-hours of Raynet communications were provided by an average of eighty operators each day. We finally closed down our network at 1720 hrs on 31 December when John Dickson OBE, Assistant Chief Constable of Strathclyde, came down to our operations room to thank us personally. Just before then, the man from BT had been round asking for a Raynet name to send his telephone bill to! We continued on high-alert standby for a further week, and the Dumfries & Galloway Group provided cover for the Red Cross at the church service on 4 January.

Several Groups have written reports of their involvement and my final report will soon be published, closing our involvement with the Lockerbie disaster. Like all the others who attended, I will never forget the size of the operation, the friendly faces in Lockerbie itself, the feeling of being one in a team of numerous services, the untiring work of the WRVS and the school meals ladies, the drawn faces of the young police officers, soldiers and other rescuers, the unending energy of the Search and Rescue Dogs and the welcome voices of the social work teams in the canteen. I will also never forget the loneliness of the moors themselves, covered with rescuers carrying out their grim task.

(Photos courtesy GM4SRL)



Top photo: Adrian Beale, G1FML, repairs a police helmet.
Lower photo: A Buchan, GM0EFH, in Lockerbie Raynet control.

Terry, G3MHV and Mady, KA6ZYF at the Bashkirian horseman monument in Ufa.

On the air from Bashkiria

Terence G. Langdon, W6/G3MHV, tells the story behind the first British/American reciprocal operation from Bashkiria in the USSR.

The possibility of operating from the Soviet Union first arose early in 1989 when I received an invitation from the USSR Academy of Sciences to give a series of lectures at a research institute in Ufa. Checking the atlas, I found that Ufa is the capital city of the Bashkir Autonomous SSR and it is located about 1100km east of Moscow near the foothills of the Ural Mountains. For amateur radio purposes, Bashkiria is in zone 17 with a prefix of UAOW.

The plans for the visit were quickly completed. My wife Mady, KA6ZYF, would accompany me and we would travel to Ufa in May when the weather was expected to be ideal.

Our thoughts then turned to amateur radio. Although we had made several QSOs with stations in Bashkiria over the years, we had no regular contact in the region. Was it possible to make contact with someone in Ufa so that we could arrange to visit one of the local radio clubs? More important, was it possible, in these days of *glasnost*, to obtain reciprocal licences to operate on the air from a station in Ufa? We had already read in the radio magazine that it was now permitted for foreigners to operate from club stations under supervision, but we were thinking specifically of trying to obtain our own reciprocal call-signs. For the latter, we immediately sent all of the information about our impending visit to the Radio Sports Federation of the USSR in Moscow. For the former, we started listening in the evenings on 20 metres SSB for a strong signal from Bashkiria.

FIRST CONTACT

We were very lucky in our listening. Within a few days we heard an S9 signal from Shamil, UW9WW, as he worked a Stateside pile-up. Furthermore, Shamil spoke excellent English and, although he was clearly surprised when we said we would be visiting Ufa, he rose immediately to the occasion and gave us information about the city and the radio clubs.

It was clear by April that our radio contacts in Ufa were developing smoothly but there was still no response from Moscow to our request for reciprocal licences. Finally, however, just before the date of our departure, word came from Moscow that we would receive reciprocal call-signs on receipt of photocopies of our current radio licences. Unfortunately, the time was then too short to send the copies and receive a reply in California. We were spending some time in Denmark prior to going to the USSR and so, in order not to confuse the situation, I asked for the reciprocal licences to be sent to me at the institute in Ufa.

Then away to Denmark (where we operated with our Danish calls, OZ1KLC and OZ1KLD) and from Copenhagen to Moscow on 13 May. The following morning, Sunday, 14 May, we flew by Aeroflot to Ufa. After the plane had landed, we remained seated with other passengers as we waited for the steps to be brought out to the plane. Shortly thereafter the steps arrived, the door was opened, and a uniformed officer entered and came straight to our seats. This was Shamil, UW9WW: it was only at this point we discovered that Shamil is an Aeroflot pilot.

Shamil welcomed us to Ufa and then, with members of the institute, we were taken to our hotel. Shamil told us we would go the next evening to the Ufa Radio Club where many people would be waiting to meet us. This was an important occasion for the club as we would be their first foreign visitors.

The next day I went to the institute and, at an appropriate time, asked if there was a letter for me from the Radio Sports Federation in Moscow. There was nothing. What a disappointment! After getting so close to a reciprocal licence, it seemed as if we would be thwarted at the last moment.

RADIO CLUB

That evening we were taken to the Ufa Radio Club, located on the upper level of a large building near the centre of Ufa. Waiting to meet us at the entrance to the building was Vitaly, UW9WR, the President of the Bashkirian Radio Federation and a Master of Sports of the USSR for his contributions to the amateur radio service over many years. We were accompanied to the upper floor, to the premises of the radio club, and it was clear that the building was used for various social and sporting activities.

The outer room of the radio club was packed. We were introduced to several people (some of whom, like UV9WN, we had already worked on the air from California), we met Kosjga, UA9WA (one of the old-timers of amateur radio in Bashkiria), and we had a few minutes to inspect the many labelled pigeon holes along the wall. We were told that all Bashkirian QSL cards are sent to this central facility from Box 88 in Moscow and then they are sorted and distributed within Bashkiria.

We were then taken into the next room, a large classroom where everyone sat at long benches fitted with morse keys. Five people sat at the front facing the group: Vitaly, Shamil, Mady and myself, plus Alexej, our interpreter from the institute. Vitaly introduced us and asked us to say a few words about our interests and experience in amateur radio: and this we did, with Alexej translating each sentence as we went along. Looking around the room during this period, I noticed there was a good distribution of ages from young to old, and also a reasonable number of females. After the introductions, we went into a question and answer session which ranged over virtually all aspects of amateur radio, and then there was an exchange of presents and we were given certificates of membership of the Bashkirian DX Club. At this point, John, UA9WMM, rose to his feet to make a presentation to us on behalf of the amateur population of the nearby city of Belebey.

When it seemed as if events were drawing to a close, Vitaly rose again, took out a folder, and produced a piece of paper which he proudly presented to us. This was our reciprocal licence to operate in Bashkiria, and there, on a single piece of paper, were our two new call-signs in the Cyrillic alphabet (U9W/W6/G3MHV and U9W/KA6ZYF in the Roman alphabet.) What a surprise! The licences started on that day, terminated on our date of departure from Ufa and covered the usual DX bands plus Top Band (limited to 10 watts input), 10 MHz (CW only) and the VHF frequencies. (In practice, we operated only on 14, 21 and 28 MHz.) Two possible operating locations were specified on the licence: the home station of Shamil, UW9WW, and club station RZ9WWA.

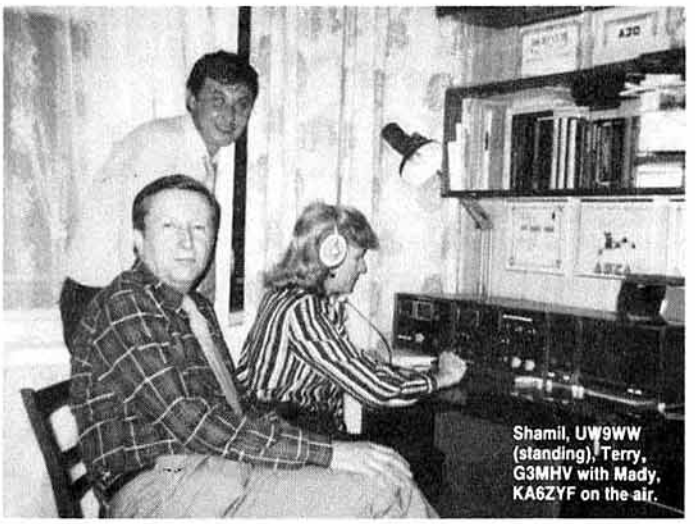
Needless to say, we were delighted. Many people later asked me why my call-sign was so long and I had no convincing explanation: except to note that I had submitted both my UK (G3MHV) and US (W6/G3MHV)

licences and all communications were sent from California.

There was no time to operate that evening. After a quick inspection of the Ufa club station, located in an adjacent room, we were taken to a restaurant for a typical Bashkirian meal with a group of the club members. The meal was excellent: something like a stew of meat and vegetables with each portion cooked individually in round earthenware containers.

During the meal, someone asked which Bashkirian stations we had contacted from California, so Mady produced her list with dates, mode and whether or not a QSL card had been received. As she noted, all QSOs were confirmed except for contacts with club station UZ9WWS in 1985 with an operator named Ural. This caused much amusement as Ural, RZ9WZ, was sitting at our table. Needless to say, we received QSLs a few days later!

The next problem was how to get on the air. I would be picked up the next morning at 9:30am to start at the institute at 10am. Shamil had a suggestion. If he collected me at 8am, I could operate for an hour, he would take me to the institute, and then Mady could operate later in the day. And so at 0228 UTC on 16 May, 1989, U9W/W6/G3MHV came on the air on 14 MHz SSB, using Shamil's home-made equipment



Shamil, UW9WW (standing), Terry, G3MHV with Mady, KA6ZYF on the air.

and the four element mono-band beam on the roof of his apartment building.

Radio conditions were very good during our stay in Ufa and, despite the limited operating time, we made more than 1000 QSOs, Mady achieved WAC (I missed Africa), and we contacted over 60 DXCC countries.

A few words should be included about Ufa. This is a large city situated on a plateau surrounded by three wide rivers. It contains a major petro-chemical complex and numerous other industries. There is no Intourist hotel so that it is fairly inaccessible to the average tourist, but our hotel was very good and the staff were extremely helpful.

Outside of the city, the landscape is stunning. We were fortunate to be taken, on two days of perfect weather, for a trip into the foothills of the Urals using a small plane. We watched entranced as we flew over a seemingly endless expanse of trees and rivers, with small settlements apparently lost in a land without roads.

At a dinner on our last evening in Ufa, we met Mr Walentin Fedotov, Director of the Commercial Centre in Ufa, and he told us about plans to improve the tourist infrastructure in Bashkiria so that, in a few years time, the area will be open to western tourists. In these days when many people are seeking a holiday away from crowds and traffic, there is no doubt that Bashkiria has much to offer.

Our final days in the Soviet Union passed very quickly. We met UA1BX, 1CK, 1DJ, 1MU and RA1AG in Leningrad, toured the monastery in Zagorsk with UA3DEA, and finally, on the last night in Moscow, Shamil flew in from Ufa for a farewell dinner with UA3DR and 3HR.

We experienced exceptional hospitality and friendship throughout our visit, not only from the amateur radio community but from people at all levels. We must especially thank Shamil, UW9WW, and Vitaly, UW9WR, and their XYLs Lena and Lily, for doing so much to make our visit a success, and Ural, RZ9WZ, Vlad, RW9WR, and John, UA9WMM, for the warm reception. We thank also RV9WB, RW9WA, RW9WJ, UA9WAT, UA9WID, UA9WS, UA9WYL, UV9WA, UV9WN, UW9WM, UW9WO and our many friends in Ufa for their generous hospitality which contributed so much to our first experience of life in Bashkiria.

G0KCA using his Kent key

RSGB Straight Key Day

Martin Atherton, G3ZAY, of the RSGB HF Committee, tells us that the 1989 Straight Key Day was "...by far the most successful of those held during the last three years. Many thanks to all who took part and for taking the trouble to write to G3VTT."

In his report and summary, Martin said "John, G3DOP, used an ex-RAF key along with a vintage T1154 transmitter and asks whether it would be possible for us all to spread out a little on 7MHz. It seems we all cluster around 7030kHz, the QRP frequency, and since both QRP and QRO stations are active during SKD, the QRM is horrendous! John also suggests we all try to use vintage equipment along with our straight keys; this sounds like a good idea to me and next year we will offer a prize for the most unusual item of vintage equipment used - but watch out for those wobbly notes!

"G3MCK used a temporary dipole and an ex-marine key to work six stations and said that he had heaps of fun. GW3SB used his HW101 and a monster ex-RN key. G3LDT was active for most of the daylight hours and used his ex-RAF Type D key bought for 7/6 in 1955. G3TSS felt lost without his Vibroplex bug but soon got used to a Kent key, which was a type used and recommended by many operators; Colin found that the average duration of his contacts was 18 minutes. G8SH and G0KCA were unable to operate and make contacts this year but spent a lot of time listening; both commented on the increased activity and on the prowess of those taking part - thanks for the letters, gentlemen. G0NCS worked 12 stations using a key bought for 50p in a local junk sale. Finally, G4XPE used an unusual key - a Dulci of 1922, of which I've never heard but which by all accounts now appears in a few of the participant's logbooks.

"I would like to finish this report by including an extract from a letter from Tom, G4OSB. Tom said 'I read about SKD a few days ago and began preparing immediately for the event - sorting out keys old and new, clearing away all my QRP gear and unnecessary clutter from the shack and checking out the Black Box with its superior receiver. The antenna was checked, cut to 7020kHz and the ATU removed. The most important change was to remove the comfortable armchair from the shack and to replace it with a chair from the dining-room. This meant business! Various topics of conversation were jotted down in preparation for the forthcoming nine-hour stint.'

"Tom went on to say 'They were all on - ex-radio officers from the Navy and the RAF and enthusiastic amateurs such as myself. I found the conversation scintillating. Not only did I hear about pump keys dating from 1916 to the present day but the air was thick with talk of delta loops, magnetic loops, quads and dipoles. Even G5RV was heard on the air - the man himself in action, and very good he was too. One electronic paddle operator was frantically trying to find a jack plug to fit to his old pump-handle so that he could join in!'

"Tom found the day unique; even one of his neighbours - who had served as a radio operator in the armed forces - came round to say that he had found Tom on a portable receiver and was he G4OSB. Finally, Tom said 'During the day I had been called an old pump-key operator, a key pounder, a brass basher and someone added that he had my fist in his ear! I found all these things quite agreeable, and in a strange way messages of endearment. The microphone has been put away in a drawer for many years now, and along with it will go the paddle - which is now out of date. For today I have had the personal satisfaction ofbeing involved with the very best of amateur radio and feel that Samuel Morse would be very proud of us all.'

"Tom's letter nicely sums up the spirit of SKD; it only leaves me to tell you that the most votes for best fist were for Stan, G3LQI - himself an ex-RAF operator. Stan will soon be receiving a small gift from the HF Committee. See you next year, and keep those wrists oiled!"

SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3 FKM

Another New Year - which I hope will be successful and happy for everyone who reads my section of Spectrum Analysis. Philip Marsh, G4WFZ, (28 Orcheston Rd, Bournemouth BH8 8SR) is anxious to trace G0GLJ, who operated as 3D2HO/P from the Lau Is. Philip asks him to contact either G3KMA or himself, and in addition offers to produce QSLs and act as QSL manager for him if so required. Any help would be most welcome.

CONTESTS

Bermuda Amateur Radio Contest

0001 17 March - 2400 18 March

Open to licensed amateurs in Bermuda, the UK, USA, Canada, and Federal Republic of Germany. Actual operating period must not exceed 36 hours, off periods must be logged and each must be of not less than 3 hours duration. All stations must be single-operator only and *must operate from their own private residence or property.* Top winners in the 1985-1989 contests will be eligible for area awards only. 3.5-28MHz phone and CW but no cross mode or cross band QSOs allowed. Exchange RS/T followed by UK county code. Ws will give state, VEs province, and VP9s their parish. UK stations work Bermuda, Canada, and the US only. Bermuda parishes are Sandys/SAN, Southampton/SOU, Warwick/WAR, Devonshire/DEV, Pembroke/PEM, Paget/PAG, Smiths/SMI, Hamilton/HAM, and St.George/STG.

Each complete QSO counts five points - a phone contact and a CW contact with the same station on the same band only count if made more than 1 hour apart. The multipliers are the Bermuda stations worked on each band and a station may be counted twice if worked on phone and CW provided the contacts were more than 1 hour apart. Bermuda novice stations (VP9 plus three-letter suffix beginning with N) are only on CW and count as a multiplier of two (they use 28-28.5, 21-21.2, 7-7.15, and 3.5-3.75MHz). The final score is the sum of QSO points from all bands multiplied by the sum of Bermuda multipliers on each band.

Top scorer in each country will be presented with a trophy at the Radio Society of Bermuda's banquet, which is to be held in October. Round-trip air fare and accommodation will be provided to overseas winners to enable them to receive their trophies at the banquet. Top scorers in each UK country will receive a certificate provided that at least 100 QSOs (including at least 5 VP9s) have been made. Every log, duplicate and other sheet must be clearly labelled with the contestant's callsign and date (including year) and where appropriate, band and mode. Separate log sheets must be used for each band, with times given in UTC and frequencies in MHz. If you have more than 200 QSOs on a band, a dupe sheet is needed. Three points will be deducted for every duplicate found in a log. A multiplier sheet of VP9 QSOs must be included. All entrants must provide a signed statement that they have observed the rules of the contest and the terms of their licence. In addition full name, station QTH, full mailing address, and a contact telephone number must be provided.

All logs must be received by the Contest Committee, Radio Society of Bermuda, PO Box HM 275, Hamilton, HM AX, Bermuda, no later than 1100 (Bermuda time) on 1 June 1990. Overseas entries should be sent by airmail, and if you think you may have won - register it! Enclose four IRCs for an acknowlegement of receipt and for a result list.

Mid-Winter Contest

0700-1900 13 January(CW)
0700-1900 14 January(SSB)

Organised by DYLC, PO Box 262, 3770 AG Barneveld, Netherlands. Copies of rules available - SASE please. In the 1989 contest (YL-SSB section) G0BIR scored 49,019 points, GM4YMM 18,840, G3KNU 17,170, G0FIP 15,138, GD4SWQ 3,468, and G4EZI 880.

AGCW-DL QRP Midwinter Contest

1500 20 January - 1500 21 January

CW only, confined to IARU Region 1 segments. Copies of full rules from me (SASE please).

UBA Contest

1300 27 January - 1300 28 January (CW)
1300 24 February - 1300 25 February (SSB)

3.5 to 28MHz. Follow IARU Region 1 bandplan and work stations worldwide. Multipliers are one for each Belgian province, Belgian prefix (ON4-ON9 and DA1, DA2), and EEC country (CT, CU, DL, EA, EA8, EI, F, G, GD, GI, GJ, GM, GU, GW, I, IS, LX, OZ, PA, SV, SV5, SV9, SY, TK, and ZB2) worked on each band. Single and multi-band entries. QSOs with Belgium, DA1 or DA2 count 10 points, with other EEC countries three, and with anyone else one point. I can supply photocopies of the rules, entry form, and log sheet (SASE please).

In the 1989 (SSB) contest 14MHz section G0EBD came second with 15,579 points. In the multi-band section GW4OFQ came second with 178,600 points followed by G5LP with 144,348 and GW4UZL with 141,368 occupying third and fourth places. GW4EZW came fifth in the multi-operator section with 80,799 points and G3XYZ eighth with 42,120. In the CW section G0EBD was 11th on 14MHz with 5,980 points, G4WUS came 15th with 4,200, and in the multi-band part G5LP was fourth with 135,608 and G3ESF 23rd with 38,703. Contacts made during this contest may be used for credits if you are applying for the European 1992 Community Award.

CQ WW DX 160m Contest

2200 26 January - 2200 28 January (CW)
2200 23 February - 2200 25 February (SSB)

Single and multi-operator. Exchange RS/T and serial number (from 001). W and VE stations will indicate their state/province. QSOs with own country count two points, with other countries in the same continent five, and with others 10. Each state, province, and DXCC country counts as a multiplier (but not W or VE). Three points will be deducted for each unmarked duplicate and false or unverifiable QSO in the log. Sample log sheets and entry forms are available from CQ 160M Contest, 76 North Broadway, Hicksville, NY, 11801 USA. Please send a large SAE and IRCs - and note that I do not have a supply of either. However I may receive the issue of *CQ Magazine* containing the rules and will then be able to supply copies! Mail CW entries by 28 February and phone by 31 March.

In the 1989 **Helvetia Contest** G4IQM scored 17,655 points in the Mixed section, G3ESF 14,820 and G3LIK 2,104 in the CW section, and G0ANH 62,64 in the Phone section.

QSL via...

As always during the contest season, there are a lot of special stations on the air and there is no room to list their QSLing details in *QTH Corner.* Some of them are (or were): CN0A (F6EEM), CN0S (French DX Foundation), CT3M (CT3EE), EA9OB (EA5BY),FG5R (W7EJ), FT4XI(F6EEM), FT5XA (FD1ITD), FT5XH (F2CW), H20A (5B4SA), HI500UD (HI8LC), I9VDQ (IT9VDQ), IY0ONU (I5KKW),J6DX, J6LRY, J6LRZ, and N9AG/J6 ((W8UMD), J79DX (AA5DX), JT0DX (HA6KNB),KC6XO (NT2X),KH0AM (JE1CKA), P40GD (N2MM), PJ4U and PJ4/K3IPK (K3IPK), PW2A (PT2BW), T32BE (WC5P), T32BO (WD5F), T32BI (KH6DFW), V63YP, V63CR (KQ1F0, 5C2CW (F2CW).

Walvis Bay

In a special national bulletin dated 9 November, SARL says that as of 8 November the prefix for Walvis Bay has been changed from ZS1 to ZS9. The change follows a request made by Walvis Bay radio amateurs to the P & T Department and SARL. In some cases the suffix has also been changed. Walvis Bay is an enclave of South Africa covering an area of 1124 sq km on the SW Atlantic coast. The bay and its hinterland were annexed by Britain in 1878, added to Cape Colony in 1884 and remained a British enclave after German annexation of SW Africa in 1892. In 1910 the settlement was included in South Africa. Walvis Bay has become a very-much-wanted country, with DXCC status currently under consideration.

QTH CORNER

A35VB	(see 5W1VB)
L73GADX and LQ-DX stations	GADX, PO Box 36, 1834 Temperley, Buenos Aires, Argentina.
JG2MWA/JD1	PO Box 59, Hamamatsukita 833, Japan.
P40P	Naoki Akiyama, N1CIX, PO Box 855, Newington, Conn, 06111, USA.
P40R	K4UEE, R Allphin Jr, 4235 Blackland Dr, Marietta, Ga, 30067, USA.
TG0FRACAP	Box 115, Guatemala City, Guatemala.
V85OO	via N2OO (see 9M6OO).
VP5Q	K2LE, A Bodony, Cornwells Beach Rd, Sands Point, NY 11050, USA.
XF4T	XE2TCQ, PO Box 66-D, Tijuana, Baja California, 22150, Mexico.
XT/W6KG	(see 5U7QL).
XT/W6QL	(see 5U7QL).
ZK2RY	(see 5W1VB)
5U7QL	Yasme Foundation, Box 2025, Castro Valley, Cal, 94546, USA.
5W1BV	Jukka Kovanen, Varuskunta, Rak 46 as 11, SF-11310 Rihimaki, Finland.
9M6OO	N2OO, Box 345 Tuckerton, NY, 08087, USA.

AWARDS

In the October column I gave details of the PA 60 Jubilee Award. VERON certificate manager Jan Lourens, PA0BN, has pointed out that in fact applications should be sent to him direct at Keerweer 13, 862CD, Oosterbeek, Netherlands, and that no QSLs are needed.

DX NEWS

Geoff Watts (62 Belmore Rd, Norwich, NR7 0PU) has produced another of his excellent DX aids. This is a list containing full information on QSL bureaux addresses of most USSR oblasts. It is a useful addition, as page 14, to the already popular USSR Oblast Guide. It costs 25p or two IRCs from outside the UK for airmail

delivery. The complete guide (14 pages) costs £1, US$3.00, or six IRCs. *DX News Sheet* reports that the ARRL DXAC recently voted on the DXCC status of some possible new countries. They were unanimous in accepting **Conway Reef**, and for **Banaba Is** the voting was 14 for, 1 against and one abstention. **Frederick Reef, Austral Is**, and **Marquesas Is** were all rejected on votes. The recommendations will now go to the Awards Committee. *QRZ DX* says that VU2JX will be visiting **Bhutan** next February under the sponsorship of an amateur radio branch of Rotary International. It is not known if he has any chance of being allowed to get on the air. A61AD now seems to be quite active and it is said that first operator Said is in fact son of the Sheikh of Dubai. 1130 on 28.555 and 21MHz around 1500 are given as operating times. JA3EMU was expecting to be on **Ogasawara Is** as JA3EMU/JD1 from 31 December to 8 January and was hoping to be on all bands from 1.8 to 28MHz on CW, SSB, and RTTY.

DX News Sheet reports that RW6AC is attempting to organise a multi-national expedition to **Georgia** next May or June with operators from the USSR, DDR and possibly the USA. USSR stations were allowed to use 18 and 24MHz from 18 October last.

T5CT in **Somalia** is believed to keep a schedule with K4DY every Friday at 0315 on 14.164 or 21.328MHz. 9Q5TE in **Congo** can often be found on Wednesdays at 1600 near 14.035 or 21.035MHz. WZ6C will be in **Sudan** for two years and will be active mostly on CW and particularly on 18 and 28MHz. He does *not* like pile-ups, tail-enders, or lists. A Dutch missionary called Piet was due to come on the air from the **Central African Republic** last month. His callsign is TL8PN and he should be found around 1200 on 21.345 or 28.345MHz - but he is not used to operating from a DX location. TT8GA is F2GA in **Tchad** and he should be there for the rest of January. *DXpress* suggests listening on 28.47MHz at 0900 on Sundays.

W4FRU will ship a complete station to an amateur resident on **Gough Is**, probably this month. S01A in **W.Sahara** can be found near 21.205MHz between 1900 and 2200. There are now at least three amateurs on **Kerguelen Is**. These are Francois, FT5XH (F6GYV), Yves, FT4XI, and FT5XA. 3C1EA seems to be new and has been worked from the UK on 21MHz CW near 21.027Mhz before 1430. G4WYG/ST2 in Khartoum is on every evening at 1800 and keeps a sked with QSL manager G4OHX on 14MHz CW - 14.01 and 14.053MHz have been suggested as good places to listen for him. When he has finished this and after working RSARS members, he will move to a lower frequency. Please QSL only to G4OHX (QTHR) and include return postage. VP8BXK on **S.Orkney Is** sometimes joins in the French DX Foundation Net on 14.256MHz at 0000, and 14.25MHz from 0200 is also a good place to look for him. A group of VP8s meets every Saturday at 1730 on 28.9MHz.

The *Long Island DX Bulletin* mentions plans being unfolded by WA4JQS (on 7.159MHz daily at 0500) for a five or six-person expedition to the **S.Sandwich Is** as VP8BZL in March or April. This is an extremely unpleasant place to visit as it is a group of volcanic islands, some of which are active. Grupo Argentina DX is one year old on 13 January and will be using some special callsigns to celebrate the fact. These will include L73GADX and 26 stations signing LQ1DX to LQ26DX inclusive and they will be on this month, February, and March. PP100CZ will be a special station celebrating the 100th Anniversary of the foundation of Brazil, and PP1CZ is rumoured to be planning a visit to **Trindade Is.**

The latest on SM7PKK and his Pacific tour is that he is due to be in **Rotume** until 13 January, then go to T2. He will finish in late April from the S.Cook Is. ZL2VS will be on **Chatham Is** between 16 and 30 January as ZM7VS and will be on all HF bands. FK0BK in **New Caledonia** is on the air on Fridays and Saturday evenings around 2300 and on week-end mornings from 0500 - 0700. He prefers 14.01 and 21.018MHz.

28MHz COUNTRIES TABLE

G0IHB	206(SSB)
G4MUW	201
G0CKP	194(CW)
G4ZYQ	177
G4DXW	172
GM4ELV	158(QRP)
G0FWX	141(SSB)
G4NXG/M	138
G4XAH	134(SSB)
G0JSM	133
G0JHC	130
GM4OBK	123
G2AKK	122(CW)
G4OBK	115
G0BXD/M	109
G4SJG	101
GD4XTT	98
GM4CHX	84
G3SDK/M	54

This year's final scores will be given in the March issue. A 1990 table will start in April.

HF F-LAYER PROPAGATION PREDICTIONS FOR JANUARY 1990

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 colums.

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	....6++95...	....89997...	....999991..	....988993..	...48777871.	541755457864	886532124788	++42.....4+5
MALTA	....79886...	....899982...	....999995..	....9888981.	.1.276678961	662753357997	987621124798	+++3....24++
GIBRALTAR	....187661...	....399882...	....699996..	....8888981.	87778961	342175456897	888652223689	++++2....3++
ICELAND	.....3785...	.....59981...	.....89993..	.....99996..	....4888891.	242.76567873	887353335788	++++2...24++
** ASIA								
OSAKA	....41.....	....73.....	....85.....	....86.....	...1751.11.1	1...42113614	....2...2563	.........24.
HONGKONG	....885.....	....8971....	....7874....	....57651...	....243542..	2....1.25751	1.......2575	253
BANGKOK	....+++94...	...169896...	....38788...	....176781..	1....4357611	3....1.25866	2.......2677	354
SINGAPORE	...178894...	...158896...	....27788...	.....66782..	3357611	2......25865	2675	352
NEW DELHI	...1++86....	...26887....	...236782...	...114675...	1357111	51.....25566	72......2677	4.........344
TEHERAN	...2+++94...	...477897...	...6547881..	...6226783..	2..4..347731	7431....15886	772.....2676	44........343
COLOMBO	...1++++6...	...247898...	...1137892..	.....16784..	2.....357832	61.....24877	5.......2667	2.........334
BAHRAIN	...2++895...	...4668971...	...5326884..	....5..47861.	31.2..147853	862....14787	771.....2566	44........234
CYPRUS	....++++81..	...2999992...	...5878996..	...77678982.	42.753468974	88552.136898	8862...13687	553......4+4
ADEN	...2+++982..	...4447994..	...51138972.	1..3..178951	63.1...47986	883....14888	771.....1566	44........233
** OCEANIA								
SUVA/S	.....3762...	.....6884...	.....8887...	....277782..	....554575..	...1521244..	....2...21..	.....
SUVA/L	44311242	66532452	....8765574.	....8645782.	...2731366..	...241..33..	....1...11..	.....
WELLINGTON/S	.....6761...	....27873...	....58886...	....776781..	....753573..	....521253..	....2...21..	.....
WELLINGTON/L	.....	....11.....	....431..11.	....7421231.	....732245..	....41..32..	....2...1...	.....
SYDNEY/S	....76783...	....87895...	...188788...	....77678...	....543574..	....21.2572.	.........25..	.........2..
SYDNEY/L	.....21.....	....132...11	36421241	56442451	....5423574.	....21..361.	.........13..	.....
PERTH	...166555...	...268777...	...1377892..	....166784..	3347831	.....1.15873	2651	.........32.
HONOLULU	.........1..	.........2..	.........5..	.1.........6..	.13.2.1.26..	..53511143..	..262...1...	...3.....
** AFRICA								
SEYCHELLES	...2447642..	...2346864..	...1.148872.	1.....278952	63.....47986	85.....14888	73......1566	4.........234
MAURITIUS	...1467773..	...23478961.	...1.1489841	21....178973	74.....47998	84.....14899	61......2577	3.........254
NAIROBI	...17678851.	...24458973.	1..411169972	42.3...58995	8611...27998	883.....4788	762.....1576	43........243
HARARE	....4457773.	...133468862	31.2...48985	64.2...28998	981.....6999	883.....3799	761.....577	43........254
CAPETOWN	44668851	1...43358984	42.11..16997	75.2....5899	9821....2799	984.....589	762.....268	53........35
LAGOS	....+++7+862	1...85458984	53..72127998	76.15...6999	99352...3899	8885.....589	6772.....377	345.......44
ASCENSION Is	78556642	1...86445764	42..83.12887	751.7....799	99515....489	88852....179	6784......47	445........5
DAKAR	....6+++7+851	88557973	31..96215897	641.83..2899	985.61...689	88844....379	66861.....57	4353......25
LAS PALMAS	....4++9971.	....6999983.	99888972	11..98778995	553.86446899	988463113689	878731....378	+5+4......4+
** S. AMERICA								
Sth SHETLAND	35555541	57655553	21..87542355	521.8631.136	664.631....3	355331.....1	12221.....	.....
FALKLAND Is	36666741	57643452	21..8731.145	431.861...26	775.73.....5	58835.....2	36652.....	.332.....
R DE JANEIRO	6544541	27432562	1...561..275	471.74....67	875.71....38	88834.....5	77762.....3	4453.....
BUENOS AIRES	....2454564.	46532352	1...773...35	311.861...16	765.74.....5	788351.....2	57762.....	2453.....
LIMA	.....+++63.	864431	....1272..23	1.1.345....4	435.642....3	688252.....1	37762.....	.443.....
BOGOTA	.....+++73.	.....86444.	731132	..1..261..15	435..43....5	788232.....3	57662.....	2433.....
** N. AMERICA								
BARBADOS	.....3++773.	5854651	7721263	1.1..75...56	535..52...27	888222.....5	76662.....3	4433.....
JAMAICA	.....8++72.	.....87543.	751132	..1..162..24	435.133....5	788342.....3	57662.....	2443.....
BERMUDA	.....9++82.	.....197674.	4753562	..1..6631265	435.153...37	888342....16	77662.....3	4433.....
NEW YORK	.....7++81.	.....89883.	1775661	..1..2663463	445.1433.147	888342....15	66662.....2	3333.....
MEXICO	.....9+61.	.....9741.	84111	..1...172..2	345.2124....1	488352.1....	16752.....	.343.....
MONTREAL	.....6++81.	.....89883.	1787751	..1..3675573	445.14342257	888342.1..26	66662.....3	3333.....
DENVER	.....296..	.....4971.	.....6852.	..1....66321	345.1..44..3	478442.11..1	26762.....	.343.....
LOS ANGELES	.....75..	.....86..	.....851.	.11....1731.	245.11.35...	268442.22...	.4762.....	..43.....
VANCOUVER	.....13..	.....35..	.....671.	.11.....873.	355.12.27532	468342.24211	14662...2...	..43.....
FAIRBANKS	.....	.....1..	.....1..13..	.1....21136..	353.24246732	466252124643	23552...2321	..23.....

The provisional mean sunspot number for November 1989, issued by the Sunspot Index Data Centre, Brussels, was 173.0. The maximum daily sunspot number was 236 on 6 November, and the minimum was 124 on 16, 17 and 19 November. The predicted smoothed sunspot numbers for January, February, March and April are respectively: (classical method) 163, 159, 155 and 151; (SIDC adjusted values) 172, 167, 162 and 157.

EXPEDITIONS

A news release from Club Bouvet dated 27 October said that the 'Aurora' was due to leave Norway in mid-November and pick up the operators in Montevideo in mid-December. Arrival date in Bouvet is 25 December and a 23-day stay is planned. Five Icom stations will be available and the callsign will be 3Y5X. Erling, LA6VM, is unfortunately not able to go and some additional operators are being sought.

There will be operation from two different sites - from the base camp at Nyroysa and from the second camp on the glacier on the eastern end of the island, which is only accesible by helicopter. This is necessary in order to have a good short-path view of most parts of the world. Nine days have been set aside for delays and for landing and this leaves at least 14 days for operation. 1.8 and 50MHz operation will be attempted, as will RTTY during the latter part of the operation. Iris, W6QL, and Lloyd, W6KG, were in Niger on another Yasme expedition when this was being written. From there they were going to Bahrain, New Zealand and Tahiti before returning home in April.

BANNED LIST

'Optional Provision No 2731 of the Radio Regulations' dated 12 October 1989, contains the names of Administrations which have expressed reservations about contacts between their own amateurs and others. Algeria, Cameroun, German Democratic Republic, Iran, Morocco, and Qatar prohibit QSOs with South Africa. Additionaly Algeria, Iran, Jordan, Kenya, Morocco, Oman, and Qatar do not allow contacts with Israel, and Oman also prohibits QSOs with the Democratic Republic of Korea. Bahrain prohibits communication with '...any country with which Bahrain is at variance' and South Korea, Finland, Grenada, Turkey, Zambia, and Zimbabwe allow contacts with countries 'with which there is reciprocity.'

Comments listed against Thailand are "Operation of amateur station is permitted and licensed to be established only in the form of club stations recognised by the P & T Dept. An individual who is licensed by his government and who operates an amateur station licensed by such government shall be permitted on a reciprocal basis. The P & T Dept reserves the right to recognise any licence on the case by case basis."

PROPAGATION

G8KG writes "The excellent HF band conditions reported last month continued for the rest of October and the first weeks of November, interrupted briefly by a severe magnetic storm and aurora on 17 November - a 27-day repeat of the 20 October event. As before, we were seeing the combined benefits of seasonal improvements, high solar indices and a mostly stable geomagnetic field. At the time of writing (mid-November) the 27-day average solar flux had been above 200 SFU for all but a few of the past 100 days and was currently just above 220. F2 MUFs well above the 50MHz mark were observed on most days during November, so that it was not surprising that even 28MHz sometimes sounded like a local band with the F2 skip closing in to well inside 2000km and strong backscatter signals from stations inside the skip zone.

"1989 has certainly been an outstanding year so far. Cycle 22 was just three years old in September and it is interesting to look at its performance in a rather wider way than is usual in these reports. The average of the observed daily 2800MHz solar flux measurements for the third year of Cycle 19 is 199.75 SFU; for Cycle 21 it is only 166.75 SFU; for Cycle 22 it is 203 SFU and this explains why 1989 has been so good. It is, of course, only part of the story since the peak will almost certainly occur sometime during the fourth year - probably in the first quarter of 1990. The prospects for the coming year are therefore excellent - at least as good as the old year and probably quite a bit better - though it remains to be seen whether, at the end of it, Cycle 22 will be ranked second or first in the modern record."

BAND REPORTS

A fine crop of logs this time, reflecting the stage of the sunspot cycle! They came from G2s AKK, HKU, GM3CSM, G3s GVV, KSH, YRM, GM4CHX, G4s DXW, EHQ, GM4ELV, GW4KGR, G4s MUW, NXG/M. GM4OBK, G0CKP, GW0GPQ, G0IHB, GW0IKX, and GM0KMJ. Calls in italics were stations on CW.

3.5MHz
2200 SV5ADM, W1, W2, VE.

7MHz
0000 V47K.
0100 HH7PV.
0400 V47K.
0600 *V31BB, VP2EZD.*
2300 *9M2AX.*

14MHz
0600 *CN0S.*
0700 *A35ML*, KH6JEB/KH7, *3C1AG.*
0800 BZ4CQ, *ZL7TZ, 5W1VB.*
0900 KH8/SM7PKK, ZK2RY.
1000 *JY2AB.*
1100 *KH8/SM7PKK, N8BJQ/KH9.*
1300 *NT2X/AH2.*
1400 *FO5BI/P* (LP), *ZK2RY, 4M6OO.*
1600 *VQ9DM, 9M6ZR.*
1800 KL7Y, *5W1ML*, 9M1MM.
1900 HS1BV.
2000 S9AGD, KA5VLS/VS6, *DF3EC/ZS9.*
2100 *5U7QL.*
2200 *CE0OGZ*, HV3SJ, KW5O/4U
2300 *BY1QH*, FM/G3GAF, UA1OIL, *3C1EA.*

18MHz
0900 *ZL2BJ.*
1000 ZL2APW.
1600 *HZ1AB, JA, VU2LO.*
1800 5N29BHF.
1900 AL7I.
2000 J37AJ, VE2HRP.
2100 VK7CK, 9K2EC.
2200 JA3FYC.

21MHz
0700 *A35ML*, BY5s HZ, RY, *KH8/SM7PKK*, 3C1AG.
0800 BV2A, *BY4RSA*, ZK2RY, 3D2XV, *5N0ELT.*
0900 *JT1BS.*
1000 5W1KT, *5W1ML.*
1100 *KX6OI, ZK2VB.*
1300 P40V, PJ8T, VP5Y.
1400 TT8GA, V63AD.
1500 *S9AGD.*
1600 HS0E, *DF3EC/ZS9, 3C0GD.*
1700 *FR4FD, 3C1AG, 3DA0/SM2DQS.*
1800 A61AC, ZD8HH.
1900 KH6JEB/KH7, KL7XD, SU1ER, VK9NS, ZS1IS.
2000 D2/LU6ELF, XW8KPL.
2100 N7DF/KH2, VP8AGR.
2300 HL9OB, W6-W7, ZL4BO.

24MHz
0800 TZ6VV.
0900 JI2KXK.
1000 JG2MWA/JD1, *6W1QB.*
1100 9K2EC, 9Y4OWB.
1200 TL8CK.
1300 C6ANX, G0BBM/TF.
1500 HK0NZY, HZ1AB, WE8E, *3B8CF.*
1600 FH8CB, T77C, TU2QQ, WN4G, ZS8MI.
1700 KH6SB, VP8BQE, ZS6GG.
1900 J28TY.
2000 VE6SH.

28MHz
0700 *BZ1OK, BZ4RDX*, TR2A, *9M8XX.*
0800 JT1T, *KX6OI*, R0C (Zone 23), YJ8NMB, ZL4LZ.
0900 A7AJ, BY4s AA, RSA, WNG, HL2IMD, 3D2PL, *9M6HF.*
1000 KH0AC, KL7XD, *V63DX.*
1100 C56/ON4QM, FS/KC1F, KH0/JA7JWF.
1200 *C56/G3OXC.* P40R, TL8A, ZF2HV.
1300 OX1O, *3C0GD*, 5U7QL.
1400 A61AD, 9N1MM.
1500 A45YT, TR8KMS, TT8GA, *P40V*, VP2EZD, 3X1SG, ON5NT/5N0.
1600 *FH5EJ*, FS/KC1F, HC8K, *S9AGD, TL8A*, TZ6VV, V31BB.
1700 FJ/DL7FT, *HZ1HZ*, VP5T.
1800 *A22EC*, D44BS, KL7XD, TG0FRACAP, ZD8MS, ZD9BV.
2100 V44KI, ZF1J.

Thanks go to *CQ Magazine*, the *DX Bulletin* (VP2ML), *DXNL* (DL3RK), the *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G4DYO), the *Ex-G radio Club magazine* (WA8TGA), *DX Report* (VK9NS), the *Lynx DX Group Bulletin* (EA2JGO), and *DX'press* (PA3CXC).

Closing date for February issue is 28 December and for March 24 January.

VHF/UHF

NORMAN FITCH G3FPK

Once again the month's news is dominated by reports of excellent F-layer contacts on 50MHz, with new countries being worked almost daily. Some spectacular auroral propagation also occurred, so the postbag was pretty big!

144MHz BANDPLAN

In the December VHF/UHF, I referred to the topic of 12.5kHz FM channel spacing. In 1986, the 25kHz R and S channels were very congested at times, so a study was set up to investigate the feasibility of changing to 12.5kHz spacing.

In December 1989 the VHF Committee discussed the topic again and concluded that the problem is now less serious. For this reason, and in response to comments from interested parties, the Committee now feels that the general introduction of 12.5kHz channel spacing is not an urgent matter, although it will be kept under review. Meanwhile, the Committee would be very interested to hear, from groups using the narrower spacing, of the practical advantages and disadvantages they have experienced.

VHF CONVENTION

Please note that the date of this year's VHF Convention is Saturday, 12 May, as stated last month in VHF/UHF, and not the 13th as listed on page 88 in the December *RadCom*. I'm afraid I misinformed you about Angus McKenzie's lecture, though; his subject will be 'Optimum systems for VHF/UHF: transverters or black boxes?' *(the editor has been hung from the 430MHz beam at HQ - Other Editor)*

REPEATER CRISIS?

No, all repeaters are not being closed down, even though one was switched off for a few weeks - see the News pages. This sub-heading was prompted by some literature from the West Wales Repeater Group which, in common with other groups, needs more members if it is to remain viable. The problem is rather obvious; if membership is small, so is the income. Without sufficient funds, groups cannot afford the site rentals, maintenance costs and electricity bills. The irony is that many regular users of a

particular repeater are probably not members of the group which funds it.

Site rental is usually the biggest item of annual expenditure for most repeater groups. For GB3WW, located at the BBC site at Carmel (IO71XT), it is now £759 - and that is a much-appreciated concessionary rate. The Group has started a recruiting drive with a target of at least 200. So if you use GB3WW and are not a member, the secretary would welcome your joining. He is John Gray, GW6ZUS, 36 Heol Pentre Felen, Morriston, Swansea, SA6 6BY. His telephone number (before 10pm please) is Swansea 790811.

AWARDS AND TABLES

The Society has a comprehensive awards programme for VHF operators, details of which are on page 113 in the current *Call Book*. The VHF Awards Manager is Ian Cornes, G4OUT. For the benefit of overseas readers, his QTH is 6 Haywood Heights, Little Haywood, Stafford, England ST18 0UR. Send him a self addressed envelope and an IRC for details.

The 50MHz band has been so good that several readers have now worked all continents, with the QSLs to prove it. The WAC certificate is issued by the ARRL and applications are processed on its behalf by the HF Awards Manager, Stephen Emlyn-Jones, GW4BKG, PO Box 20, Bridgend, Mid Glamorgan, CF35 6EP. Send him an SASE for details. GJ4ICD, G0JHC, G4JCC, G4NDG, G3WOS, G0LFF (ex-G1CWP), G3COJ and G4UPS had already submitted claims by press time.

The final listing of the 1989 Annual VHF/UHF Table will appear in the March issue and I will also include individual band placings of the top few. The 1990 table will start in the April issue, so you will have had a couple of months to accumulate some points. For brief rules, see the foot of this month's table. Incidentally, there is no need to submit lists of everything worked; if you say you have worked 60 counties and 20 countries, that is sufficient. So help save the rain forests!

There are a couple of county anomalies, since for Society awards the Isles of Scilly count as Cornwall (CNL) and North and South Humberside are combined as Humberside (HBS). The counties and codes for this table are those listed elsewhere in this issue. I have a rules leaflet, so send me an SASE if you want a copy. Or, if you have an Amstrad PCW word-processor, send me a disc and I will copy to it.

DUBUS MAGAZINE

The really dedicated VHF/UHF operator needs no introduction to *DUBUS* magazine, now in its 19th year. For newcomers, it is a quarterly publication edited by Eddi Ramm, DK3UZ, and managed by Rainer Bertelsmeier, DJ9BV. Each issue is packed with a balanced mixture of technical articles and DX worked by all known modes.

The British agent is Ken Hatton, G4IZW, and his leaflet states, "This year, *DUBUS* is presented in a new format with much more English language in all projects and information. Call or write, enclosing SASE, for details." The 1990 subscription remains at £8.75 and dues should be sent to Ken without delay. His QTH is Hamilton House, Boat Road, Bellingham, Hexham, Northumberland, NE48 2AP. (tel 0434 220636 and fax 0434 220707).

CONTEST NOTE

The Derby and District ARS is holding its fourth all-mode 144MHz contest on 11 March, 1300-1700GMT. Fixed and portable entries are permitted in the two sections; full legal power and low power, 30W maximum output. Exchanges to comprise callsigns, report and serial number, administrative county or Scottish region, with abolished metropolitan areas, like the GLC, still considered as counties.

Each contact counts two points, but club station G3ERD is worth ten. "The final score is the total number of contact points, multiplied by the number of counties worked. Each country outside the UK is scored as a county." *(Guernsey is not part of the UK, so are ALD, GUR and SRK stations considered one country or three counties? - Puzzled of Purley!)* Send an SASE to DADARS, 119 Green Lane, Derby, DE1 1RZ for a copy of the rules; entries go to the same QTH by 28 March.

ANYONE HEARD ROBIN?

This is the continuing saga of digital pollution as experienced by Chris Gare, G3WOS (HPH). He suffered a continuous S7 carrier on 50.111MHz when beaming west. The source was eventually traced to a nearby house and a BT 'Robin' answerphone instrument. The owners were friendly and let him take the gadget away for inspection.

The 'Robin' is controlled by a single-chip microcomputer and Chris found the clock frequency was derived from a chroma crystal as used in colour TV sets. The QRM was the 14th harmonic of 3.579545MHz and lower harmonics were just as strong. He cured the problem, or rather moved the carrier elsewhere, by replacing the chroma crystal with a 3.6864MHz one costing less than £1 from Maplin. This is a popular clock frequency for the 6802 MPU.

As if that wasn't enough, Chris also suffered from BAI - Burglar Alarm Interference - and this caused severe hash, 300kHz wide, usually centred around 50.11MHz. He submitted a three-page saga covering his tracing of the source, which involved late night car trips, a lot of patience, skilful DFing and tactful diplomacy in dealing with a somewhat resentful owner. To summarize, the QRM was eventually traced to an arcing mains switch in a burglar alarm system installed in a house about 2.5km away. The owner was persuaded that the faulty switch was a danger, so the burglar alarm company was summoned and fitted a new switch. This proved quite costly.

Chris Muriel, G3ZDM (CHS), was troubled by RFI on 144.400MHz, the SSB random MS reference frequency. This was traced to a 'radio teleswitch' a widely-used device attached to consumers' electricity meters for switching to Economy 7 tariff at the appropriate time. He wrote, "It contains a Radio 4 receiver (198kHz) and the switch code is sent by phase changes on the carrier, plus some kind of processor and a random-number generator."He has passed this information to the Society's EMC Committee, which is trying to resolve the problem with the manufacturer. The latter has performed EMC tests but only for susceptibility. Chris has eight other documented cases from the Midlands, the north-west and south coast areas.

SOFTWARE

I have now copied my Amstrad PCW programs for many readers. While all have mastered the word processor, some have had little experience of using CP/M. To assist them I have written CPMNOTES, a seven-page document in LocoScript 1, covering the essentials of disk management and running programs in Mallard Basic. If anyone would like a copy, send me a formatted CF-2 or CF-2DD disk in a Jiffy bag, with return postage.

There have been requests for a contest-scoring program, but I do not have anything suitable at present. However, I will try to write one that calculates and accumulates the score, conforming to the RSGB LSVHF log sheet. I do not think duplicate checking, using a hashing method, will be feasible due to the string length limitation of Mallard Basic. Watch this space.

BEACON NEWS

Two of the Australian 50MHz beacons now operate in the low end of the band - VK8VF (PH57/Darwin) on 50.056MHz and VK6RPR (OF78/Perth) on 50.066MHz. The others are still above 52.200MHz. SZ2DH on 50.015MHz is SV1DH's beacon and it runs 5W to a 4-element Yagi beamed between JA and VK. The Jersey beacon, GB3IOJ (IN89WE) on 50.065MHz has been licensed by the DTI, with French PPT agreement, to run 10dBW with a vertical antenna. Note that amateur stations are limited to horizontally polarized antennas. FR5SIX (LG58) is a new beacon from Reunion Island operating on 50.0225MHz; it came on on 19 November running 2W to a halo antenna. HC2FG has written to Ted Collins, G4UPS (DVN), confirming he is upgrading and relocating his beacon, HC2FG/B. The new site will be on Mount Animas (EI97), 620m asl with a 50W PA and J-pole antenna. It will send, 'I de HC2FG/B'.

