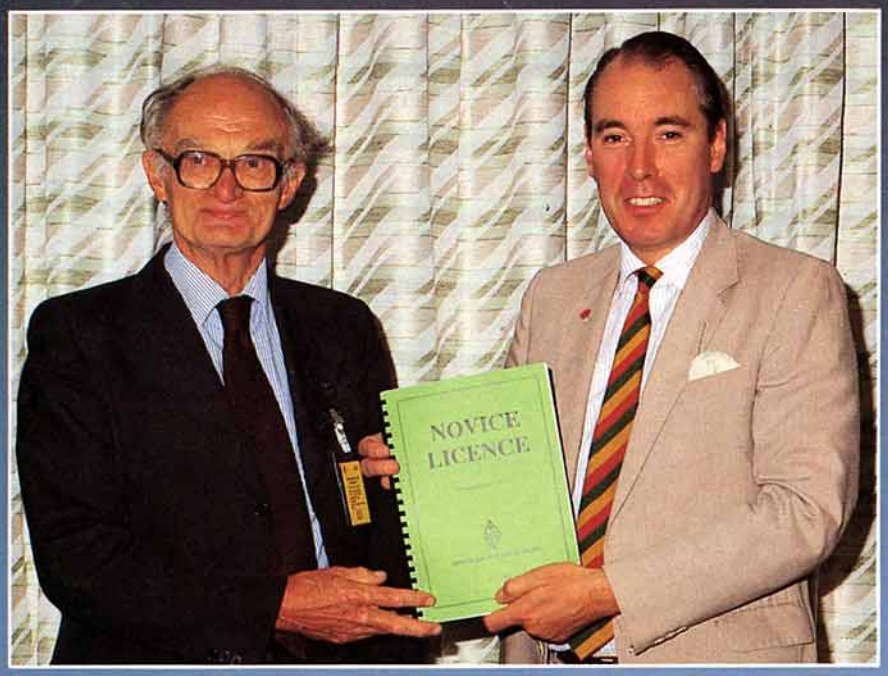
Radio Communication

September 1989



NOVICE LICENCE:

Proposals presented at Industry Conference

ICOM IC-725 HF TRANSCEIVER REVIEW

KENWOOD

TS-790E – Just when you thought it was impossible

Impossible to design and produce a multi band VHF/UHF transceiver which would render all others obsolete? But this is what Kenwood have done with the TS-790E, in the same way that the TS-940S set new standards which have not yet been beaten, or the TR-751E 2 metre multimode, which is still without any serious competition. Kenwood have the magic touch which gives the customer what the customer wants, in a package which is easy to use, performs like a dream, and is simply a delight to own.

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It is fashionable in some quarters to sneer at the microprocessor, but Kenwood write the software in their processors with the aim of giving the user complete control over a wide range of facilities and not confusing the issue. In this respect, the TS-790E adds a new dimension to VHF operating, with its dual (triple) band monitoring, cross band operation, full duplex facilities, and a wide range of features to make life esy for the operator.

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Radio Communication

VOLUME 65 No 9 **SEPTEMBER 1989**

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Main Photo: The Icom IC-725 budget HF transceiver, one of a growing range of lower cost HF units (p56). Inset: The formal Novice Licence presentation ceremony at the recent RSGB/DTI Industry conference. Sir Richard Davies, G2XM, (left) is seen here with Cliff Deamer (centre) of Marconi and Mike Coolican Head of Branch in the DTI's Radiocommunications Division.

Squarebashers G4HGT (background) and GW4LXO, putting Madeira firmly on the map during their recent DXpedition.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded 1913. Incorporated 1926. Limited by guarantee.
Member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
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COUNCIL ELECTION FOR 1990

The Society's Articles of Association require that members who are entitled to vote should be notified of those Council members who retire at the end of each year. The Council members who retire on 31 December 1989 are:

Ordinary Members
Mr Neil Brinkworth, G3UFB, who is eligible and willing to accept nomination for re-election.
Mr George Jessop, G6JP, who is eligible and willing to accept nomination for re-election.
Sir Richard Davies, G2XM, who will retire from Council at the end of 1989.