50MHz

So far, relatively few countries on the European mainland allow 50MHz operation. Of those that do, most limit the number of permits and impose restrictions on power and operating times. Andres Ivorra, EA7AG, lives in Almeria and wrote on 10 November to clarify the situation in Spain. To quote him, "I want to make it very clear that no licence, permission, authorization or whatever has been given in Spain to transmit on 50MHz to date. So all stations transmitting from Spain are pirates and that includes EA6, EA8 and EA9 (Ceuta and Melilla) in north Africa. No permission has been given to Spaniards, not to mention foreigners. You can imagine the poor impression that we get of British radio amateurs when they come to our country and, irrespectful of our laws, transmit on 50MHz while we keep on waiting for the allocation of the band..."

Andres says that the EAs are trying to persuade the authorities that they deserve the band, but that these pirate activities don't help their cause. By now TV transmissions on channels 2, 3 and 4 should have ceased, but the band is also allocated to other services and they may need some considerable time in which to be reallocated. He concludes, "The administration seems to be little prepared for a dialogue on these matters, although there is mounting pressure from we radio amateurs."

The October report by Ray Cracknell, G2AHU (HWR) begins with "50MHz results. Dramatic developments. October 1989 showed the first manifestations of real sunspot maximum conditions on 50MHz." Mentioning the events already recorded in VHF/UHF, he reports that, "...openings showed signs of normal ordinary-ray F2-layer propagation and strong signals, although marginal areas still exhibited side-scatter and off-line propagation as well as ordinary ray effects."

These reports always includes news from overseas, and that from Jeff Farmer, VK8GF, supplements the reports in the December VHF/UHF. The Buxton beacon GB3BUX (IO93BF) was copied in Alice Springs on 11, 13, 15 and 16 October. No other GB beacons were heard. From Greece, SV1DH

found October to have been the best month of Cycle 22 so far, with the 18th, 19th, 21st, 28th and 30th noted as exceptional days. Costas heard or worked 35 countries in all continents during the month.

Under the heading, 'Next Target' Ray quotes from JA1VOK's 'World VHF News' that ZL1ADP and ZL2TPY now have special licences for 24-hour operation on 50MHz. The ZL allocation is 50-54MHz but 50-51MHz operation is only permitted outside Band 1 TV hours. Their DX calling frequency is 51.110MHz, so you'd better program that QRG into a memory!

G4UPS covered the broad picture of November activity in his copious notes. To summarize, the first VS6 opening of the season took place on the 5th when VS6WV (OL72) worked some Gs, including Ted at 1202. QSL via K0TLM, 4936 N Kansas Ave, Kansas City, MO 64119, USA. Also on the 5th, ZC4MK (KM64) worked 180 Gs, calling especially for those who hadn't worked Cyprus before; Adrian is an excellent operator.

EL2FO (IJ46) worked into EI, G, GI, GM, GU, GW and PA on the 6th. Alan's QSL route is KN4F, 5104 Pilgrim Road, Memphis, TN 38116, USA. EL2B is a new station in Liberia, who worked into the UK on the 7th using a dipole. He is G3SRO and his QSL manager is G3SDL. The first W6s this cycle were heard on the 9th and G4GLT is reported to have worked K6STI.

V47SIX (FK87) was widely worked from St Kitts from the 16th and had made over 500 QSOs by the 18th. He is N4HSM. ZS9A is the new callsign of ZS2IS in Walvis Bay (JG77). TU2OJ is a new station from the Ivory Coast; he worked Gs in IO70 on the 13th and is Gerard Piejougeat, Box 634 Gagnoa. 9X5AA is likely to be QRV soon from Rwanda.

The first opening of the season into Europe for FY5DG (GJ35) was from 1127 on the 14th, when he worked G4UPS and many other Gs for about 30 minutes. W6JKV operated from CT3 from the 16th, Jim's first QSOs to G being on the 18th.

There has been such a tremendous amount of DX worked from 1 November to the deadline date that individual reports are not feasible this month. So I will list the more noteworthy DX worked on a daily basis.

From around 0900 on the 1st VK4s ALM, FNQ, FXX, JH and RO, VK8s TM and ZLX (PG66), JA4MBM, KG6DX, JA6IEF, JR6HIT. From 1045 OH and SM. From midday HC5K (FI07), VE1s and W1s. On the 2nd, from 0940 CT, OH, SM, F, G4KLF/MM plus the SV, ZB2 and 5B4 beacons. From midday, 8P6JW (GK03), 8P6LL, KP2A (FK78), VP5D (FL31), OA8ABT (FI21), TR8CA (JJ40), VE1YX and from 1500, lots of W4s and W5 in EL and EM fields.

The CT, 5B4 and ZD8 beacons were copied on the 4th, when TR8CA, VE1YX and G3GJQ/5N29 were also heard. On the 5th, from 0820 backscatter QSOs were made with F, GM, LA, PA and SM stations. From midday VS6WV, HC5K, JA6WFM/HR2, TR8CA plus W4s in Florida and W1s. On the 6th, Arabic FM was heard at 0800 and 5B4CY was S9 plus from 0925 to 1050. SV1s were heard at 1100 as was ZD8VHF. G4UPS telephoned ZD8MB who came on to work EI, G, GI, LA, PA and SM stations. Then from midday, ZS6s, TR8CA, KP2A, W2 and EL2FO.

On the 8th, strong Russian TV was audible from 0700-1240. Stations worked/heard included TR8CA, W2s, G3GJQ/5N0, OH5NT/5N0, EL2FO, W4s and W8s. On the 9th, more Russian TV, ZC4MK, ZC4EPI (KM65), HC5K, HC2FG (FI07), OA8ABT, VE1, W1, 3, 4 and 8. from 1541 N5JHV (DM62/New Mexico), N6AMA, K6STI, WA6PEV and K7NN.

The solar flux was still high at 260 on the 10th. From around noon until 1400 many US stations in call areas 1 to 3 were worked, and from 1400 W4s and W8s were available. The SMIRK contest took place over the weekend 11/12th and on the first day from 1215-1645 QSOs were made with many VO1, VE1/2 and W1-4, 8, 9 and 0 stations. Some real DX appeared, such as P43AS, KP2A, KP4BZ, KP4JN (FK68), PZ1AP, HC5K, HC2FG, 9Y4VU (FK90), HC1BI (FI09), KG4SM, HH7PV (FK28), TI2HL (EJ79), ZF1RC (EK99), YN3CC (EK62) and DL3ZM/YV5 (FK60).

The morning of the 12th brought propagation to TR8 and EL, and from just before noon to P43, KG4, HC, KP2, ZF and W3-5. 5B4CY was S9 plus at 0820 on the 13th. ZB2VHF was S7 around that time, but only when beaming due east from Devon. ZC4MK, TU2OJ, HC5K, KP2A, VP5D and some W1-3 stations were around, and a late-afternoon aurora produced GM QSOs from southern G.

At 1040 on the 14th FY7THF was S9 plus; the DX included 8P6JW, 9Y4VU, FY5DG, HCs 5K, 2GE and 2FG, OA8ABT, VP5D and VE1YX. Russian TV was strong on the 15th from 0800, and from around noon WA1OUB, HK3AVR (FK24) and dozens of VE, VO, W1, 2, 3 and 8 stations were worked until 1500. There was a repeat performance next day to VE, VO and W.

On the 17th, VK8s were heard by stations in IO70 around 1010. A major magnetic storm started on that day, the A index reaching 62, with an attendant aurora from about 1500 which brought the usual crop of G, GI, GM, PA, OH and SM stations. At 1556 G4UPS worked VP5D at RS59 both ends. The VP5 was copying GB3NHQ T9 but GB3SIX was very auroral. At 2136, Ted had auroral-E QSOs with TF6MM (IP24) and TF3EJ (HP94).

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	144MHz	430MHz	1.3GHz	Total
G3IMV	206	427	125	51	809
G4KUX	—	384	120	—	504
GM4YXI	—	340	—	—	340
G4IJE	285	338	5	2	630
G4SWX	—	333	—	—	333
G0CUZ	—	329	73	—	402
G4DHF	—	325	—	—	325
G0DAZ	137	316	122	39	614
G4RGK	50	299	133	51	533
G4XEN	66	292	114	—	472
G4RRA	—	280	80	—	360
GJ41CD	253	263	119	59	694
G4PIQ	—	261	87	—	348
G4SSO	—	256	98	—	354
G3FPK	—	241	—	—	241
G6HCV	143	229	—	—	372
GW4FRX	—	226	—	—	226
G6HKM	173	217	109	46	545
G4DOL	—	216	—	—	216
G0EVT	66	206	57	—	329
GM4CXP	—	198	31	—	229
G0GMB	—	187	99	—	286
G6DER	43	183	114	82	422
G8LHT	104	182	91	11	388
G1KDF	139	180	102	37	458
G4VXE	147	162	42	4	355
G4MUT	82	153	93	31	359
G0LFF	83	153	—	—	236
G6STI	—	152	69	24	245
GJ6TMM	62	151	47	—	260
G4XBF	—	150	—	—	150
G8ATK	—	143	94	52	289
G1SWH	97	141	57	—	295
G4TGK	—	137	—	—	137
G8XTJ	44	120	—	—	164
GW4VVX	—	115	—	—	115
G8PYP	95	105	31	—	231
G1WPF	—	101	—	—	101
GM0GDL	—	83	22	—	105
G1CEI	8	74	15	—	97
G1DOX	54	73	16	8	151
G0HVQ	50	71	—	—	121
G0HDZ	—	64	—	—	64
G0JHC	177	48	—	—	225
GM1ZVJ	5	44	—	—	49
G6UWO	—	41	44	18	103
G7CLY	—	41	1	—	42
GM1BVT	30	23	—	—	53
GM0GEI	101	—	—	—	101
G6MEN	48	—	—	—	48
G6ODT	—	—	45	—	45

No satellite, repeater or packet radio QSOs.
'Band of the month' 144MHz

The 18th was yet another good day, the DX including EL2B, ZD8MB, W6JKV/CT3, V47SIX, KP2A, KP4s EIT and BZ, FY5DG, HCs 1BI and 5K, HK3AVR, TI2s HL and KD (EJ79), HH7PV, G3GJQ/5N0, YV4DDK (FK50), PZ1AP, VE1BPY and some W1s. The 19th was a very similar day with ZD8MB, 8P6JW, 9Y4VU, PJ2EE (FK52), HI8W (FK58), HI8PM, HP3XUH, KP4BZ, HK3AVR, DL3ZM/YV5, VP2VI (FK78), TI2TL, KP2A, V47SIX, W6JKV/CT3, YV4DDK, HH7PV and KG4SM. For three hours from 1407 there were dozens of W1-4, 8,9 and 0, VE1-3 and VO stations on.

The afternoon of the 20th brought V47SIX, HC5K and KP4EIT. From 1624 the DX consisted of N5JHV, W7CI (DM41) and WA7RAI (DM33), both in Arizona, and WB0V (EN35). From 1150 the next day KP2A, VP5D, 8P6JW, HC5K and VP2EHF (FK88) were on, but at 1250 high solar noise appeared followed by a complete fadeout. VE1YX was worked by G4UPS at 1426 but signals were weak; various extremely weak W1s were around from 1430. The band had recovered by the 22nd, with Russian TV from 0830. From 1100 ZW0F (HI36) was rare DX from Fernando do Noronha. From noon on, there was propagation to VO2, VE3, W1, 2, 8 and 9.

So that is the general picture up to 22 November, compiled from G4UPS's excellent notes and letters from John Hoban, G0EVT (YSW), Darrell Moody, G0HVQ (GLR), Neil Carr, G0JHC (LNH), Dick Hide, G0LFF (SXW), Peter Hirons, G1CEI (HPH), Jon Acton, G1DOX (AVN), Gerry Schoof, G1SWH (MCH), Clyde Hinton, G1TCH (CVE), John Heys, G3BDQ (SXE), John Colebrook, G3BJD (CBA), John Hunter, G3IMV (BKS), Paul Turner, G4IJE (ESX), Paul Kerslake, G4NDG (DVN), Ela Martyr, G6HKM (ESX), Ian Harwood, G8LHT (YSS), Steve Damon, G8PYP (DOR), John Fitzgerald, G8XTJ (BKS), Geoff Brown, GJ4ICD, Steve Jones, GM0GEI (HLD), William Pettett, GM1BVT (CTR) and John Fairgrieve, GM1YZW (WIL). Many thanks, all.

Next, a few points from individual letters. Readers continue to complain about those operators,

allegedly running excessive ERP, who insist on working DX stations every time they appear. Richard Diamond, G4CVI (HPH), understands this sentiment but asks, "...what is gained by not responding to continual, unanswered CQ calls? The least you can do is let the DX know he is getting this far." He also points out that some will be unable to hear weak DX anyway because of local high noise level. G0HVQ notes that some of the more experienced DX stations call for specific countries, prefixes or numbers in an attempt to sort out the pile-ups they create. He complains about those who call out of turn and says, "50MHz was once the friendliest of the amateur bands, but it is becoming more like 14MHz every day."

G3BDQ notes that many operators never give the call of the station they are working and asks, "Is this really legal?" Yes. All we have to do is identify ourselves as stipulated in the licence. The DX stations know their calls, so why add to the QRM and waste time telling them? However, for awards and contest purposes, an exchange of callsigns and reports is the minimum requirement for a QSO.

G4IJE exchanged high-resolution colour pictures via SSTV with WA1UQC (FN31) on 50.230MHz at 1330 on 22 November. In spite of QSB, solid copy of all frames was achieved in what may be a 'first' on the band. Paul used a home-brewed RGB framestore system - 256 × 256 pixels with 16 levels of red, green and blue - processing being done by a BBC micro. (See News pages.)

G8PYP's antennas were damaged in the gales which swept along the south coast on 21/22 October. Steve has repaired them and has replaced his ruined HB9CV antenna by a 4-element Jaybeam Yagi. 5 November was quite a day for GJ4ICD, who completed WAC in four hours. His was the first 50MHz WAC application received by GW4BKG, but the ARRL will be the final arbiter.

70MHz

Very little to report on this band, I'm afraid, though there are plenty of counties to work judging by G1SWH's results. In October, Gerry added GW4IOI (GNW) on the 15th and G6OOX (NHM) on the 24th, bringing his 1989 score to 74. In the 17 November aurora, he worked G1ENJ, GM3WYL (SCD), G3LVP, G4PMK (YSW) and G4SEU (WKS).

G8LHT only worked two stations, GW4HBK (GWT) and G1SWH (MCH) during the aurora on 21 October. G8PYP has finally got his converted Pye 'Europa' working again with 10W of FM on 70.26 and 70.45MHz. Steve's antenna is a quarter-wave ground plane and he monitors .45 most evenings from Wimborne.

For next month I hope I'll get some comments on the CW contest on 10 December. Maybe the Cumulatives will drum up some activity and - more to the point - some reports? The dates are 28 January, 11 and 25 February and 11 and 25 March.

The confirmation of 70.325MHz as a packet radio frequency - it is listed as 'informal packet' on page 94 of the current *Call Book* - has caused problems for members of the Suttom and Cheam Radio Society. They made a number of inquiries about the suitability of the frequency, none of which revealed the packet use. So they bought 17 pairs of crystals for converted Pye Westminsters but will now have to choose another frequency for their club net operations. I am sure there must be packeteers who need these crystals; if you would like to do a deal, please contact G0BWV (QTHR).

The VHF Committee is appointing a Frequency Registrar whose prime function will be to keep records of the frequencies of club nets, etc. Please let us know what 70MHz frequencies you use for formal or informal, club or group operations. The aim is to avoid the 'Sutton and Cheam syndrome' in future, although it must be stressed there is no question of any groups being granted exclusive use of any frequency.

144MHz

Colin Morris, G0CUZ (WMD), learned from IK0BZY of the first contacts to southern Africa this season. These occurred on 10 October via TEP mode when IK0LYL and IW0AKA worked ZS3AT (JG87), who runs 200W to two 19-element Yagis. On 15 October at 1840, IK0BZY (JN61GW), who runs 300W to a 20-element Yagi, worked ZS3E (JG89), who uses 80W and two 11-element Yagis; signals were RST419 each end. On 2 November IK0BZY worked ZS3AT at 1855 with RST517 reports. Five minutes earlier I0FHZ (JN62AP) worked him, and is the furthest north I0 to do so.

G1CEI heard auroral signals from GM around 1900 on 13 November. Good tropo on the 15th brought a QSO with GM1SZF in Wick at 2054. In the 17 November aurora Alan McMillan, G4SSO (LDN), could only muster 25W as his PA was ill. His best DX was SP2HHX (JO94). The event started in the early afternoon with EIs at 340 degrees. Later on the 'U' countries were best at 40 degrees and the I, HG, OK and YU stations peaked at about 70 degrees.

G3IMV worked "...all the usual stuff" in this event and John mentioned SP7BCA (KO01), UA2FL (KO04), HG0HO (KN07), HG2RG (JN86), SP5KVW (KO03), SP7EXY (KO00), SP7DCS (JO91), I1KTC (JN45), YU2SB (JN95) "...and a half-QSO with RB5WA, wherever he was." John Wimble, G4TGK (KNT) worked a number of DLs on 14 November and GI4KIS (ATM) and GM0HNX (BDS) on the following day, but no new squares.

John Nelson, GW4FRX (PWS), was most displeased to have been off the air for this event with antenna problems, but his 4 × 18-element CushCraft array is now back in service. John reported an aurora on the 26th in which he worked GM4IPK (SLD) on SSB but no-one else.

John Palfrey, G4XEN (NHM), was still seeking GNW and IOS for the 1989 table. He mentioned G0AEA, but I believe Colin may have returned to the mainland. Mark Holloway, G4YRY (DOR), reports good localized tropo in the 13-15 November period, during which he contacted 17 Fs, but none further south than JN05. GB3ANG was S9 on the 15th but he only heard and/or worked five GMs between 1630 and 2040.

ANNUAL VHF/UHF TABLE
January to December 1989

Callsign	50MHz Cty	50MHz Ctr	70MHz Cty	70MHz Ctr	144MHz Cty	144MHz Ctr	430MHz Cty	430MHz Ctr	1.3GHz Cty	1.3GHz Ctr	Total Pts
G1SWH	77	33	74	7	97	22	55	9	—	—	374
G8LHT	69	18	35	5	95	30	54	15	13	5	339
G6HKM	61	43	—	—	81	28	51	16	32	8	321
G0IMG	69	29	41	5	56	12	27	5	—	—	244
G1DOX	36	8	49	6	66	18	29	6	16	7	241
G4XEN	24	9	23	4	80	31	44	13	—	—	228
G4PIQ	—	—	—	—	88	34	53	20	—	—	195
G8PYP	35	26	1	1	55	35	28	11	—	—	182
GD6ICR	8	4	34	5	54	12	40	7	8	4	176
GM1SFZ	41	11	—	—	71	16	7	6	—	—	152
G8XTJ	43	19	—	—	56	15	—	—	—	—	133
G0EVT	24	24	—	—	40	29	6	7	—	—	130
GM4CXP	28	11	4	1	60	19	4	3	—	—	129
G3FPK	—	—	—	—	77	26	—	—	—	—	103
GW4FRX	—	—	—	—	65	32	—	—	—	—	97
G4OUT	—	—	27	5	41	18	—	—	—	—	91
GM0GEI	61	29	—	—	—	—	—	—	—	—	90
G1CEI	5	5	—	—	51	14	8	4	—	—	87
GJ6TMM	28	12	—	—	23	9	1	4	—	—	77
G7CLY	—	—	—	—	58	14	4	1	—	—	77
G4TGK	—	—	—	—	55	18	—	—	—	—	73
GM0JOL	—	—	—	—	52	12	—	—	—	—	64
G6ODT	—	—	—	—	—	—	38	10	—	—	48
GM1ZVJ	4	3	—	—	24	15	—	—	—	—	46
G0HDZ	—	—	—	—	38	7	—	—	—	—	45

Do not include EI counties. British counties are the 79 listed in the January *RadCom*. Up to three different stations allowed in all 12 GM regions. Countries are the usual DXCC ones.

In the aurora on 17 November G6HKM had 36 contacts between 1640 and 1850. SP4VLG (KO13) and SP2MSL (JO92) were new squares for Ela. Other QSOs were with HB9RSO (JN36), Y25WA (JO64) and OE5VRL/5 (JN78). John Hill, G7CLY (HBN), had long-running equipment problems till September but is now QRV again, recently adding IN88 and JO23 to his squares count.

On 15 November G8LHT worked FC1LOS (JN38) and GM0HNX (BDS). The rest of Ian's DX were worked in the aurora on 17 November, the best being SP4LVG (KO13), OE5s OLL, VHL and EYM (all JN68) and HB9s DFG (JN37) and RSO. He also worked 24 assorted DL, F, ON and PA stations.

G8PYP contacted FC1s MOZ (JN09) and AMZ (JO10) in the late evening of 14 November, and on the following evening GD8GRE (IO74), all on tropo. In the aurora on the 17th, Steve worked ON4KHG (JO10), DC2AG (JO40), F1HDI (JN18), DL3ECY (JO31) and GI4KIS (IO64) from 1717.

John Lincoln, GM0JOL (HLD), worked 43 stations during the excellent aurora way back on 21 October. It started at 1049 and went on continuously till 2230. Other weak auroras were noted on 26 October and 3 and 5 November, and no doubt he will have done well in later events. (You put a good signal into G3FPK's hearing aid, John.) Other Scottish stations mentioning the 21 October aurora were GM1YZW, on the Outer Hebridean island of Lewis, and John Hilton, GM1ZVJ (LTH).

Clive O'Hennessey, GW4VVX (GWT), found the 17 November aurora very good and even had a pile-up of stations wanting to work 'QRM Valley' near Blackwood. He managed 56 QSOs on CW and SSB which produced ten new squares and OE for a new country. A QTE of 20-25 degrees brought in everything from GM to OH to OE. Clive mentions that Charlie Baird, GM7ASN (IO78TA) is QRV most nights on 144.300 and 144.222MHz and is the only active station in the square with a south-facing take off.

430MHz

Having worked GM1SZF on 144MHz on 15 November, G1CEI tried this band but no luck. Peter uses an FT-726R, BNOS 50W amplifier and 19-element Yagi from Jaybeam. G1DOX is still seeking his first GM on this band and a Kent QSO; Jon's telephone number for skeds is 0272 693235.

In the aurora on 21 October, Dave Dibley, G4RGK (BKS), heard four DLs but only worked DJ9BV (JO43). He is still looking for "...the elusive Russians on the band." GM4SIV (IO65) was contacted via tropo on the 22nd. Dave is pressing on with his EME system and is very fascinated by the mode. He can already work some of the 'big guns'

on a random basis.

G4SSO enjoyed the tropo lift of 13-15 November. Alan got three new squares from it, JN27, IN88 and GM1SZF (IO88), the latter also worked by G4XEN. G6HKM took part in the Cumulatives on 24 October but only made 38 contacts. But conditions were much better on 14 November and Ela had 76 QSOs.

Karl Lamford, G6ODT (NHM), took advantage of the good mid-November conditions by working G1YWV (HBN) on the 11th, G6WZA (SOM), DG4BR (JO33), FC1LFT and F6DBI (IN88) on the 13th and DF9TF (JO31) on the 14th. Howard Staddon, G6STI (LDN) gave a few points away in the 14 November Cumulatives session to such as GJ4TAW, GD6ICR and F1FHI (IN97), who was S9 plus off the back of the beam.

G8LHT has been beset by feeder problems, so progress has been limited. G8PYP found G8XVJ (CHS) on 29 October. On 13 November, Steve contacted F6APE (IN97), F6CCH (IN96), F1HRY (JN18) and FC1LFT and F6DBI (IN88). Next day brought ON5TX (JO10), F1FHI and FC1EZQ (JN27).

1.3GHz

G1DOX is looking for contacts on this band, particularly with GM. G4XEN is almost ready on the band and has been busy repairing an old SOTA transverter with the help of Gerald Peck, G4OIG. John has a 23-element Tonna antenna and 20m of H-100 feeder, so is looking forward to some serious operating.

G6HKM added SPE and BKS in the Cumulatives on 21 October, but Ela failed to work GM4SIV (SCD) on the 24th. Conditions were good on 13 November when she contacted GU8IRF, G6LEU (CNL), G8GDZ (WMD) and G4KCT (YSN). On the following afternoon the DB0JO beacon in JO31 was S9 and she worked DD9DU (JO31), but there was no other activity.

G8LHT is slowly improving his station and G8ZQB (LEC) was a new county on 6 November. Ian found seven stations on the 13th including DK2ZF (JO33), his first DL, G1ULS and G4BYV, first Norfolk and JO02 contacts - G1IRG (NMH) and G3XDY (SFK).

G4NDG has copied GB3MHL and worked G3GRO and G8HQJ (SXW), G1DOX, G8CHW and G8ACT (HFD), G1RER (LDN), G4ZTR (ESX), G0BPU and G3XDY (SFK) and G3KZR (SRY). These were Paul's first contacts outside of contests, but he did not mention the date.

DEADLINES

Quite an eventful month and I have a gut feeling that 1990 may be a spectacular year. The March deadline is 19 January and the April one is 24 February. A Happy New Decade to you all.

SWL

BOB TREACHER BRS32525

50MHz

The five-star rating this month most definitely goes to the 50MHz band, which has at last started to produce the DX which the experts always said it would. We begin with a report from Martin Parry, BRS52543. His first real DX came with ZC4MK (KM64) at 1058 on 29 October, and Martin caught his first big opening to the Caribbean, South America and the USA on 11 November. The list of DX is more reminiscent of 28MHz than a VHF band; PZ1AP was first in the log at 1137, and he was followed by KP4BZ, DL3ZM/YV5, HC5K, VP5D, HC1BI, HH7PV, ZF1RC and TI2KD. He also logged VOs and VEs in grid squares FN25, 66, 74, 84, 96, GN26 and 37. Stateside grid squares were EM15, 69, 84, 95, EN31, 41, 51, 61, 70, FM18, 19, 29 and FN12, 20, 30, 31, 42, 43, 53 and 54. The following day Martin found EL2FO (IJ46) at 1022.

At my QTH, the Caribbean opening on the 11th was missed as a result of having to take the family shopping - fatal, this - but 38 Ws and VEs were logged between 1325 and 1639. Best DX was WB9JMB (EN50), K5IRO (EM15) and K9HMB (EN52). The 12th saw EL2FO at 1023, followed at 1230 by P43AS, HC5K, KG4SM, HC1BI and HC2GE. Two Ws in EL87 were heard at 1350 before the band closed. EL2B was heard on the 18th at 1003. With no shopping to do on that day, I was waiting patiently for the band to open to the Caribbean. It duly did so at 1217 with KP4EIT and DL3ZM/YV5 making their appearance. We then had a six-hour power failure! The following day, the 19th, produced 8P6JW, V47SIX, PJ9EE, DL3ZM/YV5, YV4DDK, KP2A, HI8W, KG4SM, HH7PV and HI8PM. Assorted Ws and VEs followed until 1635.

The 20th provided HC5K again at 1220 and HC2FG at 1231, but the band opened further to the west later into the opening. W7s were worked from about 1620; I could not hear them, but no doubt Norman's column will have all the details. I was pleased to hear W5VY (EL09), K0GJX (Minn), NQ5X (EM13) and KB5RF (EM12). The 21st brought some backscatter with FC1JG (JN23), PA0HIP, F6DOK and GI8YDZ all being audible between 1030 and 1130. I also heard the GB3SIX beacon for the first time. At 1110 the FY7THF beacon was 20dB over S9 but alas no FYs were active. The band opened to the Caribbean at 1147 with 8P6JW, followed by KP2A, HC5K, PJ9EE, HC2FG and VP5D; it closed at 1245 with no opening to the USA. The 23rd saw only a short opening between 1229 and 1310 to HC, VE, VO and W1. The story was much the same on the 25th, with only a brief opening to VE1 between 1242 and 1306. The 26th was a little better, bringing very strong signals from VO1JN, VO1QF (the only amateur in GN26), VE1YX and VY2ZZ (ex-VE1BPY).

1989 UHF/VHF SWL TABLE

Station	50	70	144	430	TOTAL
BRS32525	146/45	11/5	92/26	14/5	334
BRS25429	116/28	—	65/17	16/7	249
BRS52543	67/26	9/4	40/13	13/4	176
BRS31976	—	5/1	89/26	39/14	174
FI1ATZ	4/4	—	59/20	7/3	97
BRS62088	26/9	—	22/8	—	65

Format of the table is squares and countries added together. If you listened on VHF or UHF during 1988, look through your logs and send me your figures.

The 50MHz DX on offer also rekindled the interest of my XYL, Joan, BRS62088. She put the domestic chores on one side to log some of the juicier stations on offer. Her best DX was EL2FO, HC1BI, HC2FG and KP2A. She also logged some VE and W stations, including VE1YX, N1EFM, KA8VHJ, W8TN, WA8NJR, WA8LXJ and WF8C.

Dave Whitaker, BRS25429, missed most of this choice DX on account of having taken a winter vacation to W6. He was alerted to the good conditions on his return but only caught about 20 USA and Canadian stations in a brief opening on 25 November. The following day was better and Dave logged HC5K and HC2FG together with over 40 Ws and VEs. His best catches were VE3RM, N4HB and WB8GEX.

HF REPORTS

Conditions during October and early November were rather mixed, being good at the beginning and end but quite poor in the middle. Most reporters sent in details of their loggings during the SSB leg of the CQWW contest, and I'll look at these later on. Under this heading I've taken information from BRSs 8841, 46598, 48462 and 90281.

Conditions on 3.5MHz seem to be down on those in 1988, but some quite good DX had been heard during the period in question. Callsigns mentioned included A61AD, BY4SZ, FJ/DL7FT, HL1EJ, VK3DZM, VP9LR, ZL4AP and 9M8AX. The 7MHz band also provided some interesting DX in the shape of AP2CW, BZ1FB, CO5GV, RI8AB and 9M8AX.

Moving up to 14MHz, the band was very good to the Pacific in the mornings and stayed open very late to the USA. Some of the better DX mentioned included A61AD, CW0L (Lobos Is), TI2LAK/HP4, AH2BE/KH9 (your scribe still needs KH9 on 14MHz!), 3C1AG, 3D2VB and 5J0DX (Gorgona Is). The 21MHz band was also good into the Pacific during the mornings, with AH2BE/KH9, YJ8NMB and 5W1ML noted. Other notable 21MHz DX included AP2JZB, CX4AB, CY0SAB (Sable Is), TU2JL and 3B9FR.

Once again 28MHz was in excellent shape and an enormous list of DX heard on this band was sent in. I hope that the following list will do justice to the information received. A large number of USA stations filled the band between lunch-time and early evening, but good signals were also copied from Africa, Asia, South America and the Caribbean. Perhaps the best DX reported was NH6RT/KH8 but other tasty items reported were BZ4AA, EL2E, FJ/DL7FT, FR5QT, H44JG, HL5BDS, JA6WFM/HR2, OA8K, PY0FF, TT8GA, V44KI, VQ9BL, YI1BGD, ZZ5SZ (San Francisco Is), 3B8FQ, 5H0TSA, 5T5SR AND 9K2KS. Colin Watson, BRS46958, spent much of his time on 29MHz FM and logged many Ws and JAs plus LU1EYT, TA1AW, CN8CC, HC3FL and 5T5SR.

DX NEWS

You will almost certainly know that 'Hurricane Hugo' caused devastation to parts of the Caribbean. Pedro, NP4A, lost his monster 3-element beam for 3.5MHz and John, KP2A, lost five of his six towers. The most heavily damaged island, however, was Montserrat. 'Hugo' was the first hurricane to strike the island directly for 62 years and essentially all the native housing was destroyed, the electrical generating plant was shut down and the airport buried under tons of rock and mud. Only a handful of structures escaped damage in the 150mph winds, and rebuilding work will take many months. As you may have already guessed, the best-known contest QTH on the island - 'The Last Resort' - was completely destroyed.

The Colvins are on their travels again; they started their latest six-month world tour in mid-October with a stop in XT2. For reference, readers might like to know that their callsigns normally end in QL or KG; QL is normally on SSB and KG on CW some 25kHz up from the band edge. QSL to YASME, Box 2025, Castro Valley, California 94546, USA.

Stations on Prince Edward Island (VE) can now use the VY2 prefix on a permanent basis. Most will keep their old VE1 suffix but some 2 X 2 callsigns (such as VY2ZZ, mentioned earlier) will be issued.

FINALE

That's all for this month. Please keep the DX news coming, whether it's on LF, HF, VHF or UHF. If it happens, it'll be reported here! Copy for the March edition should reach me by 22 January.

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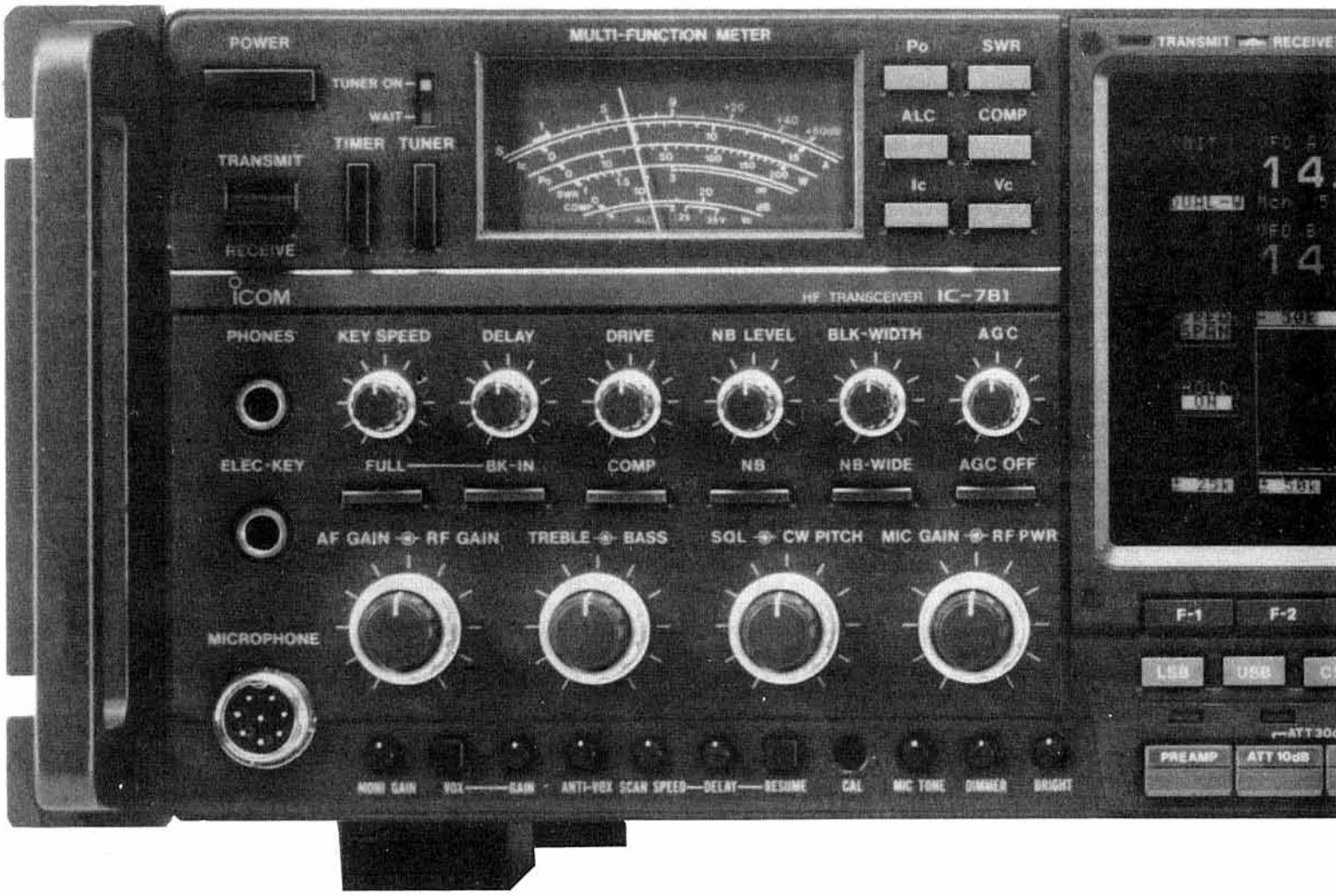

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TS-440S £1,138

The TS-440S is probably the most successful HF transceiver ever made by Kenwood, and this is no surprise when you realise that it is virtually a mobile version of the TS-940S. I can't put it better than Geoff Arnold in his review of the TS-440S: "The receiver in particular is a joy to use". He was not wrong, and just ask any TS-440S owner to confirm it. All band, all mode operation, with a receiver covering 100kHz to 30MHz; the TS-440S is unbeatable at any price.

TS-140S £862

The TS-140S was in effect designed by our customers, who demanded Kenwood performance and facilties at modest cost. The TS-140S has all mode, all band HF coverage, and of course a high performance general coverage receiver. 100W output and a first class receiver combine to make the TS-140S a really satisfying rig to own. It's also available in the form of the TS-680S which has all the bands and modes of operation of the TS-140S but with the 6 metre band as well.

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020 Telex 377482
Shops in **GLASGOW** Telephone 041-945 2626, **DARLINGTON** Telephone 0325 486121, **CAMBRIDGE** Telephone 0223 311230.

25 years in amateur radio

DAIWA RF POWER METERS

NS-660P P.E.P. METER

What's so special about "cross needle" R.F. power metering? Well, it's typically Daiwa to go direct to the heart of the matter and develop a system which will give you the true value of forward power, reflected power, and SWR all at a single glance. The elegant simplicity of the idea hides a great deal of thought, which of course is the hallmark of Daiwa products.

You will see from the photographs that the meter displays have two scales, one reading forward power, the other reflected power. Since SWR is calculated using these two values, Daiwa have arranged the meter pointers so that SWR is shown at the crossing point of the two meter needles.

Why don't other makers use the idea? Basically it's a question of power meter accuracy. The usual type of single or twin meter "SWR/power meter" uses a simple strip line to measure the VSWR on the transmission line. You will note that I have said "VSWR", and this is important. These so-called power meters are in fact ony measuring the voltage standing wave and in order to display power, you need to monitor both voltage and current in the line. Daiwa meters of course, do just that, and consequently are very accurate indeed. The cheaper so-called power meters depend for their accuracy in being terminated in a resistive load, and exhibit wild inaccuracy when terminated in a reactive load. In other words, when the indicated VSWR on the meter is other than 1:1, their accuracy is quite badly affected.

To summarise; the Daiwa cross needle power meters give you easy, unambiguous readings at a glance, and what's more those readings are accurate even in lines displaying high SWR, and since Daiwa meters measure true power, they are accurate at any point in the feedline from transmitter to aerial.

As with all Daiwa products, their meters show the Daiwa approach to design, combining accuracy, ease of use and interpretation, and that indefinable feel of quality which is the sure sign of a good product. Once owned, never discarded.

Note The NS660P measures average power and P.E.P. with a "hold" facility to memorise the actual peak power. Also measures up to 1.5kW forward power.

CN-460M

CN-410M

CN410M 3.5-150MHz 150W	**£61.72**
CN460M 140-450MHz 150W	**£65.40**
NS660P 1.8-150MHz 1500W	**£115.00**

Frequency counters by OptoElectronics

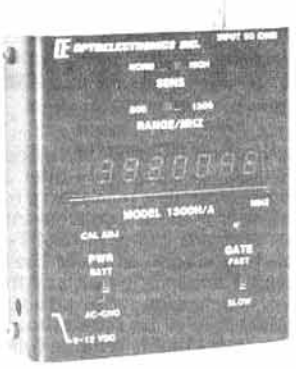
OptoElectronics specialise in high quality hand held frequency counters for the professional communications and research market, but we think that the radio amateur will appreciate just how useful the counters can be in the station or in the field. The original 1300HC model was an undoubted winner, but OptoElectronics have now introduced a new range with even more performance than before.

2400H 2.4GHz frequency counter

A new addition to the "shirt-pocket" frequency counter range from OptoElectronics, the 2400H features measurement capability from 10MHz to 2.4GHz with eight digit display, internal rechargeable batteries, selectable gate times, and high sensitivity.

Sensitivity is better than 10mV from 27 to 2100 MHz and better than 5mV from 60 to 1800 MHz. This sensitivity allows the 2400H to be used for "off-air" measurement of even low powered RF sources, using the optional telescopic antenna, and its light weight and small size make the 2400H a real carry round friend.

The 2400H has internal batteries which can be charged from any 9 to 13Volt dc source. The counter can also be powered directly from a nominal 12V dc supply, so it is really versatile.



1300H/A high sensitivity counter

The new 1300H/A counter carries on where the successful 1300H left off. With a measurement range of 1 MHz to 1300 MHz, the 1300H/A is ready for a wide variety of applications, but the outstanding feature is a sensitivity below 1mV from 30 to 400 MHz thanks to the inclusion of a surface mount pre-amplifier. This makes the 1300H/A usable for off-air measurements at up to 100 feet from a typical 150MHz 1W transmitter.

Power supply is by internal chargeable batteries, and these can be recharged from any 9 to 12 Volt dc source; and indeed the counter can be directly powered from the same source. Weighing only 9 ounces complete with batteries, the 1300H/A can literally be carried in your pocket, and extend accurate frequency measurement to any location you want.

2400H £280.00 (+£2.50pp)

1300HA £159.00 (+£2.50pp)

2210 New model 2.2GHz **£229.00 (+£2.50pp)**

Name

Address

Post Code

FREE INFO. Don't forget £1 to cover postage. R.C.

All branches are closed all day Monday.

S. WALES (BARRY) Telephone 0446 721304, **LONDON** Telephone 01-429 3256 **BOURNEMOUTH** Telephone 0202 577760

SMC — South Midlands Co

SCHOOL CLOSE, CHANDLERS FORD IND. EST., EASTLEIGH, HANTS. SO5 3BY

DYNAMIC DX

WITH THE NEW FT1000

Designed with no spared effort or expense for optimum performance and operability, the FT-1000 is the fruit of over 25,000 man-hours of intensive research and development by Yaesu's top design engineers. Instead of merely offering incremental improvements on existing designs or adding bells and whistles to an old model, the FT-1000 project involves a wholly new approach to the application of the latest digital and RF technologies to today's most demanding needs on the hf bands. Extensive surface-mount component technology allowed six microprocessors and five Direct Digital Synthesizers to be harmoniously integrated with a simple operator interface into a highly reliable full-featured transceiver optimized for serious hf applications.

ADDITIONAL FEATURES

Other features include adjustable IF width, IF shift, IF notch and APF controls. AGC presentable for fast, medium and slow + defeat, on/off selectable, preamp + adjustable attenuator -6db, -12db, -18db. Adjustable — mic gain, RF power o/p, processor and drive controls. Built in electronic keyer with adjustable speed control. Twin independent frequency displays with mode indication + much more.

OPTIONS

SP5 external L/S with audio filter
DVS-2 Digital voice message storage system
BPF-1 Sub VFO filter unit
YH-77ST Headphone for stereo or mono dual receive
TCXO-1 High Stability oscillator unit

BRIEF SPECIFICATIONS

★ General Coverage Receiver 100Khz-30Mhz
★ Ham bands TX 160-10m
★ Modes CW, USB, LSB, AM, FM, RTTY and PACKET
★ VFO steps 10Hz CW, SSB, RTTY, 100Hz AM, FM, PKT
★ Auto antenna impedance range 16.7 to 150 ohms
★ Selectable receiver band widths 2.4Khz, 2Khz, 500Hz, 250Hz
★ Dual band receiver tuning and monitoring with balance control
★ Power output up to 200 watts P.E.P. 50w AM
★ Sensitivity preamp on SSB/CW 0.25 micro volts 10db S/N
★ D.D.S. Direct Digital Synthesiser
★ Dual selectable noise blankers with adjustable threshold
★ Frequency stability ±20ppm (0 to +50°C) ± 200Hz F3 ± 0.5ppm (0 to +60°C), ± 150Hz, F3 with TXCO-1 fitted
★ 99 memories

LEEDS
SMC (Northern)
Nowell Lane
Industrial Estate
Leeds LS9 6JE
Leeds (0532) 350606
9-5.30 Mon-Sat
Closed Sat afternoon

CHESTERFIELD
SMC (Midlands)
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New Whittington
Chesterfield
Chest. (0246) 453340
9.30-5.30 Tues-Sat

JERSEY
SMC (Jersey)
1 Belmont Gardens
St. Helier, Jersey
Jersey (0534) 77067
9-5pm Mon-Sat
Closed Wed

BIRMINGHAM
SMC (Birmingham)
504 Alum Rock Road
Alum Rock
Birmingham 8 3HX
(021-327) 1497/6313
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9.00-4.00 Sat

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Devon EX13 5NY
Axminster (0297) 34918
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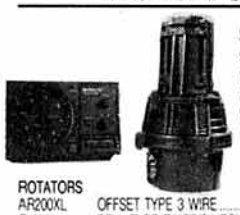
SOUTHAMPTON SHOWROOM open 9.00-5.00 Monday to Friday, 9.00-1.00 Saturday. Service Dept open Mon-Fri 9.00-5.00.

SOUTH WALES AGENT: John Doyle, Transworld Comms, Neath (0639) 632374 Day (0639) 642942 Eve. Closed Thursday.

SMC South Midlands Communications Ltd.

ROTATORS



Superb engineering standards combined with pin sharp setting accuracy means new technology from Yaesu create Kenpro Hygain.

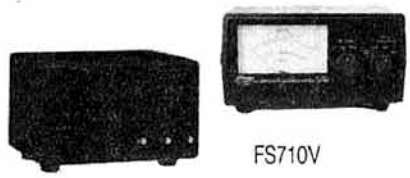
ROTATORS		
AR200XL	OFFSET TYPE 3 WIRE	£49.50
G-250	BELL TYPE TWIST/SWITCH CONTROL	£78.00
G-400	BELL TYPE METER CONTROLLER	£139.00
G-400RC	BELL TYPE ROUND CONTROLLER	£169.00
G-600RC	BELL TYPE ROUND CONTROLLER	£219.00
HAM1V	BELL TYPE METER CONTROLLER	£327.00
T2X	BELL TYPE METER CONTROLLER	£499.00
G-800SDX	BELL TYPE 450 DEG VAR. SPD	£325.00
G-1000SDX	BELL TYPE 450 DEG VAR. SPEED	£368.00
G-2000RC	BELL TYPE ROUND CONTROLLER	£445.00
KR500	ELEVATION METER CONTROLLER	£149.95
G-5400B	AZIMUTH/ELE DUAL CONTROL	£375.00
G-5600B	AZIMUTH/ELE DUAL CONTROL	£435.00
RC5-1	BELL TYPE ROUND CONTROLLER	£219.00
RC5A-3	BELL TYPE VAR. SPEED AND PRESET	£425.00
RC5B-3	BELL TYPE VAR. SPEED AND PRESET	£675.00
ROTATOR HARDWARE		
AR200AB	ALIGNMENT BEARING AR200XL	£17.50
KS505	ROTARY BEARING 1½" MAST	£19.95
GS-065	ROTARY BEARING 2" MAST	£29.95
GC-038	LOWER MAST CLAMP G-400, 600 etc	£16.95
9523	CHANNEL MASTER BEARING	£19.95
CK46	ROTARY BEARING 1.5–2.5 MAST	£34.95
MC1	LOWER MAST CLAMP RC5 SERIES	£25.00
ROTATOR CONTROL CABLE		
RC5W	5 WAY G-400RC, 800, 1000SDX PER MTR	£0.48
RC6W	6 WAY G-250, 400, 600, RC KR500 PER MTR	£0.66
RC8W	8 WAY HAMIV, T2X 2000RC RC SERIES PER MTR	£0.72

CARRIAGE:
ROTATORS FREE, ROTATOR HARDWARE £2.85, ROTATOR CABLE £3.50 UP TO OVER 20 MTS, OVER 20 MTS £5.00.

MORSE KEYS

MORSE KEYS			p.p.
HK702	STRAIGHT KEY	£42.95	£3.00
HK703	STRAIGHT KEY	£38.45	£3.00
HK704	STRAIGHT KEY	£26.35	£3.00
HK705	STRAIGHT KEY	£22.49	£3.00
HK706	STRAIGHT KEY	£21.80	£3.00
HK707	STRAIGHT KEY	£20.15	£3.00
HK708	STRAIGHT KEY	£21.50	£3.00
HK710	STRAIGHT KEY	£39.95	£3.00
HK711	STRAIGHT KEY KNEE MOUNTING	£41.75	£3.00
BK100	MECHANICAL BUG	£34.95	£3.00
MK701	SINGLE LEVER PADDLE	£38.35	£3.00
MK702	SINGLE LEVER PADDLE	£36.25	£3.00
MK703	SQUEEZE KEY	£34.50	£3.00
MK704	SQUEEZE KEY	£20.00	£3.00
MK705	SQUEEZE KEY	£32.78	£3.00
MK706	SQUEEZE KEY	£30.48	£3.00
HK802	DELUXE BRASS KEY	£112.54	£3.50
HK803	DELUXE BRASS KEY	£107.75	£3.50
HK804	DELUXE BRASS KEY	£99.69	£3.50
MORSE EQUIPMENT			
KP100	SQUEEZE KEYER	£109.75	£3.50
DEWSKEYSTD	STAR MASTER KEYER	£54.69	£3.50
DEWSKEY M	STAR MASTERKEY MEMORY	£94.99	£3.50
D70	MORSE TUTOR	£56.35	FOC
DATA TERMINAL			
PK232/FAX/ NAVTEX	MULTIMODE DATA TERMINAL	£289.95	FOC

SWR/PWR METERS



FS710V

YS60

FS710V	50-150MHz	15/150W	PEP £107.80
FS300H	1.8-60MHz	20/200/1000W	£53.40
FS210	1.8-150MHz	20/200W	Auto SWR £65.50
FS301M	2-30MHz	20/200W	£42.25
FS301MH	2-30MHz	200/2000W	£42.25
FS711H	2-30MHz	20/200W	Head/Display £43.65
FS711V	50-150MHz	20/200W	Head/Display £43.65
FS711U	430-440MHz	5/20W	Head/Display £43.65
FS711C	26-30MHz	10/100W	Head/Display £24.55
FS500V	50-150MHz	20/200W	£81.95
W720S	130-440MHz	20/200W	Head/Display £52.75
SWR50B	3-5-150MHz		£36.75
FS20DL	3-150MHz	1/10W	£43.65
FS20D	3-150MHz	5/20W	£43.65
SWR3E	3.5-150MHz	20/200/1000W	£28.75
JD110	1.5-150MHz	10/100W	£16.50
T435	144/430MHz	20/200W	£65.00
YMIX	3.5-150MHz	Rel. Power/SWR Twin meter	£31.50
OSCAR-171B	3.5-150MHz	Rel. Power/SWR Twin meter	£26.85
SP425	140-524MHz	5/15/150W	£119.95
YS60	1.6-60MHz	20/200/2000W	£93.15
YS500	140-525MHz	4/20/200W	£81.65

Carriage on all power meters £4.00

COMET & HOKUSHIN ANTENNAS

New from Hokuskin, an exciting range of high performance antennas, the WX1 has been a best seller for some time now, available are its bigger brothers the WX2 ad WX4. Both are multi section 2m/70cm colinears and the mechanical construction the best we have seen yet. On the mobile front a new mini dual bond mobile, the HS-727SS, very similar to the Comet CHL21J, and tests with our network analyser confirm its compatibility with our existing range of gutter and mag mounts. Also available a low profile hatchback mount and cable, the SS-B1, two new dual band antennas, the very slim VM-720SKR and the compact HS-727VMS. Both are suitable replacements for the 70N2M. For the HF enthusiasts a compact 10m HB9CV dual driven element antenna that is extremely light and very cleverly constructed.

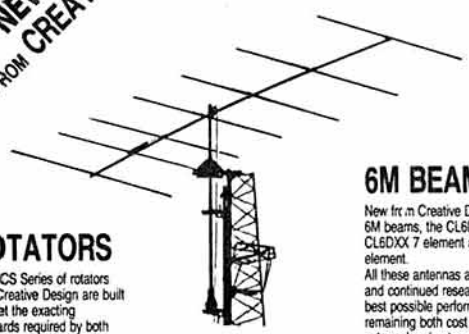
WX2	WX4	HS-727SS	28HS-2HB
VHF/UHF Base	VHF/UHF Base	VHF/UHF Mobile	10m 2 ele HB9CV
144/432MHz	144/432MHz	144/432 mini	Dual driven element
6/8db gain	7.8/10.8db gain	1/4 5/8 wave	6dbi gain
200W max	200W max	100W max	500W PEP max
£75.00	£99.00	£16.95	£65.00

MOBILE ANTENNAS		
2QW	2m 1/2 wave	£4.95
2NE	2m5/ wave folding	£13.25
78B	2m 7/8 wave	£15.00
78F	2m 7/8 wave folding	£21.50
88F	2m 8/8 wave	£24.10
258	70cm 2 x 5/8	£29.37
358	70cm 3 x 5/8	£33.73
268E	70cm 2 section colinear	£32.80
DUAL BAND MOBILE		
CHL21J	Mini dual band mobile	£14.95
CHL23J	Small dual band mobile	£16.90
CA2X4KG	2m 2 x 5/8 70cm 4 x 5/8	£39.95
70N2DX	2m 6/8 70cm 3 x 5/8	£37.75
HS-727SS	Dual band mini antenna NEW	£16.95
HS-727VMS	2m 1/2 70cm 2 x 5/8 NEW	£25.95
VM-7020SKR	2m 1/2 70cm 2 x 5/8 NEW	£24.95

DUAL BAND BASE ANTENNAS		
WX1	2m/70cm colinear	£54.99
WX2	2m/70cm colinear	£75.00
WX4	2m/70cm colinear, high gain	£99.00
CA2X4WX	2m/70cm colinear	£79.00
CA2X4MAX	2m/70cm colinear, high gain	£99.95
CF416MN	Duplexer 1.3-500/400-540MHz	£25.50
HS790DN	Duplexer I/less 1.6-150/410-460MHz	£25.50
ANTENNA MOUNTS		
GCCA	Gutter mount and cable	£14.25
HDTMCA	S/S trunk mount and cable	£19.50
SOMM	Mag mount and cable	£12.75
TBR	S/S hatch back mount NEW	£11.25
RS17	Mini hatch back mount NEW	£12.50
RS16	Mini gutter mount NEW	£12.50
SS-B1	Mini back mount & cable NEW	£26.50
CK-3LX	Cable assembly for RS16, 17, TBR	£19.95

CARRIAGE BASE ANTENNA £7.50, MOBILE ANTENNAS £4.00, CABLES AND MOUNTS £3.50

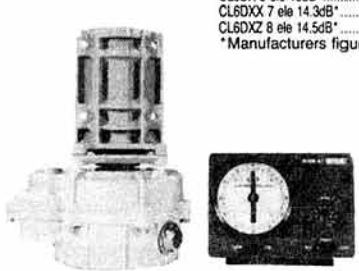
NEW FROM CREATE



ROTATORS

The RCS Series of rotators from Creative Design are built to meet the exacting standards required by both professional and amateur users. A range of methods is available designed to cater for medium to large shed antennas. All the rotators are manufactured with high quality components allowing continued and reliable operation.

RC5-1 ..... £219.00
RC5A-3 ..... £425.00
RC5B-3 ..... £675.00
CK-46 Rotary bearing £34.95



6M BEAMS

New from Creative Designs are a range of 6M beams, the CL6DX 6 element, CL6DXX 7 element and CL6DXZ 8 element.
All these antennas are the result of long and continued research to achieve the best possible performance whilst remaining both cost effective and extremely robust.

CL6DX 5 ele 13dB* £115.00
CL6DXX 7 ele 14.3dB* £168.99
CL6DXZ 8 ele 14.5dB* £225.00
*Manufacturers figures

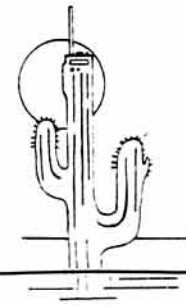
SOUTHAMPTON (0703) 255111
CHESTERFIELD (0246) 453340
AXMINSTER (0297) 34918

LEEDS (0532) 530606
BIRMINGHAM 021 327 1497

For full addresses see previous page.

NEVADA...

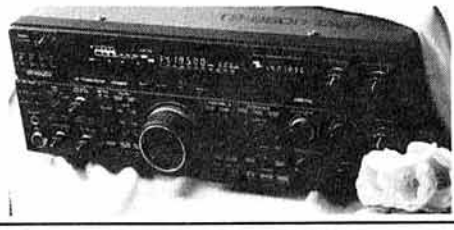
.....TALK TO THE WORLD



TALK KENWOOD

We are now officially appointed Kenwood dealers for the South Coast — and carry the complete range in stock. Just arriving is the new Kenwood TS 950 HF Transceiver — we've had a sneak preview — and it's quite something. Call for details.

TX950 SD Digital HF Transceiver **£3,199**



TALK ATU'S

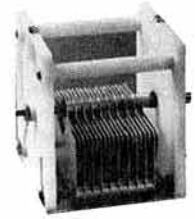
TM 1000 1 KW ALL BAND ATU

Using our high power roller coaster this ATU gives effortless matching of all long wire, G5RVvertical and coax fed antennas

Standard Model TM1000..... £168
Balun Model TM1000B £199
Standard TM1000 Kit Form.....£138

(Add £5.75 carriage for all models)

BUILD YOUR OWN AMPLIFIER OR ATU WITH OUR RANGE OF HIGH POWER COMPONENTS

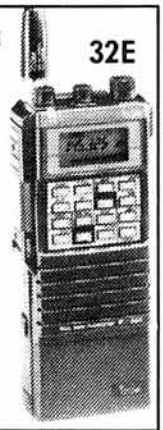


Roller Coaster 30 µH..... **£28.00**
Var. cap 250 pF (8kv)..... **£19.95**
Var. cap 250 + 250 pF (8kv).....**£28.00**
Var. cap 750 pF (4kv)..... **£28.00**
Turns Counter (For Roller)..... **£14.95**
Empty ATU Case..... **£26.00**
2kw Balun Assembly..... **£28.00**

TALK ICOM

We have just been appointed ICOM dealers for the South Coast.....Call Paul Martin our ICOM specialist for info and prices.

IC - 2SE .....Call
IC - 4SE 70cm H/held.....Call
IC - 32E 2/70 H/held.....Call
IC - 3210E 2/70 Mobile.....Call
IC - R7000 Receiver.....Call
IC - R71E Receiver.....Call
IC - 725 HF TCVR.....Call
IC - 735 HF TCVR.....Call
IC - 751A HF TCVR.....Call
IC - 761 HF TCVR.....Call
IC - 228H 2m/45w.....Call
IC - 448E 70/25w.....Call



TALK SCANNERS

We probably carry the largest stocks of scanners in the U.K. Our **New Bumper Catalogue** features all the latest models.

Here is a selection:-

New Jupiter 11 H/held.... **£299**
New Jupiter I Base ... **£379**

BEARCAT

200 XLT H/held..... **£229**
100 XLT H/held..... **£199**
100 XL H/held **£179**
55 XL H/held..... **£99**
590 XLT Mobile..... **£199**
760 XLT Mobile..... **£249**
145 XL Base..... **£115**
175 XL Base..... **£169**
210 XL Base..... **£169**

Black Jaguar BJ200 111..... **£199**
Sony Air 7 .....**£229**
Sony Pro 80..... **£299**

SCANNER ANTENNAS

Nevada Discone (50 - 700 Mhz). **£24.00**
WB1300 Discone (25-1300 Mhz)**£59.95**
PA15 Colinear (100 - 960 Mhz)...**£49.95**

ABIS SCANNER PRE-AMP

* 25-2100 Mhz
* Low noise GAAS Fet
* Variable Gain
* Switchable Band - Pass Filters

NOW IN STOCK
£79.95

AOR SCANNERS

AR 3000 **NEW**..... **£765**
AR 2002..... **£487**
AR 900..... **£235**
AR 950 **NEW!**..... **£249**
Sony ICF 7600 S/H..... **£99.00**
Standard AX700 Base..... **£575**

Large selection of S/H bargains call John Gordon for details

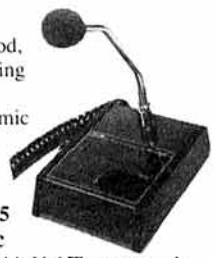
TALK ACCESSORIES

REMOTE MAST HEAD SWITCHES

NEVADA HF2 £39.95
Freq:- 1.8 - 185 Mhz
Connections:- S0239
Power:- 1,000 W Pep

NEVADA CAS - A2 £49.95
Freq:- DC - 1.3 Ghz
Connectors:- 'N' Type
Power:- 150/300 Watts

SADELTA XL30 Mic



A new electret base mic, that will give your Kenwood, Yaesu, Icom, or other leading brand of Transceiver extra 'punch' and 'clarity'. The mic may be powered from the Transceiver direct or with an internal PP3 battery.
Introductory Offer £39.95

SADELTA CM 40 Mic
As the XL 30 above, but with Vol/Tone controls
Introductory Offer £49,95

NEVADA DUMMY LOAD

A professionally built 50 Ohm dummy load that is good to 3 Ghz! using 'N' type connector
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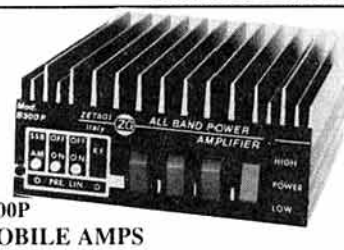

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TECHNICAL TOPICS

PAT HAWKER G3VA

CONSTANT-CURRENT NICAD CHARGING

Nicad cells and batteries can last for one or two thousand charging cycles — but to do so need to be treated carefully without being subjected to overcharging, or other abuses. In recent months, much information has been included in *TT* on the various charging constraints and the advisability of using constant-current systems; also reducing the charging rate if the attempt is to be made to keep the battery fully-charged by means of continuous trickle-charging. But it is some years since *TT* included practical advice on how to make a constant-current charger using either a FET or an adjustable three-terminal IC regulator such as the LM317 (*TT*, March 1982, pp229-230). It seems time to return to this subject.

But, first, some more general comments on the charging of nicad batteries as recommended in Part 4 of the series by Anton Wilson (*International Broadcast Engineer (IBE)*, May 1989, p4): "The electric power must first be converted to chemical potential energy which is what a battery actually stores... it is this initial conversion step that is largely responsible for the aberrant behaviour so often observed from nicad batteries... the effective capacity of a battery can be significantly reduced depending on conditions during charge ('reduced charge acceptance')... a 4Ah battery may be capable of accepting only 2Ah but is then fully charged and not capable of storing additional energy.

"Two of the dominant factors affecting charge acceptance are temperature and charge rate. Cell type, formulation and construction will also influence these factors. In general, charge acceptance is maximum at room temperature (16° to 26° C) and begins to diminish above and below this range. The effective capacity of a nicad can be reduced by 30% when charged at 45° C. At 55° C capacity can be halved. The effect of cold temperatures is somewhat different. Below 0° C the nature of the charging reaction within the cell begins to change and, depending on the charge rate, the electro-chemical reaction can produce hydrogen gas instead of storing energy. Not only will the battery not accept a normal charge but, more importantly, the hydrogen gas can create a catastrophic explosion causing injury to the operator as well as destroying equipment."

The *IBE* article is concerned primarily with the larger nicad batteries (eg 4Ah) currently used to operate broadcast video equipment: "most of the new high energy cell designs have been formulated to achieve maximum charge acceptance with fast charge currents that are approximately equal to the capacity rating of the battery. This translates to charging for between 45 and 90 minutes." Nicad cells used in the professional video industry are of the sealed cylindrical type which includes an internal over-charge protection mechanism.

They stand a very much faster charging rate than is suitable for the usual range of nicad batteries where a 'one-tenth' (0.1C) rate for up to 14 hours for fully discharged cells is the usual preferred rate. If you really need to keep cells fully charged over extended periods of intermittent use, the trickle rate should not be more than 20% (one-fifth) of the normal charging rate: see **Table 2**.

Because of the near-constant voltage discharge-curve, it is often difficult to be sure of the state of charge of a partially discharged battery, leading to uncertainty as to how long it is safe to charge the battery at the 0.1C rate. It is this factor that has led to the belief that cells/batteries should be completely discharged before recharging for 14 hours at the 0.1C rate, despite the fact that deliberately fully discharging a nicad battery may shorten its life (see *TT*, May 1988, p349). I remain uncertain what is the best answer to this problem.

But to turn to the question of practical constant-current chargers. A simple charger suitable for charging a nicad battery at its specific 0.1C rate was described by David Potter, W2GZD in *QST* (October 1981, pp34-35): see **Fig 10**. A more sophisticated unit, incorporating a timer and 0.1C and 0.02C rates for various types of cells as in Table 2 has appeared as a constructional project by Peter Phillips in *Electronics Australia*, July 1989, pp80-86: **Fig 11**. The timer automatically switches from charge to trickle-charge after periods of 44 minutes, 1.5, 2.9, 5.8 or 11.7 hours. If 14-hour charging is needed, select 11.7 hours and then when this is timed-out switch to either 1.5 hours or 2.9 hours and re-start the charger. Two LM317 current regulators are used, IC1 sets the trickle charge rate; IC2 the main charge current,

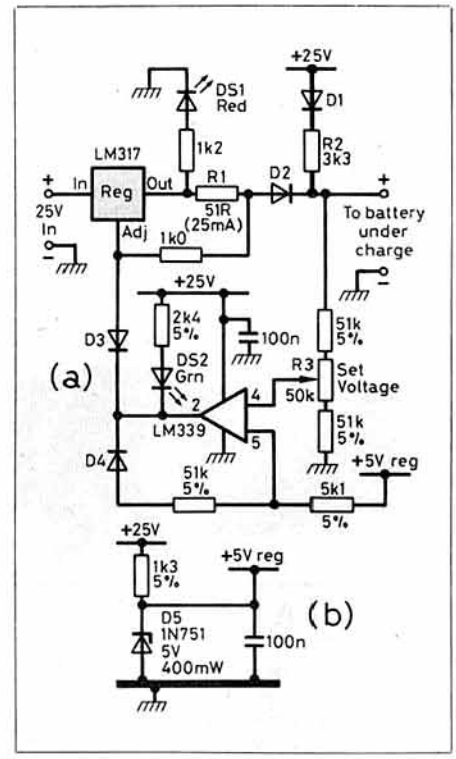


Fig 10. Constant-current charger for nicad batteries with automatic shut-down feature as described in *QST* in 1981. R3 is adjusted to provide the maximum desired battery voltage. R1 determines the maximum current (value shown for 25mA). The capacitors are disc ceramic, D1-D4 are 1A, 50PRV silicon rectifiers. DS1/DS2 are LEDs. R3 is a linear-taper, wire-wound control. (b) can be set for automatic shut-down at a fixed voltage (not really suitable for nicad cells).

each with switchable resistors for the currents shown in Table 2. During the main charge, IC1 is in effect by-passed by the action of TR1. A TO220 heat-sink needs to be fitted to IC2. R8 and R9 each need two resistors to give the required values of 24 and 20 ohms respectively.

Type	Capacity	Charging Current	Trickle-charging Current
9V battery	100mAh	10mA	2mA
AAA cells	180mAh	18mA	3.5mA
AA cells	500mAh	50mA	10mA
AA cells	600mAh	60mA	12mA
C & D cells	1.2Ah	120mA	24mA

Table 2 — Nicad charging and trickle charging currents catered for in the *Electronics Australia* design.

THE KNOBBLY RF CHOKE

George Southgate, VK5QG/G3LXO writes: "For a linear amplifier I wound up an anode RF choke as specified in 'The Classic — a grounded-grid 813 linear amplifier' by C F Atkins, G3HCV in *RadCom*, April 1971: 'A $\frac{7}{8}$-in former is wound with four sections of 34swg enamelled copper wire, the bottom section is 145 turns, followed by two sections of 30 turns each and a top section of 15 turns. The top winding is spaced $\frac{3}{16}$-in from its neighbour and the others are spaced $\frac{1}{8}$-in apart.' I found this choke very good for the HF bands but with the aid of a GDO found some nasty resonances between 30 and 150MHz. Australian TV works between 60 and 200MHz so I was concerned at this finding. Changing the geometry of the choke made little difference. I then tried threading about two dozen Radiospares ferrite beads on the 20swg wire I was using, and wound up the choke again, producing a 'knobbly choke' which has good properties on HF and which irons out a lot of problems in VHF. If the first try doesn't give the desired results, unwind, re-scatter the beads, and try again!"

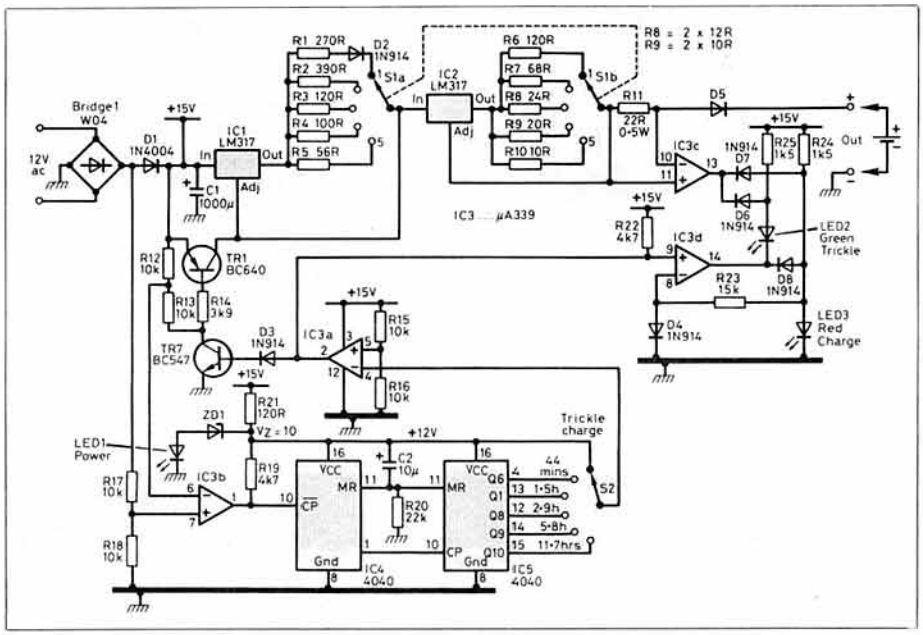


Fig 11. Flexible nicad charger with constant-current regulation for both charge and trickle charge rates on a variety of nicad cells (see Table 2).

KEEPING ANTENNA - SUPPORTS HEALTHY

For the past 30 years I have depended on some overhanging branches of a large sycamore tree in my neighbour's garden (plus my roof) to support my various HF wire antennas. Occasionally, the wires have come tumbling down, usually due to the abrasive effect of the branches moving in strong winds. But, to be honest, I have never thought over much about the health of the tree: judging by the number of unwanted shoots that spring up in my neglected garden, it seems to be in the prime of life. As you may gather, gardening and horticulture have never been my strong point.

Such a confession would probably horrify Doug Brede, W3AS — a former Associate Professor of Horticulture at Oklahoma State University. In 'The care and feeding of an amateur's favourite antenna support — the Tree' (*QST*, September 1989, pp26-28, 40), W3AS advises: "If trees are part of your antenna system take a good look at them. Are you keeping them healthy?"

His article does include a good deal of practical advice that I cannot recall ever having seen before in an amateur radio periodical. For example, I had never realised that the traditional practice of tree 'topping' is now greatly deplored as "a crime against nature," many other hints similarly emphasise that trees are alive and can be mortally wounded:

(1) Attaching ropes or wires to trees can sometimes lead to major problems for the tree. Wrapping a rope around a limb or trunk and leaving it unattended will suffocate the tree and cause a distortion of growth or the death of the limb.

(2) Most amateurs install tree-mounted antennas by throwing a line over a branch crotch. This should be used only as a temporary installation because abrasion of the rope and tree results.

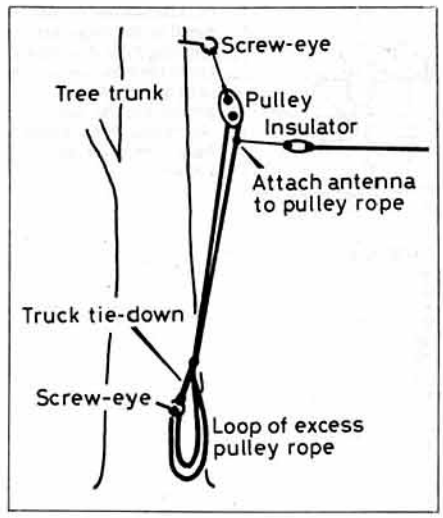


Fig 3. W3AS's recommended method of supporting an antenna from a tree that you want to remain healthy.

Over time, girdling may occur leading to the loss of one or more of the branches.

(3) The best way to secure a wire to a tree is with an eyescrew mounted into the wood. As the tree grows and expands however, the eyescrew will become embedded and must be removed and replaced.

(4) For heavy antenna loads, an eyebolt passed through the trunk or limb will support more weight than an eyescrew. Allow about ½-inch of play between the bolt and trunk or limb. Don't tighten the bolt completely, this allows for tree growth.

By using an installation with a pulley (**Fig 3**) raising and lowering the antenna for repairs (or changing) can be done without the need to climb the tree. Use an expandable lorry tie-down to apply tension to the antenna. A weight swinging from a tree can be hazardous.

Drilling a hole through a tree causes much less trauma to the tree than wrapping something (tightly) around it. Much of the core of a tree is dead tissue... although there will be some wounding of the tree at the site of the bolt or screw, this will be far less than results from wrapping a wire around the trunk. Wire wrapped in hose is just as injurious to the tree as bare wire.

W3AS also gives advice on getting the wire up the tree. For those 'temporary' installations, apart from the now time-honoured use of a bow and arrow, he mentions such alternatives as slingbats, attaching a string to a golf ball and whacking it with a sand wedge, and simply throwing a rope over a branch crotch and tieing off the loose end.

On scaling trees, he stresses that a fall from a 40-ft tree is as dangerous as a fall from a 40-ft tower: "Wear a tower-climbing belt for all tree climbs. Commercial arborists also lob a rope over a tree crotch just above the height at which they will be working. They tie the rope to their safety belt. The loose end of the rope can be held by a helper on the ground. Be sure to use good quality rope that is heavy enough to support your weight. Before use, inspect the rope for wear. Arborists prefer to use hemp rope rather than nylon, because it stretches less. Always have a helper available to fetch tools or summon help in an emergency. Be sure they wear a hard-hat; tools or branches dropped from even a moderate height can be dangerous."

Or, as Les Moxon, G6XN also once suggested consider procuring the help of a professional arborist (or his student assistant) who can usually do the job in a couple of hours.

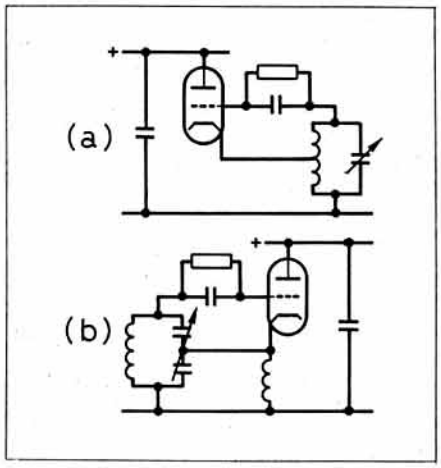


Fig 4. (a) One form of the classic Hartley oscillator with tapped inductor. (b) Equivalent form of the classic Colpitts oscillator with 'tapped' (split) capacitance.

HARTLEY OSCILLATORS: VALVE & Q-GATE FET

The two most familiar types of tunable oscillators are those based on the traditional Colpitts or Hartley arrangements using positive feedback by means of series capacitors or tapped inductor (**Fig 4**). The stability of such oscillators depends to a significant degree on the regulation of the HT and filament/heater voltages/currents. In the early 1930s, a useful variation was introduced by using screen-grid (tetrode) or pentode valves in which the output tank circuit was coupled through the electron-stream by using, in effect, the screen-grid as the 'anode' of the oscillator and taking the output from an anode circuit preferably tuned to the second harmonic of the grid circuit. A Colpitts form of electron-coupled-oscillator (ECO) was described by J B Dow (*Proc IRE*, 1931) **Fig 5(a)** but for amateur radio the most usual form of ECO was based on the Hartley configuration: **Fig 5(b)** with a large C/L ratio, and the tap near the earthy end of the coil, good frequency stability, even with a keyed oscillator, could be achieved.

It was, however, not always appreciated that one of the advantages of the ECO was its lower susceptibility to supply voltage variations in the days before the use of voltage-regulator tubes became common practice. With a tetrode/pentode ECO, an increase in anode volts with constant screen-grid voltage results in an increase in frequency whereas an increase of screen-grid voltage with the anode voltage unchanged results in a decrease in frequency. There is thus a specific anode/screen voltage ratio where a variation of a common supply results in very little change in frequency. In other respects, the requirements for good frequency stability remain much the same as for the basic Hartley or Colpitts circuits.

Some time ago Dick Rollema, PA0SE, kindly sent me a copy of a single-valve 'frequency-doubling ECO transmitter' which was one of a series of 'standard apparatus' for radio-amateurs developed by DASD (the pre-war German national society, forerunner of DARC). It was described in DASD's journal *CQ* Nr 3/1937 and later reprinted in the Dutch magazine *Radio-Expres:* **Fig 6**.

This provided an RF output to the antenna of about 15W on 3.5MHz reducing to about 5W on 28MHz with a T8/T9 note using an HT supply of 450/500V and a German RS289spez pentode (12W anode dissipation) with the suppressor grid brought out to a separate base-pin permitting it to be used in this design as a tetrode with connected electrodes. Drift was reduced to about 1.5kHz (after 30 minutes) by an early use of temperature

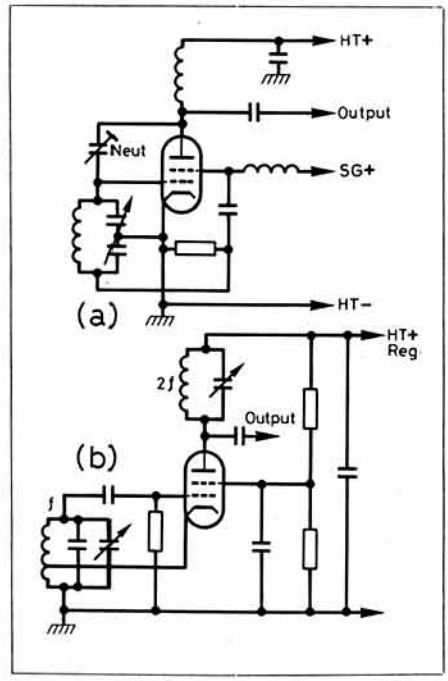


Fig 5. (a) The 1931 Dow electron-coupled-oscillator (ECO) based on the Colpitts configuration. (b) The more usual form of frequency-doubling ECO based on the Hartley oscillator as used by many amateurs throughout the valve era from about 1936 when the VFO began to replace crystal-control.

compensation by replacing C3 with two ceramic capacitors having negative temperature coefficients (not bad for 1937!).

In 1943/44, Dutch amateurs/professionals in the Zeeland province of Holland adopted this

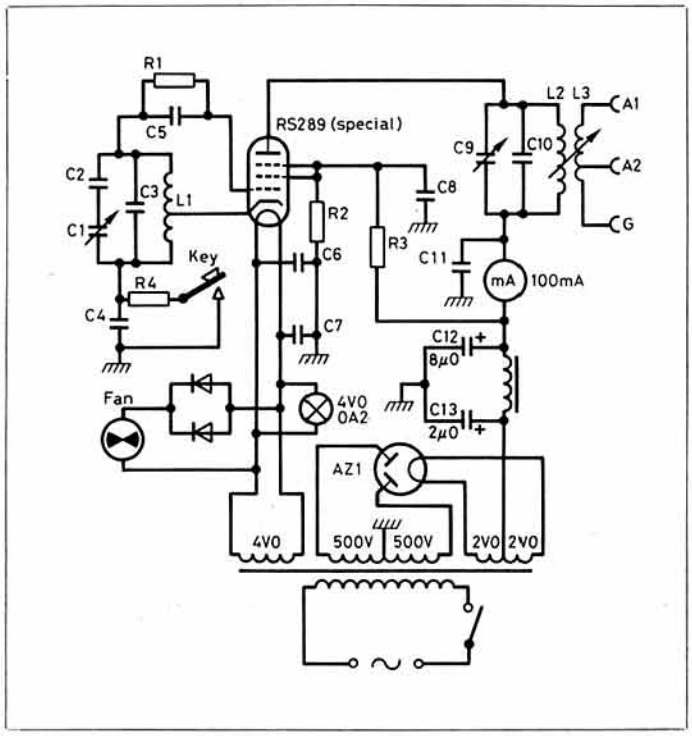


Fig 6. The DASD one-valve ECO transmitter of 1937 based on the frequency doubling ECO. A modified form of this transmitter was used by some Dutch amateurs for the 1944 clandestine Dutch Inland Radio Service on about 2.7MHz.

German design as the basis of a single-valve transmitter for use in the clandestine Dutch Internal Radio Service on about 2.7MHz (other groups mostly used a Luxor medical diathermy power oscillator modified in the Philips factory to form a variable frequency transmitter).

TT, June 1987 provided details of an up-dated version of the wartime Whaddon Mark VII/B three-valve transmitter-receiver (often known as the 'Paraset') built by S Pauwe of Mijdrecht, Holland. PA0SE reports that another reconstructed Paraset was built by William Oorschot, PA0WFO and successfully operated on 3.5 and 7MHz using FT243 crystals and he even had contacts on 14MHz using a 7MHz crystal. This encouraged PA0WFO to modify his reconstructed Paraset by replacing the crystal with a tuned circuit in the form of a Hartley ECO. PA0SE writes: "To avoid problems with heating PA0WFO put the tuned circuit in a separate metal box, connected to the remaining part of the transmitter by a piece of 'stereo cable'. He also increased the fixed capacitance in the oscillator tuned circuit to about 1000pF. It turned out to be essential to use an oscillator coil of generous dimensions with large size wire. Obviously a lot of current circulates in the 1.75MHz tuned circuit; his first small coil ran hot resulting in unacceptable drift. But as now modified it runs so stable that the signal stays within the 500Hz passband of the crystal filter in his receiver. He made many contacts on 3.5MHz without any of the stations worked noticing anything unusual about the signal from this one-valve-transmitter using a VT501 valve (similar to the original 6V6 used in the Paraset). The only drawback was that the keying has to be rather 'hard'. Any effort to 'soften' it by increasing the time-constants in the keying circuit immediately resulted in noticeable chirp. Tuning the anode tank circuit pulls the frequency somewhat, but not more than a few hundred Hertz. This frequency-doubling ECO must be about the ultimate in simplicity for a VFO-controlled transmitter — not easy to achieve with semiconductors".

I recall that some of my wartime colleagues built a simple VFO to use with a Whaddon MkIII (6V6-807) transmitter and then brought wrath down on their shoulders by sending in plain language: "Have VFO can tune up or down". Personally, I used a frequency-doubling Hartley ECO on the amateur bands for 25 years and still have one that is occasionally brought into use.

My excuse (though I don't believe one is needed) for recalling valve-type oscillators arises from a letter received from George Southgate, VK5QG, who was G3LXO from 1958 to 1968 before emigrating to Australia. He has developed a tunable oscillator which is virtually a (Class A?) solid-state version of the Hartley oscillator of Fig 1(a). VK5QG writes: "What makes me put pen to paper is an interesting FET oscillator that I have developed recently. I call it a QGate oscillator to match the suffix of my callsign. I have not seen it before in print although I expect your readers will tell me I have rediscovered the wheel, as there is not a lot that comes up new in this world today. The QGate oscillator is a Hartley oscillator as used in the ECO version but with a few unusual characteristics.

"It came about while building a solidstate receiver with a couple of 10.7MHz 8-pole crystal filters in the IF strip and MC1350 chips. I got all this part working using a signal generator as a local oscillator and then had to think seriously about an in-built tunable oscillator which needed to tune from 24.7MHz to 25.05MHz to provide coverage of the 14MHz band. I soon discovered that to give good stability one needs high-C and hence low-L. None of the conventional oscillators I tried wanted to work in this way, ie only about 0.15μH and 270pF. I tried a conventional Hartley with a gate capacitor/resistor but couldn't push it up much above 15MHz with this high C/L ratio so I started making the coupling capacitor between the gate and tuned circuit larger but this did not seem to improve matters much. So, as a last resort, I tried the effect of removing both the coupling capacitor and the associated gate-leak resistor in order to keep the damping on the tuned circuit to a minimum. Much to my surprise, this worked very well with all sorts of L/C ratios, including very high C/L ratios, albeit with reduced output.

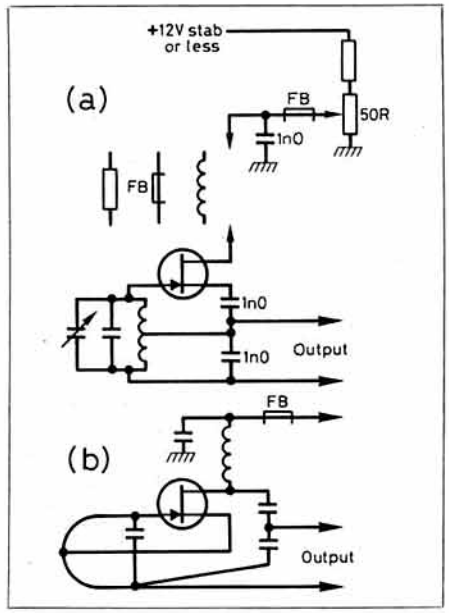


Fig 7. The QGate solid-state FET version of the Hartley oscillator developed by VK5QG with no gate coupling capacitor or gate-leak resistor. (b) a 300MHz version using 'hairpin' inductance.

"The circuit arrangement shown in **Fig 7(a)** produces a very clean sine-wave output with amplitudes of 5 to 10mV rms, throughout the range of a few tens of kHz to over 300MHz. In its lash-up form, I found my 25MHz oscillator drifts about 120Hz in the first minute from switch-on and then with room temperature changes over a range of ±15Hz or so, taking as much as 15 minutes to move about 10Hz or so! I have taken the usual VFO precautions including a mixture of silver-mica and polystyrene capacitors across the tuned circuit to provide temperature compensation, although probably, with care, these drift and stability figures could be further improved. A useful feature is the reduction in component count to a bare minimum, with the minimum loading of the tuned circuit when used with the very high gate-source impedance of a junction FET. I have tried this circuit using a MOSFET device but it seems more difficult to get going. There is the disadvantage of the tapped coil though I have not found this a problem.

"Other features include: (1) It will oscillate with very low voltage, 2-3V usually being sufficient: hence the 50-ohm potentiometer; (2) it will tolerate being loaded with less than 10-ohms at the output, yet still oscillate although the output drops considerably. The output impedance of the arrangement shown in Fig 4(a) appears to be in the order of 50-100ohms; and (3) the frequency changes little when the load changes, a feature found in few other oscillators! A 50MHz oscillator was found to move only 210Hz when loaded down from 50ohms to 8ohms.

"I have used 2N3819 junction-FETs but these need between about 7-15mA to go into oscillation, depending on the spread of characteristics. The MPF102 seems a better choice, needing only 3 to 4mA. I also tried a 2N5459 and this needed about 10mA. Note that it is always necessary to include the capacitor to ground after the standard blocking capacitor in order to complete the RF circuit. The drain load can be a resistor of a few hundred ohms, a small RF choke or even just a ferrite bead on the transistor lead. I find that it is useful to start off with the tap at the centre of the coil, then adjusting it towards the earthy end to suit individual circumstances. With its low-impedance output this oscillator drives into the base of a bipolar transistor buffer/amplifier with ease.

"The 300MHz QGate oscillator I made up had a hairpin loop about one inch long and was tuned with 5pF: **Fig 7(b)**. I suspect that this type of oscillator could be pushed up towards the UHF region by using either coax lines or cavities but I do not have the necessary test gear to try this. Could this be the elusive class A oscillator that people have been searching for in the past?"

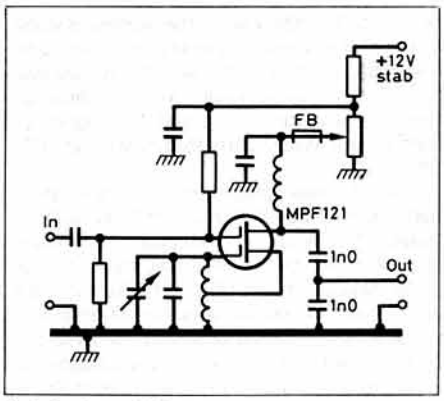


Fig 8. Dual-gate MOSFET frequency-changer tried by VK5QG but note that the QGate oscillator seems to work better (more readily) with junction-FET devices.

VK5QG also tried this form of oscillator in a dual-gate MOSFET mixer arrangement using an MPF121 device: **Fig 8**. The mixer works well but difficulties were experienced with the oscillator section which tended to squeg. There was also a need to adjust the tapping point on the coil to achieve a good sine wave output, though this is greater than with the single-gate JFETs, around 20mV RMS: it might, however, form the basis of a 28MHz direct-conversion receiver, and VK5QG intends to try this when time permits.

SECONDARY BATTERIES: POINTERS & PROGRESS

The subject of how to obtain long active lifetimes from rechargeable batteries continues to attract the attention of many amateurs. One thing is clear: batteries are not the deceptively simple components that they may appear; used wisely and all will be well; used unwisely and costs will shoot up and reliability shoot down.

Dr Roy Hill, GM0IJF, writes: "Experience taught me, years ago, that solid-state chemistry is one of the most difficult branches of chemistry. Why was I ever daft enough to do research in this subject? Any chemical systems involving solids (so we can include electrochemical systems, and electrochemical cells in particular) present special difficulties: it is easy enough to say what should, by theory, happen — but how fast? That's another matter. However, one thing seems to be certain: the faster you make a process go, the more finely divided and reactive the product will be; so that the reverse process, when you try it, will go faster and easier. (There are good thermodynamic reasons for this). Ni-cad cells are an object lesson, as has so often been described in *TT*. If they are charged fairly slowly, say at 0.1C and then discharged slowly or left lying about unused, they rapidly deteriorate. Sometimes, even, crystals grow so large that they short-circuit the electrodes.

"The moral is: if we want a cell to have a good high-current discharge performance we should charge it fast. And I think this is true also of lead-acid batteries. This is why I did not much like G4LSA's battery charger controller (*TT*, October 1939, p39). When I tried it, it tends to give proportional control, and so charges slowly much of the time. The arrangement **(Fig 10)** I use simply switches the charger on when the voltage falls to 12.1V (say) and off when it gets to about 14.2V. The charging rate is always at 4A or more."

Ron Wilson, G3DSV, also commenting further on the G4LSA controllers to which he drew attention in the October *TT* writes: I have recently purchased a new rig and it must be more sensitive than the old one since I have noticed a small amount of hash at the point where the controller cuts off the charge. A complete cure is effect with the arrangement shown in **Fig 11**. The capacitor to the earth line is essential since for obvious reasons the output of battery chargers is always isolated from the case."

Recently, due to a prior commitment, I was unable to attend an IEE discussion meeting on 'Advances in secondary batteries' but I did obtain a brief abstract from which the following notes are culled:

Dr M L Whitehead (ERA Technology) stressed that the lead-acid battery, in response to the current need for lightweight, low-maintenance power sources, has been progressing at an accelerating rate: "The quantum leap in the

RF VOLTIMETERS FOR TRANSMITTER TUNING

I have never been able to shake off the traditional belief that what really matters is feeding amps of RF into the antenna, even though nowadays most amateurs, with solid-state transceivers with broad-band output networks, would never dream of operating their transmitters without an SWR meter. With an end-fed 'long-wire' (40m) antenna and an old 813 power-amplifier with pi-network and ATU, I still use the tip given me many years ago by Roy Wilkins, G2ALM of using simultaneously both current (shunted torch bulb) and voltage (neon bulb) indicators.

Gerald Stancey, G3MCK, in his browsing through old issues of *QST* came across an article 'RF Voltmeters — a lower-cost alternative to the thermocouple ammeter' by George Grammer, W1DF (the then Technical Editor) published in September 1952. This included circuit diagrams of RF voltmeters for use as HF transmitter output indicators for both unbalanced and balanced lines. G3MCK points out that with the current increased interest in open-wire feeders the balanced arrangement, the only circuit ever noted for balanced lines, could still be of interest.

W1DF introduced his designs as follows: "There is no really satisfactory substitute for an RF indicator in a transmitter. Adjusting by plate loading only approximates the proper tuning conditions for maximum output and sometimes, especially with tetrodes, the approximation is not as close as could be desired."

Fig 9 shows circuits for (a) unbalanced and (b) balanced lines. The germanium crystal-diode (eg 1N34) has a peak inverse rating of only about 50V so it is necessary to reduce the applied voltage by using a potential divider; the resistors also help to minimise the harmonics generated by the diode which otherwise might be a source of TVI.

Of the balanced arrangement, W1DF wrote: "The voltmeter has a definite advantage over ammeters here. For one thing only one instrument is required. More important, the circuit shown will prevent parallel (common-mode) voltages on the line from operating the meter, a condition that cannot easily be overcome when ammeters are used. The only RF voltage acting on the (crystal) diode is that developed across R2, which is proportional to the voltage difference across the (transmission) line. Parallel components, assuming the line to be reasonably well balanced to ground, are in phase in the line wires and cannot develop a voltage across R2. They could act between each wire and ground through the crystal-diode, but are prevented from doing so by the RF chokes. Thus the meter reads only the actual voltage applied to the line by the transmitter."

W1DF notes that the values of R1, R2, R3 depend on the impedance of the line. R1 + R2 or R1 + R2 + R3 (where R3 has the same value as R1) should total at least 100 times the impedance at that point on the line. A *matched* 300-ohm line calls for R1 and R3 to be about 15,000-ohms. The value of R2 depends on meter sensitivity (1mA fsd in W1DF's units) and transmitter power (about $\frac{1}{25}$th of the total if R4 is 10,000-ohms).

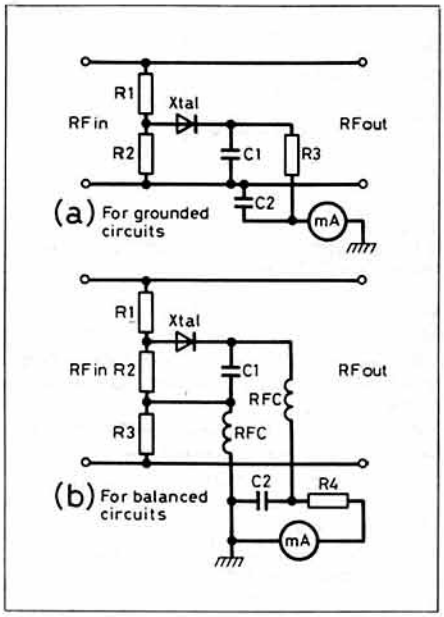


Fig 9. The 1952 W1DF RF voltmeter circuits used for tuning transmitters to deliver maximum power into transmission lines. R1/R2 and R1/R2/R3 are voltage dividers used to reduce voltage applied to germanium 'crystal diodes' of the period. C1 and C2 are RF bypass capacitors, typically 0.005μF. See text for component ratings etc.

For 600-ohm matched lines values of R1, R3 should be doubled with R2 remaining as before.

For voltage-fed open-wire resonant lines, where the impedance could be several thousand ohms, problems can arise partly because resistor values would need to be very high (and of suitable voltage rating) and partly because they will have shunt capacitance which can affect the calculations. For tuned lines, however, W1DF provides a simpler solution: measure the RF voltage across the unbalanced coax line between transmitter and ATU at the point where it goes into the ATU: "When the coax line is properly matched, voltmeter indications at this point mean every bit as much as across the open-wire line itself."

For the unbalanced circuit, the power rating of R1 needs to be about $\frac{1}{100}$th of the RF in the line (1W for every 100W RF output). In the balanced circuit, power is shared by R1 and R3 and can be about 1W rating for 200W RF output.

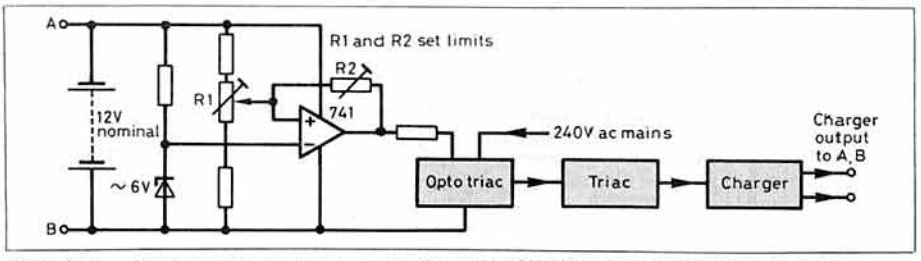


Fig 10. Outline of the lead-acid battery-charger controller used by GM0IJF to ensure that the battery is always charged at the optimum charging rate of about 4A or more.

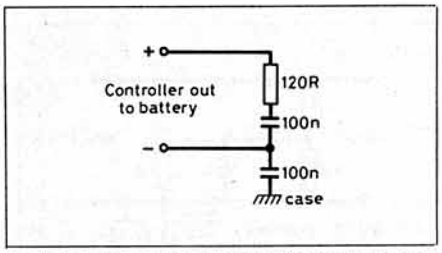


Fig 11. Hash suppression fitted by G3DSV to his charger-controller (see *TT* October).

technology has been the development and commercial exploitation of sealed lead-acid technology. Achieving the 'impossible' is having far-reaching implications for both the battery manufacturer and the user."

On nickel-cadmium batteries, Dr R N Thomas (SAFT UK) notes that advances have been made in high temperature performance, fast charging and energy density including the potential of nickel metal hydride and lithium alternatives to offer even higher density and a less environmentally-damaging (green) product.

Dr R M Dill (AERE) reminds us that the Harwell Laboratory of AEA Technology has been engaged in research on advanced batteries for more than 15 years, with progress being made in nickel/hydrogen cells for use in satellites; sodium/metal chloride batteries for traction applications; and, most relevant to *TT* readers, solid-state lithium/polymer batteries for consumer and other applications.

Finally in this section a nicad tip from George Southgate, VK5QG/G3LXO. He writes: "Having a few nicad C-type cells that had grown crystals internally and developed short-circuits, I gave them the well-known 'big-C zap' treatment (discharging a large value electrolytic capacitor through the cell) to blow them clear. This worked fine, but they soon short-circuited again if left on the shelf for any length of time. I drilled a very small hole, No 60 drill, into the vent hole under the metal top-hat cap and injected about 0.5cc of distilled water into them, resealing with a plug of silicon rubber solution. Then I made what I thought was my big mistake. I accidentally charged one of them at normal rate (0.1C) for 14 hours but with reverse polarity. Not wanting to admit defeat and throw the cell away, I discharged it at a rate of a few mA for a time; the charge only held for about 30 minutes and was then down to zero again. I then charged it for 14 hours at normal rate with the correct polarity. To my surprise, the cell now seems as good as new, back to full capacity and showing no tendency to grow short-circuiting crystals if left for a time in storage. In view of the success of this treatment, I have since repeated the process deliberately for other cells suffering from short-circuits. It seems to work every time. Good things sometimes come from accidents — long live serendipity!"

HEALTH HAZARDS: TOUGHER GUIDELINES

A *TT* item in August 1985 'Radiation and leukaemia risks' drew attention to a letter from Dr Samuel Milham in *The Lancet* (April 6, 1985) reporting his study of the 'cause of death' as recorded on the death certificates of 1691 amateurs whose names had been listed in *QST* 'Silent Keys' columns between 1971 and 1983 and who had lived in California or Washington State. Dr Milham had found that 24 deaths were ascribed to leukaemias (a form of blood cancer) as compared with an expected 12.6 from statistical averages. Although clearly the increased risk (11 out of 1700) was small it was statistically significant and raised new doubts about the possibility that long-term exposure to non-ionizing radiation at levels found in some American amateur stations might have microbiological effects.