Zonal Members
Zone A — Mr G Smith, G4AJJ, has given notice of resignation from the Council with effect from 17 December 1989, and expressed the wish to accept nomination for election to the consequent vacancy. The Society has received legal advice that he is not debarred by the provisions of Article 26 from standing for election (despite his not having served the required three consecutive years on the Council), and that the Council should give notice of the vacancy and invite nominations in accordance with the provisions of Article 52. Notice is therefore given of the vacancy. Zone A consists of the following counties: Cheshire, Cleveland, Cumbria, Durham, Greater Manchester, Humberside (north of the River Humber), Isle of Man, Lancashire, Merseyside, Northumberland Tyne & Wear, North, South & West Yorkshire.
Zone G — Since Mr Frank Hall, GM8BZX, is to become President in 1990, a vacancy for Zone G is created. Zone G comprises all of the regions and island groups in Scotland.

ELECTION OF THE 1990 COUNCIL

1 The role of Council and Council members.
To assist candidates and those making nominations, the following notes are intended to summarise very briefly the main functions of Council and Council members. The size, complexity and long-term nature of the Society's activities makes it necessary for the day-to-day control of its affairs to be in the hands of a stable administration. At present, the workload is divided between the full-time staff, approximately 30 in number, and the volunteer effort represented by the 16 sub-committees of Council and its honorary officers. Of the HQ effort, roughly half can be regarded as being devoted directly to amateur radio matters, the remainder being concerned with administrative tasks. Responsibility to Council for the working of HQ lies primarily with the Finance & Staff Committee, with the Licensing Advisory Committee being heavily involved with licensing aspects. The work of the other committees is mainly concerned with amateur radio matters, although there may be major financial implications.

The main work of Council is that of monitoring the work of HQ and the committees to ensure their effectiveness in handling the commercial aspects of the Society's operation (an income of over £1 million per annum), together with those matters it has identified as being important to amateur radio on both the national and international level.

The main duty of Council members obviously is to play an active part in this operation. This will involve, inter alia, the attendance at, typically, seven Council meetings each year; the critical review of the 200 or so sets of committee minutes and working documents produced during the same period; and the capacity to react constructively to this and other information. Council members are also expected to deal with individual members' problems: their duty is to ensure that these are dealt with by the responsible committee or other body.

2 Candidate's qualifications and details.
a) The candidate must have been a corporate member for at least three years at the time of nomination.
b) The candidate must submit the following:
(i) Written, signed consent to accept office, if elected.
(ii) If appropriate, a statement that she/he is over 70 years of age or will become so during the term of office if elected. The Society's Articles of Association requires that the Council ballot paper shall state the date of birth of any candidate who will have attained the age of 70 before the end of the term of office he/she would normally serve if elected.
iii) A statement declaring any commercial interest in the field of amateur radio.

These declarations, together with nominations, may conveniently be made by using the 'Candidate's Form for the Election of Ordinary or Zonal Members of Council' (Form CF/CE & Form NF/CE) available on request from:

The Secretary (DAE)
RSGB
Lambda House
Cranborne Road
Potters Bar
Herts EN6 3JE

3 Nomination procedure
a) The nominations for each candidate, at least 10 in number, must be fully paid-up corporate members at the time of nomination. In the case of zonal members, the candidates and nominators must reside in the zone concerned.
b) Nominators may nominate only one candidate.
c) The nominations may be made on the "Candidate's Form" referred to above, the associated "Nominator's Form" or on any sheet of paper. Each nomination must be signed by the nominator, who should include the name of his/her town.

4 Additional information on candidates
In order to assist the membership in voting, a candidate may enclose a maximum of 200 words as a CV or statement describing pertinent experience which will be circulated within the ballot forms. This must be confined to biographical facts. Clearly, involvement with decision-making in organisations of similar size to the RSGB (or larger) would be relevant, and this should be stated. Prospective candidates will find it useful to have had experience of RSGB procedures, including committee membership or other duties, writing for Society publications or organising events. This experience should be quoted together with details of participation in amateur radio at the local level. Bona fide statements will receive the minimum of editing consistent with good style and factual accuracy; however, statements exceeding 200 words will be cut to that number.

The candidate may also supply a recent black-and-white head-and-shoulders photograph for publication with the CV, if she/he wishes.

5 Information on nominators
Nominators are required to give details of their place of residence. It is to be noted that voters may place higher value on nominations if they are seen to have come from many parts of the UK in the case of Ordinary Members, or many parts of the zone in the case of Zonal Members, rather than a restricted area.