This was and remains a matter of controversy. As noted in *TT* at the time, the possibility of an increased risk of some leukaemias among 'electrical workers' had also been postulated by a New Zealand study, although this had suggested that the link was more likely to be due to exposure to metal and flux fumes during soldering and substances such as polychlorinated biphenyls (PCBs) than to non-ionizing radiation.

Similarly, a recent 675-page American book *Biological Effects and Health Implications of Radiofrequency Radiation* by Sol Michaelson and James Clin (Plenum Press) makes no reference to Dr Milman's work and on page 626 states: "Microwave-induced cancer has not been reported or suspected in medical surveillance examinations of microwave workers or service personnel (Silverman 1979, 1980). Two cohort epidemiological studies (Robinette and Silverman, 1977; Robinette *et al*, 1980; Lilienfeld *et al*, 1978) that looked into the question systematically did not show an excess of any form of cancer that could be interpreted as microwave related (Silverman 1979, 1980, 1985)."

However, a well-researched article 'Is Amateur Radio Hazardous to our Health?' by Ivan A Shulman MD, WC2S (*QST* October, 1989) notes that Dr Milman later increased his research base to 2485 amateur-deaths (2083 in California). This further study revealed no significant difference in cancer deaths from the population at large but showed a disproportion within this category of certain rare forms of cancer such as multiple myeloma and non-Hodgkin's lymphomas; the death rates from all leukaemias were only slightly, and not statistically significant, increased except for acute myelogenous leukaemia which was found to be significant. On the other hand, deaths due to cancer of the pancreas and lung, and to all respiratory, circulatory diseases and to accidents were less in amateurs as a group than in the total population. From this study, Dr Milham concluded: "Amateur Radio licensees in California and Washington State do have a higher death rate due to acute myelogenous leukaemia, multiple myeloma and possibly other specific types of lymphoma". He believes that exposure to magnetic or electrical fields, either as a consequence of work or hobby, should be considered significant enough to support further research into both the epidemiology of and the biologic mechanisms involved. He recognizes that studies based on death certificate data alone are subject to limitations and errors.

One of the expert medical researchers in this field is the Australian W Ross Adey, K6UI (formerly VK3 and VK5) who supports the view that further research is needed into the microbiological effects (if any) of magnetic and electro-magnetic fields, and who read through the *QST* article. WC2S draws up a set of guidelines that he feels would cover all potential or suspected hazards affecting radio amateurs. These guidelines are more restrictive than any that I have seen previously (several of them breached in operating G3VA!) and are geared to the higher American legal-limits of power. However, they are worthy of study:

(1) Do not stand or sit close to your power supplies or linear amplifiers while operating, even when they are in stand-by mode.

(2) Stay at least 24-in away from any power transformer, electrical fans or other source of high-level 60Hz magnetic fields while in operation.

(3) Do not tune up or operate a high-power linear amplifier while the shields or covers are off.

(4) Run your transmission lines away from where you or other people sit in or near your shack.

(5) Properly terminated coaxial transmission feed lines should be used in preference to open-wire or end-fed antenna installations which come directly into the transmitter, as the RF radiated from a co-axial feed line is much lower.

(6) Use common sense about placing all antennas well away from yourself and others, especially for VHF, UHF and particularly microwave applications. No one should be in the near field of an antenna.

(7) No person should be near any transmitting antenna while it is operating. This is especially true for all mobile or ground mounted vertical antennas. The use of indoor transmitting antennas which are close to people in a house or apartment should be reconsidered.

(8) Use the minimal power needed to make a QSO, especially if the antenna is less than 35ft above the ground.

(9) Handheld radios should be used on the lowest power setting needed to carry out communications.

ANTENNA ELEVATION DRIVE

The growing use of microwave dish antennas for TV-reception from geostationary satellites, satellite-communications, Earth-Moon-Earth (EME 'moon-bounce') etc has brought about a requirement to be able to change the elevation of an antenna from the operating position.

Stuart Jones,GW3XYW provides details **(Fig 12)** of the arrangement he has used successfully for two antennas: a 22ft-diameter EME dish and a 6ft (1.8m) TVRO dish. He writes: "Separate potentiometer units are used for position indicators with either a computer or moving coil meter. If the constructor is doubtful about good water-proofing it might be safer to use a 110V or lower-voltage motor in conjunction with a suitable isolating transformer."

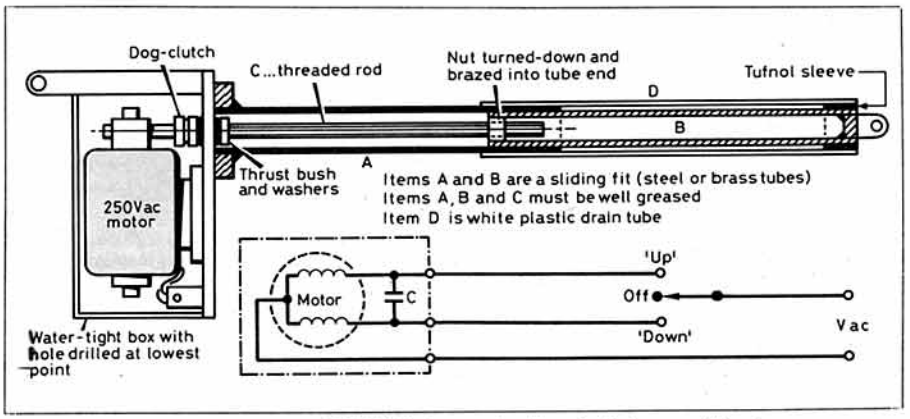


Fig 12. Antenna elevation drive as used by GW3XYW for large and medium-sized microwave dish antennas.

(10) Handhelds should be kept as far from the head as possible when operating. The use of a separate microphone or similar device is recommended.

(11) Transmissions using a handheld radio should be kept as short as possible.

(12) Power density measurements should be made before running more than 25W in a VHF mobile installation, particularly if the antenna is rear-deck mounted and passengers may ride in the back seat. The safest mobile antenna location is in the centre of the metal roof.

(13) The development of an accurate inexpensive power-density meter would be of major benefit to the Amateur Radio community so that RF power-density measurements could be taken in all radio installations. Because of the current high-cost of such devices, groups of amateurs or clubs may wish to purchase one and share in its use.

(14) Soldering should only be done in a well ventilated area. A small fan should be used to blow away toxic fumes.

(15) When using toxic chemicals, such as when etching printed-circuit boards or repairing fibreglass, wear gloves and goggles, use proper tools, and avoid contact with any of the chemicals. If accidentally contaminated, wash off the compounds immediately with copious quantities of water. Again, the importance of always working in a well ventilated area with personal protective covering cannot be overemphasised.

(16) Hazardous chemicals, such as those in the PCBs class, are used in some capacitors and dummy loads. Use extreme care in handling these materials and consult with the appropriate local authorities to determine the proper means of disposing of these chemicals in an environmentally responsible way.

A worrying aspect of the WC2S survey is that he suggests there is a growing body of opinion that not all handheld transceivers with less than the usually accepted figure of 7W RF output are safe if held near the operator's head, and that more stringent guidelines may be introduced in this area.

I would, however, emphasise that even if one accepts that low-level, non-ionizing radiation may prove to have microbiological effects, the risks must be very small indeed compared with some other natural hazards, including most probably the radon gas that leaks into many homes and which has been found to account for nearly one-half of the average UK exposure to ionizing radiation (accounting for a UK average of 1.2 millisieverts and, in some parts of Cornwall, up to 20 millisieverts per annum).

POT-POURRI

The peak of solar cycle N22 is now being predicted for February 1990 and may be of similar magnitude as the record cycle 19 which peaked about 33 years ago. During 1989 two giant solar flares of unprecedented magnitude occurred, one in February and the other at the end of October. The February event even set off the safety cut-outs in the electricity supply grid in Quebec, Canada, triggering a black-out over most of the province.

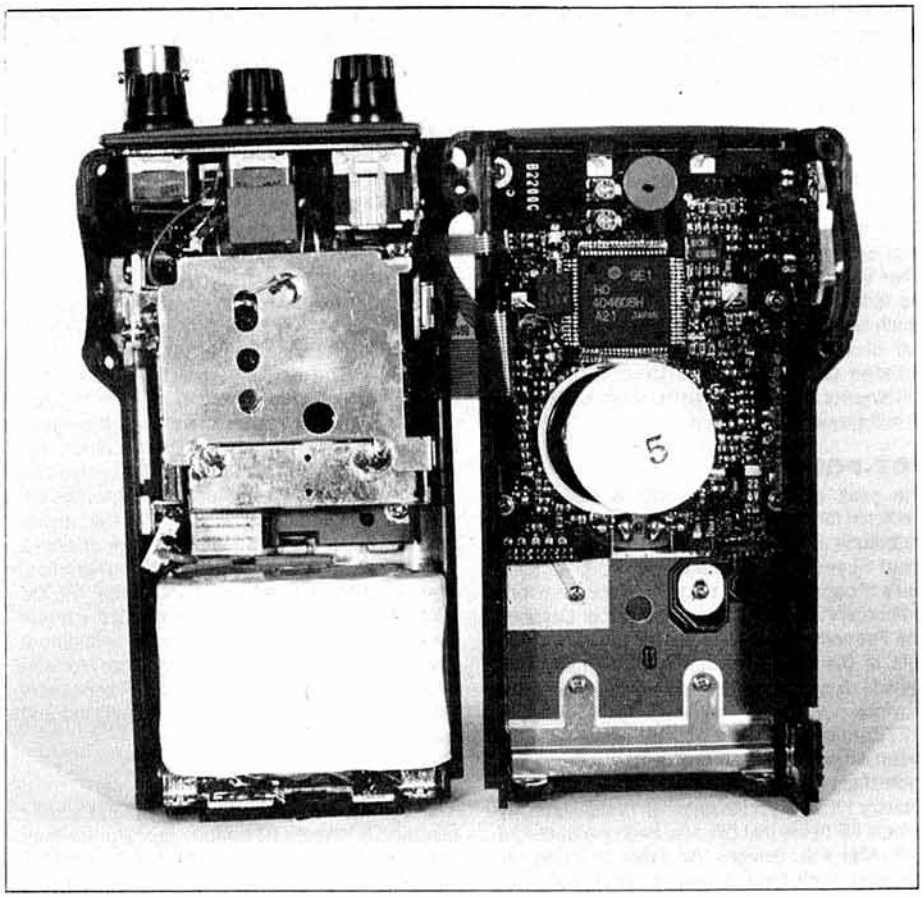
TT January 1989, Fig 4, page 38, reproduced the circuit diagram of the Moorabin Mark IV 20A PSU. I note that Doug Friend, VK4AIZ (Amateur Radio, January 1989) raises the question of susceptibility to local RF fields that has also been encountered with other PSU designs. He wrote: "I found the design (I don't think it was my PCB design or wiring layout) susceptible to RF energy, notably HF. The cure of the problem has been to place a 4.7μF 25V tag tantalum electrolytic capacitor between pin 3 of the 723 and earth, with short leads right at the IC pin itself."

LINEARS AND DISTORTERS

John Clarke, TK5FF/G8KA has been following the *TT* items about linears and distortion. He writes: "One advantage of sticking to two 3-500z valves is that with our ordinary 100W black boxes it is virtually impossible to overdrive them. Of course any idiot can overdrive his black box by turning up the microphone gain. If he uses a speech processor or an RF processor all he has to do is to watch his ALC limits on the meter of his (say) Trio. The KW1000 uses 572B valves but these have jumped up in price, are hard to drive, but can run on much higher voltages than most people believe: 2400V with slight colour. My homebrew and my factory Viewstar using the Eimac valves give almost identical performance. One novel excitement was when the anode blocking capacitor of the Viewstar blew up with a sound like a rifle shot and accompanying lightning. The capacitor was a Centralab 1000pF (5000V wkg)! As my friend Marv W6FR pointed out one needs to think not merely about the voltage but also the RF current flowing through anode blocking capacitors. He sent me four 250pF capacitors rated for 30kV working. These are installed and give an added feeling of safety!

FEEDBACK:

The component marked 'meter' in the circuit diagram of I1ARZ's IC tuning controller for loop antennas (*TT*, November 1989, Fig 3, page 37) should have been marked 'motor'. In the text, the minimum motor voltage should have read 3-4v. □



REVIEW: ICOM IC-2SET

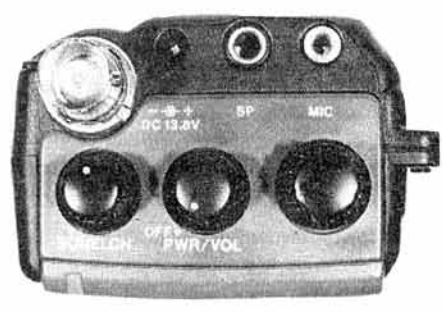
Just when you thought that they couldn't get much smaller, another 2m 'Diminuitive' appears — Peter Hart, G3SJX, investigates.

Over the years Icom have produced a successful range of 2 metre FM hand portables. The IC2E, possibly the most popular portable ever made, was launched in 1980 and was later followed by the IC02E and IC micro 2. The latest models in the series are the IC-2SE and now the IC-2SET. Each successive model has offered more and more features over preceding models in a smaller and smaller size, and the IC-2SE/IC-2SET is no exception. Currently the smallest portable on the market, this tiny radio is packed with features to rival the most comprehensive mobile. The IC-2SET, reviewed here, is the keyboard version of the IC-2SE which eases the selection of many of these facilities and provides direct input of frequency and memory number.

PRINCIPAL FEATURES

The IC-2SET has two versions, the standard European model covering the frequency range 144-146MHz and a version for the Italian market covering 140-150MHz. The companion IC-2SAT covers non-European markets with slightly different frequency limits. Frequencies may be entered directly from the keypad or stepped via a click-step rotary tuning control on the top panel which is also used to increment or decrement the memory number, set the time and so on. The tuning step size may be set to 5, 10, 12.5, 15, 20, 25 or 50kHz with 100kHz or 1MHz for fast stepping. The other two rotary controls are volume and squelch. 48 memories are provided which store frequency and simplex/'duplex' status and may be accessed directly from the keypad or through the click-step tuning control. Switching between VFO and memory modes is provided as well as transfer of memory contents to VFO and vice versa. Unwanted memory contents can be 'masked' which means that in effect they are removed but remain available for future recall.

Repeater operation is accomodated with TX/RX frequency offsets which can be set over the extremely wide range of ± 60MHz in steps of 25kHz. 600kHz is the default setting. This is commonly described as 'duplex' operation but this is a misnomer; duplex operation strictly speaking means simultaneous receive and transmit as used in telephones. A 1750Hz toneburst is enabled by pushing the PTT twice in quick succession, but as there is no timer, the PTT must be briefly released to switch it off. Some repeaters do not allow a carrier drop immediately after a tone burst which will present a problem with this rig; a more satisfactory solution would have been to include a half second timer. A monitor button is provided which opens the squelch and, in repeater mode, checks the repeater input frequency.



Top panel view of the IC-2SET

The rig can scan over the complete frequency range, between programmed limits or through the memories, and unwanted frequencies or memories may be skipped. Scanning will stop when the squelch opens, as normal, and will resume either when the signal disappears or after 10 seconds (this is user selectable).

A call channel facility gives quick access to a frequently used channel. A priority watch feature may be enabled which will operate in one of three ways: to check a memory channel, perform a memory scan or check the call channel. In all cases, priority watch checking is performed at 5 second intervals.

The transmitter power output is switchable between high and low, and the low power setting can itself be set by the user to one of three levels. In the high power position, the actual power depends on the battery voltage and is up to 5W output with a 13.8V power source.

The radio incorporates an internal 7.2V 300mAH rechargeable battery pack. A range of additional battery packs are available (BP81-BP86) which clip onto the bottom of the radio, prolonging the duration between charges. BP81, BP82, BP83 and BP84 are 7.2V packs with capacities of 110, 300, 600 and 1000mAH respectively. BP85 is a 12V 340mAH pack for higher transmit powers, and BP86 is an empty case for fitting six AA sized cells. Alternatively, the radio may be powered from an external supply in the range 6-16V DC.

In order to prolong battery life, two power saving functions have been built into this radio. If no signal is received (the squelch remains closed) or no button is pressed for five seconds, the power saver circuit is activated. In this mode, the receiver is cycled on for only 125msec every 500msec or 2sec (again, this is user selectable). This function may be disabled when immediate response is required such as for packet operation. Auto power-off may be selected to aid battery economy further. If the radio remains dormant for a period (20, 40 or 60 minutes) then it can be automatically turned off. The IC-2SET also includes a real-time clock and this can be used to turn on the radio at a preset time.

The liquid crystal display indicates frequency, memory number, S-meter, TX power level and a number of status flags. For night-time operation, a backlight is provided which remains on for five seconds after the last keypress. Other facilities include frequency lock, PTT lockout, key confirmation beep tone on/off and red/green LED for TX/RX indication. This may be disabled to reduce current consumption even more.

A DTMF (Dual Tone Multi-Frequency) encoder is fitted as standard and a variety of selective calling functions may be incorporated with the appropriate option installed. The UT49 DTMF decoder option provides a paging and coded squelch function for use with other transceivers suitably equipped. The UT50 option is a sub-audible tone squelch encoder/decoder and the UT51 is a sub-audible tone encoder to access repeaters so equipped (although this is not used in the UK).

The IC-2SET is provided with a small battery charger and short 'rubber duck' antenna. Other accessories available include various battery packs and chargers, speaker/microphone/headset/VOX/PTT combinations, carrying cases for diffferent battery configurations and a mobile bracket. A 44 page instruction manual is provided, which is up to the usual high Icom standard, together with a circuit diagram and operating summary card. Altogether an impressive array of facilities in such a compact radio.

DESCRIPTION

The IC-2SET is small enough to comfortably fit into a pocket. Approximate dimensions are 50(w) × 105(h) × 33mm(d) and the weight is about 270g. With added battery packs, the height and weight obviously increase. The front of the unit contains the 16 key keypad, small speaker, microphone, two buttons and display. The three rotary controls are mounted on the top panel together with BNC antenna connector and small sockets for mic, speaker and external supply/charging.

The case separates into two parts revealing two assemblies connected by a ribbon cable. A third of the volume is taken up by the internal battery, and the logic unit containing the microcontroller with battery backup is mounted in the front part behind the keypad. The backup battery is a rechargeable lithium cell which, although it never needs replacing, only retains the memories for one week if the main battery pack is fully exhausted. The rear part of the case is metalised and contains the RF circuitry. Miniature surface mount technology and components are used throughout. The receiver is a double superhet with intermediate frequencies of 30.875MHz and 455kHz. A simple single loop, single chip frequency synthesiser is used for the RX local oscillator and TX source and has the capability of tuning over a much wider range than is at first apparent. The frequency range is selected by diodes in the initialisation matrix on the logic board; removal of a diode permits the receiver only to operate over the wide extended frequency range 80 to 190MHz. The TX power amplifier uses a power module with a simple heatsink near the PTT button (to keep the fingers warm in cold weather).

MEASUREMENTS

The transmit power and current measurements were made with the IC-2SET powered from an external PSU. All other measurements were made using the internal battery as a power source. With the exception of transmit power, all other performance figures were independent of supply voltage over the specified range of 6-16V.

Sensitivity

The sensitivity figure is fairly typical of a 2 metre rig. The squelch operated effectively from about 0.1uV.

S-meter calibration

I have yet to come across an FM-only rig which has an acceptable S-meter. The IC-SET is on the good side of typical with a range from the first to the last 'blob' of about 27dB.

Adjacent channel rejection

The IF filters fitted into this radio are too wide to permit full use of 12.5kHz channel spacings. Rejection at 25kHz channelling is limited to 61dB, not by the filters, but by reciprocal mixing due to frequency synthesiser noise. This also limits the rejection of channels further out as indicated in the table under blocking/reciprocal mixing.

Intermodulation

The third order intercept was measured as -30dBm. This really is rather poor and although problems may not be experienced when using the little 'rubber duck' antenna, overloading of the radio is possible using larger antennas.

Audio output

Although the audio output is sufficient to drive the internal speaker and external phones, a higher audio output is needed to drive an external speaker in the car.

Frequency accuracy

As supplied, and at room temperature, the transmit frequency was very accurate at 200Hz high.

Transmit deviation

The deviation was set about right for 25kHz channelling.

Current consumption

The receive current consumption is quite low and very low with the power saver activated. On transmit, the efficiency is much higher than many portables currently on the market.

ON AIR PERFORMANCE

The IC-2SET was used solely with the 'rubber duck' antenna supplied and mainly with just the internal battery although the 12V BP-85 pack was also used. The radio was generally easy to use, and operation of even some of the more obscure functions was fairly straightforward, not needing too much reference to the handbook. The keypad buttons are very small but I found them simple and positive to use. On extended high power operation, the case around the PTT button became quite hot and there is a warning to this effect in the handbook. The radio is particularly convenient to carry around and easily fits in pockets.

The received audio was clear with adequate volume for normal personal operation. At higher levels the speaker rattled but this is inevitable in a small portable. The transmit audio was reported as clear and readable.

The 'rubber duck' helical antenna supplied with the set, although only 10cm long, seemed very effective and I was able to access quite distant repeaters. The potential toneburst problem I mentioned earlier was not experienced in the South London area, but this will be a problem in other areas.

Having used the IC-2SET for a few weeks, I offer the following suggestions for future models: automatic selection of repeater offset in the standard repeater sub-band as adopted in some mobiles, an indicator to show when the battery is being charged, the inclusion of a toneburst timer and a state of charge indicator on the LCD display. This latter feature is quite difficult to implement for NiCad batteries but nevertheless would be very useful.

ICOM IC-2SET MEASURED PERFORMANCE

RECEIVER MEASUREMENTS

Supply current	
unsquelched no audio	78mA
squelched	56mA
with audio	up to 150mA
power saver mode	6 or 13mA ave

S meter sensitivity	
S3	0.4μV (-115dBm)
S5	0.6μV (-111.5dBm)
S7	1.4μV (-104dBm)
S9	4.3μV (-94dBm)
S9 + blob	7μV (-90dBm)

Sensitivity for 12dB SINAD, 3kHz pk dev: 0.16μV (-123dBm)

Adjacent channel rejection	
1) 25kHz with 3kHz dev.	61db
2) 12.5kHz with 3kHz dev.	14dB
3) 12.5kHz with 1.5 kHz dev.	28dB
Co-channel rejection	6dB
Image rejection	70dB
Rejection of other spurious responses	>90dB
Blocking/recip mixing —	
50kHz offset	-56dBm (67dB)
100kHz offset	-50dBm (73dB)
200kHz offset	-47dBm (76dB)
3rd order intercept	-30dBm
Max audio before clipping into 8ohm	0.2W
Audio distortion up to slipping level	2.5%

TRANSMITTER MEASUREMENTS

Power output	7.2V	13.8V
high power	1.8W	5.4W
low power 1	0.45W	0.45W
low power 2	1.4W	1.5W
low power 3	1.8W	3.3W

Current consumption	7.2V	13.8V
high power	0.78A	1.2A
low power 1	0.43A	0.43A
low power 2	0.68A	0.68A
low power 3	0.78A	0.95A

Harmonic output	-75dBC
Spurious outputs	<-72dBC
Max deviation	4.8kHz
Toneburst freq	1754Hz
Toneburst deviation	3.2kHz

NOTE: All signal input voltages given as pd across antenna terminal.

CONCLUSIONS

The IC-2SET is a very versatile portable. It is small enough to take anywhere and packed with all the features desirable in a 2 metre FM rig. The performance is generally acceptable, although a narrower IF filter would permit more effective use with 12.5kHz channel spacings. The receiver strong signal performance is rather limited although this is unlikely to cause problems if used only as a portable, and the tone burst arrangement makes operation with some repeaters difficult. The current price of the IC-2SET as of November 1989 is £295 with external battery packs a rather expensive £34 to £72. The BP86 case for housing AA cells costs £10.50 and various carrying case options £6.50 □

I would like to thank Icom (UK) Ltd of Herne Bay, Kent for the loan of the equipment.

Dual bi-polar PSU project

John Share, G3OKA, presents a useful piece of lab gear for the home experimenter

The ready availability and low cost of three-terminal regulator ICs makes them an obvious choice as the basic building block in a variety of power supplies, the circuit shown in **Fig. 1** being typical. Each component in the design needs to be considered so as to determine its operating parameters, and using this information, select the correct component from the various catalogues. In the majority of cases minute evaluation of every design equation is negated by component tolerance. This permits the designer to corrupt complex mathematics into simple equations which, whilst not providing absolute values, do provide values which are sufficiently accurate for the purposes of component selection. It is vital that the value determined by short-cut methods err towards a small over design, the higher specification being unlikely to influence component selection very much.

Particular attention must be paid to the minimum input voltage to the regulator which must always exceed the required output by a minimum of 3 volts. This value relates to the absolute input voltage as determined by the transformer and smoothing capacitor and is the starting point in the design procedure.

TRANSFORMER

To select a suitable transformer it is necessary first to determine the required terminal voltage, which can be assumed to be not less than the minimum input voltage to the regulator.

$$V(min) = V(load) + 3 = V(rms)$$

It is not necessary to modify a higher-voltage transformer to deliver the calculated minimum value. Calculation of the peak rectified voltage under no-load conditions will reveal the maximum possible value:

$$V(peak) = \sqrt{2} \times V(rms)$$

This assumes that absolutely no load is placed on the rectifier; as soon as load is applied the forward volt drop of the rectifier becomes apparent. It is convenient to simply ignore the characteristic curve of the rectifier diode and assume that the forward volt drop is 0.7 volts irrespective of the actual current. The transformer windings have resistance, so as soon as load is applied, volts are lost in the winding resistance. The intricacies of iron losses and copper losses are usefully given by the 'regulation' part of the transformer specification. For a small transformer the regulation may be as high as 15%, thus if one applies full load to the transformer then the terminal voltage will drop by 15%. For lesser loads it is quite in order to simply scale the regulation relative to the actual load and the rated maximum current of the transformer.

For a capacitive input filter the transformer current is always greater than the load current. As a general rule the relationship between the two currents is approximately:

$$I(transformer) = 1.61 \times I\ (load).$$

Knowing the regulation, the terminal voltage at the specified load can be calculated:

$$V(loaded) = V(rms) \times (1 - ((R/100) \times I(load)/I(max)))$$

The peak voltage for these terminal voltages, including the volt drop due to the rectifier is determined by:

$$V(peak) = \sqrt{2} \times V(loaded) - V(diode).$$

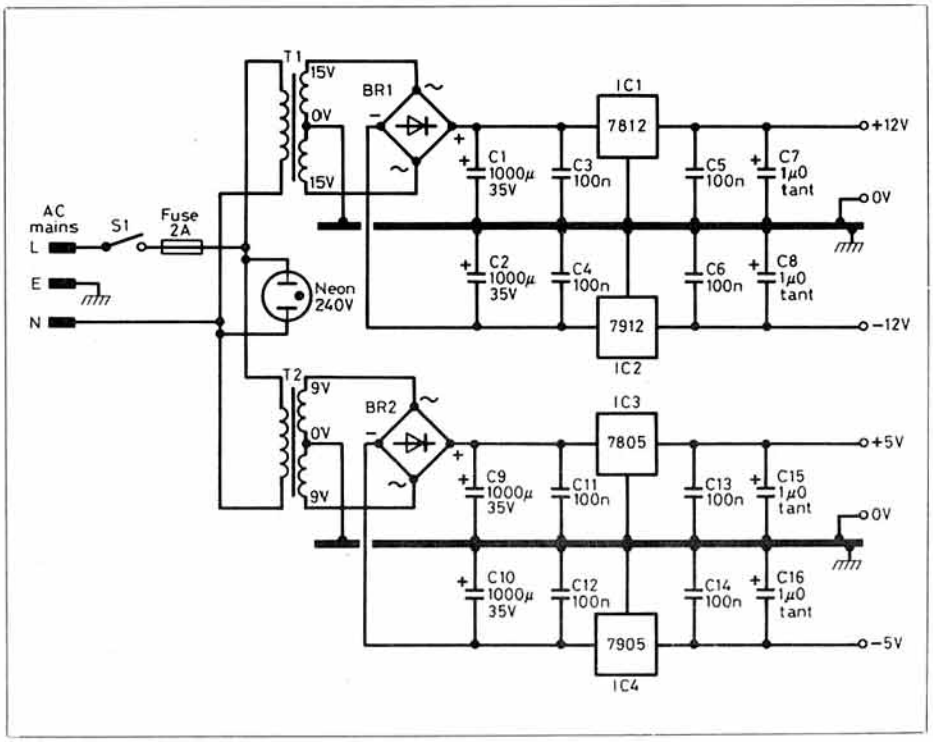


Fig 1. Schematic diagram of the dual bi-polar power supply.

SMOOTHING CAPACITOR

Having determined the regulator minimum input voltage and the peak voltage, the tolerable ripple can be calculated:

$$V(ripple) = V(pp) = V(peak) - V(min)$$

A simple method of determining the value of smoothing capacity required is to use the allowable ripple voltage and load current as the limiting parameters.

$$C = I(load) \times \sqrt{2} / F(Hz) \times V(pp) \times \sqrt{3}$$

Electrolytic capacitors have notoriously wide manufacturing tolerances, the next higher preferred value component would be a prudent choice. The working voltage of a capacitor can be equal to the peak voltage it will experience in the circuit, few designers would allow such a situation and opt for a 50% margin of safety.

REGULATOR DISSIPATION

The fact that a regulator can pass a specified amount of current is not unconditional, thermal protection shuts down the device when the case temperature exceeds a safe value. For this reason it is essential that the dissipation is calculated and heat sinking applied when necessary.

The voltage drop across the regulator is at a maximum under very light loading conditions, whilst the current passing through the regulator is at a maximum under full load conditions. It is quite in order to ignore any currents which the regulator may consume and consider the input and output currents to be equal. By using the no-load peak voltage and full-load current, the dissipation value given is one which cannot be reached and is therefore a safe value:

$$Dissipation = V(no\ load) - V(out) \times I\ (full\ load)$$

Clearly these approximations err well towards safe operation. A more realistic value can be calculated from an approximation of the RMS value of the input voltage and the full load current:

$$RMS\ V(input) = 0.75\ V(ripple) + V(min)$$

$$Dissipation = RMS\ V(input) - V(out) \times I(load)$$

Generally if the dissipation is below 1 watt then the device can be mounted directly onto a PCB without fear of scorching the board. Above this value simply employ standard heatsinks, using their °C/W rating to ensure that the temperature does not exceed 20°C.

HIGH FREQUENCY STABILITY

Three-terminal regulators contain wide bandwidth feedback circuitry with high gain, a combination guaranteed to take advantage of any suggestion of instability. The manufacturers recommend fitting a high frequency bypass capacitor directly to the input and ground terminal and suggest a value of 10nF, they also suggest that a 1uF tantalum bypass is fitted directly to the output and ground terminals. Following these recommendations does ensure stable operation of the devices.

RECTIFIERS

At switch-on the smoothing capacitor contains no charge and appears as a short circuit to the transformer and rectifier. The only current limit is the winding resistance of the transformer which can be calculated from the transformer regulation specification:

$$V(drop) = V(terminal) \times Regulation/100$$

This is the voltage lost at the transformers full load rating, using Ohms law the winding resistance can be calculated:

$$R(winding) = V(drop)/I(f.load)$$

The switch on surge rectifier current can be estimated by assuming that the transformer voltage is a square wave and that the capacitor never charges, thus:

$$I(surge) = V(terminal)/R(winding)$$

In reality the transformer does not deliver square waves and the rectified waveform applied to the capacitor is half a sine wave at twice primary frequency. It is not unreasonable to consider the capacitor as having an ac resistance equal to its reactance which is given by:

$$Xc = 10^6/2 \times 3.1416 \times f(Hz) \times C\ (uF)$$

The surge current can now be calculated by considering the capacitor, not as a short circuit, but as a resistor.

$$I(surge) = V(terminal)/R(winding) + Xc$$

This shows that the rectifier is called upon to pass considerably more current than that supplied to the load and somewhat less than the first approximation.

High rectifier current persists until the capacitor is charged, a time which can be calculated from the time constant formed by the winding resistance and the capacity. By definition, the RC time constant is the period taken for the capacitor potential to reach 70% of its peak value, and it requires a period of 10RC for the potential to reach 99.9%. Therefore the period of time during which the rectifier and transformer will be subjected to a current flow greater than normal operational loading can be calculated:

$$t = 10 \times R(winding) \times C(Farads)$$

Transformers and rectifiers are generally able to withstand considerable overload for a few cycles, although the period calculated should not exceed half a second without reappraisal of the design.

The reverse voltage specification of the rectifier diodes requires them to withstand being reverse connected between the positive voltage at the smoothing capacitor and the maximum negative excursion of the transformer. This can be simplified to:

$$V(reverse) = 2V(peak)$$

Diodes with high reverse ratings are readily available and many catalogues start listing from 100V, and are packaged as four diodes connected for bridge operation.

COMPONENT LIST

CAPACITORS

C1,2,9.,10	1,000uF, 35V Elect
C3,4,5,6,11, 12,13,14	100n
C7,8,15,16	1uF Tant

SEMICONDUCTORS

IC1	7812 Regulator
IC2	7912 Regulator
IC3	7805 Regulator
IC4	7905 Regulator
BR1,2	1.6A Bridge rectifier

MISCELLANEOUS

T1	15V, 6VA Transformer
T2	9V, 6VA Transformer
S1	Mains On/off switch

Fuseholder, neon panel light, 12 x 18 x 6.5cm case (RS Code 508.605), connectors as preferred. Note: RS components can be ordered via Electromail, PO Box 33, Corby, Northants NN17 9EL.

CONCLUSION

A number of power supplies have been designed using the methods given — each unit has proven reliable and met its design specification. Considering the amount of corruption of mathematics which has taken place it seems rather unjust on those who derived equations to specify components to numerous decimal places only to find manufacturers supply components to 10% tolerance! □

The PCB for this project is available from Badger Boards, priced £5.10 including postage and packing — see page 43.

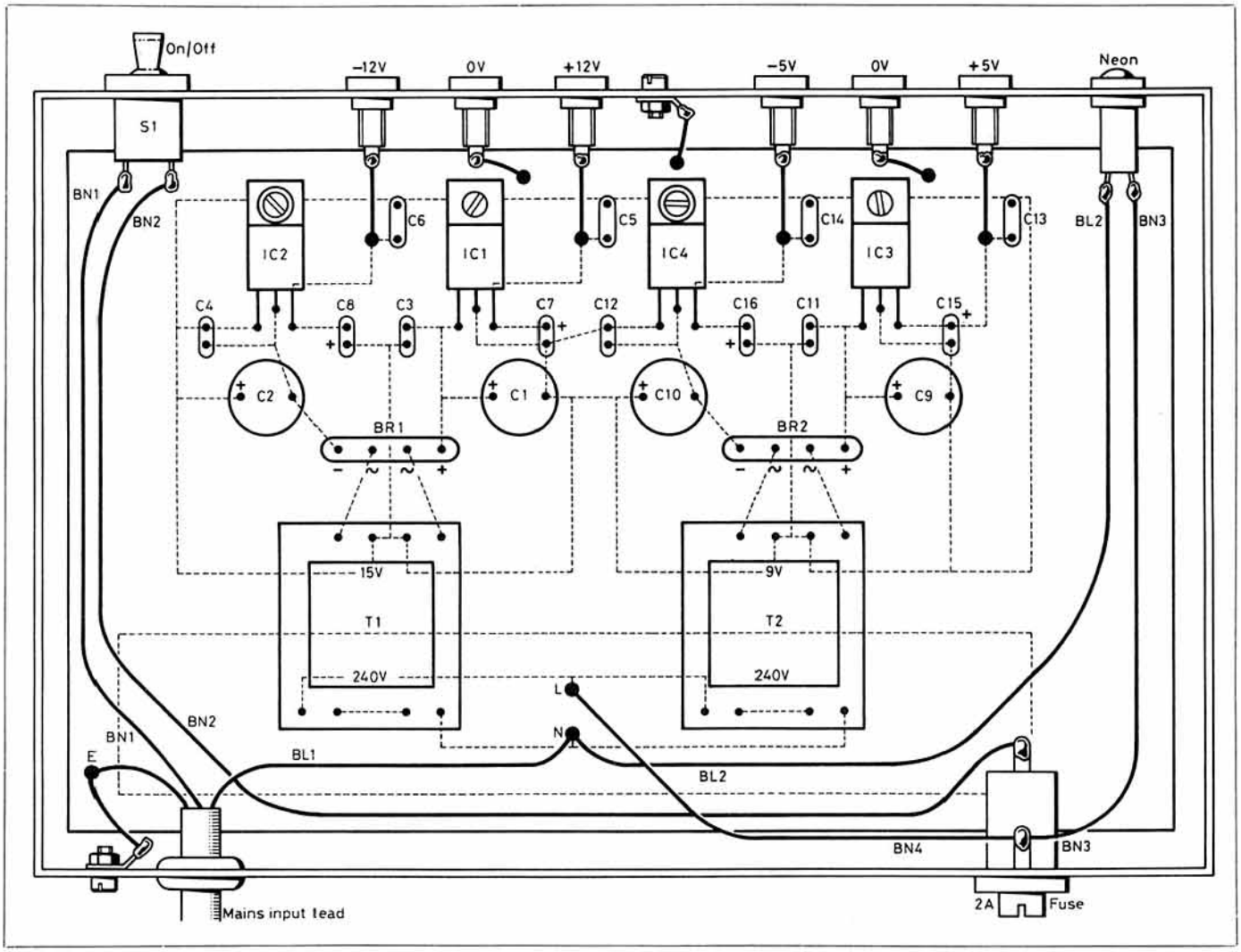


Fig 2. Suggested layout and component overlay.

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*Items in **bold** are featured in the January Sale to RSGB members.*

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January 1990

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November 1989

BOARD DESCRIPTON	CODE	PRICE
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Febuary/March 1989

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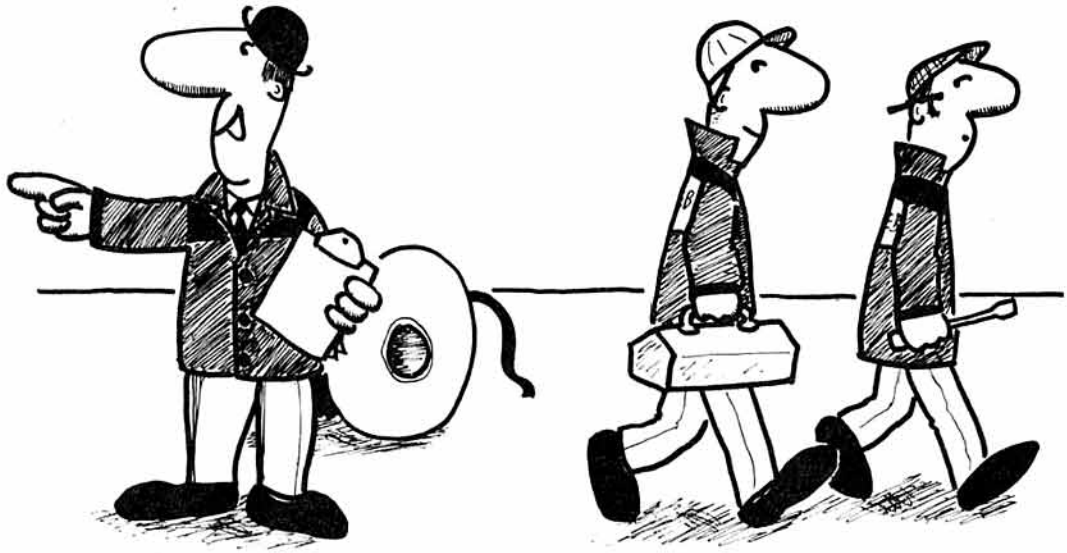
All prices include postage and packing.
Please note these PCBs are not available from RSGB HQ, but direct from Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coalfield B74 4JF. Tel: 021-353 9326

A Tale of Noise

The local electricity board really should have known better than to come between Patrick Allely, GW3KJW, and his radio!



'The team swung into action like a finely tuned machine'

Just after last Christmas, we in the village, each received a letter written in Welsh and English, to inform us that on certain days in January 1989 the electricity supply would be cut off in order that new overhead equipment could be installed.

"Great," I thought, "We may be rid of some of the overhead wires which are the source of so much interference from time to time in this otherwise idyllic VHF location."

MANWEB INVASION

For a number of days in January and February, the village was invaded by numerous MANWEB engineers, who cut off our electricity supply, thereby depriving us of a means of cooking (gas has not reached the Llyn Peninsula). To make matters worse - before commencing work they brewed up outside our houses using compressed gas cylinder cookers fitted in their trailers.

This was accepted in good grace as the end result promised a constant voltage and not the trickle of electricity that sometimes dripped out of the wall sockets.

After two months, the village was disfigured by the erection of a large transformer suspended between two poles high above the lane in the village centre and darkening the sun. Connected to this was the 11kV line running across the fields within 50 yards of my house, and a new 3 phase line which again is suspended in the air running along the lane across the front of my house. My daughter, who is interested in music, studies the positions of the birds perched on the five wires and informs me that the musical notation so largely displayed does not sound tuneful when played on a recorder.

In addition to the 3 phase line and transformer, MANWEB also renewed the air brake switches and insulators on a pole supporting the 11kV line. This pole is 50 yards south of my QTH.

They then, on completion of their job, restored the supply, brewed up again, then departed leaving me with electricity and an S9 noise level from 160 metres through to 70cms.

The noise was easily traced and found to be emanating from the pole with the new switches and insulators. The noise persisted until it rained and then, mercifully and wonderfully, no QRN, except when I turned the beam south, then the noise level crept up as it pointed at the offending pole.

QRN QSO

On 5th March I wrote to the General Manager of MANWEB at Chester, outlining my complaint and suggesting that, since I did not receive the interference before this change of system, their installation was faulty.

I did not get a written reply, but a week later, I received a telephone message from an engineer in Caernarfon, to say that the fault was probably due to salt deposits on the insulators, a common fault in this area, and would be only apparent during humid weather. This was patently nonsense as the fault was apparent in a completely dry atmosphere. This engineer also told me that someone would come to look at the problem. Nothing happened except the noise became even stronger.

On 18th April I again wrote to the Manager at Chester reiterating the complaint and pointing out that, although I had been assured that the problem would be checked, nothing had been done about it. I had spoken to MANWEB employees whilst they were removing the old transformer and who had installed the new equipment, but they professed total ignorance of any problem and suggested I write again. I received no reply to this letter.

A WORD FROM 'THE MANAGEMENT'

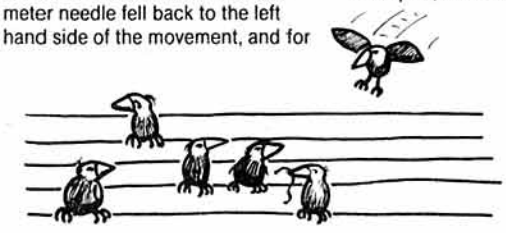
On the 27th April I again wrote to MANWEB, informing them that the noise situation was now even more severe and that it would appear that they had a serious problem with their installation. I asked for a written reply or acknowledgement of my letter in order that I may have the name of a responsible official within MANWEB — no such luck. BUT, on Monday 1st May, I received a telephone call from the District Engineer at Caernarfon with apologies for the apparent lack of help, and the promise that a local engineer would visit me the following Friday and check the situation. Significantly he said that it would be no good sending the foreman who did the installation as he would not know what to do.

On Friday 5th May, as promised, a MANWEB engineer called at my house and listened to the radiated noise, he seemed a little surprised as an S9 + 40 noise level increased massively as I turned the aerial through 90 degrees towards the offending pole.

"I'll be back in a few minutes," he said, and off he went. I stayed in the shack and watched the S-meter. Success — within minutes the S-meter needle fell back to the left hand side of the movement, and for the first time in months, I could again hear faint signals in the 2 metre band.

He returned to the house and looked at the S-meter with some satisfaction. He had found three faults on the 11kV line, and had switched out of circuit the offending new installation on the pole near my house. He believed that the fault was either a poorly made compression joint, or a faulty insulator. He accepted my grateful thanks, but he would not accept a cup of tea. Now I have a quiet noise-free band, but the village will be without electricity once more when the repair work is done, and I now feel quite ashamed that the leading villain in the children's book I have written is called Manweb; mind you, his side-kick is named Norweb.

The moral: If you have such a problem, nag and nag again, if possible pinpoint the source of interference and remind the Electricity Board of their statutory obligation to provide an interference free supply. My experience is that if you can do the detective work, and are prepared to make a fuss about it, they will do their part, with a little prodding.



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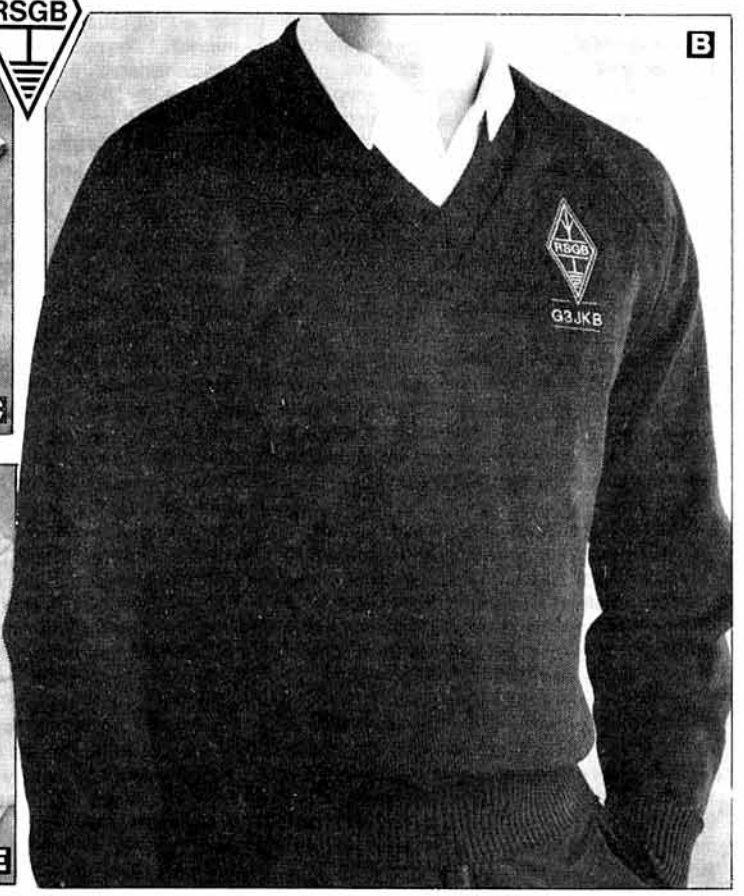

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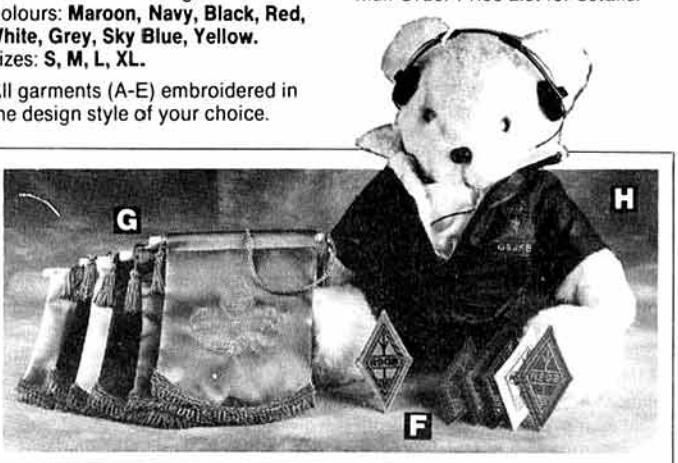


IN PRACTICE

Thanks again for your letters; it's nice to know that the topics we've covered so far have been interesting to many of you, and we'll keep at it. Please remember what we said an issue or two ago - this is very much *your* column and the main purpose if it is to try and give you an insight into *your* practical problems and queries, not to write masses of stuff which'll send most of you straight to sleep. The more relevant we can make this column to precisely what you want to know, the better we'll be pleased. No holds barred - ask anything you want and we'll dig into our library to find an answer.

Down to business, then, and the first question of 1990 is about a promising-sounding 144MHz antenna system. In the answer to this, we've also dealt with a query from C T of London SE26 about waterproofing and also one from M V of Bracknell about how to terminate LDF4-50 cable.

144MHz Antenna System

"I'm considering putting up a box of four antennas for 144MHz this spring. I've solved most of the practical problems, but one thing worries me a little. I'm planning to use a four-way Tonna power divider and to use LDF4-50 Heliax to feed each antenna, but I don't know how to mount the divider on the frame and whether or not it's OK to run the Heliax straight into it. Since the Heliax is almost rigid, how should I mount the power divider without putting too much stress on it or the connectors? And how should I waterproof such big connectors? Do you know anyone who has done anything similar, and whether or not they had any problems?' A J, Birmingham

The short answer to the questions in the last sentence is a) me and b) yes. However, let's consider some of the issues involved. If you wish to use more than one antenna in a VHF/UHF array, you must find a method of making sure that each antenna in the array receives the same amount of transmitter power whilst keeping the impedance seen by the transmitter to 50Ω. The most popular way of doing this nowadays is to build or buy a device known as a 'power divider' or 'power splitter'. This is a device with a 50Ω input and the required number of 50Ω outputs on it - either two or four are the most common - from which the individual antennas are fed. As with many published designs, the Tonna examples work on the basis of a quarter-wave transformer in which all the output ports are paralleled and there is an internal transformation from the 50Ω input to 12.5Ω or 25Ω depending on whether there are four or two outputs.

LDF4-50 is a smaller-diameter brother of the semi-rigid LDF5-50 'Heliax' coaxial cable made by the Andrew Corporation, which we looked at in the November 1989 edition of In Practice; it has fractionally higher loss but it's mechanically somewhat easier to use because of its smaller bending radius. In principle, there's no problem at all with connecting LDF4-50 feeder to each antenna as long as the impedance is 50Ω, since both the power divider and the LDF4-50 also have impedances of 50Ω. The difficulties which may well arise are mechanical, if various people's experiences are anything to go by.

To illustrate the potential problems, here is an outline of what happened in my own four-Yagi 144MHz installation. I also used a Tonna power divider and, because at that time I had access to quite a bit of it, I ran LDF4-50 from the divider to each antenna to achieve lower RF loss than would have been the case with UR67 or H100. This looped its way round the stacking frame, to which it was tightly held with most of a boxful of cable ties, and for about six months the set-up worked very well. However, I noticed one day during an aurora that the directivity of the array was much worse than usual and was also decidedly asymmetrical. I also noticed that the VSWR of the array was considerably higher than normal. I carried on working the DX (there was quite a bit of activity from Finnish and Soviet stations and some new squares were at stake, so I wasn't about to go QRT for what I thought was a minor antenna problem) and resolved to fix the array later.

The following day I went out to see what was wrong, expecting to find a loose driven element or some other fairly obvious mechanical fault, but everything looked normal from ground level. It wasn't until I luffed the tower over and started to look more closely at the array that I registered the fact that the run of cabling coming from the power divider looked a little strange. Close inspection then revealed what had happened. Believe it or not, the two N-type sockets on one side of the divider had pulled right out of the body and were hanging in space in inch or so away from it! I'd been working the auroral DX on a vertically stacked pair of antennas instead of a box of four...

My first instinct was to curse Monsieur Tonna for making weak and feeble power dividers, but then I started to think about how I'd installed the divider and Heliax. The power divider was held in two plastic pipe clips, which were themselves bolted to a metal plate - actually one of SMC's 'diamond clamps'. In turn, this was fixed to the main vertical member from the rotator. The Heliax connectors were screwed into the power divider output ports in the usual way. What I'd forgotten were two things. The first was that the N-type sockets which form the output connections on a Tonna power divider are standard Ns which, by the look of them, are soft-soldered to the body of the device. Because of this, they cannot be expected to take much in the way of bending or shearing forces. Now most people use something like UR67 or H100 for the antenna feeders; these types of cable are flexible and any slight misalignment won't matter. However, the second thing I'd forgotten was that the combination of LDF4-50 and the large-bodied connectors associated with this cable formed something much more rigid. The combination of the weight of the Heliax and the inevitable bending which had been applied to it when the array was built - together with some assistance from strong winds - had applied a great deal of lateral force to the connectors on the power divider, which had promptly broken away from the body. Subsequent experiments on the remaining ports of the power divider proved that as little a foot of LDF4-50 connected to one of them gave enough leverage for it to be broken off with hardly any effort applied at the other end.

The answer was not to mount the power divider on anything at all but to allow the four LDF4-50 feeders coming into it to support it and let it find its own level. Also, I put a slight 'kink' in each leg of the feeder in order to ensure that each connector came in straight, as it were, and did not apply a bending load to the N sockets. The Heliax was held on to the frame as close as possible to the power divider with cable ties, so that the minimum possible length of it was unsupported. There have been no problems since I repaired the array in this way.

The moral of the story is not to regard the power divider as being capable of resisting any bending or torsional forces applied to it by cables connected to its ports, and that it's necessary to find a way of mounting the divider which relieves the output connectors of any such forces. If you're using flexible cable for the antenna feeders, you're not likely to have major problems. However, if you plan to use semi-rigid, it's best to install the divider last of all and to make sure that no loads are applied to it. The manner in which you do this depends on the disposition of your feeders and what supports are available for them, but the golden rule seems to be to support the feeders as firmly as possible and to let the divider itself assume whatever position it wishes. Allow it to 'float' in the cabling so that it can move slightly if it wishes to.

As always when using Heliax, it's important to remember to treat it carefully. Keep any bends round the frame as gentle as possible, and use plenty of cable ties to support it. Incidentally, it's worth noting that RS Components introduced a range of 'weather-resistant' cable ties in their latest catalogue. These are stated to be "...ideal for use in outdoor applications or where UV radiation is present". Using these would certainly be beneficial in any antenna application, since the ordinary translucent variety have a nasty habit of becoming very brittle and literally falling apart as soon as you touch them after a few years' exposure to sunlight.

Waterproofing

Let's now consider the matter of waterproofing. First of all, it's often thought that a properly installed N-type connector can be thought of as waterproof. This may be more or less true for the N-types used with flexible cables such as UR67, but unfortunately it's far from true for the connectors used with Heliax cables. Several professional users have had problems with water ingress into their Heliax connectors and feeders - the Civil Aviation Authority, for one - and I don't think it's giving away any official secrets to reveal that my local RAF airfield had no end of trouble last year with water getting into their new LDF4-50 feeders and causing them a lot of problems. So if you're planning to use Heliax of any variety, you must pay a lot of attention to keeping water (not to mention ultra-violet radiation from the sun) away from where it's not wanted. If the following recommendations sound way over the top, let me assure you that they're the product of a good deal of learning the hard way. With Heliax connectors costing what they do, you really can't be too careful - and if these techniques are good enough for the RAF and British Telecom, they should be just about OK for us.

First of all, turn back to page 70 of the November 1989 edition of *RadCom* and have a look at the Andrew Antennas diagram explaining how to attach connectors to LDF5-50 cable. You will see from this that the only barrier to moisture getting in at the rear of the connector is an O-ring coated with silicon grease, and that the insulation of the cable is cut short slightly before the O-ring. This leaves two possible points for moisture entry. The first happens if you forget to fit the O-ring (even professionals have forgotten to do so before now) or don't grease it properly before you fit it. The other is by capillary action between the outer of the Heliax and the outside of its screen. The best way to stop both is to run some acrylic sealant round the rear of the connector at the point where the cable enters it. Make sure that the sealant is not one of those which evolves acetic acid during curing - use Silastic 738, or the Electromail equivalent (stock number 552-602 for a 100g tube). Do this as soon as you've finished attaching a connector to a length of feeder.

The next stage is to acquire some adhesive-lined heat-shrink tubing, and you'll also need to organize some electrical power out to the antenna site. For LDF4-50 connectors you'll need 25mm diameter tubing (the Electromail stock number is 399-754) and of course something with which to shrink it, such as a hot-air paint stripping gun. Screw the connector on to the power divider. Then cut off about eight inches of this and shrink it on to the connector and cable, making sure that one end of the tubing is taken right up to the body of the divider. This will give an excellent moisture

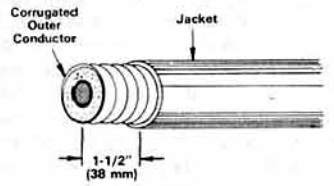
LDF4-50 CONNECTOR FITMENT

Tools and Materials Required for Assembly

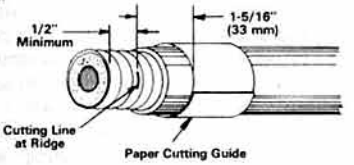
Scale	Spacing gauge (supplied)
Knife	Solder, 63/37 RMA flux core
Pliers	Garnet cloth, 240 grit or finer
Flat file	Three wrenches: two 13/16"; one 1"
Wire brush	Solvent, comothene, vythene, or other non-flammable cleaning fluid
Damp cloth	Soldering iron, min. 150 W: a resistance type iron is recommended when soldering in low-temperature environments
Jeweler's saw or fine-toothed hacksaw	

Read Instructions Thoroughly Before Assembly

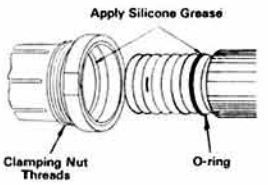
1. Prepare Cable. Straighten the end of the cable for at least 10 in (254 mm) and remove some of the jacket with a knife as shown to expose the outer conductor. Deburr the sharp end of the outer conductor.



2. Mark Conductor and Remove Jacket. Scribe a cutting line with a knife on the top of the crest of the exposed, corrugated outer conductor. Remove the jacket to the dimension shown, using a straight-edged piece of heavy paper wrapped around the cable to guide the cut.



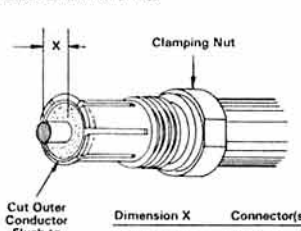
3. Clean Conductor and Add O-ring. Clean the outer conductor with solvent. Add the thick O-ring to second, fully exposed conductor groove from the jacket. Apply a thin coating of silicone grease with your finger tip to the outer surface of the O-ring and to the gasket lead chamfer in the clamping nut. **Note:** Clamping nut threads must be kept free of grease.



4. Add Clamping Nut and Cut Cable. Push the clamping nut fully onto the cable with a smooth twisting motion so that the spring contacts snap into the conductor groove and the O-ring seats properly against the inside surface of the clamping nut. Check that the conductor cut line is aligned with the edge of the clamping nut.

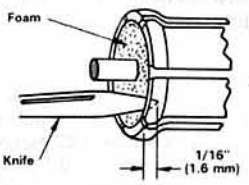
Tightly grip the clamping nut and carefully cut through the outer conductor with a fine-toothed saw. The cut must be flush with the clamping nut and shallow so that the inner conductor is not damaged. Then pull off the outer conductor with pliers. Carefully clean all foam from the inner conductor with a knife.

Cut the inner conductor to the length shown and deburr the cut end with a file.



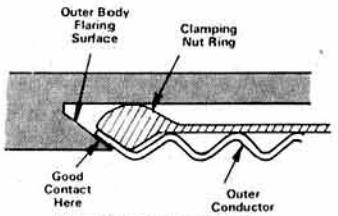
Dimension X	Connector(s)
7/32" (5 mm)	L44N/EN/W/EW/J/T/NT DF/DM/48923/204516
1/4" (6 mm)	L44M
9/32" (7 mm)	206405
5/16" (8 mm)	L44P/U
3/8" (10 mm)	L44R/ER/206406
7/16" (11 mm)	L44F

5. Separate Foam from Outer Conductor. Insert the tip of a knife to a depth of 1/16 inch (1.6 mm) between the foam and the outer conductor of the cable and separate them so that the outer conductor can be flared. Move the knife around the entire circumference of the outer conductor. Scrape away any foam clinging to the outer conductor and remove any burrs from the inside edge. Remove copper particles from the foam with a wire brush.



6. Flare Outer Conductor. Thread the connector outer body onto the clamping nut and tighten the connection with wrenches. Hold the clamping nut and turn only the outer body. The flaring surface of the outer body will flatten the outer conductor against the clamping nut ring. Disassemble the connection and inspect the flare to ensure good metal-to-metal contact on final assembly.

Internal Flaring Details of Connector Assembly



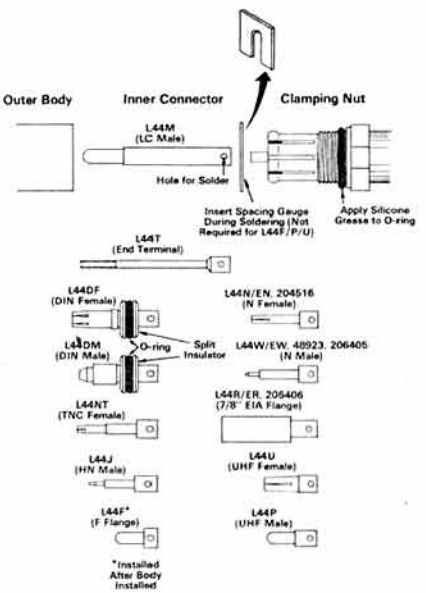
Note: Outer conductor must not extend beyond clamping nut.

7. Install Inner Connector and Outer Body. Clean the inner conductor with solvent and slide the inner connector onto the conductor. (**Note:** The inner conductor of L44F is installed after installing the outer body.) Insert the spacing gauge to properly position the inner connector for soldering. (Gauge is not required for L44F/P/U connectors.)

Solder the inner connector in place using the solder hole provided. Cool the connection with a damp cloth and clean the surface with garnet cloth. Make sure the connector is aligned with the axis of the cable.

The inner connector is different for each type of connector assembly as shown in the following illustration. Differences in outer body details have been deleted to simplify the illustration.

Add the large O-ring to the connector clamping nut. Apply a thin coating of silicone grease to the outer surface of the O-ring. Keep all connector threads free of grease. Thread the outer body onto the clamping nut and tighten the connection with wrenches. Hold the clamping nut and turn only the outer body.



seal, and the act of applying heat from the gun will also tend to drive out any residual condensation, etc, from the connector body.

Unfortunately, heat-shrink tubing has virtually no resistance to the ultra-violet (UV) radiation present in sunlight - it'll crack and break up in just a few weeks in summer - so it's unwise just to leave things at that. So the next step is to over-wrap the entire assembly tightly with self-amalgamating tape. If it's a cold day when you do this, use a hair dryer or the hot-air paint stripper to warm up the body of the connector before you begin winding the tape; this will drive any remaining moisture away and will also make the tape easier to apply. Start with a length of tape about three feet long and begin at the cable end about three inches from the rear of the connector. Wrap it tightly over the cable and connector, moving up about half the tape's width on each turn. This should take you nicely to the body of the power divider. Then repeat the process with another length of tape but this time begin at the power divider end and work back down the cable. It's important to keep an even tension on the tape as you wind it.

Having applied the self-amalgamating tape, wind two or three layers of ordinary insulating tape over the top of it. Here again, begin at the cable end and work forwards towards the power divider, overlapping successive layers by about half the width of the tape. Then work backwards in the same way, followed by yet another layer going towards the divider. Incidentally, do take care if you're standing on a step ladder or similar support to do this work. There's nothing that sends you quite so giddy as staring upwards and winding tape round connectors for ten minutes or so - make sure you don't fall off the ladder when you finish winding and look at the horizon again.

Repeat this process for all connections to the power divider. Then apply several coats of suitable varnish to the result; marine-grade polyurethane seems to work well. It's best if you apply four or five thin coats, leaving a good half-hour in between each one. Make sure that every part of the wrapping is coated - it's easy to miss a section.

When the varnish is dry, the finishing touch is to spray a generous coating of 'Waxoyl' over the entire assembly. The reason for this is that even the best grades of polyurethane varnish aren't completely resistant to UV, whereas 'Waxoyl' certainly is. Professional users have tried 'Denso' grease-impregnated tape and also 'Sylglas' in the past, but remember that the intention isn't to provide waterproofing - you've done that - but to keep UV from causing embrittlement of the varnish and attacking the tapes underneath. 'Denso' tape will do this but it's very messy, and 'Sylglas' doesn't seem to be totally UV-resistant from what we've heard. A coat or two of 'Waxoyl' seems to work very well indeed, and you can always finish off the can by spraying some on any other metalwork which needs weather protection.

Again, I'm sorry if the above sounds very long-winded but in practice it seems to be necessary to go to considerable lengths to give real long-term protection to Heliax connectors. Having said that, amateurs tend to evolve their own pet waterproofing schemes and there are no doubt other ways to go about the job - but this one is pretty well guaranteed to protect your connectors in the harshest environments. The important point to bear in mind is that waterproofing is relatively easy - it's keeping UV radiation from causing long-term degradation of the waterproofing that requires forethought.

For the benefit of Messrs M V, P H and others who asked on the air, we've reproduced the fitting instructions for LDF4-50 connectors by kind permission of Andrew Antennas Ltd.

Andrew are at Loch Gelly, Fife, and the phone number is 0592 780561.

Low-cost N-types for LDF4-50

Although surplus off-cuts of Andrew 'Heliax' cable may turn up at tempting prices, as we noted a few months ago, the cost of the proper Andrew connectors is quite another matter - you're looking at a good £35 for new LDF5-50 connectors and around £20 for LDF4-50 items. Unfortunately, it's difficult to use cheaper substitutes for the large LDF5-50 cable unless you have a lathe to make your own (see the RSGB Microwave Newsletter Technical Collection for some ideas as to how to go about it. However, the smaller LDF4-50 'Heliax' can be made to take ordinary 'N' plugs and line sockets at a much more manageable £2-3 apiece.

The two problems which have to be solved are a) how to clamp the shell of the connector to the cable and b) how to graft the centre pin onto the aluminium-cored central conductor. Here is one way to do it, which gives both good RF performance and mechanical strength. Unlike crude bodges involving a blowtorch and half a stick of plumber's solder, this method even allows the connector to be dismantled if necessary.

The 'N' connectors must be the type with a captive centre pin and a 'top-hat' ferrule for the outer braid (e.g. the Greenpar type, available from many component suppliers and also own-branded by RS Components/Electromail). Discard the 'top-hat' and the rubber sleeve and bore out the clamping nut to 13.5mm so that it can just be forced over the copper sheath of the Heliax. Cut the end of the cable clean and square, at the maximum diameter of one of the corrugations in the cable. Strip back the plastic outer cover and slide on a length of heat-shrink sleeving (big enough to fit over the connector body, and preferably of the adhesive-lined variety), followed by the clamping nut.

If you have access to a lathe, turn a brass collar to 15.0mm OD, 13.5mm ID and 8mm length - you might make several while you're at it. If you haven't, you can cut two collars from a straight 15mm capillary pipe connector. In either case, it's most important that both ends of the collar are square and flat. Smear the outer of the Heliax and the inside of the collar with flux paste and slide the collar into position, square and flush with the end of the cable. If you're using the capillary fittings, locate the solder bulge at the nut end. Solder the collar into place. Note that this is not a job for a soldering iron; unless you're a real artist with a blowtorch, the best tool is a hot-air gun.

Now drill and tap an 8BA or M2.0 hole exactly in the centre of the inner conductor, which is copper-plated aluminium. Use a lubricant when tapping the hole, but be sure to remove all traces of it afterwards. Insert a brass screw and cut the head off, leaving a 6mm stem. Solder the screw in place using aluminium solder and a large iron, making sure that the solder covers all the exposed aluminium and connects to the copper plating. Re-tin the stem of the screw with ordinary tin/lead solder. Make sure you clean all solder, flux and debris off the end of the foam dielectric (use a fairly powerful solvent such as 1.1.1.trichloroethane, usually marketed as PCB cleaner, but only it in a well-ventilated area - preferably out of doors) and give the end of the collar a final tickle with a file to make sure that it's absolutely flat and square. Fit the PTFE washer from the connector and solder the centre pin in place.

Carefully assemble the whole connector, tighten the clamping nut and check that the centre pin is in the right place. If it isn't, dismantle the connector and fix the problem - otherwise you'll damage every other connector you screw on!

Finally, check the VSWR before shrinking on the sleeving. The RF performance of the connector depends very much on the quality of the pressure joint on to the inside of the connector shell - which is why we've kept banging on about getting the end of the collar flat and square. With a little care, this low-cost 'dirty tricks' connector should be good to at least 1.3GHz.

Note that the connector is no longer waterproof where the nut joins the cable, except for the heat-shrink sleeving and any additional waterproofing you choose to provide. So re-read the answer to the quesion above on waterproofing and try some of the techniques mentioned there.

Hot tips

1. To help heat-shrink sleeving and self-amalgamating tape to bond to the polyethylene jacket of Heliax and 'Hosepipe-100' cables, prime the jacket with a thin smear of PVC cement and allow it to dry before applying the sleeving or tape.
2. When making emergency outdoor repairs to coaxial connectors on a cold, damp day, use a hot-air gun to take the chill and condensation off the cable jacket and the connectors.
3. To turn a small soldering iron into a big one - especially outdoors - use a hot-air gun to provide background heat.

Credit Where Credit's Due Dept.

The original author of the piece on servicing valve receivers in the November 1989 'In Practice' was Mr M R Perry, G8AKX, of Kidderminster. Mr Perry tells us that it was based on "...many years of using such as the 1155, S27, 1392, 640 and 730/4 and various bits and pieces of surplus equipment". Thank you sir - you'll be pleased to know that we had two or three letters thanking us (or rather you) for that nice item. More on valve Rxs next month.

Overhauling Rotators

"I use a second-hand Ham-IV rotator (which must be a good ten or fifteen years old) for my HF beam. Recently, the direction indicator has started jumping badly and the speed of rotation seems slower than it used to be. Sometimes the indicator takes some time to settle down after I've stopped turning the antenna. I'm not familiar with the internal construction of rotators and have no documentation on this one - can I overhaul it myself and, if so, can you advise me what to do?"
D D, Leicester

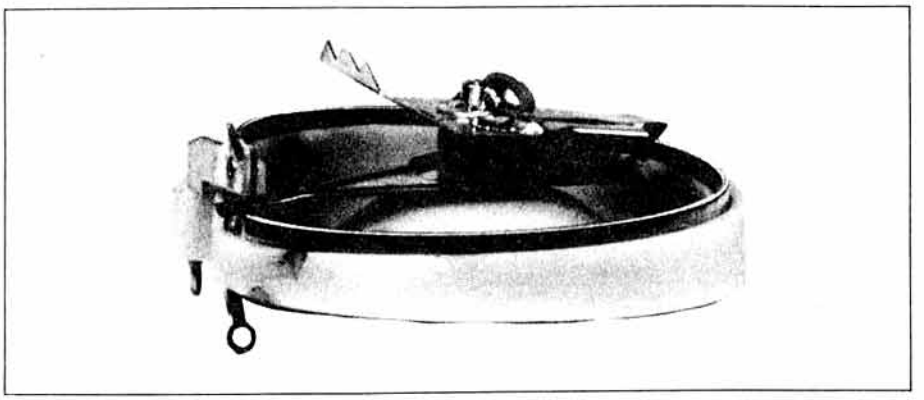
The short answer is to be prepared to make a great deal of mess when you dismantle the unit for repairs, so don't do so in the kitchen or on the lounge floor! It's very easy to overhaul rotators yourself provided you're prepared for all the muck and grease which inevitably seems to be associated with them, and at the end of it you'll have the satisfaction of knowing that the unit should work well for another twenty years or so.

The 'Ham-IV' (the earlier model of which was the Ham-M) was originally made by Cornell-Dubilier Electronics (CDE), who were taken over by the Telex Corporation last year; it's almost exactly the same as the 'CD44' except for the braking system. For the past seventeen years the main UK importer was South Midlands Communications, although nowadays it's HRS. SMC tell us that they still have a full spares holding for the Ham-IV and other CDE rotators and can also supply service manuals.

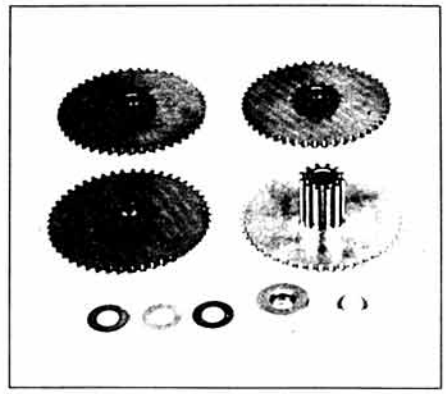
It would be wise to obtain the manual for the rotator before you take it to pieces so that you can at least see how it's supposed to go back together. In the case of the Ham-IV, dismantling starts with removing the four retaining screws in the bottom housing and lifting the upper casting away from it to expose the wire-wound potentiometer. This supplies positional feedback to the direction indicator; tarnishing and contamination of its track and the wiping contact on the associated rotor arm is almost certainly the cause of the fluctuating indicator readings. You will also see all the main drive mechanism. At this stage you can clean the potentiometer winding and rotor arm if you wish, although it might be better to do so when you've re-greased the gears and bearings as described below so that any stray grease is removed from the pot track prior to reassembly. A good way to clean and polish the contact area of the potentiometer winding is to use a squirt of contact cleaner on the end of a cotton bud or a piece of J-Cloth. It's best to use a cleaner which leaves a trace of lubricant - try Electromail's 'Switch Cleaner' stock number 554-153, or the aerosol variant which is 567-648.

Full dismantling and reassembly information is given in the service manual, and it's worth reiterating that you'll find putting the rotator back together a lot easier if you have a copy available - we'll just cover a few of the important points here. Having cleaned up the potentiometer and rotor arm, you can now lift the motor and brake mechanism out of the bottom housing; then remove the ball-bearing retainer and place it on a clean piece of paper. You can then clean the bearings. The way I usually do this is to immerse everything in white spirit and agitate vigorously, after which I spend some time with a supply of J-Cloths and remove as much of the old grease as possible. Do the same with the inside of the bell housing, especially the 'track' which rides on the ball bearings.

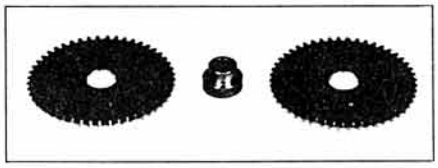
When you've finished - and there's no way around the fact that this is a messy and tedious job - apply a very small amount of Castrol MS3 or equivalent grease to the track and bearings. MS3 contains a small amount of molybdenum disulphide and thus combines a very wide temperature range with low friction, but this particular grease is black in colour and thin in consistency and it's extremely difficult to apply without getting it everywhere except where you want it to go. Dire warning - from bitter personal experience, MS3 is essentially impossible to remove from clothing once it's on. Old trousers and shirt should be the 'rig of the day' when greasing rotators with it, and you'll need plenty of old newspaper and J-Cloths to hand. At the same time, distribute some grease around the



Wire-wound positional feedback potentiometer.



Ring gear (above), spur gears (below) require special attention during an overhaul.
Reduction gear set which lies between the motor and the spur gears.

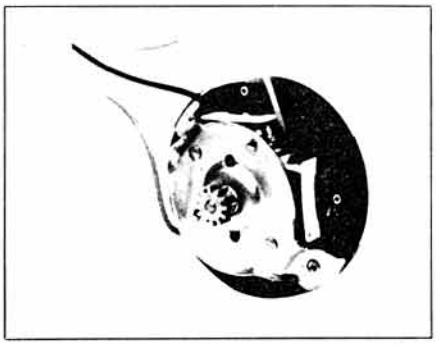


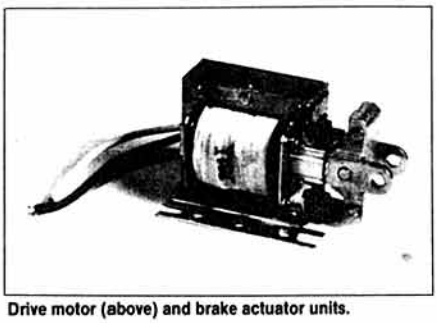
ring gear and spur gears. CDE say that '...approximately one thimbleful of grease should be used to lubricate a completely dry rotator' and you certainly shouldn't apply anything heavier than a very thin film of it. You won't regret doing the job, however - old grease which has hardened and lost its lubricity is usually the reason why rotators slow down with advancing years, and a cleaning and regreasing session will usually restore them to 'as-new' condition.

Here's a final tip for when you're ready to reassemble the rotator. The four screws which hold the unit together are quite coarse-threaded, and when the rotator was manufactured they were 'self-tapped' into the aluminium-alloy bell housing. Once you dismantle this type of fastener, it's never subsequently quite as strong as when it was initially assembled. A small amount of Loctite 290 (Electromail calls it 'high strength retainer' and their stock number is 567-222) applied to the threads prior to tightening-up the screws will make sure that they can't move again until you come to service the rotator in another twenty years' time. Loctite 290 is very handy stuff, incidentally, and once you have some around the shack you'll wonder how you ever managed without it. It's ideal for locking the coarse-threaded nuts and screws you use on your antenna mounting clamps, for example, and for securing any other threaded fastener which you don't really want to come unfastened until you're good and ready to apply some force to it via a screwdriver or spanner.

All in all, rotators are very easy to service and repair - but do get hold of the service manual before you attack yours. Amongst other things, most of them give resistance readings which should be expected across various wires in the feed to the rotator, so you can decide whether any fault is in the rotator itself or the control box. This saves the awful chore of removing the antennas from the rotator and bringing the thing back to earth only to find that there was a wire off in the control unit...

Photos courtesy of S.M.C. Ltd.





Drive motor (above) and brake actuator units.

Screws, nuts and washers

"Can you suggest a good source of assorted small screws, nuts and washers, etc, for general use in the shack? I never seem to have the right ones available, and most of the catalogue suppliers seem to want to supply them in units of several hundred, which is rather too many!" D B, Harrogate

Both RS Components (Electromail) and Farnell Electronic Components do a wide range of fastener-type hardware, and you certainly don't need to order from them in hundreds at once. Farnell offers what they call a 'General Screw Kit' (stock number 146-837), which contains a selection of 4 and 6BA zinc-plated and clear passivated screws, shakeproof washers and nuts (although, surprisingly, not washers), all in quantities of 100 off, and this costs £17.33 plus VAT and packing. This comes in a box with internal dividers, and you can buy replacement quantities when you need them; we've had one for a few years and it's very handy. Farnell also do an 'Instrument Screw Kit' (stock number 146-836), which contains nickel-plated 2, 4 and 6BA items, but this costs £37.77 plus VAT and packing. Washers and other items such as solder tags, studding and self-tapping screws are also available. Farnell are at Canal Road, Leeds LS12 2TU; telephone 0532 636311 or fax them on 0532 633411. According to the friendly Farnell rep, who visited us only a few weeks ago, they will supply to private individuals if you give them an Access or Visa number and they'll be happy to open a credit account for bona-fide radio clubs.

Electromail also does a good range of fasteners; the current catalogue (November 1989-February 1990) lumps them all together in Section 13. They sell both BA and metric sizes in bags of 100, with slotted or Philips-type pan-, cheese-, round- or countersunk heads. They don't offer screw kits, but you could buy a suitable box with internal dividers and make up your own; however, they sell several other kits containing such items as crinkle washers, TORX screws, grub screws, socket screws, nylon screws, springs and circlips. Incidentally, both Farnell and Electromail sell 'Hank' bushes, which are otherwise hard to get and which are the best way to form a threaded insert in thin sheet aluminium - ideal for removable covers on the top or bottom of an aluminium chassis. Electromail is the mail-order division of RS Components, and the catalogue costs £4.95 from PO Box 33, Corby, Northants NN17 9EL; they take credit cards. If you want to open an account with RS Components, you need to be able to assure them that you'll spend at least £500 a year with them, according to the RS rep we saw a few months ago...

Drilling in Brass

"I'm trying to build a 430MHz amplifier which contains a number of brass parts, but I am having enormous difficulty in drilling clean holes in the brass with my electric drill. Is there something I'm not doing properly?" M T, Warwick

Not that we can think of. Brass is quite a lot harder than aluminium alloy, and the drill bits you use on it need to be in good condition; you can make holes in aluminium alloy quite happily with some twenty-year-old bits in an ancient hand-held electric drill but brass makes rather more demands on the tools you use on it. Use sharp drill bits and a medium speed and feed rate - i.e. let the drill go through the metal in its own time rather than leaning on it and don't try to blast your way through with the drill going at its maximum speed. Also, make sure that the work is firmly clamped to something solid before drilling; it's terribly easy to end up with a pentagonal or heptagonal hole in brass rather than a circular one if you don't. You get the best results by using a proper workshop-type drilling machine, of course, but most shacks don't contain one. Actually, there's a lot to be said for the old fashioned geared hand drill when working on brass. You have much better control of both speed and feed rate when using one, and for small holes you'll probably get better results than you will by using a power drill. And the exercise will do you good...

Brass responds very well to reaming, so if you want to make quite a large hole it's best to drill slightly undersize and ream to final size. It's also easy to file. All in all, brass is a very pleasant metal with which to work, provided that your tools are in good condition. One odd thing is that files which have previously been used on steel or ferrous metals seem not to like working on brass, and vice-versa; you'll often find that even new files which have been used for only a matter of minutes on one will hardly cut the other, no matter how much you attempt to clean them with a wire brush. We've never seen any explanation of this in print, but if you do a lot of metalwork it's well worth keeping separate files for use on the different metals. The same doesn't seem to be true of drill bits, however.

...And Finally

That's about all we have space for this time - do keep those letters coming, and we'll be back next month. Just a thought to leave you with - we hear from the hi-fi world that not only does the *type* of cable you use in a system make a difference to how it sounds but - of all things - cables are now supposed to be *directional*, in the sense that if you swap them end-for-end you'll hear a difference in the sound. Well, on that basis I suppose I'd better stop writing this, go out and dig up my 120' length of LDF-5 and reverse it end-for-end and see whether I can work any more DX. I've come to the conclusion that if you rate engineering integrity on a scale of 1 to 10, the average hi-fi manufacturer or reviewer scores about 0.01... □

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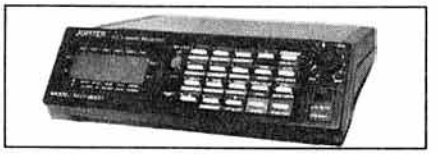

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Letter from G0MBM THAT SAYS IT ALL

With permission we reproduce in full a letter from a newly licenced amateur living near Peterborough.

Dear OM,

It is very rare indeed that one takes the trouble to write to a designer/manufacturer in praise of his product. I feel compelled to do so and to congratulate you on the DD antenna recently supplied to me.

As my QTH is a listed building I am not permitted to erect an elaborate antenna system. The DD is slung between a tree and a chimney stack approximately 10m above the ground with about 30m of coax running along the ground and by a tortuous route to the shack. The rig is a Kenwood TS 440 S with a built in auto-antenna tuner. I achieve very low SWR on all bands between and including 3.5 MHz to 28 MHz. This also includes 29 MHz FM. The DX results have been dramatic and although I have only had my full 'A' licence since August '89 my QSO's are already envied by many of our "old hand" Club Members.

I thought you would like to know this. Thank you for a super product.

73's (signed) Tony Burley 30th Oct 1989

FOOTNOTE. He has an MP.DD.7/14/21/28.L. designed to work on the four bands WITHOUT an ATU. PRICES given in the JUNE 1989 Advertisement are still correct.

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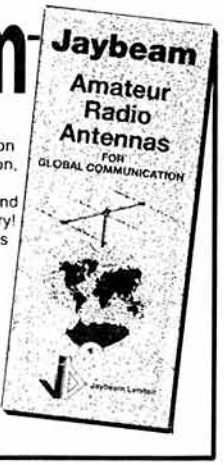

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One breakthrough after another

Another year, another decade, another breakthrough. At last we have been graced with what I believe to be the finest release of software since the beginning of packet radio mailboxes.

From the stable of YFB software comes the latest release - YFB 3.xx, by Steve Coleman, G4YFB. I have been one of the lucky ones to be offered this software to Beta test, it has run since mid November with very few, very minor problems. All these I can tell you Steve has fixed and by the time you read this it will be on general release.

The software which runs under 'Desqview' will allow the SysOp with G8BPQ TheNode to open four user ports, a forwarding port, a statistics port and a working OS port all within 640k memory.

The manager program has been completely re-written; it is fast and semi-intelligent, making a shadow copy of itself in case of accidents.

The forwarding window occupies 30k of memory, stands alone and cannot be connected to. Instead of forwarding once an hour, the system is set with an amount of minutes between forwarding. The software can scan 400 messages for forwarding in less than 5 seconds and if using expanded memory with a disk cache, the forward scan is instantaneous. No message stays on the mailbox for more than 10 minutes. Looking at some of the headers that have recently been analysed by Mike Dennison, G3XDV, mail stays at some mailboxes for over 1500 minutes.

When two mailboxes using G4YFB software forward to each other, the system sends a second reverse prompt, so should mail come into the mailbox on another port during forwarding, it will scan again to send it out while connected instead of waiting another hour.

Commands are the similar to all other mailboxes except LT (list to) and LF (list from) have now become LA (list all) of a particular callsign.

For what I believe to be the first time the OS command is fully implemented, it allows the user to run a program on the mailbox computer. At this time a simple test program has been installed, but by the time of general release it is hoped to have a range of programs available to the user including YAPP for binary transfer.

This is certainly worth a look, the documentation I have been informed will be supplied as a bound book, although at the time of writing it was not quite complete. Well done Steve, keep flying the flag and thank you for giving me a chance to use a great software package.

ARRL Computer Networking Conference

The 8th annual conference took place during the weekend of 7 October 1989, in Colorado Springs, at the Air Force Academy. It was sponsored by TAPR (Tucson Amateur Packet Radio), Academy Packet Radio Club, USAFA Cadet Radio Club, RMPRA (Rocky Mountain Packet Radio Association) and ARRL (American Radio Relay League). This year's proceedings encompassed HF Packet, Networking, Application and users, High speed packet, Satellites and other general packet papers. With 150 attendees it has been reported in the *Packet Status Register* (the TAPR newsletter) that this was the best conference to date. The full copy of the proceedings will be available from the RSGB very soon. A report on the Conference appears in the RSGB's packet newsletter *Connect International*.

Back in time

Each month this year I intend to look back in time at significant happenings within the packet scene in this country. It is very interesting to see what stage we were at just a few years ago.

3 years ago... January 1987

D-Day for digipeaters. It was reported in *RadCom* that on 22 November 1986 at 12.00 hours GB3HQ turned on its digipeater. The DTI had granted permission within 3 months of application, for the licensing of 14 digipeaters around the country. Was this the beginning of the network?

4 years ago... January 1986

"I have a micro, and want to run RTTY. What else do I need?"

Ian Wade, G3NRW, the previous editor of this column was asking for information for what was available. Hardware or software, also discussed were changeover speed for Amtor. Note that not once was the word 'packet' mentioned.

Implementing 9600 Baud

The problem with 9600 Baud and the G3RUH modem seems to lie with us the amateur not wanting to undertake surgery to our valued rigs. I have been sent various mods for some of the popular rigs and will publish them over the coming months.

If you have taken a scalpel to your radio successfully please write and let me know. This month if you are the proud owner of a Kenwood TM 531/A 1299 MHz rig, then 9600 Baud here you come. This is probably the simplest of all the mods, as it involves cutting and joining two wires.

Refer to you schematic diagram and find the tone encoder chip marked IC 301. Adjacent to this circuit is a jumper marked W301. One side has three connections marked SC E TO the input to the rig for audio from the modem should be connected to the position marked TO and the ground should be taken from the position marked E. The two wires to the tone board should be cut.

The modem should be set up as the manual suggests; care should be taken to make sure this is done properly as a lot of problems with 9600 Baud have been due to poor setup of the modem board.

Users

Firstly let me remind you all that you have until the 16th January to send in your crossword from last month. 1st prize is a TNC.

Many users have asked what is DCD (data carrier detect) and how can it be improved?

Proper data carrier detect is one of the most important items to consider on any multiple access packet frequency. Most DCD circuits are deficient for the popular frequencies we use in this country but they can be dramatically improved.

The purpose of the DCD in the modem is to prevent transmission on an occupied channel. If two stations transmit at the same time a collision occurs, which means both stations will have to send the data again. This increases the load on the frequency and substantially reduces the speed of transmission.

The best DCD circuit should be able to distinguish information from noise, it must transmit data even when the squelch is open, it should tolerate different levels of signal. Most of all it must be fast; many TNCs rely on the radio squelch to keep noise from the modem. Many squelch circuits however open very slowly during which time the TNC may transmit a packet even though someone else has started to send.

Available now are two upgrades produced by TAPR, dependant on the type of TNC you have they will offer faster throughput, fast attack - slow decay DCD with hang time which will compensate for temporary fades due to multipath and, a DCD which will allow you run with the squelch open.

The 2211 DCD Upgrade

This is for TNCs using the XR2211 demodulator *ie* TNC1/TNC2, AEA PKT-1, AEA PK-80, TNC220, DRSI HF*MODEM, MFJ1270/1274.

The PC board is small and shaped to fit inside a TNC1/2. After construction (approx 1 hour) you simply unplug the XR2211 chip from its socket, insert it onto the board you have just built and plug the circuit back into the socket you have taken the chip from.

The State Machine DCD upgrade

This has been designed for modems such as: KPC1/2/4/2400, KAM, AEA PK-87/88/232, TINY 2/ MICRO 2, DRSI PC*PA TYPE 1/2.

This upgrade adaptor adds an EPROM based State Machine to derive DCD based on lockup of a digital PLL. It is small enough to fit inside most TNCs and claims to dramatically improve DCD operation, allowing to run with open squelch.This also allows other stations to reduce their TXDelay, which in turn improves throughput.

Further details of these upgrades are available direct from TAPR, PO Box 12925, Tucson, Arizona 85732.

Portable Packet

Last month I mentioned the latest line of TNCs for the yuppie, allowing total portable packet. If you are trying to interface an Atari Portfolio to one then give Phil Bridges a call on 0703-207155 as he has managed to get a software program to work for packet.

Are you using Packet either portable or in unusual circumstances? If so drop me a line at the above address.

Thought for the month

We have great problems remembering our ASCII set of characters. We have 26 letters in upper and lower case, the numbers zero to nine, and assorted symbols all of which fit into 256 combinations. This allows us to use only eight-bit bytes to represent a character. Spare a thought for the Japanese packet users, who commonly use 2000 kanji characters and two sets of 51 character phonetic syllabary. Japanese word processors and packet TNCs use two bytes to represent each of 6000 characters according to the JIS (Japan Industrial Standard) code. Shift-JIS uses two eight-bit digital blocks to create a 16-bit expression for a single kanji character.

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

Having outlined the background to satellites in our last month's contribution, this month would seem appropriate to tackle the basic concepts of satellite communication. It would not be too far fetched to suggest that satellites are little more than 'repeaters', miniaturised and put on to a spacecraft, which is circulating the earth in a finite orbit. Its orbit can be calculated and predicted to an accuracy far more necessary than is needed for practical purposes and thus we can have a means of knowing just where in space the satellite is; when it is in range of our ground-station and how to direct an antenna array at it. We are thus able to provide a means of communication using VHF frequencies, with the advantages that these provide.

The orbit of the satellite is a balance between the centrifugal forces derived from the launch procedure and the gravity of the earth. There are many other factors involved, but this simple explanation will do for a general understanding of the forces involved. One factor that must be appreciated is that once in orbit its path through space remains fixed, whilst the earth rotates beneath it. This relationship between the orbital path and the position of a point on the earth's surface, means that we do have to do some calculations to know just where it is in relation to the location of our ground-station. Such factors as the speed of the satellite around its orbital path, the angle of its path to the earth's equator, the day of the year, the time of day and so on. You can get some idea of what is going on by getting a small globe of the world and fixing a ring of wire around it going from pole to pole about half an inch or so above the globe's surface. Slip a glass bead on the wire before you fix it in place. Then spin the globe round on its pivot, having fixed the wire and its 'satellite' to the pivot. Moving the bead along the wire to represent the 'orbit', you can see just how complicated their respective motions one to another are.

Calculating Orbits

There are essentially two ways in which these calculations can be done. First, we can use astronomical data relating to satellites in orbit around another object in space, such as the motion of the planets around the sun. This data is derived from Kepler's Laws, which were first propounded by an astronomer of that name in the year 1609. We need not spell out these laws at this stage. If you are interested look them up in any good textbook on Astronomy. They concern the characteristics of planetary motion of the,planets around the sun and it so happens that they apply equally well to artificial satellites orbiting freely in space. From these Laws a series of equations can be compounded which produce figures called Kepler's Elements. These can be used to calculate the parameters we need for our satellite orbital predictions and with the help of a suitable computer and software, the calculations can be produced without too much difficulty.

The orbital data required for predictions using these Elements has been provided by NASA and other professional astronomical institutions, but nowadays amateur satellite organisations and some amateur radio stations produce Element Sets just as accurate as NASA and other Government Agencies. This activity has become a hobby in itself for some radio amateurs and especially so with home computer buffs.

The other way we can obtain these orbital predictions is by using a simple gadget known as an Orbital Tracker. This is used with an Orbital Prediction Calendar, which is a booklet containing the information needed to use the Tracker for each satellite we're using for everyday over the period of the calendar.

The usual type of Tracker or 'Oscalator' as it is more usually called, consists of a sketch map of one or other of the world's hemispheres — in the UK it is of course the Northern Hemisphere — glued on to a suitably sized piece of stiff card or thin plywood. Somewhere about twelve inches is the usual size, though the writer's first one was a magnificent two foot square effort which hung on the shack wall. Subsequent experience indicated nothing so large was really necessary. The North Pole on the map is centred on the midpoint of the board and a transparent plastic cursor on which is engraved the track of the particular satellite for which it is to be used is also fixed through the position of the North Pole sothat it can be moved around the fixing point.

OSCAR9 16-11-89
09:38:58 171.3<
20:06:42 328.2>
23:06:03 13.0>
OSCAR11 16-11-89
01:22:36 61.2>
12:51:29 233.4<
22:41:58 21.1>
OSCAR12 16-11-89
01:28:13 245.8<
13:02:08 61.3>
22:40:24 207.5<
RS10-11 16-11-89
00:15:51 293.1>
12:30:57 117.7<
23:01:02 276.0>

Excerpt from Amateur Radio Satellite Calendar.

AMSAT-UK sells an Oscalator Package, with tracking overlays, etc, for all the existing satellites for £3.50 to AMSAT-UK members plus 10% for non-members, postage/ packing inclusive. The Orbital Prediction Calendar is also obtainable from AMSAT-UK. These are compiled from professional sources. They tell you the times of crossing the equator — known as the EQX — the longitudes of the crossing of the equator and much else. They are available from AMSAT-UK at £1.00 for a two monthly period. The earlier Calendars gave data for each orbit of every satellite, but as the number of satellites increased, it became impractical to give so much information and keep the Calendar at a reasonable size — and price! Now it is more usual to give a 'reference orbit' or two only, from which other orbits can be calculated.

As you will see from the diagram the map is calibrated from 0 degrees, which is South — at the bottom — round in a clockwise direction, through West to 180 degrees which is North, through East at 270 degrees, back to South — 0 degrees again. There is also a small 'overlay' which is centred on London, calibrated from North — 0 degrees through East which is 90 degrees, to 180 degrees — South — and back through 270 degrees to North. There are circles inscribed on this overlay which give the range of an average amateur satellite station when working into the particular satellite the cursor is intended for. This overlay indicates the beam heading to use for accessing the satellite.

The orbital Calendar is used as follows. An insert from the currently available Calendar (November '89) is reproduced herewith, to ilustrate the way it's used. From this we see that the last column of figures refers to the Russian satellite designated RS 10-11. The three entries show that at 00:15:51 GMT, the satellite will cross the equator at 293.1 degrees longitude. A second entry below gives another equatorial crossing of 117.7 degrees at 12:30:57 GMT. And the last entry tells us that at 23:01:02 GMT the satellite will cross the equator again at 276 degrees. This is for the day dated 16th November 89. If we want to listen at a time not shown by these figures, we can add or subtract the times of the Period of the satellite, ie the time of one complete orbit from equator crossing time to the next crossing time, to get a time we need. We have also to add or subtract the Increment, that is the degrees of longitude between each orbit of the satellite. The Increment is the amount in degrees, the earth has moved in an easterly direction during the passage of the satellite during its Period. These figures are shown on the first page of the Calendar. For RS 10-11, they are 1 hour and 45 minutes for the period and 26 degrees for the increment.

So, having sorted this out, we will rotate the cursor so that '0' on its track is over the equatorial crossing of 117 degrees. Tracing down the cursor track until it crosses the range circle centred over London, we see that the satellite will take about 27 minutes to get to within range of our QTH, very roughly. So we add this to the time it crossed the equator which gives us 12.57 GMT. Running down the cursor

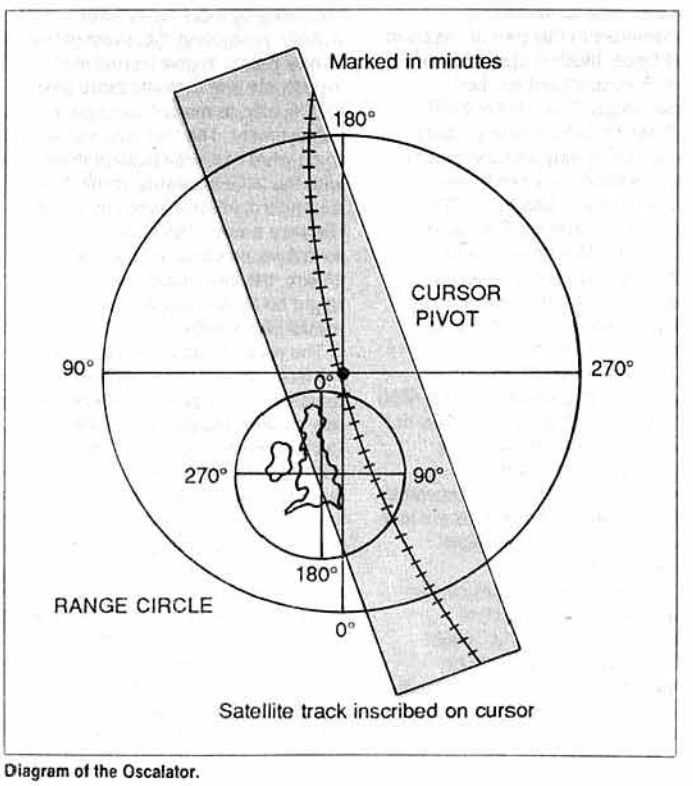

Diagram of the Oscalator.

track, we see that it is within the range circle for approx. 12 minutes and that during this time, the bearing of the satellite from our QTH, will change from approx, North, to almost due East. So we must adjust our beam antenna accordingly. And that is all there is to it. No expensive computer, no tedious feeding Kepler's Elements in to it, no updating of the Elements. What else could be simpler!

News

There is quite a line-up of new satellites awaiting for launch and if all goes according to plan, January should see quite a bit of activity in this direction. UoSAT-D and E are awaiting launch which is scheduled for the 9th January. A series of miniaturised satellites called 'Microsats' about which we shall have more to say later, are also due for launch about this time too. And the Russians are expected to launch a couple of satellites similar to the RS 10-11 satellites in the not too distant future. A second amateur radio satellite is being built by the Japanese, which will be similar to their existing one, JAS 1, but will have a much more powerful power supply.

OSCAR 13 suffered a 'crash', ie computer failure, on 9 October last, but this was soon put right by one of the Control Stations. The fault was thought to be due to damage to the computer by active radiation particles from enhanced solar activity. When the design of Oscar 13 was being considered, steps were taken to shield the vulnerable components of the computer against excessive solar radiation, to a far greater level than had been done for Oscar 10. In the case of Oscar 10, it was a fault in the Integrated Housekeeping Unit (IHU) memory. The IHU memory was designed to correct what are called 'soft errors' — the kind which occur randomly and are one-shot events and so-called 'hard error', ie ones which represent a physical change in the hardware and are permanent.

The steps taken to reduce the possibility of such radiation damage had included putting a tantalum metal strip around the 16k NMOS chips and enclosing them in a brass enclosure. The Harris Corporation of Melbourne, Florida undertook to supply AMSAT with special modules for Oscar 13. These were of a special radiation-hardened type which it was hoped would prevent the radiation problems which Oscar 10 suffered. It seems as though this had been successful, as the 'crash' was due to the software having been corrupted; this is known as a "byte-flip", and is caused by radiation changing the software code digital numeration from a 0 to a 1 or whatever. On reloading the control software into Oscar 13, all was well again!