Nominators may also supply for publication details of how long they have known the candidate and of relevant positions that they hold or have held; for example, as the chairman of an amateur radio club, a member of Council etc, or who can indicate management experience.

The standard nomination form referred to above is designed to facilitate the supply of this information. The candidate's declaration together with the completed nominations should be sent in a single closed envelope and addressed to:
The Secretary (DAE)
RSGB
Lambda House
Cranborne Road
Potters Bar
Herts EN6 3JE
...to arrive no later than **10 October 1989**.
Please mark the envelope '1990 Council Nominations'.
Nominations for all candidates will be acknowledged by return of post.

THE 1990 RSGB PRESIDENT

At the RSGB Council meeting held on 27 July 1989, Frank Hall, GM8BZX, was elected President for 1990.

Society Officers changes
Dave Butler, G4ASR, was appointed the Society's new VHF Manager effective 1 August 1989. The VHF Committee also has a new Chairman, Peter Burden, G3UBX. Norman O'Brien, G3LP, has resigned from Council. This creates a casual vacancy for the remainder of 1989.

RSGB International Convention 1990
The RSGB is to hold its 1990 International Convention and Exhibition at the National Exhibition Centre near Birmingham. This followed a recommendation from the Exhibition and Rally Committee. The dates will be 21 and 22 April 1990.

Project YEAR Conference
The Society has published the proceedings of its Project YEAR Industry Conference which was held on 20 July 1989. This joint RSGB/DTI Conference was opened by the Minister and attracted speakers from the DTI, Industry and the RSGB. A report on the Conference appears in this issue of *RadCom*. The Conference proceedings are available to members at £2.80. The cost covers production, packing and postage.

Passing on skills at local level

If you care to look around your local community, you will find that there are hundreds of volunteers passing on their various skills to anyone who wishes to acquire them. This applies to a very wide range of hobbies, including both personal and sporting activities. Believe it or not, there are a large number of young, and not so young, people who are using their leisure time for the benefit of others, and who gain a great deal of personal satisfaction from helping those with like interests to get started.

Undoubtedly the secret to success is the local club. Think of almost any pastime and there will invariably be a nearby club or group which you can join. Clubs, almost without exception, specialise in training because in most cases there is no alternative available, and certainly none which combines learning with ready access to a pool of enthusiastic specialists. In amateur radio many clubs train beginners, some most effectively, but there is clearly room for far more to be done

In fact, the very future of amateur radio depends on how effectively existing radio amateurs can pass their skills on to others. There is no other way of ensuring the existence of future generations of radio amateurs upon which the continuation of the service depends.

If there is a snag to what appears to be the normal way of training people for leisure activities, it lies in the very nature of radio amateurs themselves. Many are attracted to the service because amateur radio is a hobby which can be pursued in the comfort of one's own home. In addition many, although not all of course, tend to be loners; the enjoyment of amateur radio is being on one's own just experimenting or communicating with the outside world - enjoying the thrill of working a new county, square, country or continent entirely through one's own effort.

However marvellous and enjoyable that can undoubtedly be, it is not really conducive to the recruitment and training of beginners. Most successful leisure activities involve actually meeting people, reacting with them and learning from them. Many clubs organise group activities, but perhaps more clubs should consider group training sessions and perhaps a regular evening on-the-air to help beginners gain direct 'hands-on' operating experience. Because the numbers in UK amateur radio are almost static, certainly compared with five to ten years ago, the RSGB Council has initiated Project YEAR. This is nothing more or less than an initiative to create an on-going awareness for the need to recruit more people to amateur radio; and to train beginners.