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Common Sub-bands for DX

WARC 1992 is not too far away and, in the run up to this important conference, IARU Region 1 national societies are preparing to seriously address the increasing problem of common frequency sub-bands for DX working in most, if not all, the microwave bands. Two main areas of concern have been recognized - first the need to seek to retain the current 'wide' band allocations above 1GHz and, second, to identify and nominate the 'common' sub-bands for narrowband DX working which should, for example, remain as at present, 2MHz wide. It has also been recognised that many administrations (and fortunately the DTI in the UK is not one of them!) may not be aware that international contacts ARE possible, and increasingly frequent, on the microwave bands. Clearly a case for some education!

The main 'problem' bands are the 2.3, 5.7 and 10GHz bands, something which has previously been hinted-at in this column and elsewhere on a number of occasions.

In the 2.3GHz band, common segments at 2320 - 2322MHz (the current European standard) and 2400 - 2402MHz have been discussed, with the latter seeming to be common to all Region 1 countries. However, this sub-band may be susceptible to ISM interference and research will be necessary to see whether this is really the case. In some parts of the UK we are aware of high powered (troposcatter or satellite?) transmitters in this part of the band and Oscar Mode S operators are invited to comment on their experiences. The current 2320 - 2322MHz sub-band has probably been 'lost' in Italy and Switzerland. 2400 2450MHz is a designated amateur 'space' band and 2390 - 2392MHz is used for EME work.

On the 5.7GHz band, 5760 - 5762MHz is currently used but, once again, is not common to all Region 1 countries. What does appear to be common is 5668 - 5670MHz (in the UK, the bottom part of this fragmented band is 5650 - 5680MHz), although this does not bear the favourable harmonic relationship to 1152MHz ie. 1152MHz × 5 = 5760MHz. Accepting that harmonic relationships are lost, this is therefore one possible answer on this band.

The 10GHz band poses similar problems. Here the current narrowband segment is 10368 - 10370MHz, understood to be irretrievably 'lost' in Italy, Finland and Austria. Even in the UK there have been some delays in licensing beacons in this area, although these difficulties now seem to have been overcome. One alternative solution discussed in Region 1 is 10450 - 10452MHz, again on the edge of a space band and not without difficulties in Germany and Holland. I personally find it difficult to accept that the professional co-users of the 10GHz band might find it difficult (or inconvenient?) to avoid a 2MHz-wide 'window' centred on 10369MHz, particularly since amateur powers are generally very low and highly directional antennas are used, making the potential for interference minimal. However, in the coming months, such matters will be carefully reviewed and discussed with our own licensing authority, well in advance of WARC.

Finally, in the 24GHz band, there is strong support to move the narrowband segment to 24048 - 24050MHz, ie the very top of the new UK Primary segment.

I've raised the subject again here in order to try to stimulate sensible, active discussion and observation among UK microwave operators. The Microwave Committee will welcome serious, considered comment and user's views on these matters. Written comments only, please, to me or any other member of the committee, as soon as possible.

Ideas for New 10GHz Operating Awards

Quite a long time ago, the possibility of extending the 10GHz award 'portfolio' to encourage more 10GHz operating was noted in the Newsletter. More recently, two more suggestions were made by Allan, G8LSD, both of which are worthy of consideration and reader's comment. The objectives of both suggestions are aimed at encouraging more adventurous activity, promoting the investigation of new paths, to give incentive to investigate and evaluate more sites and, finally, to reward consistent achievement. The first suggestion is to do what has already been done with the 24GHz awards, ie establish a standard, intermediate and senior distance award. The standard award would stand as it is now, 150km, the intermediate award might be 300km and the senior award 500 or 600km.

The second suggestion is for a '5 × 5 Gold Award' ie the recipient must be able to prove contacts into five Locator squares from ONE site (as the present Squares Award) and then repeat that from four other squares, hence the 5 × 5. Operation from the junction of four adjoining squares would have to count, of course, as one site/Square combination only.

What do you think? Certainly the proposal is not inconsistent with the present awards and might just help stimulate further and more determined efforts on the band, recognising that either suggestion would be quite difficult to meet using wideband gear but quite easy using narrowband equipment. Again your opinions and views would be welcomed.

The 'Closed' Season

Winter is almost traditionally a quiet time for microwaves, particularly portable operation on the higher bands. May I remind you that the first Sunday of each month from November through to March are 'Winter Activity Days'? Failing active operation, maybe this is the time to brush the cobwebs from the gear and 'fettle' it for the next season, which is not all that far away. Or maybe build some new, improved gear. In either instance, we'd be pleased to hear from you. On the subject of construction, the John Rouse Memorial Trophy, subject to Council approval, will run from September 1989 to January 1991 in order to give all you avid designer-constructors time to make your entries and show off your latest creations not only at the national exhibitions, but also at various round tables. Thereafter the award, we hope, will run from January to January, a rather easier and more convenient adjudication period, allowing the award to be made at one of the major events in the spring, for instance the VHF/UHF Conventon or the National Convention.

Sorry this is a short contribution, but there has been little news to report (closed season again!) and at this time of year deadlines are earlier than usual.

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QSL Competition

It seems there may have been some confusion over who was supposed to contact whom in my QSL Competition held last year. Don Phillips, the proprietor of Contact Cards had been waiting for the three winners to get in touch with him, while the winners were anxiously waiting for Don! However, thanks to Don's letter, I have managed to untangle things. The three winners — Ken Clarke ex-BRS88772 (now G7BXG), Yvonne Blain ex-BRS91937 (now G7DMN), and Mick Toms BRS31976 — should all now have heard from Contact Cards about their prizes. I hope soon to be in a position to reproduce in the column the cards chosen by the winners.

Since doing so well in the competition, Ken Clarke now finds himself unemployed, but he had been busy attending job interviews and is currently in the midst of an Employment Training Course and examinations. This leaves him little time to air his G7 callsign, but he reported some good DX via tropo with his 2.5W from Nottingham.

Since coming home second in the competition, Yvonne Blain has passed the RAE and is licensed as G7DMN. She has moved too, to Telford, so has not been able to use the new callsign very much. Even though she now has the RAE pass, she still considers herself an SWL, and hoped soon to master the CW so she could obtain a G0 callsign.

VHF Contests for 1990

Bryn, G4DEZ, Chairman of the VHF Contests Committee wrote about listener support in UHF/VHF Contests. The Committee is disappointed at the number of listeners who do not provide logs in support of the Society's events. As readers may know, Bryn is the new VHFCC Chairman and he is trying to make contests more enjoyable, and trying to erase the Red Tape and bureaucracy which had begun to surround VHF contests. He made an important point. Not only do SWL entries count towards the VHF Listener Championship, but they can be extremely useful as check logs to verify contacts claimed by our transmitting colleagues.

Bryn has made it clear that for 1990 there will be an SWL section for ALL contests organised and adjudicated by the VHFCC, even if the contest rules (by omission) fail to be published. Scoring will be as for the transmitting section, *ie* if a contest is radial ring x counties, then the SWL section will be the same. We all hope that by opening up all UHF/VHF contests to listeners, that more SWLs will put in an entry. It doesn't matter how many or how few contests you submit logs for, or how many or how few stations are logged, the Committee just want to see an increase in the number of listener logs being received. This will certainly make the fight for the Hanson Trophy — the only trophy awarded to an SWL at UHF/VHF (for the best SWL contest performance in any one year) more worthwhile.

For the dates of this year's UHF/VHF contests, see the Contest Calendar which appears every month in 'Contest News.'

GB6RB — Robbie Burns

Mike, GM4SUC (ex-BRS43941) wrote with news that Ayrshire Raynet will be operating the special event station GB6RB from the Land O'Burns Centre in Alloway on 27 January from 0900-1700 on all bands 3.5-28MHz, plus 144MHz on SSB and RTTY. There will be a special commemorative certificate for all SWL reports received. Reports should be sent direct to PO Box 36, Prestwick, Scotland, with a second class stamp (1 IRC from European SWLs, 3 from DX SWLs) to cover postage of the A4 certificate.

Solent Fortifications Award

Vic, G6MWY passed on details of this Award. It is based on hearing the special event stations which will be active during 1990 from the many Forts and Castles that surround the Solent. It will certainly not be the easiest Award to collect because the Forts and Castles will be activated by volunteers on an 'as and when' basis. QSL cards are not required, but the organisers of the Award say it would be good to get a fine collection of listener cards from those who hear the stations.

The basic aim should be to log any callsign in the GB0CD-, GB1CD-, GB2CD- or GB6CD series. The final letter in the callsign denotes the Fort or Castle. A table showing the full callsigns, their WAB square and Maidenhead Locator is shown here. There are three classes of Award — Basic, Silver and Gold. On HF, you need 7, 10 or 13 contacts. On UHF/VHF your distance from Cowes Castle determines how many contacts you need to claim the Award. Up to 80kms you will need to log 7, 10 or 13 stations; up to 400kms you will need 3, 5 or 7 stations; while listener stations over 400kms will only need 1, 2 or 3 stations. Claims, which should be certified by two amateurs or the Secretary of a Radio Society should be sent (along with the £3 fee) to Mr G Crawley G0IVW, 4 Ardington Rise, Purbrook, Hampshire PO7 5QP. The Award is also available to licensed amateurs on a similar basis. If anyone has any queries, they should be addressed to Vic Harris G6MWY, 72 Elmore Avenue, Lee-on-the-Solent, Hampshire PO13 9ES.

CALLSIGN	LOCATION	NGR	LOCATOR
0CDA/1CDA	Fort Blockhouse	SZ 69	IO90KS
0CDB/1CDB	Fort Brockhurst	SU 50	I090KT
0CDC/1CDC	Carisbrooke Castle	SZ 48	I090IQ
0CDD/1CDD	Fort Victoria	SZ 38	IO90FQ
0CDE/1CDE	Fort Purbrook	SU 60	IO90LU
0CDF/1CDF	Ford Fareham	SU 50	IO90JU
0CDG/1CDG	Fort Gomer	SZ 59	IO90JS
0CDH/1CDH	Hurst Castle	SZ 38	IO90FQ
0CDI/1CDI	Calshot Castle	SU 40	IO90IT
0CDJ/1CDJ	Round Tower	SZ 69	IO90KS
0CDK/1CDK	Gilkicker Fort	SZ 69	IO90KS
0CDL/1CDL	Lumps Fort	SZ 69	IO90KS
0CDM/1CDM	Fort Monckton	SZ 69	IO90KS
0CDN/1CDN	Needles Battery	SZ 28	IO90FP
0CDO/1CDO	Southsea Castle	SZ 69	IO90KS
0CDP/1CDP	Portchester Castle	SU 60	IO90KU
0CDQ/1CDQ	Square Tower	SZ 69	IO90KS
0CDR/1CDR	Cowes Castle	SZ 49	IO90IS
0CDS/1CDS	Fort Southwick	SU 60	IO90KU
0CDT/1CDT	Fort Nelson	SU 60	IO90KU
0CDU/1CDU	Fort Cumberland	SZ 69	IO90LS
0CDV/1CDV	Spitbank Fort	SZ 69	IO90KS
0CDW/1CDW	Ford Widley	SU 60	IO90LU
0CDX/1CDX	Golden Hill Fort	SZ 38	IO90FQ
0CDY/1CDY	St George Barracks	SU 60	IO90KT
0CDZ/1CDZ	Puckpool Mortar Battery	SZ 69	IO90KR
2CDQ/6CDQ	Fort Grange	SU 50	IO90KT
2CDR/6CDR	Fort Rowner	SU 50	IO90KT
4CDS/6CDS	Netley Castle	SU 40	IO90HV
2CDT/6CDT	Hilsea Lines	SU 60	IO90LU
2CDU/6CDU	Bembridge Fort	SZ 68	IO90KQ
2CDV/6CDV	Ventnor Radar Stn	SZ 55	IO90JO
2CDW/6CDW	Fort Wallington	SU 50	IO90KU
2CDX/6CDX	Bouldnor Battery	SZ 39	IO90GR
2CDY/6CDY	Yarmouth Castle	SZ 38	IO90GQ
2CDZ/6CDZ	Culver Battery	SZ 68	IO90KQ

Table of Solent Forts special event stations.

UBA Contest 1990

Jan, ON6JG has sent details of this year's UBA Contest to be held between 1300-1300 over the weekends of 27-28 January (CW) and 24-25 February (SSB). There were few SWL entries in 1989, and the UBA would like to see an increase this year. Only stations taking part in the Contest may be logged for scoring purposes. Stations heard from ON, DA1 and DA2 count 10 points, other stations from the European Community count 3 points, any other station counts 1 point. A maximum number of 42 multipliers exist. They are — Belgian Provinces (AN, BT, HT, LB, LG, LU, NR, OV and WV; ON4-9, DA1 and 2; and EC Member States — CT, CU, DL, EA, EA6, EI, F, G, GD, GI, GJ, GM, GU, GW, I, IS, LX, OZ, PA, SV, SV5, SV9, SY, TK and ZB2. Final score is QSO points x Multipliers. Usual log data is required and if both sides of a contest contact are heard, they may be claimed as separate stations and the callsigns should appear in the 'station heard' column. The same station may not be logged more than 10 times per band in the 'station worked' column. Logs should go, postmarked no later than 30 days after the contest, to Jan Galicia ON6JG, Oude Gendarmeriestraat 62, B-3100 Heist Op Den Berg, Belgium.

'The SWL Club'

This is a Hungarian SWL organisation. They have sent me details of their 'TSTL' — The SWL Top List. The idea of TSTL is to find the best DX listener. Points are awarded for various confirmed DXCC and WAZ achievements on 3.5-28MHz. Each DXCC country confirmed counts 1 point per band, and each WAZ Zone confirmed counts 15 points per band. The final score is DXCC + WAZ totals added together. There is no time limit which means that any British SWL could go through their QSL cards and submit a score. Claims must be certified by two licensed amateurs and must be updated twice each year; a quarterly results sheet is available — I have sent for one and will reproduce it in due course. At the end of each year, the best three entries receive a souvenir. Claims should be sent to Kazimierz Czech, Ul. Gornica 36/6, 44-300 Wodzislaw Sl, Poland.

Newcomers

I am pleased to welcome Malcolm Hince RS92596 who joined the Society in October. He uses a Kenwood R2000 receiver into a random length of wire and also has a CWR-600 Codemaster which decodes CW and RTTY. He has JEP Electronics 'RMS3' CW and RTTY software, and their fax program too, both run through a Spectrum 128 Computer.

Finale

Thanks for a bumper mailbag. please keep the news and views flowing. I am still looking for news of our newer members, items relating to the more unusual side of SWLing, news from any HABers, and any constructional projects which readers consider will benefit SWL members of the Society. The deadline for the March issue is 19 January, so I look forward to hearing from as many SWLs as possible by this date.

CONTEST NEWS

RULES

CONTEST RULES FOR JANUARY TO MARCH 1990

144MHz CW
Date: 21 Jan 1990
General Rules apply.
Three Sections:
Section F Fixed station single operator
Section O Open, all others.
Section L Listeners
Time: 1000 - 1700GMT.
Adjudicator: G8HHI QTHR.

70MHz Cumulatives
Dates: 28 Jan, 11 Feb, 25 Feb, 11 Mar, 25 Mar
General Rules apply.
Three Sections:
Section F Fixed station single operator
Section O Open, all others.
Section L Listeners.
QTH information must be exchanged.
Time: 0900 - 1100GMT
Adjudicator: G4JLG QTHR.
Special note: 25 March is also the Fixed station contest. Contestants can enter both the cumulatives 2 hour session and the Fixed station contest using the same contacts, but please use separate logs for each event.

432MHz Fixed/AFS/SWL
Date: 4 Feb
Rules as per 1989
Time: 0900 - 1500GMT
Adjudicator: to be agreed, send logs to G4DEZ.
Entries from Single Ops or Multi Ops Fixed are encouraged as well as club stations.

144/432MHz
Dates: 3/4 Mar
General Rules apply.
Four Sections:
Section S Single operator portables
Section F Single operator fixed
Section M Multi operator stations fixed or portable
Section L Listeners
Single operators use same call on both bands.
Single band entries not accepted.
Time: 1400 - 1400GMT
Adjudicator: G4DEZ (possibly G4WAD, Tanglewood, Bridge Street, Lower Moor, Pershore, Worcs.)
Special Note: Newly licenced entrants, (less than one year, note on coversheet in BOLD letters, your date of first license issue) for award purposes.

1.8MHZ SSB CONTEST 1990 RULES

This contest replaces the original 'Town and Country' event, and is designed to generate activity both within and outside the UK. The multiplier system should encourage stations to search as well as call CQ. This event is also open to receiving stations, and holders of UK Class B licences are encouraged to enter.
1) Date & Time. 2100GMT Saturday 24 March to 0100GMT Sunday 25 March 1990.
2) Sections. (a) British Isles (b) Overseas (including EI). Single-operator entries only. British Isles entrants must be members of RSGB. Overseas entrants may work only British Isles stations for points.
3) Band and Mode. 1.8MHz band, SSB only. UK entrants must transmit within the sub-band 1860-1960kHz. Overseas entrants must operate within their own frequency allocations. Split-frequency operation is permitted.
4) Exchange. RS plus serial number starting at 001. British Isles stations must also give their County Code, as published in *RadCom* or the *RSGB Call Book*.
5) Scoring. Section (a) Three points for each completed contact.
Section (b) Three points for each completed contact with a station in the British Isles (excluding EI).
5.1) Multipliers. Section (a) One for each British Isles county and one for each country *outside the British Isles.*
Section (b) One for each British Isles County.
5.2) Final Score. Total of contact points multiplied by total of multipliers.
6) Documentation. Logs to be headed: Time (GMT), Callsign, RS/Number Sent, RS/Number received, Code Received, Multiplier, Points. Duplicate contacts must be clearly marked without claim for points. Unmarked duplicates will be penalized at the rate of ten times the number of points claimed and logs containing more than five unmarked duplicates for which points have been claimed will normally be disqualified. Each entry must be accompanied by a cover sheet and the following signed declaration: *"I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and within the terms of my licence. I agree that the decision of the Council of the RSGB shall be final in all cases of dispute."* Inclusion of a summary sheet listing multipliers, and a 'dupe' or check sheet would be appreciated.
7) Address for entries. Logs should be addressed to: HF Contests Committee, PO Box 73, Lichfield, Staffs WS13 6UJ, England.
8) Closing date for entries. Logs must be postmarked not later than 15 days after the end of the contest.
9) Data Protection Act. Entrants should note that the contest adjudicator may enter information from their logs into a computer, for the purpose of checking and preparing tabulations. Entrants objecting to this must clearly state their objection on the cover sheet.
10) Awards. Certificates of merit will be awarded to the first three entrants in each section.
11) Receiving Contest. Transmitting contest rules 1, 2, 3, 5, 7, 8, 9, and 10 will apply.
11.1) Documentation. Transmitting rule 6 applies except:
Logs to be headed: Time (GMT), Callsign of station heard, RS/Serial number/County Code (if any) sent by that station, Callsign of station being worked, Multiplier, Points.
The callsign in the 'station being worked' column may only repeat once in every three contacts logged EXCEPT when the 'station heard' is a new multiplier for the entrant.
The declaration must include the wording "I do not hold any licence which would qualify me to enter the transmitting contest."

ROPOCO 1 CONTEST RULES

Please note the revised times for this contest.
1) The Guidelines for HF contests, as published in the 1989 edition of the *RSGB Callbook* and in this month's *RadCom* will apply.
2) Date and time: 0700-0900 GMT on Sunday 1 April 1990.
3) Sections: Single operator only. All entrants must be paid-up members of the RSGB resident in the British Isles and holding a Class A transmitting licence.
4) Band and Mode: CW in the 3.5MHz band. Entrants should operate within 3520 and 3570kHz.
5) Exchange: RST plus- for the first contact the entrants own postal code. For the second and subsequent contacts, the postal code received in the previous contact should be transmitted. Contacts with stations outside of the United Kingdom will not count for points. Column 5 of the log sheet should be headed 'Postcode Received' and used for this purpose.
6) Scoring: Ten points for each completed contact.
7) Documentation: Entrants should use the RSGB log sheet HFC1, or a log sheet on A4 sized paper that is formatted for 40 contacts per page (in groups of 10). Each entry must include a signed declaration stating that the rules and spirit of the contest were observed and that the station was operated in accordance with the entrant's licence conditions. If entrants use the RSGB Summary sheet HFC2 (Rev80), the extra sentence confirming that the licence conditions have been observed, must be added to the declaraion. Note that HFC2 (Rev 90) includes this addition.
8) Address and Date for Logs: Entries should be sent to HFCC, c/o, G6LX, 279 Addiscombe Road, Croydon, CRO 7HY. All logs must be postmarked not later than 16 April 1990.
9) Awards: Certificates of Merit will be awarded to the leading three stations. The Verulam Silver Jubilee Trophy will be awarded to the entrant with the highest checked score and most accurate log. The results of this event will be added to the results of the ROPOCO 2 event (August 1990) and the entrant having the highest aggregate score in the two events will be awarded the G5MY trophy.

GUIDELINES AND CODE OF CONDUCT FOR RSGB HF CONTESTS

These guidelines are applicable to most RSGB HF events and should be read in conjunction with the rules for each contest. By entering a contest, entrants agree to be bound by the contest rules and these guidelines. Unless otherwise specified in the individual contest rules, all entrants must be fully paid up members of the RSGB.

1. Entrants may only use one callsign during the duration of a contest.
2. Entrants must operate from a single location during a contest. This applies to all events, *including those that are run in separate sessions, e.g. Cumulative, Low Power etc.*
3. UK entrants should note that their log entries may be processed on a computer. This information is held on a temporary file during the adjudication process and for a limited period thereafter before being erased. If any UK entrant objects to this they must clearly state their objection on the cover sheet of the entry so the information can be hand processed. (See also paragraph 12.)
4. For the purposes of entries, the UK is defined as being in the call areas G, GD, GI, GJ, GM, GU and GW. Unless otherwise stated in the specific rules, *entries from stations using the GB prefix, aeronautical and maritime mobile will not be accepted.*
5. Single-operator contests are defined as being events that are manned by an individual operator *who receives no assistance whatsoever during the contest period.* In certain contests multi-operator entries are permitted in accordance with the specific rules for each event. Special arrangements apply for unsighted operators to receive assistance in log-keeping for single-operator events. Such operators who require help should contact the HF Contests Committee for details. A SWL (Receiving) Section is included in some contests and participants should operate in accordance with these guidelines (where applicable) and the specific contest rules.
6. For each contest only one contact with a specific station, either fixed, portable or mobile, may be claimed for points on each band. In Cumulative contests that are split into separate sessions, *each of the sessions is regarded as a separate contest.*
7. Entrants should be particularly careful to check their logs for callsign and arithmetical errors and for duplicate contacts before submitting contest entries. Points will be deducted for errors and unmarked duplicate contacts which will attract a loss of 10 times the claimed score plus a loss of the contact and bonus/multiplier points where applicable.
8. If the individual contest rules state that a band of frequencies should be used, entrants are required to ensure that all contacts are made within the limits specified.
9. Entrants should always be courteous in their operating procedure and considerate to those who are less experienced. Entrants should avoid whenever possible, causing interference to non-contest stations (including DX windows, RTTY frequencies, nets etc).
10. Only completed contacts count for points. Failure to QRS or to give a repeat when requested might negate the contact if the other station cannot copy.
11. Logs must be clearly written, typed or printed on one side only of the RSGB HF Contest Long Sheet HFC1, or on international A4 sized paper using blue or black ink. *Home produced logs must be formatted to correspond with HFC1 and should be based on 40 entries per page using the same columns and spacing.* HFC1 contains a column headed (5). This is used for extra data when specified in the individual contest rules eg ROPOCO. In multi-operator contests, the call-sign of the operator should be entered in this column. Computer derived logs must follow the same format as HFC1. Any log that is incomplete in any respect, or is illegible, or differs in format from these guidelines may not be accepted as an entry. Separate logs must be submitted for each band worked. SWL logs are prepared using the same general format as HFC1, but the columns should be headed: date/time (gmt), callsign of station heard, RST (or RS) and serial number sent by station heard, callsign of station being worked, bonus (where applicable) and points. The band in use must be shown on the top of each log sheet.
12. To meet requests from entrants, a revised HFC1(Rev 90) will be available shortly from RSGB HQ. This has 1/8" line spacing (1/4" between entries) so as to be compatible with many models of dot matrix and daisywheel printers.
13. Unless otherwise stated in the specific rules, each entry must include a signed declaration/summary sheet, preferably using the RSGB HF Contest Declaration sheet HFC2 (Rev 90), (obtainable from RSGB HQ). This sheet differs from the earlier HFC2 in regard to the declaration. Entrants using the original (Rev 80) cover sheet, should amend the declaration to read: *'I declare that this station was operated strictly in accordance with the rules and the spirit of the contest and within the conditions of my licence. I agree that the decision of the Council of the RSGB shall be final in all cases of dispute. I agree to the data from this entry being entered into a computer for the sole purpose of the contest adjudication.'* SWL entrants must also state *'I certify that I do not hold a Class-A transmitting licence'.*
14. A separate cover sheet is required for each band worked during the CW Field Day contest (NFD). This is additional to the HF Contest Declaration Sheet. A sample of this band cover sheet is sent to all NFD entrants.
15. The HF Contests Committee work to tight deadlines in regard to the adjudication and publishing of contest results. It is essential that contest entrants pay particular attention to the closing date for receipt of entries as given in the specific rules as it

may not be possible to accept late entries once adjudication has commenced. Entrants should ensure that their entry is properly packed before mailing. The HFCC do not acknowledge receipt of entries, unless a stamped addressed card is enclosed requesting proof of receipt.

16. Awards are made at the discretion of the Council of the RSGB and may consist of certificates of merit, trophies, plaques or other items. The awards applicable to any contest are detailed in the specific rules. Winners of trophies are required to observe the conditions of the award and sign for the receipt of the trophy. Certificates are mailed to the address on the cover sheet. If a certificate is to be sent to another person or to a different address, this should be clearly stated on the cover sheet or a separate letter.

17. Entrants should note that all entries become the property of the RSGB and cannot be returned to entrants once adjudication has commenced.

18. The HF Contests Committee are always glad to answer queries on contest rules. Please address your questions to the contest adjudicator as detailed in the individual rules, or to the HFCC, Box 73, Lichfield, Staffs.

19. These Guidelines and Code of Conduct for RSGB HF contests replace and supersede earlier versions which are now cancelled.

CODE LETTERS FOR USE IN RSGB CONTESTS

County/Region	RSGB Zone	Letters
Alderney	D	ALD
Co Antrim	F	ATM
Co Armagh	F	ARM
Avon	D	AVN
Bedfordshire	B	BFD
Berkshire	D	BRK
Borders	G	BDS
Buckinghamshire	D	BKS
Cambridgeshire	B	CBE
Central	G	CTR
Cheshire	A	CHS
Cleveland	A	CVE
Clwyd	E	CWD
Cornwall	D	CNL
Cumbria	A	CBA
Derbyshire	B	DYS
Devon	D	DVN
Dorset	D	DOR
Co Down	F	DWN
Dumfries & Galloway	G	DGL
Co Durham	A	DHM
Dyfed	E	DFD
Essex	C	ESX
Co Fermanagh	F	FMH
Fife	G	FFE
Mid Glamorgan	E	GNM
South Glamorgan	E	GNS
West Glamorgan	E	GNW
Gloucester	D	GLR
Grampian	G	GRN
Guernsey	D	GUR
Gwent	E	GWT
Gwynedd	E	GDD
Hampshire	D	HPH
Hereford & Worcester	B	HWR
Hertfordshire	C	HFD
Highlands	G	HLD
Humberside	A/B	HBS
Isle of Man	A	IOM
Isles of Scilly	D	IOS
Isle of Wight	D	IOW
Jersey	D	JER
Kent	C	KNT
Lancashire	A	LNH
Leicestershire	B	LEC
Lincolnshire	B	LCN
Greater London	C	LDN
Co Londonderry	F	LDR
Lothian	G	LTH
Greater Manchester	A	MCH
Merseyside	A	MSY
Norfolk	C	NOR
Northamptonshire	B	NHM
Northumberland	A	NLD
Nottinghamshire	B	NOT
Orkney	G	OKE
Oxfordshire	D	OFE
Powys	E	PWS
Shropshire	B	SPE
Sark	D	SRK
Shetland	G	SLD
Somerset	D	SOM
Staffordshire	B	SFD
Strathclyde	G	SCD
Suffolk	C	SFK
Surrey	C	SRY
East Sussex	C	SXE
West Sussex	C	SXW
Tayside	G	TYS
Tyne & Wear	A	TWR
Co Tyrone	F	TYR
Warwickshire	B	WKS
Western Isles	G	WIL
West Midlands	B	WMD
Wiltshire	D	WLT
North Yorkshire	A	YSN
South Yorkshire	A	YSS
West Yorkshire	A	YSW

RESULTS

144MHZ TROPHY CONTEST RESULTS

This year, sporadic E gave G4LIP/P a single contact into HG, and GM0FRT made a number of auroral contacts with Scandinavia, but there was nothing like the 10 Italian stations worked by GU3CKR/P in 1988. Nevertheless, many stations worked into East Germany, which is not the norm for this contest.

As usual, the quantity and quality of the equipment needed to excel in this event has escalated, with GU4APA/P now using 3 large antenna systems and two amplifiers of considerable power, and at least 4 stations using two or more arrays of Yagis. Many single operator stations are also better equipped, and the contest is notable for the high scores of the single operator stations compared with 1988. G4FRE/P made a valiant attempt to displace G4PIQ from lead, but couldn't quite make it. G4FRE commented on the difficulty of operating a /P station of this size single handed. The adjudicator marvels that it can be done at all!

The SWL section was very close indeed. Three logs had to be adjudicated twice, eventually checking every contact, to establish the true positions.

For once, there were indications in the logs that interference levels and bad signals were less troublesome than in previous years. There were a few grumbles about bad signals, but not in a way that made it clear that a formal complaint was being made. Please, if you do make a complaint about a signal, do so unequivocally. Also, if a complaint is made against you, don't just enter it in the log - you are supposed to explain what corrective action, if any, was taken! Nevertheless, it seemed that the contest was more gentlemanly than usual, and one station was congratulated on the courteous way it handled a bad signal complaint, correcting the problem immediately and apologising for the trouble caused. Thanks to both parties.

It is getting to be hard work to find errors in the logs submitted by most stations. Scoring is usually spot on. Oddly, 80% of errors are made on the last letter of the QRA locator, about 10% on the penultimate letter and the remainder on the callsign. Locator code numbers are very rarely wrong. Motto: if the signal isn't 5 & 9+, ask for a repeat of the locator code letters, and you might be surprised how often you will have got it wrong. Nevertheless, some groups have lost quite a lot of points. It's no use marking a duplicate and then claiming the points for it, and if you do mark incomplete and duplicate contacts after adding up the scores, you should deduct the points you originally claimed for them! Further, if a station will not give a serial number, make a comment to this effect in the log, or the adjudicator might assume that the contact is incomplete.

Congratulations (an inadequate word in view of the effort and expense involved, I feel) to the Northern Lights (GU4APA/P) who will receive the Mitchell-Milling Trophy, and to Andrew Cook, G4PIQ, who retains the Thorogood Trophy. Congratulations also to the Wulfrun CG (GJ3XBY/P), the other station to emigrate from the mainland, and to G4FRE/P (who emigrated to the West) in the single operator section. Congratulations also to the zonal winners, and thanks to all who took part to make this a contest that nearly everyone seemed to enjoy.

Unfortunately, space does not allow all the group names to be listed. I see that G8SMR/P is now the S. Manchester Sheep Worriers club (no wonder they are in a static position in the field) and G0KEG/P is the KEG Kontest Klub (presumably accounting for some locator code errors). The Windbreakers, G0HRC/P, had difficultly lighting their Bar-B-Q, which may have been a blessing in disguise. Finally, a special welcome for the school club entries, G8ZKE/P and G4WKS/P. Why don't we all get some young people involved in our contest groups? Contests are a good way of encouraging interest. How about a section for groups with at least one operator under 18?

G4JLG

144 MHZ TROPHY CONTEST RESULTS

SINGLE OPERATOR SECTION

Posn	Callsign	Pts	QSOs	Loc	Amp	Ant	Best DX	Km
1	G4PIQ	4932	438	01MU	2x 250B	1x14Y	DL0BQ/P	846
2	G4FRE/P	4865	455	81UQ	2x 250B	2x 9Y	HB9S/P	841
3	GM0FRT	3135	196	87WB	2x 8874	1x19Y	SM5BEI	1229
4	G6HKM	2530	290	01FT	160w	1x15Y	DL0UL/P	748
5	G6VDO	1714	262	83SO	1x 350	1x14Y	F6FKL/P	793
6	G4ARI	1432	220	92IQ	100w	1x10Y	FD1GHP	724
7	GW3JXN	1143	128	72SC	2x 250B	1x13Y	F6HPP/P	630
8	G0HXO/P	1070	114	70NJ	60w	1x14P	PA3DSB	715
9	G8PHN/P	960	126	01GP	10w	1x10Y	GI0LIX/P	568
10	G4DFI	729	79	01BL	1x 350F	1x9Y	DF0OL/P	565
11	G0APZ	637	83	90WW	25w	1x8Q	DK0VKG/P	473
12	GM8DOH/P	524	38	75MA	8w	HB9CV	F6CTT/P	696
13	G8ZRE	522	68	83NE	100w	1x8XY	FA1LIX/P	515
14	GW4NVA/P	370	31	73QF	25w	1x9Y	F6IFR	574
15	G0KYS	239	29	70WI	25w	1x5Y	G3WRS/P	484

ALL OTHER STATIONS SECTION

Posn	Callsign	Pts	QSOs	Loc	Amp	Ant	Best DX	Km
1	GU4APA/P	13509	926	89VR	*	**	EA3AIR/P	894
2	GJ3XBY/P	10823	728	89WG	3CX800	***	DK0FW/P	878
3	G4LIP/P	9511	719	03CE	2x 250B	8x17Y	HG0KLZ/3	1514
4	G3CKR/P	8919	767	93AD	2x 250F	120 el	FF2LY/P	980
5	G8LNC/P	8470	700	90JO	2x 250B	4x19Y	Y36CK/P	821
6	GW4GFX/P	7768	704	81NV	2x 250B	6x17Y	DB0FAW/P	857
7	G4RKV/P	6773	537	01OI	2x 250B	2x17Y	DF0AJ/P	794
8	G0HRC/P	5988	491	01PU	4CX1000	1x21Y	F6HBP/P	806
9	G4SIV/P	5948	476	92TR	3CX800	$	FF2LY/P	880
10	G3EFX/P	4764	420	90XV	2x 250B	$$	DH3NAN	793
11	GD4IOM	4222	359	74QD	8877	4x17Y	F6HPP/P	767
12	GI0LIX/P	4125	310	74BU	1x 250B	2x 9Y	F6IFR	756
13	G2XV/P	3768	369	02EE	$$$	2x17Y	HB9LU/P	810
14	G8SMR/P	3566	442	93EH	1x 250B	2x17Y	F6IPR/P	795
15	G0KYW/P	3375	384	80RT	#	20 el	DF1VW/P	697
16	G8NEY/P	3373	252	79JX	2x 250B	4x9Y	DF0OK	819
17	G3WRS/P	3295	347	94MJ	150w	2x16Y	DF1VW/P	757
18	G0KEG/P	3288	392	91PS	2x 250B	1x18Y	F6HBP/P	867
19	G1KAR/P	3041	292	00DR	1x 250B	2x15Y	F6HBP/P	733
20	G3TCR/P	2622	357	91JH	80w	2x17Y	HB9/F1FHI	752
21	G4DSF/P	2577	316	92NQ	2x 250B	2x16Y	FF6KQV/P	743
22	G4ERG/P	2448	247	94WC	2x 250B	4x11Y	F6APE	751
23	G8ZKE/P	2419	341	82QL	80w	1x17Y	DL0UL/P	976
24	G6CTU/P	2325	329	91XG	1x 250B	2x17Y	GI4XJD/P	646
25	G4EKT/P	2024	264	93PV	##	1x21Y	FF6KSL	744
26	G8LVQ/P	1814	264	94NI	1x 250B	4x19Y	DC8VJ	969
27	G4WKS/P	1512	242	92GB	25w	1x8Y	HB9/F1FHI	580
28	G1WIS/P	1473	169	90KQ	100w	1x9Y	F6FNL/P	756
29	G7EAR/P	1466	206	91RK	100w	2x9Y	DF0OL/P	610
30	G8NJA/P	866	106	80DO	1x 350F	1x17Y	DF0OL/P	838
31	G7BRC/P	805	123	01HH	80w	1x14P	GD4IOM	473
32	G7FDC	323	66	80FJ	200w	2x13Y	FF6KSL	682

SWL SECTION

Posn	Station	Pts	QSOs	Loc	Ant	Best DX	Km
1	RS31976	369	55	01HO	1x9Y	DK0UKW/P	461
2	RS52543	360	38	83LT	1x12ZL	FA1LIX/P	579
3	RS32525	358	26	01AL	1x9Y	HB9/F1FHI	698
4	RS28198	301	43	00HX	1x10P	HB9/F1FHI	620
5	RS37798	159	47	91MD	1/4w V	F6CTT/P	300

ZONAL WINNERS

Zone	Single Op.	All Others
A	G6VDO	GD4IOM
B	G4ARI	G4LIP/P
C	G4PIQ	G4RKV/P
D	G4FRE/P	GU4APA/P
E	GW3JXN	GW4GFX/P
F	-	GI0LIX/P
G	GM0FRT	-

KEY

* 2x 250B + 2x 8874
** 4x9Y + 4x9Y + 4x17Y
*** 80 el colin + 4x17Y
$ 4x 9Y + 4x 16Y
$$ 3x17Y + 2x 16Y
$$$ NAG linear, 300w
1x 350 until generator blew up, then 150w

Check Logs from F/G4BLX/P, G7AOU, G2FWX, GW4GBH/P, and GM7ASN.

RSGB SWL CONTEST 1989 RESULTS

The biggest problem with this contest was that a good many entrants appear to have misunderstood the rules, and will therefore find themselves disqualified.

The rule which caused most problems was the one which only allows a station in the 'station worked' column to be logged once in every three QSOs heard unless the station being worked is a new multiplier for the listener. Most of the entries from East Germany unfortunately fell foul of this rule. Some entrants even logged as many as nine QSOs in a row made by the same station - including six UB5s on the trot! Philip Sinclair, RS42353, also finds himself disqualified from his first SWL contest because his log failed to show any 'stations worked'. Another disqualification was Y33-21-E who unfortunately misread too many callsigns for me to entertain his log.

On the plus side, conditions were quite good. JAs and Ws appeared side by side in some logs on 28MHz during the Saturday afternoon, and there was a sprinkling of far eastern stations in the logs too. Once again, the number of African stations logged was poor, but some entrants caught TL8RM, TR8SA, ZD8BOB, 5H3TW, 9J2BO and

9X5KP. KH6 appeared in several logs. 14MHz again provided most of the contest traffic, and the difference between very good scores and the mediocre ones was largely accounted for by the large amount of 'ordinary stuff' in the higher scoring logs. 7MHz also provided many Europeans for those keen on amassing a big score. No-one spent very much time on 3.5MHz.

Once again the CW section was poorly supported. No G logs were received, while only one SWL took the event seriously. Jean-Jacques Yerganian, ONL-383, must be congratulated for another first class log which took first place by a tremendous margin.

We have a 'home' winner in the SSB section this year, with Martin Parry, BRS52543, also putting in a fine effort, which won by a good margin from Mike Parent, BRS88763/568. Certificate winners are indicated in the results table.

We will be considering alterations to the rules for 1990, and one or two suggestions have been made which could improve the contest. However,the most important thing is that would-be entrants should read the rules *very carefully* to avoid the disappointment of disqualification.

Bob Treacher, BRS32525

RSGB SWL CONTEST 1989

SSB SECTION

Pos	Station	Pts	Multi	Final Score
1	BRS52543*	677	200	135,400
2	BRS88763/568*	473	148	79,004
3	BRS25209	376	152	57,152
4	BRS90400	369	147	54,243
5	BRS25429	273	128	34,944
6	ONL-6945	215	91	19,565
7	BRS20249	153	107	16,371
8	G7AOU	183	69	12,627
9	JA7-30195	120	74	8,880
10	Y52-01-B	118	70	8,260
11	G1VDW	108	68	7,344
12	JG7LBN	132	39	5,148
13	JA7-10052	30	17	510

Check logs: BRS32525, BRS62088

Disqualified: RS42353, Y32-22-K, Y49-01-C, Y49-04-D, Y52-13-B, Y67-04-L, Y67-07-L/P ('station worked' rules). Y33-21-E (excessive incorrect callsigns).

CW SECTION

Pos	Station	Pts	Multi	Final Score
1	ONL-383*	761	234	178,074
2	BCRS195	59	38	2242
3	Y52-15-B	23	14	322

Disqualified: Y67-07-L/P ('station worked' rules).

* certificate winners.

IMPORTANT NOTE

Please note that the compilation of all RSGB Contest information is now undertaken by one representative from each contest committee and all reports and results should be directed to them for conversion to disk. This system has been devised so that i) there is a central source for all information, so as to avoid duplication and ii) as *RadCom* moves over to desk top publishing contest news will integrate with that process.

For HF the representative is Steve Knowles,G3UFY; for VHF/UHF Bryn Llewllyn, G4DEZ and for HF-DF events Trevor Gage, G1MPJ - all of whom are QTHR in the most recent Callbook.

CONTESTS CALENDAR

RSGB HF CONTESTS

6 Jan	7MHz LF Cumulative (Nov89)
7 Jan	3.5MHz LF Cumulative (Nov89)
8 Jan	1.8MHz LF Cumulative (Nov89)
13 Jan	3.5MHz LF Cumulative (Nov89)
14 Jan	AFS 3.5MHz (Oct89)
14 Jan	7MHz LF Cumulative (Nov89)
16 Jan	1.8MHz LF Cumulative (Nov89)
20 Jan	7MHz LF Cumulative (Nov89)
21 Jan	3.5MHz LF Cumulative (Nov89)
24 Jan	1.8MHz LF Cumulative (Nov89)
27 Jan	3.5MHz LF Cumulative (Nov89)
28 Jan	7MHz LF Cumulative (Nov89)
1 Feb	1.8MHz LF Cumulative (Nov89)
3 Feb	7MHz LF Cumulative (Nov89)
4 Feb	3.5MHz LF Cumulative (Nov89)
9 Feb	1.8MHz LF Cumulative (Nov89)
10 Feb	1st 1.8MHz Contest (Nov89)
24 Feb	7MHz CW Contest (Aug89)
24,25 Mar	1.8MHz SSB (Jan90)
1 Apr	Ropoco 1 (Jan90)

RSGB VHF CONTESTS

21 Jan	144MHz CW (Jan90)
28 Jan	70MHz Cumulatives (Jan90)
4 Feb	432MHz Fixed/AFS/SWL (Jan90)
11 Feb	70MHz Cumulatives
25 Feb	70MHz Cumulatives
3,4 Mar	144/432MHz (Jan90)
11 Mar	70MHz Cumulatives
25 Mar	70MHz Cumulative/Fixed/SWL
8 Apr	50MHz Trophy Fixed/Single/Multi
5,6 May	432MHz Trophy & SWL
5,6 May	434MHz to 24GHz
19,20 May	144MHz & SWL Single/All others
10 Jun	432MHz CW Single/Multi
10 Jun	432MHz FM Fixed & Open
7,8 Jul	VHF Field Day
28 Jul	144MHz Low Power/SWL
29 Jul	432MHz Low Power/SWL
All Aug	432MHz Activity
12 Aug	1·3 & 2·3GHz Trophies
All Sep	1296MHz Activity
1,2 Sep	144MHz Trophy/SWL
16 Sep	70MHz Trophy/SWL
30 Sep	50MHz CW
6,7 Oct	432MHz - 24GHz SWL & IARU
9 Oct	1·3 & 2·3GHz Cumulatives
17 Oct	432MHz Cumulatives
21 Oct	70MHz CW
25 Oct	1·3 & 2·3GHz Cumulatives
2 Nov	432MHz Cumulatives
3,4 Nov	432MHz CW 8-hr Marconi/RSGB
10 Nov	1·3 & 2·3GHz Cumulatives
2 Dec	144MHz AFS/Fixed/SWL
4 Dec	432MHz Cumulatives

There will be an SWL section in every VHF contest even if not mentioned in rules

OTHER CONTESTS

13 Jan DYLC Mid-Winter Contest (Aug89)

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

CONTEST LOG SHEETS

Readers are reminded that both HFand VHF logsheets are available from Headquarters in packs of 100. Prices (which include postage and packing) are £3.29 for members and £3.87 for non-members. When ordering please remember to specify which type of log sheet you require.

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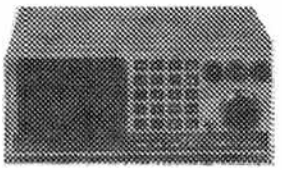

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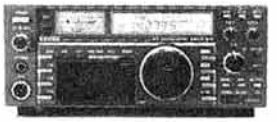

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CHL25J Mobile 144/432 3/5.5dB .93M 120W £29.95
CA-702 Mobile 144/432 3/5.5dB 200W £24.22
CA-2x4FX Base 144/432 4.5/7dB 2.02M F/Glass £52.50
CA-2x4WX Base 144/432 6.5/9dB 3.18M F/Glass £74.00
CA-2X4SUP Base 144/432 6/8.4dB 2.54M £69.00
CA-2x4 MAX Super gain 144/432 8.5/11.9dB 5.4M F/Glass £125.00
CA-ABC22A Base Colin. 2M 6.5dB 2.87M £36.00
CA-ABC23 Base Colin. 2M 7.8dB 4.5M £59.50
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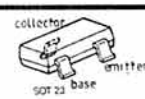

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FOR SALE

● FT102 HF tcvr WARC, bands, mic, manual, near new cond: £475. Tom G8BFY. (Peterborough) 0733 202655 after 6.30pm

● YAESU FT207R 2m h/held tcvr, remote spkr/mic NC3A, quick chrgr/AC adaptor, mobile adaptor. Buyer inspects and collects: £145ono. G4XNV not QTHR. (Liverpool) 051-428 2248

● COLLINS 30L-1 linear exc.cond with spare PA valves plus Collins dummy load: £500ono. Yaesu FT7: £270ono. 4CX250s, 4CX350s. 0229 32164

● KANTRONICS Kam modem, packet RTTY/CW/AMTOR: £185. Tokyo hy-power 50MHz tcvr: £275. Both items boxed, as new. G0CKP QTHR. (Tonbridge) 0732 350153

● FTDX401, FY401 spkr MFJ941D tuner II 18AVT/WP vert ant, T100 100W, some spare valves. Complete station: £375ono. Would exch for good rcvr. QTHR. (Barton-on-Humber) 0652 635162 after 2.30pm

● YAESU FL2100Z inc WARC bands: £550. Spares available. G3POI QTHR. 0959 75992

● AR40 rotator complete control box and wire. GWO: £45. G4ISB. (Manchester) 061-766 5265

● YAESU FT200 HF tcvr, FP200 PSU: £180. Buyer collects. G3NIR. (Gravesend) 0474 320118

● R278/URR synthesised ground UHF RX, 220-400MHz, 230VAC: £55. Plessey PR153, HF SSB RX, 6ch, 3u high. H6K: £40. BV221AF, AC PSU: £25. A40, CPRC26 VHF manpacks c/w canvas, batts: £40ea. SAE for WWII, post-war military list. Chris, G8SSP QTHR. (Eastleigh) 0703 619441

● SERVICE manual, Ferguson 3V31 video recorder: £8. Sony SL3000UB portable video recorder, fair working cond, plus matching tuner timer, mint. Both with inst and service manuals: £60. Prefer buyer collects latter. G6AQC. (Oxford) 0865 243634 after 7pm

● COLLINS 32V TX. Spare set of valves. Needs 115VAC plus strong table. Cheap sturdy 100W. HF CW. Buyer collects: £50ono. H/B FSK driver for 32V available. Maplin TU1000 RTTY TX/RX terminal, RS232 and TTL levels: £40. G3RFI QTHR. (Potton) 0767 260800

● YAESU FT75 HF 5-band tcvr, FV50C VFO mobile PSU: £185ono. 2m XY 5/5ele: £15. G3BDK QTHR. (Towcester) 0327 52309

● INMAC V21/23 modem with Comstar R232 s/ware for use with Amstrad CPC computers: £50. 5in B/W 12V monitor composite video input: £25. G3XNE. (Bude) 0288 354564

● TNC220 with PMS: £100. IC402: £200. MML432/30LS: £65. SMC Oscar II 28MHz FM: £30. HF6V, ZB21Q expedition use only: £100. Dave. (Ipswich) 0473 642639 day

● DATONG Tutor D70: £40. Technical s/ware TX3 plus Tifi interface suitable BBC Micro: £35. Also Variometer: £10. Ray, G1ZYZ. (Ickford) 08447 387

● KENWOOD TH205E, VHF FM tcvr, new 15-6-89, nicads, chrgr, spkr mic etc: £160. Icom IC202S, extra xtals, manual, orig.packing etc. VGC: £150. Rare Belcom LS202E multimode h/held, nicads, chrgr, manual, orig.packing. VGC: £175. Dave. (Fareham, Hants) 0329 230737

● ICOM IC24G with m/mount and mic. Exc.cond and perfect WO: £120. Paul. (Broadstairs) 0843 61448

● YAESU SSB tcvr FT707, FP700 PSU: £450. Kenwood ATU AT230: £150. RTT system, colour Genie computer with Radsoft TU and s/ware: £60. Diawa electronic keyer DK210: £25. All in exc.cond. Collect or pay carr. GM4WQO. 041-799 2771

● DATONG MK keyboard: £70. FL3 audio filter: £80. Tono 350 CW/RTTY computer, 10in green monitor: £150. SW200B swr. Peak PEP pwr meter. 1.8-150MHz: £60. G4HKL QTHR.

● SB101, PSU: £150. Eveready radio, sky casket: £40. Bush radio PR82: £20. Grayshaw R-C bridge: £10. RSGB h/book 1963: £5. BC221Q: £25. CCT/info, HW32 B28 SCR211AF. Valves, 807: £3ea. 4X150A-7609. Mine detector amp. A21193. G3KTH QTHR. 0905 774624

● FDK750 2m multimode 20W, little used. Boxed: £230. Trio 210 2m FM h/held with batts, chrgr. G4YQX. (Kidlington) 08675 77144

● TS930S FM fitted: £1150ono. FT726R multimode, boxed. Yaesu basestation in immac cond. Harvey, G4YNI QTHR. (Manchester) 061-740 7708

● ICOM 271E incs Mutek F/E, PSU, base mic and manuals. Boxed, immac cond: £575. No offers. Yaesu FT102 HF tcvr, inc MD1 base mic: £480. EHT transformer 620-0-620: £10. Alan G6ZYG. (Rushden, Northants) 0933 318493

● AOR2002 scanner with PSU and orig.packing: £385. BJ200 Mk2 scanner with chrgr and orig.packing: £130. GM8LKL QTHR. (Edinburgh) 031-449 4124

● MOSLEY TA33J HF 3ele beam: £65. CDR AR22 rotator with controller: £60. G4EAH QTHR. (Crowthorne) 0344 771591

● ICOM IC740: £595 with marker unit and service manual. Charlie G0EIW. (Surrey) 0883 722486 or 01-680 4797

● KENWOOD TS770E VHF/UHF multimode basestation: £600. SP70 spkr: £40. MC60 mic: £40. Sota VHF linear 100W incs 20A PSU: £175. Sota UHF linear 50W: £80. All unmarked cond. May take dual band H/P or CD player in p/ex. (Tamworth) 0827 716373

● 2M basestation. Trio TS700, 10W, all-mode. Manuals, 240V/12V. With MM 100W amp: £300. G1YLP QTHR. (Cheltenham) 0242 580248

● PS430: £135. SP230: £55. Orig.boxes. 2200GX: £55. Lowe 2m monitor: £38. Oscar SWR200: £24. Tradiper VOX3 for TS700 series. MH1 scan mic. 101B h/book. Various lengths RG213 coax, switches, discone, 9ele 2m tonna, plus many other 2m/70cm ants. G4DVE QTHR. (Dudley) 0384 50539

● FT101ZD FM fan: £450. Also TS700G all-mode 2m: £250. Or both: £650. G4EGP. (Paignton) 0803 555549

● TS830S with YK88C filter and mic. Mint cond. Orig.packing, manual etc: £725. Carr at cost. 0446 743296

● ANDREWS LDF5-50 Rugby ATS 30m to good home for good price TDA1037 5W audio amp: £1ea. G8TWH QTHR. (Coventry) 0203 441590

● SHACK clearance. Trio TS830S HF tcvr, AT230 ATU, SP230 spkr unit. All immac.cond. Kent mounted solid brass morse key, Turner plus 3B base mic, hand mic, TV1 filters plus many extras: £875 the lot. No split. Prefer buyer inspects/collects. G0EWD QTHR. (Sheffield) 0226 765306 after 6pm

● TS440. Auto tuner narrow CW and SSB filters, extra interface: £925. TS430 FM narrow CW and SSB filters: £625. SB220 2kW linear: £625. 14in CGA monitor Commodore and IBM compatible: £100. IC735 narrow CW filter. All above VGC. Buyer collects/pays carr. (Oswestry) 0691 831111

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● TRIO R2000 rcvr, VC10 cvtr 118-174MHz, manual, boxed. As new: £490. G6MBI QTHR. (Nottingham) 0602 615417

● H/HELD, Yaesu FT470 dual-band. Boxed as new. An exc specimen, with extended guarantee from main importer: £329. Steve, G0AXS QTHR. 0705 827371 eve. 0705 487207 day

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● FLDX400 TX: £125. FRDX400 RX: £125. Spare valves inc PAs inc in price. SSM Zmatch: £30. TA speech processor: £30. Heathkit inline pwr/swr meter: £15. All ono. GM4ABK QTHR. (Glasgow) 041-637 1665

● YAESU FR50B, FL50B, FV50B 80-10 SSB/CW, leads, mic: £175. Yaesu FT790R, case: £275. Yaesu FT227R 2m/10W FM m/mount: £125. FT207R 2m H/H, spkr/mic, chrgr: £90ono. Trio TR9130, m/mount: £275. R1155 int PSU, AF stage. Offers? All VGC. G4HGM not QTHR. (Warwick) 0926 881164

● RACAL RA17 Mk2 gen.cov RX 0.5-30MHz rack mounting model with manual. Offers. G3VSB QTHR. (Uttoxeter) 0889 590289

● APPLE II Europlus, green monitor, duo-drive, auto 80col card, 16k language card, selection of non-radio s/ware: £200. Carr.extra. 0835 62015

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● KENWOOD TS140S, boxed, immac. PS430, SP430: £695 buys complete station. Bencher BY1 iambic key, black, boxed. Hardly used: £45. G0KMC QTHR. (Aylesbury) 0296 29342 eve w/e

● DATONG auto RF speech processor: £45. Sommerkamp FT277, FT101Mk2, 160/10m inc kit for new bands. Inc LLL speech processor, spare PA valves, Shure 401 mic, built-in PSU: £335. Avo 8 Mk5: £75. Buyer collects. Not QTHR. (Chichester) 0243 573308

● SCANNER AOR2002 under 1yr old. 25-550MHz, 800-1300MHz. Mint cond. Boxed. Save £160 on new price: £320. Ken G0MRR. (Harlow, Essex) 0279 26647

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● YAESU FT1 tcvr. Filters, FM, mains/batt operation. MD1 desk mic. Unmarked new cond: £950. G4ZJT. (Hitchin) 0462 457687

● DRAKE separates T4XB, R4B, AC4 PSU. 160-10m, TX or split operation. VGC, orig.manuals, cables: £400. G4IPI QTHR. (Alton, Hants) 0420 63993

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● YAESU rcvrs FT101D: £190ono. FRG7: £120ono. Both in exc.order, manuals. BC221, mint unmodded: £15. Derek, G6IOW QTHR. (Braintree, Essex) 0376 27547

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● ICOM IC275E 2m multimode basestation. 2-25W as new inc mic. boxed: £800ono. Chris, G1HLN QTHR. (Redditch) 0527 41569

● HF Trio TL911 2kW linear amp, recently serviced. New valves: £500. Buyer collects, arrange carr. G0ITF QTHR. (Coventry) 0203 683669

● FT736R all-mode 2m/70cm plus 6m module and Adonis desk mic. As new, box, h/book etc: £1400ovno. (Milton Keynes) 0908 616726

● NEC Corporation fax tcvr model Nefax 4500. Serial no 2849. Date July 1983. Offers. G3OXV QTHR. (Daventry) 0327 702265

● MMT50/28S as new: £150. MMT144/28R as new: £150. Tonna 50/5 6m F9FT: £25. SB200. GWO. SW wafers need cleaning: £195. (Milton Keynes) 0908 313379

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● TS700G plus 100W linear: £375. Tonna Oscars 4off: £125. KR500 elevator unused: £110. 10ele Cuedee: £30. G1TAN QTHR. (Herne Bay) 0227 361141 after 8pm

● FT767GX HF 2m/6m/70cm. All mods, only 6mths old. Mint. Hardly used: £1750. Toshiba printer HXP550: £125. VDU: £20. Tonna 9000E: £300. MM liner 144-100W: £130. Bremi PSU. 13.8/10A: £25. Howard G0HZH. (Ipswich) 0394 460474

● BBC computer with remote keyboard, 2 disk drives, 100cps printer, high res monitor. Solidisc 286k board. Numerous ROMS, AMTOR, Wordwise etc. Voltmace joystick rollerball s/ware. Too much to mention. G3CIV controller packet AMTOR RTTY. Would invite offers for whole package. Would consider swap for modern HF rig and/or cash. G4LAP QTHR. (Horsham) 0403 790513

● TRIO HF pair. T599 TX, JR599CS RX. Fitted 2m option. Digital readout. All leads, manuals. No mods, faults. No split: £200. FRG7700 RX fitted narrow filters. Manuals. No faults. ATU preamp inc: £150. G8ZON QTHR. (Portsmouth) 0705 829129

● YAESU FT7B 50W rig fitted YC7B digital readout and top-band using G4ENA tvtr. Heatherlite mobile mic and headset. Orig.box and manual. Also cir.diag amended to inc tvtr: £360. Drae 12A PSU: £85. All equip ex /con. Delivery costs to be shared. Jim, G4ULM not QTHR. (St. Neots) 0480 212402

● ACORN teletext adaptor: £50. Acorn Prestel adaptor: £35. Both exc.cond and PWO. Also MM 2m AM RX and TX: £20ea. (Guildford) 0483 575870

● YAESU FT209R h/held. 2 FNB2 nicads, NC9C chrgr, MH12AB spkr mic, PA3 DC adaptor, FBA5 batt case, soft case: £175. Genuine Andrew Heliax N-type plugs, male and female terminations: £10ea. Small discount for quantity. Paul, G4XTA QTHR. 09313 359

● KENWOOD TS520S tcvr exc.cond with DG5 digital freq display and counter: £450. G4FVR QTHR. 0723 365043

● BARCO CRM2631 professional 26in colour rcvr/monitor, VHF/UHF tuner, PAL, Secam, NTSC, video I/O, exc.cond, ideal amateur/DXTV: £99ono. (Oxford) 0865 341428

● TELEQUIPMENT D43A, 15MHz, dual beam scope, manual: £50. Avo sig.gen to 80MHz: £10. Mobile mic: £5. G4ILA QTHR. (Lymm) 092575 2388

● LINEAR amp FL1000 Sommerkamp 3.5-30MHz grounded grid 400W output. 15x8x12in: £275. FT708R, case and chrgr. Hardly used: £140. G3UCE QTHR. (Lancaster) 0524 822125

● KENWOOD TM221ES 2m mobile: £240. Yaesu FV101DM digital VFO: £120. Both VGC. G0LYS not QTHR. (Liverpool) 051-727 7757

● GOING QRT. TS940 fitted Lowe phase noise mod and bank controller: £1295. TL922 linear: £995. Daiwa CNW518 tuner, swr/output meter, covers WARC, 2.5kW: £190. Fritzell FB33 triband-der fitted 7MHz add-on kit, superior German construction: £150. Strumech P60 tower auto braked: £140. MC60 mic: £50. SEM ant tuning bridge: £15. Servicing, inst manuals where appropriate. All mint cond. Prefer buyer collects or freight at cost. Free bits and bobs for collectors main equip, consisting coax, headsets, switches, books etc. G4CHP QTHR. (Norwich) 0508 470365

● MOBILE 10m FM rig c/w small ATU and swr meter. Mounted on prop shaft bracket: £45. G3XBE QTHR. (Bradford) 0274 728219

● PSU 25A 30W max with meters: £72. Capco APC3000 ATU. V.nice cond: £172. Dr. Adair, 0624 22342 eve

● MODEL 200 lap-computer, Tandy, c/w 3 banks full RAM. Extra books, bar wand, boxed. Thousands UHF/VHF frequencies. Plus post: £250. (Ipswich) 0473 85203

● TRIO R2000 rcvr all-modes, with manual: £375ono. VGC. Buyer collect or pay carr. GW4VUC QTHR. (Cwmbran, Gwent) 06333 4577

● ENTIRE contents of radio shack for sale. The property of the late G0GGK. Yaesu FT757GX tcvr. Yaesu FP700 PSU. Icom IC260E tcvr. Freq.meter, signal corp. Racal transmitter. Sig.gen Advance J1A. Freq.calibrator CT432. 2x scopes. Transistor test set CT446. Test oscillator set. Sig.gen Type 71. Solatron Varipack. Marconi sig.gen. Heathkit valve voltmeter. Numerous small items inc PSUs, mics, morse keys, headsets, plus cabinets full of transistors, relays, resistors, transformers, aerial parts, plugs, cabling etc. Also books, manuals and periodicals. To sell in one lot at a bargain price. Located Sheffield area. 08907 81435 after 6pm

● RACAL 117E gen.cov rcvr: £225ono. Will exch with cash adjustment for HF rig. G1SDI. (Batley) 0924 474548

● YAESU FRG9600 Mk3 scanner, 100kHz-950MHz. HF/VHF/UHF multimode with Yaesu PA4C PSU, as new: £440. Cost £625. GW4WBT. (Llandudno) 0492 78107

● TR7625 FM rig. Also TR7010 SSB tcvr and Trio R1000 rcvr. All in good cond: £500 the lot. 0634 251689

● HEATHKIT SB101 tcvr, PS spkr, all manuals, CW filter, driver final valves. 12mths old: £100. John QTHR. (Stratford-on-Avon) 0789 740511

● ICOM IC255E 2m FM synth tcvr. 25/1W: £150. Icom IC22A 2m FM tcvr. Many xtal channels: £85. Racal ISB adaptor for RA117 etc: £50. All in good cond, with h/books. G3MBN QTHR. (Bath) 0225 810621

● ICOM 740 FL44A mem-pack. 2 mics, h/book, boxed. Immac: £425. PS15: £100. KW108 monitor scope. Immac: £60. SS design HB 13.8V reg 10A PSU meter: £20. BC221AK. Reg PSU h/book. Orig charts: £15. Heath reg 1-400V 120mA PSU twin meters. Bias: £20. Hameg scope 8MHz with monitor adaptor: £40. KW PSU for Vespa: £15.G3RHM QTHR. (W. London) 01-423 2329

● FV707DM VFO/memory/scanning unit. Mint: £150. Pair top band traps: £9. Rollercoaster: £5. Pair 813s: £10. Jim. (Bournemouth) 0202 518828

● BBC Master 128, twin Opus 40/80T drives, 22in colour monitor, s/ware: £400. Possible delivery NW area. G0JSO QTHR. (Warrington) 0925 726903

● ICOM IC271E 2m all-mode, IC PS25 int PSU fitted. VGC: £550. G1HRI not QTHR. (Hyde, Cheshire) 061-351 1727 after 6pm

● JIL SXZ00N scanner, covers 26-88MHz, 108-180 and 380-514MHz c/w PSU manual and discone: £150ono. Also Realistic DX400 RX. Ideal beginners SWL: £65ono. Both items good cond. Buyer collects or pay carr. (Nottingham) 0602 724505

● VERSATOWER. Planning refusal forces sale of 40ft post mount c/w head cage and winches. Brand new, never been used. Buyer to inspect and collect: £480. Also 2 Racal HF tcvrs 6ch SSB with 3 matching PSU's: Offers? Steve G4SVG. (Reading) 073529 5105

● YAESU FT736R, mint cond, hardly used. Fitted 6m module, int keyer c/w ants Jaybeam 4Y/6m, 6Y/2m, 12Y/70cm, inst books etc. All in orig.packing: £1350. G4RBJ QTHR. (Dereham) 0362 697155

● 2M multimode Trio 700G. VGC: £250. Electronic keyer Daiwa DK210, as new: £48. QTHR. (Ruskington, Lincs) 0526 833281

● 101 key, clicky IBM style keyboard: £25ono. Panasonic 5.25 drive fits IBM clone: £25ono. Both replaced hence sale. CTE CT1600 FM 2m h/held with spkr mic and mobile booster cradle. 4mths old. Exc.cond: £140. G1EBH QTHR. (Basildon) 0268 45573 after 6pm

● MM 2m 144/30 linear: £85. Yaesu FC707 ATU: £120ono. 2x 2m XY 5 plus 5ele yagis: £15ea. Engineers lathe, suit model worker. BGSC 5.5in throw. 12in between centres. Some change wheels and tool bits etc. Stand: £290. QTHR. (Towcester) 0327 52309

● PHILIPS MX294 high band mobile radio. VGC: £200. TED3 CTCSS option: £50. As new. Pye F494 basestation, M81 desk top remote control unit, as new, high band: £475. Datong DF unit c/w aerials and display: £200. Racal 9824 freq.counter 560MHz: £125. Schlumberger precision VHF sig.gen FSM500 with FS30 digital sig.gen 300Hz-470MHz AM/FM: £350. Marconi TF2303 modulation meter: £100. (March) 0354 741168

● 8877/3CX1500A7. As new. Good offers! Collins transformer 0-2850V centre tapped 1A. 5V/10A heater transformer, new, 2000-0-2000V 1A transformer. (Brigg) 0652 54222

● YAESU FT101Z used as standby only, c/w mic, fan, h/book. Immac: £375ovno. WARC bands. G4OBB QTHR. (Oxford) 0865 61866

● SEM Tranzmatch ATU 1.8-30mc/s: £50. Inc post. Also R109 WD RX c/w service phones, h/book, few spare valves. 6V MG car batt, complete and working. Collectors item: £100. Buyer collects. Peter, G4VUN not QTHR. (Cleveland) 0287 34397 day

● YAESU FT790R 70cm tcvr. Exc.cond: £210. MM 432MHz linear 10/50W: £120. Alinco 432MHz linear 1.5/10W: £40. MM 144MHz linear 1/3-100W: £100. Richard G0CFB. (Halesworth) 0986 83403 eve-w/e

● VERSATOWER BP60: £500. CDE heavy duty rotator: £180. Jaybeam TB3 MkII 3ele triband yagi: £180. All 3: £800. Commodore C64 with 1541 disk drive Bartg ST5MC terminal. TX3 RTTY/CW/ASCII s/ware with all leads and other radio s/ware: £250ono. ST5MC will decode CW/RTTY with TX3. Buyer inspects and collects. Steve. (Bromyard, Herefordshire) 0885 482556 after 6pm

● CTE International 2m h/held still under guarantee: £105. G7ALY not QTHR. (W.Midlands) 0384 877726

● EDDYSTONE 358X complete coils PSU: £40. B40: £40. Buyer collects. G3AJT QTHR. (Romsey, Hants) 0794 512557

● TRIO 440S incs auto tuner: £950. Kenwood TH215E plus spare nicad: £200. (Warrington) 0925 722879 after 6pm

● 123 set c/w DC/PSU. All leads, head set. Working. Also h/book: £85. G4LIO QTHR. (Portsmouth) 0705 373320

● FT757GX with PSU, manual, boxed, as new: £675. TS520SE, mint, 500Hz CW filter, spares, PAs and driver, boxed: £425ono. Trio PS30, as new: £150. Racal RA17L, mint cond. Black slimline cabinet: £200ono. With manuals, spare valves. FT7B, never used mobile with freq.counter and manual. Yaesu's best ever mobile 100W: £325ono. G4PPG QTHR. (Standish, Lancs) 0257 421442

● FT290R c/w nicads, chrgr, 25W amp, flexi AE, simple reversible RIT mod: £260. MM 2m TX 70cm tripler: £15. G0EZB QTHR. 0939 250087

● TRIO TS830S, late model, mint cond, orig.packing etc: £700. Prefer buyer inspects and collects. Rick, G4WXF QTHR. (Hereford) 056884 580

● TS440S Kenwood. Mint cond with YK88C CW filter: £850. G0GLL QTHR. (Halifax) 0422 365600

● TRIO 9130 multimode 25W/5W. Mint, m/mount, box, manual: £325. Datong D70 morse tutor: £35. G0CKH QTHR. (Norwich) 0603 51201

● YAESU FT480R 2m multimode, 10W FM, SSB/CW mobile TX/RX: £275ono. (Guildford) 0483 62586

● PDP11/23 2x RLOS and disks, 8 async channels plus VDU: £350ono. (Bridgend) 0656 662171 day

● COMMODORE 64 s/ware. Eprom programmer cartridge maker kit, printer, plotter. Many manuals etc. G8FVC QTHR. 01-954 5115 day. (Colchester) 0376 71330 eve-w/e

● FT707 c/w CW filter, PSU, ATU, ext VFO: £600ono. FT200 c/w PSU, ext VFO: £250ono. GW4JBO QTHR. (Newport) 0633 856994

● MEMORY ICs. 16 off 1 Mbit by 1 bit DRAM type. Hitachi HM511000-12. Never used and in orig.tube: £300 or swap for FT290R in exc.cond. Mutek F/E preferred. Also 4 HN27C256G-20 Eproms: £12. GW4JJW QTHR. (Cardiff)

● KENWOOD TS680S with filter YG455C1 plus MC60 desk mic: £800, JIL SX200: £100. Mint and boxed. GW6XII QTHR. (Gilwern, Gwent) 0873 831954

● COMPLETE Yaesu HF/2m station comprising FT757GX, FC757AT, FP707, MD1 desk mic. Kenwood lowpass filter. Mains filter: £800ono. FT290, little used, as new c/w helical whip, chrgr, soft cases: £225. CDR rotator 14ele 2m crossed yagi co-linear. HF minibeam. Assorted low loss coax PL2595 ant switches, magmount, gutter mount 7/8 whip, 2x PSUs: Offers. Genuine sale. All boxed equip, in exc.cond c/w inst manuals. Can be seen in use. John, G0CHU QTHR. (Warwickshire) 0827 895957

● 8ELE Jaybeam 2m beam. VGC: £12. Heathkit grid dip oscillator: £12. Carbon mic, very old, heavy. Offers. Carr.extra. G4LEA. (Bristol) 0272 772435

● SHARP MZ80K computer system incs printer, double disk drives and interface unit disk and tape s/ware, manuals: £200ono. GW3UOO. (Buckley) 0244 550595

● KENWOOD VHF 2m multimode 711E, mint cond, boxed c/w manual and service manual. Hardly used: £295. Carr.extra. 0202 534933

● Mackay remote ATU: £50. Cash waiting. Free to museum, Creed INDS/INDC morse perforator reader units. You collect. Tim G4DNV. 0423 781446

● YAESU FRG7700, FRV7700, FRT7700: £275. Racal 117E SSB unit RA3H: £250. Yaesu FT2700RH, Daiwa CN460M, dual aerial, duplexer: £395. Advance digital multimeter: £50. Avo model 8: £35. Beomaster 900 tuner: £25. Eddystone 840A: £35. Armstrong A10HF amp: £20. Redifon SSB TX/RX GR410T, GR410 SSB radiophone, 12V pwr unit, test unit: £100. Labgear regulated pwr unit 700V: £35. Solatron digital voltmeter: £50. G1NAX QTHR. (Plymouth) 0752 775375

● JENNINGS vacuum variable cap. 12-500pF 7500V part no CSVF 500/UCSF-500-0207 from ITT. Tim G4DNV. 0423 781446

● BBC-B computer issue 7 with data recorder and some s/ware. Little used. Buyer to collect: £165ono. GW8JLY QTHR. (Cardiff) 0222 553842

● IRCs for sale: 40p each. G4YLO QTHR. (Shepton Mallet) 0749 813627

● SONY HVS2000P video mixer, as new. Orig.packing and insts. Service manual inc in price: £80. 70cm tvtr 432/28 MM unit. 10W output, ideal for packet use: £80. 144/28 cvtr MM unit. Separate 116MHz output: £15. PFIs working SU8 with spare batts and chrgr: £25ono. 10m SSB mobile tcvr. 28-29.5MHz, synth VFO, 10W RIT. Matches above tvtr, c/w DC lead and mic: £65. G4SZX not QTHR. (Thorne) 0405 813713

● CCTV camera, mains powered, video output: Offers. G4IVF QTHR. 0664 65985 day. (Oakham, Leics) 0572 812354 eve

● DATONG D70 morse tutor: £35. Also auto speech processor: £40. G4RHI QTHR. (Axminster) 0297 32572

● FT726 with 70/2/6/HF modules, satellite unit, CW filter, desk mic, manuals, orig.packing, recent SMC overhaul: £950. MM 100W 144MHz linear: £60. 17ele 144MHz tonna: £20. Rotator: £10. 6ele 50MHz create: £55. Rotator: £20. 30ft Dural mast 2in dia with guys: £20. 20ft Dural mast 2in dia, tatty: £10. 12ft tonna telescopic mast: £10. 2 Dural scaffold poles: £15. 50ft H100 coax: £7. 60ft Westflex 103 coax: £10. Moving to block of flats so goodbye VHF DX. G5NU QTHR. (Reading) 0734 871200

● YAESU FT203R h/held. Exc.cond. Orig.box: £140. Also Yaesu FT703R h/held, exc.cond, orig.box: £130. 1yr old. G7CHK. (Halifax) 0422 206682

● JST 135 tcvr 150W out, options 1.8kHz, 1.00kHz filters, bandwidth control, mic. NFG 97 ATU. Used RX only. Cost £1977. Sell: £1500ono. Icom 271E 2m basestation, Mutek F/E, VGC: £600ono. SM8 mic, unused: £65ono. BNOS LPM amp 144-10-180, mint: £300ono. Trio SM220 monitorscope, unused: £290ono. MFJ artificial earth: £50. Datong morse tutor: £50. Pocom PRM 1200 packet decoder, unused: £220ono. Hamgear PMX pre-selector: £50, mint. G6SFD. (Dronfield) 0246 413413 eve-w/e

● NRD525 RX with CMK165 VHF/UHF cvtr. Sony active ant LW/MW/SW. Diamond D130N discone VHF ant. All items as new. V.little use. Inst manuals for all items. Offers around: £900. G3LLZ QTHR. (Swindon) 0793 828188

● YAESU FT102 with matching tuner: £675. Inspection and test invited, delivery by arrangement. G3XFN QTHR. (Sutton Coldfield) 021-353 3364 anytime

● YAESU FRG9600 comm rcvr 60 905 megs. No mods: £300ono. As new. G1DKP QTHR. (Jarrow) 091-489 7939

● KRESSON RF generator 27.1MHz vacuum tunable caps with 5CX1500A and 3CX3000A7 valves max 4kW: Offers or exch for modern all-band rig. Also parts for auto tuning unit aerial. GW0ALR. (Camarthen) 0267 237078

● FT290R, nicads, chrgr, case: £225. MML144/30LS: £60. Tvtr MMT144/28: £100. MM 15dB attenuator: £7. 9ele tonna: £20. DNT 10FM conversion: £30. 25W amp: £15. 3ele 10m yagi, needs attn: £10. Tektronix type 545 scope: £25. Neil G4SEN. 0477 500296. (Congleton) 0260 275192

● TS820, VFO820, YF88HCW CW filter, h/books, no mic. VGC. Orig.boxes: £500ono. Ray, GW3MDK QTHR. (Colwyn Bay) 0492 530523

● 6M module for Yaesu FT726R: £210. Yaesu FT726R, 2m/70cm, sat modules fitted: £680. Both items together: £875. G0FAJ QTHR. (Weymouth) 0305 789022

● FT290, MBM, s/case, nicads, chrgr: £220ono. FT101Z c/w filter, fan, manual: £400ono. GM0GDL QTHR. (Alva) 0259 60477

● KENWOOD TS9130 all-mode 2m mobile tcvr: £180. QTHR. (Basingstoke) 0256 24969

● YAESU FT757GX c/w FP757GX PSU, MH1B8 mic, m/mount, Welz SP220 swr/pwr meter. VGC, boxed: £600. Yaesu FT23R h/held c/w FNB10 nicad pack, PA6 AC chrgr. 2x rubber whip ant. VGC: £185. GM0AVB QTHR. (Dumfries) 0387 50269

● YAESU FT290R, case, ant, nicads etc. Also combine 20W linear and preamp, Cirkit: £250. G7EAT not QTHR. (Amersham) 0494 727478

● FTDX401, exc.cond. Realigned, new PAs, no mods. Full legal pwr: £200ono. G3VGN QTHR. (Whitby, N.Yorks) 0947 602332

● ICOM micro 2E 2m h/held, case, chrgr, unused: £175. Various meters, enquire. 1kVA auto xfmr: £4. (Warwick) 0926 490897

● PK88 packet controller with Commodore computer with cables etc: £125. Post paid. M.Marsden, 205 Moss Lane, Burscough, Lancs, L40 4AS. (Ormskirk) 0704 892088

● RACAL RA17 rcvr. VGC c/w manual: Offers. G1EMJ QTHR. 0902 771909

● EDDYSTONE EC958 commercial rcvr 10kHz-30MHz: £650. Collins KW2A TX/RX AC/DC pwr units, 2nd VFO, carrying case: £750. Kenwood R2000 int VFO cvtr: £350. FDK multi U11 430MHz tcvr: £150. Standard C828M 2m transportable: £130. SX200 VHF/UHF scanning rcvr: £150. KW1000C linear amp: £200. KW2000 CAT SSB TX/RX: £150. Valradio 24VDC 230VAC 150W inverter: £85. Solarscope CD1014.3 scope: £185. (Ashtead) 0372 272486

● AMAZING offer. Complete and v.successful, HF DX station from mains plug thru to ant. Capable of 0.5kW on all bands. For less than the price of a modern tcvr. IC740: £550. IC720A: £550. IC2KL: £1100. AT500: £300. Altron telescopic mast: £250. TB2: £125. Rotator: £100. Complete station with either 740 or 720A: £2000. Tony Morgan. 0625 585254

● TB2 on 40ft telescopic wall mounted tiltover mast with planning permission. Attached to 4 bed detached house in East Grinstead, Sussex: £125k. Tony G0CJU. 0625 585254

● WEST German quality Fritzel triband beams. 2 remaining FB33 3ele 2kW with 7/10MHz add-on kit: £275. FB33 3ele 5kW trapless driven full size elements tribander: Offers. Ants, new, boxed and better quality than most tribanders. G0JSM. (Leyland, Lancs) 0772 622009

● ICOM 740 inc int PSU: £580. SM5 desk mic: £50. Trio R2000: £450. Scanner SX200N: £250. Code Master CWR600: £100. Tono 5000E: £350. GW0AQR QTHR. (Caernarfon) 0286 3576 6-7pm eve

● ICOM IC290D 2m multimode with mains PSU and unused 7ele ZL-special beam: £380. Also BSX2 TNC board with AM7910 modem chip: £35. Prefer buyer collects, but delivery 20 miles possible. James, GM0ICP at University so not QTHR. 031-667 1971 x3024 Room 512. (Edinburgh) 0721 21787 after Dec 16

● 2M/70CM h/helds, TR2500, TR3500 fist-mics. Quick chrgrs, m/chrgr. 2m: £150. 70cm: £200. Creed printer free. Linear valves 572B/TT60L: £20. G3LZN. 05643 2014 or 03267 4463

● TS430S: £620. PS430S: £130. AT250, auto ATU: £220. Will haggle. G3DYY QTHR. (Huntingdon) 0487 841558

● YAESU FT707 tcvr, Yaesu FP707 PSU. Both unused 5yrs: £425. Trio TR2300 2m trans inc chrgr, Kenwood VB2300 10W pwr amp, Pye 75-150W reflectometer: £125. Jaybeam colinear on 10ft pole: £30. Datong D70 morse tutor: £40. 01-776 0077

● RCVR NRD515, orig.packing and manuals: £575. Active ant ARA30: £60. Audio filter FL3: £60. Aerial coupler AT1000: £15. (Tunbridge Wells) 0892 36026

● MARCONI prof HF RX H2540, 1-30MHz, 1Hz readout 1980 DOM SSB ISB filts 2.4, 1.2, 500, 250. Histab osc FSK carrier AGC full spec, manuals: £550. Mint KWM3 line: Offers. VAC variables. No time wasters please. G3YFK. (Shrewsbury) 0743 884858

● FT101ZD 6-bands, SSB/CW, 600Hz CW filter, fan, mic, manual: £395. KW107 Supermatch ATU: £85. G4VIW QTHR. (Hornchurch) 04024 45199 eve-w/e

● STANDARD C8900 2m/FM tcvr 10W, box, manual: £120. Bremi 3A PSU: £10. Lightweight rotator and 2m 5ele yagi: £20. G0CZB. (Hitchin) 0462 434552

● ALTRON AQ620 3ele beam spacesaver ant for 6/10/15/20m. Exc.cond with inst: £100. Semiconda68 rcvr 10-80m, works on 12V: £55. Scope Telequipment S54 single beam DC-10MHz probe, manual. GWO: £55. Prefer buyer collects. G0JMM QTHR. (Ilford) 01-554 3492

● DRAGON 32, G4BMK RTTY s/ware TU: £60. IC02E boxed, s/case, spare nicads: £175. 18AVT/WB weatherproofed: £50. G4AFU. (Penrith) 09312 514

● FL2100Z linear, spare tube: £500. Buyer collect. (Manchester) 061-370 6836

● HW7 Heathkit QRP rig. Unmodified: £50. Rotator, believed working: £5. DC30P mostly built QRP rig with paperwork: £45. G4RBP QTHR. (Lee-on-the-Solent) 0705 553551

● HEATHKIT SB101 with HP23 PSU, h/books: £220. Heathkit HM102 swr/pwr meter 100-1000W, h/book: £25. Osker SWR200 swr/pwr meter: £25. AT1000 SWL ATU, plus info: £30. LSG17 RF sig.gen 100kHz-150MHz or 450MHz on harmonics, h/book: £60. Yaesu YD148 desk mic: £15. Kenwood RZ1 mobile-base scanner 100kHz-990MHz, no gaps, h/book, boxed: £310. Telequipment D53A, suspect timebase fault, type BJD Y.Amps, manual: £25. Buyer collects or I will arrange carr at cost. Martyn, G4VAO QTHR. (Norwich) 0603 872853

● TRIO TS520 HF tcvr with Shure mic, manual and orig.box. Good cond: £360 inc free delivery. MFJ Versatuner ATU: £50 or both for: £400. Free delivery. Dean, G0JQR QTHR. (Ashington) 0670 819297

● YAESU FT221R 2m multimode with Mutek F/E board: £325. Drae 13.5V 24A PSU: £100. Tatty 16ele tonna: £5. (Dursley) 0453 860151

● YAESU FT101Z 160/10m JJV/WWV, aux. VGC. Little used. plus 3 output valves, w/shop manual: £275. (Stockport) 0625 874049

● FT101E mic 600HZ CW filter. Manual, boxed, good cond: £325. G4FVD QTHR. (Windsor) 0753 856678

● FT102 tcvr, FC102 ant tuner. Both mint cond, boxed: £695. FT708R c/w NC8 chrgr, PSU: £195. G4STW QTHR. (Scunthorpe) 0724 862569

● COMMODORE 64 computer, C2N Datassette, pwr pack, manuals: £80. G0ELG QTHR. (Croydon) 01-689 7432

● GERMAN suitcase radio, unusual inverted valves and cast construction. Would interest collector: Offers. G8KDU QTHR. (Herne Bay) 0227 367270

● MM modules RTTY TX MM4001 keyboard and small printer: £150. Yaesu FT480R 2m multimode: £250. FT790R 70cm multimode with matching linear: £275. Would consider exch small 70cm mobile TM431E or similar. Also 2m h/held FT23 or similar. G4IUT. (Newport, Shropshire) 0952 79235

● 2M Yaesu FT227R. VGC. Slim Jim 5/8 ant. Good way to start on 2m FM: £90. G3ZLG. (Bristol) 0272 685860

● ICOM IC490E, 70cm multimode 1/10W. Exc.cond. Only used in shack. Box and accs: £300. Mark, G0KHZ QTHR. 0482 665589

● SUBSTANTIAL commercial log-periodic ant with data. 13ele 50-500MHz FWD 7dBi F/B 15dB 500W PEP 50ohms SO239 boom 2.5m: £40. G1EEH. (Crewkerne) 0308 68598

● HOWES HC266 2-6m tvtr and 5ele tonna ant: £140. G0KOG QTHR. (Northampton) 0604 51928

● FT690R 6m multimode with RN Electronics 25W PA: £270. RN Electronics 6m tvtr 25W output 2m IF: £135. G8IFN. (Witham) 0376 515318

● AR88 gen.cov rcvr. CPTE with h/book and reme manual. Buyer collects: £50. Gordon, G1YLC QTHR. (Gloucester) 0452 617595

● KENWOOD TS930S built-in tuner AT930, 2x CW filters. Collins 30L1 1kW amp, modified for full electronic break-in with the 930. Both immac. Prefer not to split: £1850 or offers. Racal 9903 50MHz counter/timer: £100. Green 2601 300W termination wattmeter 50ohms: £100. Fluke DVM 4.5 digit 8050A: £150. Farnell dual PSU LT30-2 2x 30V/2A: £50. Leak Stereo 70 amp, Akai CSM3 cassette deck, Integrex VHF tuner, Celestion Ditton 15 spkrs, Sony CDP101 CD player, minor fault: £180ono the lot. Sony music centre/tape/radio: £40. Chinchilla cat, exc pedigree, born Feb 89, breeding/pet: £150. 3 bed detached bungalow 1yr old, 5mins M1, quiet area, many features. Ask for details: £95000. All items open to offers. Dale G3VMK. (Nottingham) 0602 736149

● YAESU FRG9600/RWC scanner. Modified 0.1-950MHz, all modes, unused, still boxed, with manuals. Immac, must sell. Offers. (Torquay) 0803 64139

● TH3 Jnr beam with BN86 balun. TS830S, hardly used. Spare valves, orig.packing, no mods. Best offers. G3RNV. (Stockport) 061-477 0315

● TS520S HF tcvr plus Yaesu YD148 desk mic. CW filter fitted, switchable. Little used, exc.order: £350. No offers, buyer to inspect/collect. Yaesu mobile ant, plus gutter mount, 144MHz with 7MHz loading coil: £20. G4EHT QTHR. (Lichfield) 0543 251133

● TONNA ants 435MHz 21ele. 2 off with phasing harness and pwr splitter: £75. Buyer collects. G8GYS QTHR. (Andover) 0264 56429

● YAESU FT77S 10W compact HF rig c/w FM, cal, mic, CW filter: £350ono. Unwin, G0FMT QTHR. (nr.Cambridge) 0763 261215

● HEATHKIT W100 HF tcvr with H/B PSU: £180. Standard C58 multimode: £180. KW Ezeematch ATU: £45. Rotator: £45. 70cm 7ele x-yagi ant: £15. 2m 5ele x-yagi: £15. Spkr: £5. Ant poles and brackets: £35. PSU 3A: £5. Going QRT. (Chippenham) 0249 659042

● YAESU FT690R2 with FL6020 linear, as brand new in box: £325. Mutek TVVF144A 144MHz tvtr, new type, boxed: £175. No offers. Buyer collects. G6OWX QTHR. (London) 01-691 2040

● YAESU FL2100 HF linear amp: £350. 3 QY3-250 plus bases, heater xfmr: £30. 80m CW transmitter 6W: £15. G3TSO. (Cirencester) 028575 532

● FTDX401, spkr, spare PA valves, h/book: £200. RT7/APN1: £25. MN26A, indicator, control box: £25. R208, LF cvtr: Offers. G0JNT QTHR. (Grimsby) 0472 752794

● MARCONI marine Atalanta RX. 14kHz-28MHz. Int PSU and spkr. Recently re-aligned. Almost mint cond: £130. Can deliver locally otherwise prefer

buyer collects. Also Loran C RX: £25. Seacall, selective call unit: £15. G4YXX QTHR. (Wincanton) 0963 32389

● TRIO R600 HF rcvr, c/w manual and box. Exc.cond: £180ovno. Dave G0BBJ. 0705 696380 eve

● ICOM M2E handheld and speaker mic £160. Trio 2300 handy talkie 2m £100. Motorola 120W linear PA £60. H/duty 25A 12V PSU £30. 6-ITT Starfone UHF handheld, chargers+batteries £25. 100ft LDF4.50 cable with 'N' types £40. 138.175MHz colinear 144 £10. LX80 printer £60. Data test set £30. G8LXI, 01 981 3518.

● OSCILLOSCOPES. Tektronix types 503, 547. Solarscope type CD-614. Best offers secure. G7CAU, 0920 830112 (answerphone).

● DRAKE TR-4C/W HF rig with MS-4 speaker and PSU. Ex condx with desk mic, speech processor and manuals. £395. G4NMP, 0709 554665 (Rotherham).

● COBRA ON 10m with manual, £80. GW3UMD, QTHR. Tel: 0222 761813 (Cardiff).

● PK-88 PACKET controller with all leads and operating manual, £85 (P&P extra if required).

● ALINCO ALR72E 430MHz FM mini mobile 25W 21-memories scanning dual VFOs, many other features c/w mobile bracket. All as new, boxed. 3 5/8 70cm colinear, boxed, never used outside. Hansen 2/70 swr/pwr meter boxed unused (over £70 new) all for £349. May exchange for IC251, FT101ZD, FT77, FRG8800 or WHY? Ian G1HQK, 01 517 8277.

● TRIO TS930S transceiver and Trio station monitor SM220. Seen working by arrangement West Sussex. G2ALO, QTHR. £1125 complete. Buyer collects. 0903 742146.

● FOR sale or exch. Commodore C128 computer, disk drive, colour moniter, printer, all cables, boxes. As new. Also joysticks Expert cartridge games, W.Pro etc. Paper. All mint cond. For modern rcvr Trio, Yaesu, Icom etc. Larkspur outfit, complete, mint. C11 TX R210 RX, mains PSU, ATU, cables, mic, phones, junction boxes. Manual, works FB. £200. Or with C128 outfit for better RX or TX/RX. (Mansfield, Notts) 0623 29473 eve-w/e.

WANTED

● EARLY wireless sets wanted. Also horn speakers, xtal sets, unusual shaped radios, early Ham rcvrs. Any cond or incomplete welcome. Also early books, components, catalogues, Wireless Worlds. Drake MS4, Sherwood filters. James, G4ERU, 5 Luther Rd, Winton, Bournemouth. 0202 510400.

● YAESU FT227R, FT480R. 6 wanted urgently. Ken G4IZW.

● GOOD clear photocopy or orig PCB layout of Withers conversion kit for Storno CQM713. Will pay all costs. G4KEL QTHR. (Morden) 01-330 0695

● 3AFP31 CRT for Heathkit OS1 scope. MI29011 BCD chip for Marconi TF2670 digital multimeter. G3MWO QTHR. (Beyton) 0359 70218

● WIRELESS set No.48. Also No.18 and 21. Any units for W/S No.52. Morriss, G4GEN QTHR. 0825 712205

● VFO230 ext VFO for TS830. Must be mint. GW3TMP. 0244 549563 ansaphone anytime

● PAIR Type-J field phones in GWO and in good cond. Stuart, G4GTX QTHR. (Sunderland) 091-528 4435

● ICOM 751A or 751 tcvr. Also PSU SM6 desk mic. WHY? G3XNE. (Bude) 0288 354564

● OPERATORS service manual, technical data for Nippon Alpha model W63 2m FM rig, or info leading to same. 0324 35081 day. (Livingston) 0506 416365

● ICOM IC240, unmodified in perfect WO and good cond. With mount and mic. Paul. (Broadstairs) 0843 61448

● DATONG multimode filter model FL3. G0HHH QTHR. (Kidderminster) 0562 67026 anytime

● RAF air publications relating to radio radar and navigation equip. Exc. price offered. Write or phone anytime. Many thanks. M. Gee, 17 Foxley Cl, Mountford Est, Ferncliff Rd, Hackney, London, E8 2JN. 01-790 2846 or 01-254 9083

● SERVICE manual or cir.diag for Datong FL3 filter unit to help overseas amateur who's ancient unit does not merit the cost of post to Leeds. Roger, G0GXS QTHR. (St.Ives, Cambs) 0480 300255

● TS940S int ATU preferred but not essential. Cash waiting. FT726 with case adjustment if required. Harvey, G4YNI QTHR. (Manchester) 061-740 7708

● BIRD 43 thru line VHF plug-in module. Consider any freq. range if cheap. 3 slow motion drives. Alan G6ZYG. (Rushden) 0933 318493

● FAULTY or incomplete Racal RA17 rcvr for spares. Also AR88 in similar cond. Will arrange collection. Steve G3YFG. 0254 823305

● ANY Grundig reel-to-reel recorders from TK1 to TK2200 plus manuals and mics. Any cond. Also wanted, wire recorders and horn loudspeakers. Mike G8CTJ. (Virginia Water) 09904 3025

● NEEDED to refurbish TS900. CW filter YJ3395C. Any plug-in circuit boards or parts. G3OPJ QTHR. 0643 821322

● DOUGLAS or Avo coil winding machine suitable for fine gauge wires. Also old, pre-1950, spark plugs and associated tin boxes. Martin, G8NWZ QTHR. (Wellingborough) 0933 73611 after 6.30pm

● SERVICE and/or operators info for Minolta photocopier model Regma 1600E. Also paper, toner etc. G3WLY QTHR. (Portsmouth) 0705 257171

● TELEVISION Engineering by JC Wilson 1937. £20 paid for clean copy. G2KU QTHR. (Croydon) 01-657 1126

● 70CM h/held or mobile FM rig, will swap FT23R with extended freq.cov and spare batt pack with chrgr. Service manual or any info on Sperry Univac printer type 0786 NFPA type II, made in W.Germany. G3HCM QTHR. (York) 0759 318408

● EMOTATOR model 103BLX ant rotator. Complete system or motor only. Must be in good cond. G3AAE QTHR. 01-508 3669

● RACAL 1720 transmitter drive unit. Any cond, anything considered. Also RA63. Racal SSB adaptor. Cabinet for Racal RA117. Distance no object. (Bromley, Kent) 01-462 4461

● DRAKE MN2700, Drake MN2700 ant tuner unit. Urgent. Drake PS7 PSU Urgent. Top cash price paid. Please call anytime. (Notts) 0602 609345

● AVO or Douglas coil winding machine. Also pre 1950s sparkplugs and tin boxes. Also any sales or technical literature, catalogues etc, relating to sparkplugs and magneto ignition equip. Martin, G8NWZ QTHR. (Wellingborough) 0933 73611

● B2 TX/RX working or not, but reasonably complete. PSU not necessary. G3LYU QTHR. (Leicester) 0533 876459 after 6pm

● BNOS 144MHz lienar and preamp 3W in 180W out: £250. Yaesu FT790R, nicads, case etc: £250. Mutek 50MHz tvtr 144MHz IF: £200. MM 1296MHz tvtr, 144MHz IF: £150. SSB electronics 23cm linear: £90. All exc.cond. Hokushin 2m/70cm diplexer unused: £25. Rotator speed controller kit, see Radcom Jan 86: £25. Pye PFI pocketphones RX and TX, chrgrs, etc. Details, G6MXL QTHR. (Poole) 0202 665284

● VALVE type QQVO3-10. G3KH QTHR. (Leicester)

● KENWOOD/Trio SP930 spkr. G4ARI QTHR. 0530 243258

● IC202 wanted for IP expeditions on Scottish mountains. Tom GM0GMD. (nr.Sterling) 0786 825441

● POCKET watch type meters. Popular in the 1930s. Any make or type wanted for my collection. Condition not too important. Any reasonable price paid. Terry G4FET, 9 Lyndhurst Ave, Hastings, Sussex. 0424 436546 eve

● EDDYSTONE. Wanted, pre-war radios, components and orig paper work. Damaged or not. Nick. 01-852 4065

● 70CM module for Yaesu FT726R. Len G7EHM (Kettering) 0536 514544

● PYE BC34 pocketfone PF85 chrgr and PF85 leather case. Spare batts or WHY. Old car radio. Prefer valve type. (March) 0354 741168

● OST mags 1988 to present. G3UGL QTHR. 0234 750050

● R408 must be EWO especially film scale. G3ICB QTHR. 0635 64345

● WE316A doorknob tungsram 015/400 or similar, and Arcturus blue glass valves. Also needed, 10 and 211 TX valves. Bernard Litherland, G4IMT QTHR. 0225 891254

● FL200B, Sommerkamp, cir.diag or w/shop manual to buy, borrow or copy. Dave, G0FEH QTHR. (Leamington Spa) 0926 452085 eve

● ZVC or CLF board required. Completed, partly completed or PCB only. G3ZLF QTHR.

● MMX1268/144 satellite TX up cvtr Oscar 10. G0DLC QTHR. (Bideford) 0271 476109

● YAESU FT107M owner requires DMS107 mem unit in GWO. Clive. (Hull) 0482 644516 eve

● AT180 ATU and inst book. QTHR. G3MTB. (Barton-on-Humber) 0652 635310

● HROM gen.cov and bandspread coils. Also case. Yaesu 902DM mem unnit PI choke for 600W linear. G3GDC. (Plymouth) 0752 403551

● Operating maint, manual and cir.diag for Philips dual-beam scope PM3203. G4CHO QTHR. (Horndean) 0705 597188

● KENWOOD VFO230, digital ext VFO for TS830/530. Must be mint, boxed etc. Immediate top cash price paid for the right unit. G0KPH QTHR. (Leamington) 0926 429719 anytime

● KW Ezeematch in good cond. GM4SSA QTHR 88-9. (Hillswick) 080623 291

● FRV7700 cvtr model Bravo, FRV7700 cvtr model Delta, FRT7700 ant unit, FF5 CW filter. G3ZJH QTHR. (Bristol) 0272 691025

● DRAKE R4245, RR3, DSR2 or R7A. Any cond, would import. (Shrewsbury) 0743 884858

● SPARES for emotator 103LBX. Need outer casting. Any other parts not essential. (Manchester) 061-370 6836

● RX F/E module for lowband FM Pye Olympic. Manual or data on Storno CQL634 tcvr. Control box and cable for Pye W20 Whitehall. Data on Pye Dual Westminster controller, ex WD. Commercial dipole or similar base ant for 70MHz. G3VKM QTHR. (Norfolk) 0502 77622

● ANY ex-PMR equip tuned and converted for use on the 70MHz band, particularly interested in AM gear, either base or mobile. The more pwr out the better. Must be in GWO. G8GZZ QTHR. (Woking) 0483 723506

● EDDYSTONE EP14, EP20 or EP17R panoramic display unit. All letters answered. UK cheque paid. DJ0OS, Waldstr.57, D-4902 Bad Salzuflen, Germany.

● KW-107 ATU and PALM IV in good working order. Tel: 021 445 3207, John, G4OJS.

EXCHANGE

● PK232 May 88. All leads BBC ROM, PC Fax, PC RTTY s/ware. Trio CO1303D 75mm scope WHY or offers. G4LTH. (Corringham) 0375 674301

● NFD pwr problems? We have 7kVA diesel generator to sell or exch for FL2100 linear or equiv for Northern contest group. Buyer collects unless you have what we want. G4WSE QTHR. (S. Wirral) 051-339 0842

HELPLINES HELPLINESHELPLIN

T1154M TRANSMITTER

Greetings from the Helplines department; we hope you have a happy and successful New Year and that all your projects work first time! Let's begin with a letter from Mr P Quested, G0DRT, who writes "I am just completing restoration of a T1154M transmitter but am having problems with a supply of valves for it - i.e. two VT104s and two VT105s. I wonder if anyone can help me with these? If necessary, I am prepared to purchase another T1154 in order to obtain the valves. I am also looking for a female connector for my Collins TCS12 transmitter, which is otherwise in working order - albeit with a lash-up of wires. I can be reached on 0795 876277". Can anyone assist? Mr Quested is at 252 Barton Hill Drive, Minster, Sheerness, Kent ME12 3LZ.