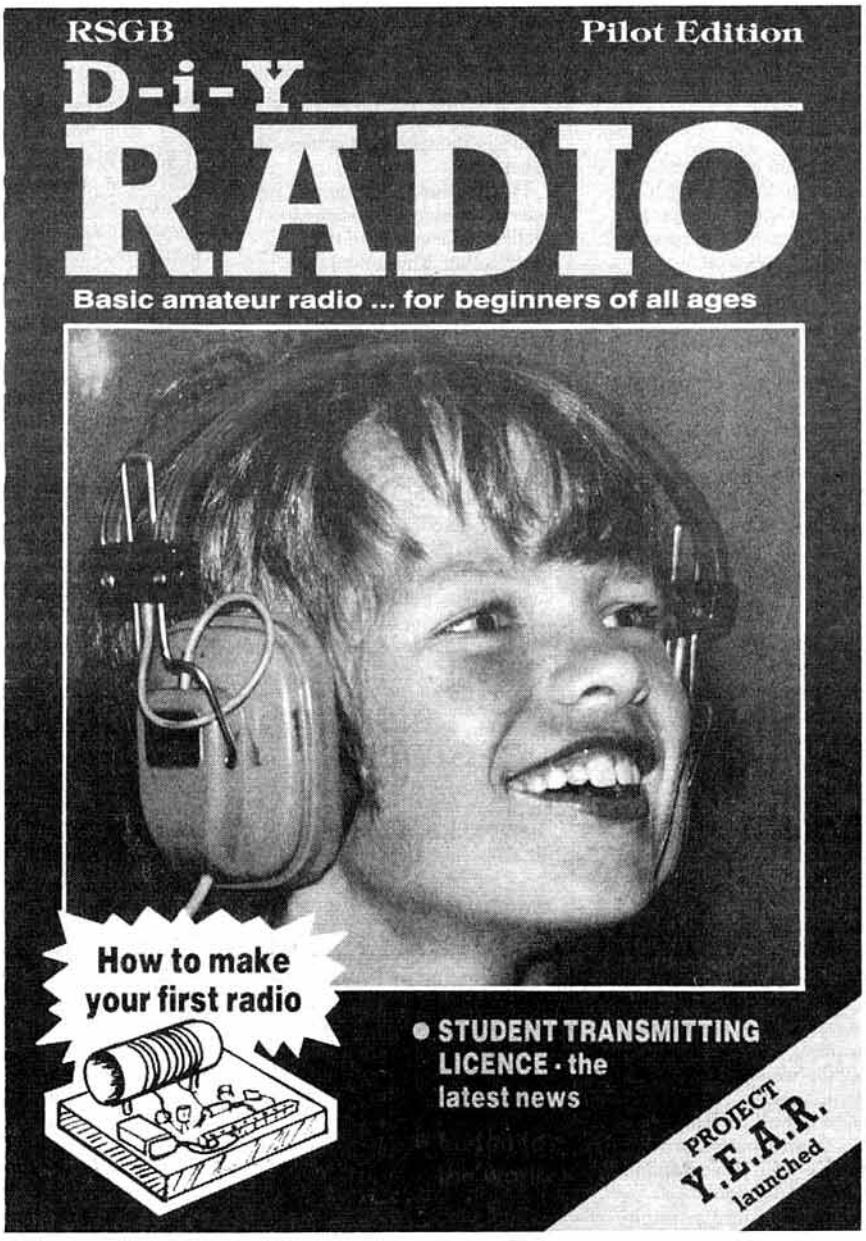
If the numbers in amateur radio fall because no-one will give up a few hours a week to train tomorrow's amateurs, and commercial pressure on the radio spectrum increases, we cannot expect a bright future.

What can you do? If you care about the future of amateur radio, offer your services to your local club so as to help train beginners. If, like some 50% of UK amateurs, you are not a member of your local club, then think of joining it. Be prepared to give up just an hour or two each week to help beginners derive the same fun and pleasure from amateur radio which you have experienced. Work with your local club, RSGB Liaison Officer (there is nominally one in each county, Scottish region or large Island) and zonal Council member, to help put more effort into local recruitment and training.

One other thing is also relevant, most questions which beginners and newly licensed amateurs ask are far best answered at local Club level through personal contacts. Has your Club got a recruitment officer? Has it a training officer? Are there members who are available by telephone in the evenings and weekends, perhaps on rotation, to help answer questions?

If amateur radio is to prosper then the local community is where it will begin. Council, staff and all officers of the Society are there to help amateur radio flourish, but much also depends on you.
David Evans, G3OUF

D-i-Y RADIO



First produced as a result of the Project YEAR (Youth into Electronics via Amateur Radio) initiative, this magazine is firmly targetted at the newcomer to radio. Containing hints, tips and good down-to-earth advice from seasoned writers, **D-i-Y RADIO** features articles in construction, components and suppliers in terms which the newcomer can understand.

The popularity of this Pilot issue was such that it quickly sold out when first launched, so here is another opportunity to get your 'first edition'!