SOURCES OF OLD MANUALS

Now a little help for others. Mr B Castle, G4DYF, says "In the November Helplines I asked for information about any successor for Mr A J Brooks in providing photocopies of out-of-date equipment manuals. I should like to thank the eight people who have very kindly written and telephoned. Their messages are summarized as follows. All stock and goodwill was taken over from Mr Brooks, when he retired due to ill health about two years ago, by Mr Ken Bentley. His address is 27 De Vere Gardens, Cranbrook, Ilford, Essex IG1 3EB - telephone 01-554 6631. A catalogue of service manuals dating back to 1935 is also available from Mauritron Technical Services at 8 Cherry Tree Road, Chinnor, Oxon OX9 4QY - telephone 0844 51694." Thank you sir - nice to know that our readers helped.

You also helped Mr Bill Rogers, G1UOR, who wrote "May I thank, through your column, the following people who very quickly answered my request for a circuit diagram in the October Helplines; Ray Hills, G2BDA; Dave Thornton, G1ASR; Robin Scadden, G3TFM; John Mattison, G6LWR; Allan Taylor, G3JMO; and F Inman, G0LTL. It has taken four years, including a letter to Japan (which went unanswered) to obtain this information, which can only prove - after one short letter to Helplines - that the amateurs run a better service than the professionals. Long may your meter read 59+!" Well done, all - let's hope we can keep up the good work.

GELOSO R209

A plaintive letter from Mr T Hackworth, G0IXR, says "Can anyone help me obtain a copy of the circuit diagram for a Geloso R209 receiver? I have problems and need it urgently. All expenses covered." Anyone out there with a copy? Mr Hackworth is QTHR and his telephone number is Nottingham (0602) 212967.

ECKO BATTERY ELIMINATORS

Mr M J Shepherd, G8YZW, writes "I have two old Ekco Battery Eliminators, types AC18 and AC25. As obtained, some internal wiring was missing and the multi-section block capacitors are so leaky that I cannot obtain any usable reading - so I need to know what the values were. Can anyone help me with information on these items?" Sounds a trifle tricky - any Ecko battery eliminator experts reading this? Mr Shepherd's address is 66 Westerland Avenue, Canvey Island, Essex SS8 8JS.

MILITARY EQUIPMENT

Another power supply poser comes from Mr I G Mant, G4WWX, who says "Please can any reader help me concerning an ex-Army surplus power supply unit marked 'Power Supply Test Set No 6625-99-949-5448'. This equipment was originally used to provide a variable-voltage supply to man-pack radios such as the A41/42 series whilst they were undergoing bench servicing. It consists of two units - a mains PSU and a control panel with four meters, joined by a multi-way cable. I urgently need the circuit diagram or, if possible, the REME service sheets (EMERs) and also the original kit of connecting leads. Also, can anyone provide me with information on the transistorized inverter unit which replaced the rotary transformer in late models of the Wireless Set No 62?" Hmm - any ex-Army or TA readers with the requisite information? Mr Mant's address is 28 Welbourne Road, Childwall, Liverpool L16 6AJ.

Another reader seeking assistance with ex-military equipment is Mr M G Taylor, G3UCT. He's currently restoring a Wireless Set (Canadian) No 29 and would like to hear from anyone who has any connectors for this set - or indeed anyone who has restored a WS C29 in the past. Write to him at 'Wychwood', 27 Glen Road, Fleet, Aldershot, Hants GU13 9QD.

GORDON HIGHLANDERS

Mr John Campbell, GM4WQQ, throws down the gauntlet in his letter to us; he says "I managed to get this request on Channel 4 Oracle but so far no response. Let's see if Helplines will do better!" Of course it will, sir. Mr Campbell writes "I would be obliged if through you I might be able to get in touch with some of my old wartime (1939-46) comrades. The Gordon Highlanders was my regiment but most of my service was with GHQ Liaison Regiment (Phantom). If at all possible I would like to hear from any former members of 'E' or 'L' Squadron". Well, chaps - we've got to do better than Channel 4. Mr Campbell didn't give us his address and the Callbook simply says 'Station located near Glasgow', so any information to RSGB Headquarters please and we'll pass it on.

MARCONI ECKO SIGNAL GENERATOR

Now a cry for help from Mr W G Mott, G4KLP, who says "I am in the process of renovating a very old standard signal generator manufactured by Marconi Ecko Instruments Ltd - possibly prior to 1939 as it contains come capacitors manufactured in Germany! I have been in touch with Marconi but unfortunately they cannot help as their old records have been destroyed. The instrument is similar in appearance to a TF144G but has a slightly different panel layout. The main frequency dial is calibrated from zero to 180 and the AC power plug is at the rear of the cabinet. The valve line-up comprises three type AC/P and a UU4 rectifier, all of which still function within specification tolerances!

"I would like not only to identify the generator but also to get hold of a circuit diagram, handbook or any helpful information. My efforts to find an appropriate RF output coaxial plug have also been unfruitful, so perhaps a member could solve that problem. Eventually I have to draw up some graphs for frequency calibration. It is interesting to note that once the instrument has warmed up, it appears to be rock-steady. This is surprising for such an ancient piece of equipment, although it is built like a battleship and is almost as heavy!" Ah - they don't make them like that any more, sir. Who invented these beastly synthesizers anyway? Mr Mott is at 9 Grampian Way, Oulton Broad, Lowestoft, Suffolk NR32 3EP - and we'd be interested to hear of the outcome.

PHILIPS REEL-TO-REEL

Mr S Ainsworth, G0HTP, has a problem with a Philips reel-to-reel tape recorder type N4515. He says "The playback/record function has failed on this machine, which is about 11 years old. Otherwise it's a super machine, in excellent order. The service manual, which I have succeeded in obtaining, is no help, and the machine seems too good to discard. I should like to contact someone (an ex-Philips engineer, maybe?) with an intimate working knowledge of the electro-mechanical servo and who can give me some advice or point me in the right direction. All replies acknowledged and postage repaid". Anyone assist? Mr Ainsworth is at 494 Overpool Road, Ellesmere Port, South Wirral L66 2JJ - or ring him on 051-355 2833.

THORN EMI SCOPE

A short note next from Douglas Byrne, G3KPO, curator of the Wireless Museum on the Isle of Wight. Douglas needs information on the Thorn-EMI oscilloscope type WM18 - his address is 52 West Hill Road, Ryde, IOW, PO33 1LN, and his telephone number is 0983 67665. Doug's museum is a fascinating place, incidentally, and well worth a visit if you're anywhere near the Island - do try and help him if you can.

GOLDEN OLDIES

Another short note from the redoubtable Geoff Watts, BRS3129, asks "Does anybody know the address of any firm that deals in new or secondhand 'oldie' cassettes? Please write to 62 Belmore Road, Norwich NR7 0PU or ring 0603 33103.

EDDYSTONE SPEAKER

Some of the remarks in a letter from Mr R Williams, RS6072, had us in fits of laughter. He claims to be getting 'old and senile' but it doesn't sound like it to us - far from it! The gist of it was that Mr Williams is looking for an Eddystone circular speaker, in any condition. He says "...In my time as an SWL I must have had 5 or 6 of them from the days when I had a 640, and for purely sentimental reasons I would dearly love to see one on my shelf again. I'd say regardless of price, but as a disabled OAP within reason. Can you find it in your heart to give me a mention?" Of course we can - anyone got an Eddystone circular speaker at a reasonable price? If so, let Mr Williams know about it. He's at 62 Kingscliffe Road, Grantham Lincs NG31 8ET - or ring him on 0476 66047.

ISLE OF LEWIS INFO

Mr A S Gawthrope, G1SWW, says "I am planning an expedition to the Isle of Lewis in the first quarter of next year. We would be looking for a location opposite Stornoway on the western coast and it is hoped that we will be operational on HF and VHF. I am currently seeking information on the island. For example, on the north-western corner there is a radio station locally called 'decker'. It would be very useful to know what part of the radio spectrum this is in so that we don't cause any interference. Also, prior contact with other amateurs on the island would be useful". We suspect Mr Gawthrope is thinking

of the 'Decca Navigator' LF navigation system and, if we remember rightly, the one on Lewis is the 'Green' transmitter of the 'Hebridean' chain 8E. That would put it on somewhere near 80kHz. Any other information should go to Mr Gawthrope at 16 The Paddocks, Normandy, Guildford, Surrey GU3 2HA.

HEARING-AID WINDSHIELDS

Next, a letter from Miss Ida Johnston of 63 Ballygowan Road, Belfast BT5 7LJ, who says "I am a user of a National Health-issue hearing aid. Please let me know whether, in the course of your work in connection with radios, etc, you have been able to solve the problem of 'wind boom' in microphones. Most hearing-aid users seem to have to contend with the noise of the wind in the microphone on stormy days. It would be very helpful if this difficulty could be overcome". We seem to remember from our broadcasting days that the usual solution involves a rather cumbersome 'windshield', although in studios a foam plastic fitting over the microphone tends to cut down some of it - anyone got any better ideas? Unfortunately we're not familiar with the microphone technology fitted to hearing aids - can anyone be of more assistance? Please drop Miss Johnston a line if you can help.

TRIO R300

That old Trio R300 receiver is still bringing letters in to 'Helplines'. Mr T McKee, GW7FRD, writes "Any information on this receiver would be welcome, especially a source for obtaining an amateur bandspread drum". Seems we could really do with an article about this machine - or just a set of notes which we could work up into an 'In Practice' feature, as we said last time. In the meantime, Mr McKee is at 15 Pen Y Fan, Trallwn, Swansea SA7 9XB.

CODAR AT5

Mr J F Hackett, RS32138, says that he is restoring a Codar AT5 AM/CW transmitter and its 250/S power supply and wonders whether anyone could furnish him with a circuit diagram, operating manual or "...whatever information is available on this once-popular 160/80-metre rig. I will meet any costs incurred - please write to me at 42 Central Avenue, New Basford, Nottingham NG7 7AF or give me a ring on 0602 606552". Nice old rig, the AT5 - good luck with it!

DE-SOLDERING STATION

Here's an offer that some won't be able to refuse. Mr M Rogers, G4RGB, of 662 Maidstone Road, Wigmore, Gillingham, Kent ME8 0LH, says "Please could you let readers know that I have in my possession a de-soldering station that I am prepared to lend to members - or alternatively I can remove multi-leg components from individual PCBs myself. I don't want to send the unit through the post since it is rather heavy and it would have to be personally collected". What a splendid chap - have you ever thought of moving a bit nearer Potters Bar? You can ring Mr Rogers on 0634 30822.

LONG-LOST RELATIVES

And finally for this time, a sad letter from Mr R Burton, G1RAY, who writes "It would be greatly appreciated if any help could be offered to bring a family together again. My wife's family unit split up in March/April 1939 in Kidderminster; Mary has not seen her mother, elder brother or sister since that date. Mary was put into care and we believe that the mother and two children returned to the London area - possibly Uxbridge, Viewsley or Ivor. Our efforts to trace them, with the help of both the BBC and the IBA, have been fruitless - hence this appeal to 'Helplines'.
"The mother's name was Mary Ann Elizabeth Smith, born 1912 and a London area market trader. The brother's name was George Smith, born between 1928 and 1930 and the sister's name was Nellie Smith, born between 1931 and 1932. The father's name was George Moseley, who died in 1936 aged 34 years in Hillingdon Hospital, Uxbridge". Mr Burton adds "Your help would bring peace to one very troubled lady". Anyone for which any of the above rings any bells at all is asked to write to Mr Burton at 108 Wolverton Road, Rednal, Birmingham B45 8RN.

Mr Editor Bobbett is beating me about the head again and muttering about space, so we'd better sign off for this month. Keep those letters coming in 1990, and let's try and make it the year when no request for help goes unanswered.

Helplines is designed to help put people in touch with each other. If you have a problem, it's more 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 there to help you and to give you the opportunity of helping others. Write to us marking your envelope 'Helplines' and we'll do what we can to get the message out.

CLUB NEWS

DEADLINE - Items for inclusion in the MARCH 1990 issue must be sent to HQ marked "Club News - DIARY", to be received by 20 January 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

▶South Bristol ARC - 3, photographic equipment evening; 10, HF activity evening; 17, Bristol Rally planning evening; 24, soldering iron evening; 31, planning evening - Lundy expedition.
▶Weston-Super-Mare RS - 8, AGM; 15, constructors evening; Feb 5, talk by Ray Mason on his experiences as a radio operator with the wartime SOE; 19, constructors evening. Details 0934 514429.

BERKSHIRE

▶Maidenhead DARC - 4, talk "Radio Pagers" by Dave, G4CGS; 16, equipment clinic; Feb 1, new equipment evening. Details Maidenhead 25952.

BUCKINGHAMSHIRE

▶Aylesbury Vale RS - 10, Christmas/New Year club dinner. 8pm, The Plough, Tring Road, Aylesbury; 24, AGM; Feb 7, surplus equipment sale. Details 0280 817496.

CLWYD

▶Conwy Valley ARC - 4, talk & demonstration "Power Supply Construction - Making Your Own PS" by John Lawrence, GW3JGA; Feb 1, talk "Keyers" by Brian Clark, GW3HGL.

CO FERMANAGH

▶Loch Ern ARC - ***NEW SECRETARY*** Mr. A.R. McGee, GI0BFD, 15 Glenwood Gdns, Carrigans, Enniskillen, Co Fermanagh BT74 NYC.

CUMBRIA

▶Carlisle & DARS - ***NEW VENUE*** Morton Community Centre, Wigton Road, Carlisle. 7.30pm every Monday except Bank holidays. Weekly Morse class.
▶Eden & DARS - 24, annual dinner. Details 09312 514.

DEVON

▶Plymouth RC - Meets 7.30pm on Tuesdays at Frederick St Centre Plymouth (just off King St). RAE & Morse classes. Club station & library. C&G examination centre for RAE. 2, construction cup; 9, visit to Poly (Radio Eng. dept) TBA; 16, activity night; 23, talk "Contest" by Laurence Mason, G4HTD; 30, activity night; Feb 6, talk "Marine Mobile" by Mike Charlton; 13, activity night; 20, talk "Archives" by Alison. Details from Bob Slater, tel: 0752 361842.
▶Torbay ARS - 5, 12, club nights; 19, monthly meeting followed by construction competition judging; 26 club night; Feb 2, 9, club nights; 16, monthly meeting followed by talk"Filters and Cavities".

DORSET

▶Flight Refuelling ARS - 7, talk "Antennas" by John, G0API.
▶Plessey Christchurch ARS - 11, talk "Radio Air Navigation" by G8REZ.

EAST SUSSEX

▶Hastings E&RC - 17, talk "MI6 & Pirate Radio on the Thames" by Mr. T. Albury.

ESSEX

▶Braintree & DARS - 15, talk "Electronic Informaion Gathering" by Henry, G1GMM; Feb 5, film show "Caribbean Hot Nights" by John, G3OLO.

GREATER LONDON

▶Acton, Brentford & Chiswick ARC - 16, AGM.
▶Biggin Hill ARC - 16, AGM. Details 01 462 2689.
▶Edgware & DARS - 11, AGM; 25, informal. Details Hatfield 65707.
▶Southgate ARC - 11, talk "Compact HF Antennas" by Tony Preedy, G3LMP; 25, club videos of 89; Feb 8, talk "Sporadic E Propagation" by Jim Bacon, G3YLA.
▶Wimbledon & DARS - 26, night on the air; Feb 9, Test Your Own Equipment - Nick, G6AJY.

GREATER MANCHESTER

▶Eccles & DARS - 2,talk "192 - Directory Enquiries" by G7ELA; Feb 6, discussion "Club Stand at the Norbreck Rally", chairman G8KRG.
▶Stockport RS - 10, talk "Micro RX" by W. Shaw, G3SHW; 24, talk "Better Reception of AM and SSB Signals" by Ian Butterworth, G4B20; Feb 14, talk "Magnetic Antennas" by Don Powell, G0FHI. Details 061 439 3831 or 061 480 3236.

HAMPSHIRE

▶Basingstoke ARC - ***NEW SECRETARY*** Andy Winn, G1JTO, 59 Renown Way, Chineham, Basingstoke, Hants, RG24 0YD, tel: 0256 64756.1, talk "An Insight into Cellular Radio" by G4SQZ.
▶Eastleigh (Itchen Valley ARC) - 12, your questions answered' 26, talk "Photography" by Mr. Bob Thomas; Feb 9, talk "Fibre Optics" by Peter Harris, Southampton University. Details 0703 736784.
▶Fareham & DARC - 10, talk "How to Buy, Sell and Maintain Recent Radio Equipments" by Chris, G8JFJ; 17, AGM; 31, talk "Project - Simple Direction Finding Receiver" by Andrew, G0AMS; Feb 14, junk sale. Details 0705 321411/2 (daytime).
▶Farnborough & DARS - 10, film night hosted by G4MBZ; 24, talk by winner of the construction contest; Feb 14, talk TBA.
▶Horndean & DARC - 4, quiz; Feb 1, brains trust.
▶Liphook (Three Counties ARC) - 3, talk "Communication in the Lifeboat Service" by Colin Beeston; 17, visit by Phil Bridges of Siskin Electronics; 31, talk "The River Wey" by Adrian Bird; Feb 14, talk "The Solent Fortifications Award" by Victor Harris.
▶Southampton ARS - the club has been suspended for one year. Details from RLO, tel: 0703 693673.

HEREFORD & WORCESTER

▶Kidderminster & DARS - 9, Ordinary general meeting followed by talk "Safety In (and Out of) the Shack" by G7EZA; 23, talk "Technical Ceramics" by G8BKL.

HERTFORDSHIRE

▶Cheshunt & DARC - 10, talk "Indoor Antennas" by Derek, G3LXP; 24, talk "DXpedition" by Roy, G4UNL and Peter, G0KLU; Feb 7, talk "Computers, Databases and Examples" by Ian, G4IUZ.
▶Stevenage & DARS - 2, no meeting; 16, tips, hints and kinks. Everyone bring at least one; 23, committee meeting 17 Green acres; Feb 6, talk "Psst - Wanna Buy a Rig?" by Tony, G1ZZH; 20, talk "Band Plans and Square Bashing" by Jay, G3HEA.
▶Verulam ARC - ***NEW SECRETARY*** Mr. Walter Craine, G3PMF, QTHR.

HUMBERSIDE

▶Goole RES - 5, Morse code instruction; 12, quiz evening; 19, talk "Video Engineering" by Steve Price, G8VHL; 26, social evening; Feb 9, junk sale; 16, HF operating evening.
▶Hornsea ARC - 3, slide and film show by Jeff, G4IGY; 10, annual dinner; 17, committee meeting; 24, talk "The Wonderful World of Wireless" by Jeff, G4IGY; Feb 7, talk "Plaisance to Mount Pleasant By Land, Sea and Air" by Harry, G7DNN; 14, talk "QRP Setting Up and Operating" by Dave, G0DEB. Details 0964 533331.

KENT

▶East Kent RS - ***NEW VENUE*** The Canterbury High School, Knight Avenue, Canterbury. ***NEW SECRETARY*** Brian Tutt, 76 Reculver Road, Herne Bay, Kent CT6 6ND, tel: 366232. Meetings held on 1st and 3rd Thursday of each month. 18, talk "Weather and the Use of Satellites in Weather Forecasting" by Ron Lobeck, TVS Weatherman. 7.30pm.
▶South East Kent (YMCA) ARC - 10, talk "TVI - The Problems and Cure" by G4HXE; 17, committee meeting; 24, talk "The Early Days of Television" by G4ZMO.

LEICESTERSHIRE

▶Leicester RS - 8, committee meeting, HF/VHF activity night; 15, RSGB video, TBA; 22, AGM; 29, HF/VHF night on the air; Feb 5, HF/VHF night on the air; 12, committee meeting, HF/VHF activity night; 19, talk - subject TBA.

LOTHIAN

▶Lothian RS - 10, 24, TBA.

MERSEYSIDE

▶Wirral & DARC - 10 AGM; 24, surplus equipment sale; Feb 4, discussion night; any questions answered (if poss!) Details 051 648 5892.

NORFOLK

▶Norfolk ARC - 3, talk "The Big Guns of Contesting" by Rick Johnson, G3VZT; 7, 80m AFS; 10, talk "Radio Astronomy" by Ron McArthur, Norwich Astronomical Society; 17, debate "Should Amateurs Homebrew"; 24, test gear demonstration; 31, informal and committee meeting; Feb 7, "Real Radio" - club project discussion; 14, talk "Science for All" by Arnold Tomalin, G3PTB; 21, informal and Project YEAR planning. Details 0508 78258.

NORTHAMPTONSHIRE

▶Nene Valley RC - 10, pre-AGM discussion; 17, AGM. Election of officers.
▶Northampton RC - 25, talk "Propagation" by Jim, G3YLA.

NOTTINGHAMSHIRE

▶ARC of Nottingham - 4, forum and activity; 11, video "Ben Nevis DXpedition"; 18, talk "Solid State PAs" by Mike, G2SP; 5, activity night.
▶Mansfield ARS - 4, video; 18, test gear; Feb 1, home brew evening; bring your winter project, finished or not; 15, talk by Fire Prevention Officer.

ORKNEY

▶Orkney AR Group - 10, slides and tape "Aurora - What Causes It?"; Feb 7, slides and tape "Aurora - What Causes It?" (part 2). Details from Alan, GM4IOB or Bill, GM3IBU.

SHROPSHIRE

▶Telford & DARS - 3, club station on VHF bands. Details Telford 770922.

SOMERSET

▶Mid Somerset ARC - 5, open evening; 19, talk by Mr. D.A.I. Jackson, District Manager, Radio Investigation Service, DTI; Feb 2, computer link-up between Richard, G0JDV and Basil, G4VVP; 16, talk by Peter, G3RZP, Zonal Council Member, RSGB.
▶Yeovil ARC - 11, talk "Home Construction Techniques" by G3PDJ; 18, talk "Using Home Brew Test Gear" by G3PDJ; Feb 1, discussion night.

SOUTH GLAMORGAN

▶Cardiff RSGB Group - 8, talk "Satellite Communications" by Jim Baker of British Telecom; Feb 12, 4-way quiz - Cardiff/Barry/ British Telecom/Raynet.

SURREY

▶Dorking & DARS - 9, informal in Falkland Arms; 23, AGM in Ashcombe School; Feb 13, informal.
▶Sutton & Cheam RS - 14, 3.5MHz fixed and AFS team contest; 19, TBA; Feb 16, TBA.

WARWICKSHIRE

▶Mid-Warwickshire ARS - 9, night on the air at Warwick School; 23, what did Santa bring members??
▶Rugby ATS - 9, bring & buy sale; 23, talk "Packet Radio - A Toe Hold" by S.A.Tompsett, G8LYB; Feb 13, talk "The QSL Bureau" by P. Story, G0BDF.
▶Stratford upon Avon & DARS - 8, talk "Test Equipment" by David Jones, G6FEO; 22, New Year social and skittles at the Gay Dog, Quinton; Feb 12, talk "VHF Antennas" by Derek Bedford, G4ABS.

WEST GLAMORGAN

▶Swansea ARS - 18, visit to CCTV studio, University College, Swansea; Feb 1, visit to West Glamorgan County Hall for a talk and demonstration on urban traffic control. Details 0792 818100 (home) or 0639 815437 (daytime).

WEST MIDLANDS

▶Coventry ARS - 5, night on the air and Morse tuition; 12, computer night - bring your own if you can!; 19, night on the air and Morse tuition; 26, annual dinner (provisional).
▶Midland ARS - 16, junk sale; Feb 20, project night organised by G6DRN, 7.30pm at Unit 16, 60 Regent Place, off Caroline Street, Birmingham B1 3NJ.
▶Stourbridge ARS - 8, on the air; 22, talk "Forensic Scientist"; Feb 5, on the air; 19, constructors competition.
▶Worthing & DARC -3, tabletop sale; 10, Conversion of 2-way Radios to Amateur Use by SMC; 17, discussion; 24, talk "Digital VFO" by G7BZZ; 31, talk "Workshop Practice" by G8JVE. Details 0903 753893.

WEST YORKSHIRE

▶Halifax & DARS - 16, talk "Mountain Rescue" by Peter, G6CNL; Feb 20, junk sale/surplus sale.
▶Otley ARS - 2, free and easy; 9, presentation of BATC tapes by Harvey, G1RRG; 16, night on the air; 23, slide show "Travel" and "Historical" by Harry, G3CQQ; 30, free and easy; Feb 6, talk "3cm - Past and Future" by Peter Blakeborough, G3PYB, Deputy Chief Engineer of YTV; 13, night on the air.
▶Pontefract & DARS - 4, talk TBA; 11, committee meeting/on the air night; 18, junk sale (Main Hall); 25, video TBA; Feb 1, AGM (free raffle for those attending); 8, talk by Brian, G3SYC; 15, committee meeting/ Components Fair meeting.
▶Spen Valley ARS - 4, RSGB videos; 18, visit to Arena 1, Electronic News Gathering. Details 0274 875038.
▶Todmorden & DARS - 1, construction competition; 15, talk by Des, G3JWN (provisional); Feb 6, AGM.

WILTSHIRE

▶Blackmore Vale ARS - 9, talk "Cellular Telephones" by Dave, G0GWC; 23, club station G4RBV on air; Feb 13, talk "Power Supplies" by Steve, G1ZTO.
▶Salisbury R&ES - 9, RSGB video; 16 AGM. Meetings each Tuesday, RAE class and CW class. Details 098 062 2809.
▶Trowbridge & DARC - 3, AGM. Details 0380 830383.

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'.

21 JANUARY

▶Oldham ARC Rally - Queen Elizabeth Hall. Opens 11am, 10.30am for disabled visitors. Lots of free parking; special event callsign GB4ORC will be operational from 1st to 31st Jan. Details from Kathy,. G4ZEP, tel: 061 624 7354 (work) or 061 652 8617 (home).

24 FEBRUARY

▶Rainham Radio Rally - Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. Doors open 10.15am (10am for disabled visitors). Traders, bring & buy, bar, snacks. Talk-in on S22 & SU22. Details from Bob, G0LKE, tel: 0634 362154.

25 FEBRUARY

▶The 3rd TAW & Torridge Rally - BAAC Hall, Bideford, Devon. Doors open 10.30am. Trade stands, bring & buy, bar, refreshments, talk-in S22. Details: G0GFK 02372 76402.

3 MARCH

▶Tyneside ARS Rally - North-Eastern Exhibition Centre, Gosforth Park Race Course. (1 mile north of Newcastle upon Tyne). Doors open at 11am. Usual trade stands, Morse tests, bring and buy, refreshments, and ample free parking. Talk-in on S22 and SU8. Details from Terry, G6VEG, tel: 091 264 8196.

4 MARCH

▶Trafford Rally - G-MEX, The Greater Manchester Exhibition & Events Centre, City Centre, Manchester. Doors open at 10.30 for all, with priority to any disabled visitors. Admission £1. Usual and new traders. Parking. RSGB stand. Bring & Buy. Morse tests. Refreshments. Licensed bar. Talk in station (GB1GMX) on S22, 2m. Details from Graham, G1IJK tel 061-748 9804.

11 MARCH

▶South Essex ARS Mobile Rally - The Paddocks, Canvey Island, Essex. Starts 10 am. Trade stands, bring & buy etc. refreshments. Talk-in (G4RSE) on S22. Details from Ken Hendry, G0BBN, tel: 0268 755350

▶Welsh Mobile Rally - Barry Leisure Centre, off Horton Road, Barry, South Glamorgan. Details GW6RCK.

18 MARCH

▶Tiverton RC Mid Devon Rally at the Pannier Market, Tiverton. Doors open at 10.00.Free parking; food & drinks available; club room open all day' talk-in on S22; trade attendance by invitation only. Details from G4TSW, Mid Devon Rally, PO Box 3, Tiverton, Devon EX16 6RS.

▶Wythall Rally - Wythall Park, Silver Street, Wythall, Worcs. (on the A435 near junction 3 on M42, south west of Birmingham). Doors open 11.00am. Usual trade stands; flea market; bring & buy; RSGB Morse test (provisional); bar and snacks; talk-in on S22; admission 50p. Details G0EYO, tel: 021 430 7267.

1 APRIL

▶White Rose Rally - Leeds University. Details G4DXA, PO Box 73, Leeds LS1 5AR.

8 APRIL

▶Cambridgeshire Repeater Group Rally and Junk Sale/Auction. Details G0HEM (QTHR).

▶Launceston ARS Rally at Launceston College. Doors open 10am. Bar; hot snacks; bring & buy; traders; Morse tests; opinions on your CW progress; RSGB publications on sale; breakfast bar for traders from 6am; parking; talk-in on S22. Details from Maggie on 040921 219 or Rodney & Joy on 0566-5167.

▶Swansea ARS Rally - Swansea Leisure Centre, situated on the A4067 Swansea-Mumbles coast road. Doors open 10.30am. Trade stands; bring & buy; repeater groups; demonstration station; bar; refreshments. Details from Roger, tel: 0792 404422.

15 APRIL

▶Centre of England AR Rally - Motorcycle Museum, Bickenhill, near NEC Birmingham. Details from Margaret or Frank, G4UMF, tel: 0952 598173.

13 MAY

▶Drayton Manor Mobile Rally - Drayton Manor Park, near Tamworth, Staffs. Details from Norman, G8BHE, tel: 021 422 9787.

College, Radegund Road, Cambridge. Details from Brian, G4TRO, tel: 0223 353664.

20 MAY

▶Cambridge & DARC 5th Annual Rally and Radio Car Boot Sale at Coleridge Community

27 MAY

▶14th Annual East Suffolk Wireless Revival 1990 - Civil Service Sports Ground, Straight Road, Bucklesham, Ipswich. Details from Paul Whiting, G4YQC, 77 Melford Way, Felixstowe, Suffolk, tel: 0473 642595.

▶Plymouth Radio and Electronics Fair - Plymstock School, Church Road, Plymouth. Details from Jan Fisher, G0IVZ, tel: 0752 340946 evenings/weekends.

28 MAY

▶Bircotes Radio Rally - near Bawtry, Doncaster. Booking forms/details 23 Florence Avenue Balby, Doncaster. Tel: 0302 857526.

3 JUNE

▶British Telecom (S. Wales District) ARS 2nd Annual Radio Rally - BT Headquarters, Coryton, Cardiff. Details from Martyn Jenkins, GW7EYP, tel: 0222 379634 (office hours).

▶Southend & DARS Mobile Rally at Rocheway Youth Centre, Rochford Essex. Details from John Stone, G0DFE, tel: 0702 202216.

10 JUNE

▶21st Elvaston Castle Mobile Radio Rally, Elvaston Castle Country Park near Derby. Details from John, G4PZY on 0332 767994.

▶Royal Naval ARS 30th Annual Mobile Rally - HMS Mercury, Nr. Petersfield, Hants. Details 0703 557469.

24 JUNE

▶City of Bristol Group 33rd Longleat Amateur Radio Rally, Longleat Park, Warminster, Wilts. Details Shaun O'Sullivan, G8VPG, tel: 0225 873098.

OTHER EVENTS

20/21 JANUARY

▶Scottish Tourist Board (Radio Amateur) Expedition Group GM9OCC - Cultural City of Europe 1990 under auspices of West of Scotland ARS (Glasgow) Award available. Details on the air.

9/10 MARCH

▶London AR Show - Picketts Lock Centre, Picketts Lock Lane, Edmonton, London N9 (just off the North Circular Road). Talk-in on 2m and 70cm. Bars. Restaurants. Disabled facilities. Free parking. Huge exhibition area. Bring & Buy. Dedicated area for Special Interest Groups. Admisson £1. For further details and advance ticket sales, phone 0923 678770.

18 MARCH

▶Norbreck Amateur Radio, Electronics and Computing Exhibition organised by the Northern Amateur Radio Societies Association (NARSA) at the Norbreck Castle Exhibition Centre, Blackpool. Details from Peter Denton, G6CGF, tel: 051 630 5790.

25 MARCH

▶Pontefract & DARS 11th Annual Components Fair - Carleton Community Centre, Carleton, Pontefract. Commences 11am; bookstall; bring & buy; licensed bar etc; talk-in on S20; admission free. Details from Mr. B. Senior, 5 Park Close, Darrington, Pontefract WF8 3BA, tel: 0977 704067.

▶Dover (YMCA) ARC QRP Convention & Table Fair - Dover YMCA ARC, Dover. Opens 10.30. Details from G0BPS, tel: 0303 276171.

1 APRIL

▶IARU Region 1 Conference starts - Torremolinos, Spain. Details G3FKM.

21/22 APRIL

▶RSGB National Convention and Amateur Radio Exhibition - National Exhibition Centre Birmingham. Easy to reach by rail, air and road - use Junction 6 of M42 for motorway access, usual talk-in facilities available. Free parking with free courtesy bus to exhibition area, entry fee £2. New exhibition hall No.7 being used this year. Not just another radio show but *the* amateur radio exhibition of the year, supported by an extensive programme of lectures, presentations and other events. Details 0277 225563.

29 APRIL

▶Bury RS 1990 Hamfest - Castle Sports Centre, Bolton St, Bury. Details from C.D.W. Marcroft, Mosses Community Centre, Cecil St, Bury, tel: 0706 229930 (evenings only).

6 MAY

▶BATC Convention, Harlaxton Manor, Nr. Grantham. Details from Paul Marshall, G8MJW: tel: 0522 703348.

12 MAY

▶RSGB VHF Convention - Sandown Park Exhibition Centre. Details from Geoff Stone, G3FZL, tel: 01 699 6940. Trade contact: Les Hawkyard, G5HD, tel: 0409 28342.

the last...

'SHAMBOLIC SHACK' BOUQUETS...

No doubt you get many letters of complaint, so I feel it is only fair and proper to say THANK YOU for the most wonderful, superb and in some cases life-saving services offered by the RSGB.

No, I don't mean the Planning Advisory Committee - I've already got my mast; I don't mean the QSL bureau, good though it is. The thing I'm thinking of is December's *RadCom*, which arrived just in time to save my life.

Like quite a few amateurs, my 'shack' is a desk in the corner of my wife and I's bedroom. I think it's quite tidy, with my gear neatly laid out, the odd Westminster awaiting conversion, a few drums of cable piled up in the corner of the bedroom, a few magazines scattered about the floor and the computer software neatly arranged against the skirting board. *She* decided that it wasn't tidy enough, *she* thought it not unreasonable that she should be able to get into her wardrobe without having to move a box of transformers (awaiting my next PSU project)... when, like an angel, *RadCom* arrived.

I only had to show her the 'Most Shambolic Shack in Britain' article and I was saved. Just think, I said, you might have married G3LMR... and I think she then realized how neat and tidy I really am! So many thanks, *RadCom*, and John, G3LMR.

P.S. I note with interest that all the winners and highly commended amateurs are all Class 'A'. Is this a privilege that comes with the licence, or does morse make you untidy?

Steve Beazley, G7BIM

G3LMR should be nominated for the next Honours List for philanthropic and public services. I left my *RadCom* open at the photograph of the winning 'shambolic shack', and my wife promised never to complain again.

Stuart Kind, G4AYP

Thank you for setting such a consistently high standard in your production of *RadCom*, and in particular this month (December) for the delightful, well written and witty article on the 'Most Shambolic Shack' award. As no name is shown for the author I assume it was you. Thanks a lot.

Ronnie Reed, G2RX

Sadly no - 'twas written by someone more talented than me! - Ed.

...AND BRICKBATS

At a time when the RSGB is promoting amateur radio as a suitable hobby for the younger generation, why do you waste two pages of this month's journal with what can only be described as a load of dangerous rubbish? I refer, of course, to the 'Most Shambolic Shack in Britain Award'

What an amateur does in his own shack is his own business. But to publicise and award such a lack of common sense is totally irresponsible. The obvious danger to life and limb is evident in the photos, ie twisted and haphazard wiring, paper stacked on top of heat-generating equipment, to mention only two, shows a complete disregard by the owner for his own safety, not to mention any visitors that stray into his minefield.

The article may have been intended as a joke. If so it was in very bad taste and can do nothing but harm to the Amateur Radio Movement.

RadCom often contains items complaining about incorrect and misleading reporting by the 'media' of amateur radio activities. I wonder what they will make of this self-denigrating masterpiece.

Owen W Kemp, G4TLK

As licensed radio amateurs I am sure that we are all sufficiently qualified to know what constitutes 'safe' and 'unsafe'. That aside, I think it will be a very sad day when we can no longer have a laugh at our own expense - Ed.

ROCKALL EXPEDITION

A couple of years ago, there was quite a stramash in *RadCom* over a well-known radio pirate operating from Rockall in the Atlantic.

On the 25th and 26th August 1989, GM4YLN Chriss, an ardent QRP operator, carried out a similar expedition to Rockall.

In those two days from the rock he made 200 QSOs, even to the point of receiving cards from G stations he had not worked.

The question is... why has there been no mention in *RadCom* if this first expedition to Rockall? Could it be sour grapes, I wonder?

Stewart Cameron, GM4UTP

On my part there certainly is sour grapes concerning Scotland's spectacular scenery! But the simple answer is - nobody told us - Ed.

QSL BUREAU GRIPES

I read with amusement Ted Allen's letter, 'Tnx from the QSL Bureau' printed in the November *RadCom*.

It seems to me that G3DRN has an annual gripe at the amateurs in G-land over the sending of QSL cards in the month of June. Could it be that the job is too much for one person and that at long last the Society has started to listen to the membership and made a decision to move this service to HQ where hopefully a more efficient system will be employed?

Over the last four years I have written to the RSGB begging, pleading and generally hoping that the G1 series would obtain a service in the QSL Bureau similar to that of G0s, G3s, G4s etc, but the general consensus of opinion from both Ted Allen and the Society is that G1s do not send enough cards to warrant more than one sub-manager. Surely that cannot be the case otherwise why is it that the system crashed this year causing long delays to cards being sorted and sent out, and why so many amateurs are constantly criticizing the efficiency or lack of it in the QSL bureau.

Whenever I have written to G3DRN with any queries or suggestions re the QSL Bureau his replies have always been patronizing and sarcastic and as the readers of his letter will note this is again his ultimate reason for his letter.

I would also like to know why the Society insists on members indicating the amount of cards they would like to receive in the top left-hand corners of their SAEs when it is commonly known that cards are not despatched until the 10kg weight has been reached and the sub-managers put more cards in the envelopes than the postage allows for, usually resulting in the recipient having to pay surcharges.

Let's hope that the 1990s bring a change to the present system and that the majority of amateurs that use this system can look forward to a QSL Bureau that works and works fairly

By the way, when the staff at HQ take over the QSL system, will the ruling of no cards in June still apply?

Steve G Bryan, G1SGB

Our HQ QSL manager replies:

1) Ted Allen is right. There is not yet enough throughput of G1 cards to justify a separate sub-manager for each letter. The QSL Bureau did not and has not crashed. It is alive and well and thriving (at least the incoming side is) at HQ.

2) The QSL Bureau does not insist on indication on SAEs. It is only recom-

mended when some users are impatient and do not wish to wait until the maximum weight limit (18-20 cards or 60g) accumulates.

3) The QSL bureau anticipates being 'open' 12 months of the year!

BUYING GEAR ABROAD

Having just returned from the USA with a transceiver under my arm, readers might be interested to learn of one of the quite unexpected problems encountered in the transaction.

With the present exchange rate plus import duty and VAT payable at Customs, there seemed little advantage in buying new equipment, but purchasing second-hand (or 'used' as it's called over there) appeared quite an attractive proposition. The American amateurs are well known to keep their gear in truly immaculate condition - even to the extent of keeping the original packing case! Dealers overhaul and re-align the sets they offer for sale, and cover them with a first class guarantee.

So, immediately on arrival at the home of my host in Des Moines, Iowa, I searched for a radio store dealing in amateur equipment, but to no avail - there didn't appear to be a single one in the whole of the Mid-West.

Next thing to do was to pick up the phone and dial 0800 free calls to stores hundreds of miles away. The salesmen were all courteous and willing to give all the information requested - they couldn't have been more helpful.

Eventually I decided to have a TenTec Omni-D with all three crystal filters priced at $457, which seemed very reasonable.

So far, so good. Then came the big snag!

"You'll accept Access or Visa?" I queried, not expecting any problem. Oh yes, of course they would, if and only if I took the card into the store - but NOT over the telephone. Impasse...

Luckily, my kind host came to the rescue, and asked if the store would accept his card over the phone. Yes, they would do that, as he had a permanent address in the States, but all cards from foreigners had to be presented so that they could be fed into the checking machine. The wonders of modern accountancy...

To cut a long story short, I paid my host in dollars at the bank that afternoon, and three days later the set arrived via UPS, beautifully packed and transported half way across America for under $5! It was in truly pristine condition without a scratch or any sign of wear, and complete with handbook and official receipt.

The latter was necessary for production at the British Customs, together with my amateur licence validation document. Even though I had to pay Import Duty plus 15% VAT, I still consider it was well worthwhile the time and trouble taken. The result might not have been so successful had I been staying in an hotel or my host had not come to rescue so willingly. Wait 'till I see my bank manager!

Douglas Byrne, G3KPO

NOVICE LICENCE

How refreshing it was to read about the Bardstown experiment. What a great pity that the RSGB had not done more ten or fifteen years ago to get more youngsters into amateur radio. Even when CB came along the RSGB shunned them thinking that they would go away.

My son at the age of 11 spent a year going to the local amateur course run by John Hardy, G3KND. John put in a great deal of work with James but he failed the exam and got nothing for his efforts. James was rather upset and wanted nothing more to do with radio. I tried to get him to have another go but to no avail. As he said, even if he passed he couldn't get a licence.

That was the end of the story until last September when we arrived in Australia. They have had novice licences for some years. I at last managed to get James to have another go. We sent off our $A25 (£12) for the novice theory and morse tapes pack from the local WIA office. With ten weeks to go till the exam in November we set to work, the result of which James passed the four part exam (regulations, theory, 5wpm sending and 5wpm receiving). If he had failed any part he would only have needed to retake that part he had failed in. He is now up to 9wpm and eager to take the full call in February. What a change of attitude.

I urge the RSGB to press as hard as they can for the introduction of the Novice Licence within the next month or so - not the end of next year or the year after that. Enough time has been wasted already. In the meantime we are off to the local Dept of Comms Office to pick up his new licence.

Roland Brade, VK2GAL/G3VIR

ONE CLASS TICKET

Your reply to Mr Gilchrist, GM0EWK, in November's *RadCom* prompts this unprecedented move of putting pen to paper.

I never held a Class B licence as I always wanted to work the HF bands, so held back until I had passed the morse. However, if I were a Class B licensee, I would be incensed at the thought of being given a novice licence to work HF. The RAE is the same for all of us; differentiation rests solely with the CW certificate.

Surely then the answer is simple, abolish the idea of different classes of licence holders on different bands. Let all who pass the RAE use any band they wish to. Only those who have become proficient in morse will be able to (or indeed want to) work CW, therefore the morse test could also be abolished. There are sufficient numbers of proficient CW operators to keep the standards up anyway. A good standard is a matter of pride to most operators.

I believe that the foregoing would work and also save a large turnover in callsigns. Why not conduct a referendum amongst the members, then you can propose something to the DTI that is accepted by the majority.

P. Ingram, G4OZL

'DX PILE-UPS' APOLOGY

The 'Last Word' page of the December issue of *RadCom* contained a letter, headed 'DX Pile-ups' by Brian Levett, G3TXH. In this letter, Mr Levett made reference to a G station who "is now in the top echelon of the DXCC listings."

By this reference to the top echelon (rung) of the DXCC listings Mr Levett has unwittingly brought suspicion on to a few innocent individuals listed on the top rung as follows:

DXCC Mixed - G3AAE, GW3AHN, G3FKM, G3FXB, GM3ITN, G3KMA

DXCC Phone - GW3AHN

I wrote to Mr Levett on the 30 November and received a letter from him today dated 1 December 1989 containing the following.

"You were most certainly NOT the individual in question. I had a couple of phone calls last evening on the subject but not from the individual himself. The list of calls you sent did not contain the one I meant so maybe he has slipped back in the table since I last saw it."

The latest DXCC listings are contained in the July issue of *QST* and also in the RSGB DX News Sheet No 1373 dated 5 July 1989 so whilst Mr Levett and myself know that the individual in not myself, suspicions could still linger in the minds of readers of *RadCom*.

Tom Higginson, GW3AHN

INTERPRETING THE LICENCE

With reference to the letter from G4LJF in November *RadCom*. Whilst I agree in principle with his comments on the operating habits of some amateurs wasting time quoting strings of callsigns as well as their own, common sense suggests that some flexibility is desirable in the interest of efficient operating. Nevertheless G4LJF has misquoted the new Amateur Radio Licence by omitting the word AND which crucially alters the meaning of the relevant clause of the licence.

"Para 7 (1)(b); During transmissions, the licensee shall transmit the callsign specified at the beginning and at the end of each period of communication with a licensed amateur AND when the period communication is longer than 15 minutes, at the end of each interval of 15 minutes."

The period of communication does not mean QSO, but each over. When an over reaches 15 minutes duration the callsign must be given, and at each subsequent 15 minute interval.

It is difficult for new listeners to understand who is saying what to whom on some HF nets, when all they hear every 15 minutes is an unintelligible list of callsigns given a great speed. This sort of operating will not encourage listeners to become licensed.

This is the way I read and feel the spirit of the new Licence was intended, but to give your callsign at the beginning and the end of a one or two word reply is ridiculous.

John Battle-Welch, G4NYZ

CALLBOOK TITLES

Mr NEA Rush G3HBZ objects to ladies being listed as Mrs, Miss or Ms in the RSGB *Callbook*.

I get tired of people assuming that I am a man - because I am not! I also get called 'Old Man' even if the person at the other end of a contact has already heard my voice! I have belonged to four radio clubs and have been accepted as a person in the same hobby by all the men I have met.

I wonder why Mr Rush is worried by the inclusion of ladies under their correct title - does he also object to Rev, Dr, Captain, W/Cmdr, Major, F/Lt, Cdr, etc. and the occasional addition of qualifications after a person's name?

PLEASE continue to list me as Mrs in the callbook - I'm not the only one with my postcode on a second line!

I think that the *Callbook* is an excellent production.

Mrs C G Sheldon

I agree with Mr NEA Rush that it is not necessary to record in the *Callbook* whether one is Miss, Mrs or Ms, but neither is it necessary to record whether one is Rev, Dr, Prof, Maj, Col etc.

However, I totally disagree with Mr Rush over his comment that valuable space is being used up in the *Callbook* by including such detail. Surely the size of entry is governed by the length of one's name, house name, street, town, county etc.

Although I did not ask for it, I have 'Mrs' included in my entry in the *Callbook*, and it takes up no more line space than my husband's entry - and *he* has more initials than I have! (Though not as many as Mr Rush!).

Following Mr Rush's line of reasoning, are amateurs going to have to think twice about moving house, changing name and so on, in case they take up more than one line of space in the *Callbook*?

V Lockhart (Mrs), G0BVL

J W MATHEWS

I was most interested to read in August *RadCom* the account marking the anniversary of J W Mathews' successful two-way QSO between the UK and the USA. I remember the event well as G6LL was an Old Boy of my school and, although about 5 or 6 years his junior, I got to know him through the School Wireless Club, and I visited his shack more than once.I recall his huge transmitting valves with the high plate voltage which, on one occasion, actually sparked through the glass envelope.

The school club had been started about 1922 through the enterprise of a master, Charles Davenport, who knew 'Jack' Frost and through him, not only did we meet Capt. Eckersley and Capt. Round who had just developed the 'moving coil' microphone, but we also paid several visits to the old 2LO, then housed in the Institution of Electrical Engineers at Savoy Hill. I remember the studio walls were lined with seaweed between Kraft paper, and the OB board consisted of a kitchen table top! We were, I believe, only the second school in London to have a wireless club, the first being Mill Hill.

Mathews was naturally a hero to us following his achievement and it gave me great pleasure to see that his pioneering work has not been forgotten and that his name has been brought to the notice of the present generation.

W A W Lankshear, G0HFB

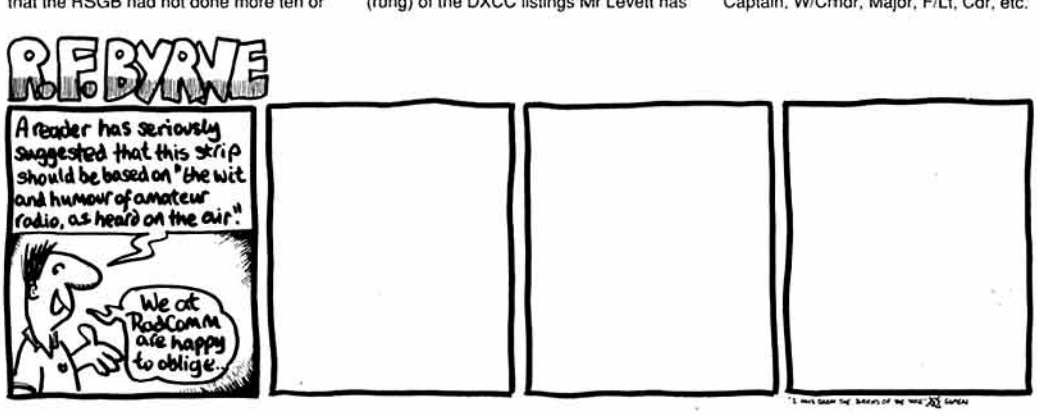
WATT'S UP WITH DBW?

Some time ago I sent you a somewhat facetious letter, which you did not print, about the use of dBW for radio frequency power. I think a more serious and logical aproach is required.

In all the advertisements that I have seen in your columns or elsewhere I have never seen the output quoted in dBW. I have never seen an SWR/Power meter scaled in dBW. This means that in EVERY case when it is used it has to be converted, does this seem reasonable?

H. Du V Ashcroft, G4CCM

Please note that the views expressed in 'Last Word' are not necessarily those of the RSGB. We reserve the right to edit letters and regret that we can no longer acknowledge them individually but will pass them on to the relevant department.



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ICOM

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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.

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