Why not order your copy now, just send £1.50 (cheque or postal order) to:

RSGB SALES (CWO)

Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE

Sir Richard Davies, G2XM, RSGB Immediate Past President, chairman of the conference (left) examining the Novice Licence discussion document with Cliff Deamer of Marconi Defence Systems (centre) and Mike Coolican, Head of Branch in the DTI's Radio Communications Division.

A Novice Licence for the UK

"....the Licence would give beginners a first taste of communication by radio and a stimulus to develop their skills further.... this is a splendid idea..... I congratulate you on the initiative". (Robert Atkins, MP, Parliamentary Under-Secretary of State for Industry)

On 20 July 1989 Sir Richard Davies, G2XM, the Society's Immediate Past President, formally presented the RSGB Novice Licence Discussion Document to the DTI Minister, Robert Atkins MP. The occasion was the Society's first-ever Industry Conference on Project YEAR (Youth into Electronics via Amateur Radio), the proceedings of which are reported in detail elsewhere in this issue.

For members who have been following the Society's various announcements about the proposed Student Licence, there will be few surprises except perhaps for the name itself. Here the view of the membership was that the licence being developed for beginners should be called a "Novice Licence" (voted for by 32.4%), not a "Student Licence" for which the corresponding figure was 23.8%. It is interesting to note that the next choice of name was a "Basic Amateur Radio Licence" (15.8%) and then a "Provisional Licence" (15.1%).

The RSGB Novice Licence Discussion Document - all 46 pages of it - is now available to RSGB members by post. What follows is a resume of what has been proposed, the background and reasons for the proposal itself.

Project YEAR is born

The story of the Novice Licence really began about two years ago, when it was realised that the average age of UK radio amateurs was increasing. This was chiefly because far fewer beginners (especially young beginners) were coming into the hobby. It was also evident to the Society's Council that amateur radio was a marvellous medium with which to introduce young people to the subjects of science, electronics and engineering; skills in which the United Kingdom is soon likely to find itself in short supply. In response to these two important matters, Project YEAR was conceived and launched by the Society's Patron (HRH Prince Philip, Duke of Edinburgh) in July 1988.

In September 1988, a major article and survey concerned with Project YEAR was circulated to every member of the Society through the medium of *RadCom*. The responses received were carefully analysed, and the results were published in the January 1989 issue. Of the members replying, more than 80% supported the notion of some form of beginners' licence.

The views obtained from the membership on bands, powers, age limits, licence duration, Morse speed and other topics were used by the Society as a basis for consideration. In essence, that is why there should be no surprises in the final discussion document submitted to the DTI. What must be stressed at this stage is the fact that the document given to the Department of Trade and Industry is a "discussion" document. Nothing is cast in the proverbial tablets of stone, and it is expected that the final form of this new licence will be hammered out during discussions between the Society and the DTI. The step the Society has now taken is to state formally that it would like to begin discussions.

APPENDIX D - Novice Licence Schedule (for discussion with the DTI)

Frequency - MHz	Permitted modes of transmission	DC input to final stage - watts	Notes
1.950 - 2.000	MORSE TELEPHONY DATA RTTY	5	
3.565 - 3.585	MORSE	5	
10.130 - 10.140	MORSE	5	
21.100 - 21.149	MORSE	5	
28.100 - 28.190	MORSE DATA RTTY	5	
28.225 - 28.300	MORSE DATA RTTY	5	
28.300 - 28.500	MORSE TELEPHONY	5	
50.620 - 50.760	DATA	5	Note 1
51.250 - 51.750	MORSE TELEPHONY DATA	5	Note 1
433.000 - 435.000	MORSE TELEPHONY DATA	5	
1240 - 1325	MORSE TELEPHONY DATA RTTY SSTV FSTV	5	
10000 - 10500	MORSE TELEPHONY DATA RTTY SSTV FSTV	5	

Note 1: Horizontal Polarisation. Antenna not above 20m above ground level.

Project YEAR

The aim of Project YEAR can be simply stated. It is an RSGB initiative to create a continuing awareness of the need to recruit young people into amateur radio - possibly as a prelude to a career in science, electronics or engineering. There are six key objectives to Project YEAR, of which the Novice Licence is one. Each integral part of the project is essential to its future success. These six objectives are:

(1) The creation of a framework for the introduction of a Novice Amateur Radio Licence class within the UK. This would include the establishment of an organisation to provide the necessary training and examination facilities.

(2) The production of recruitment

Annual Meeting Venues

At a recent meeting, Council determined the venues for the next three Annual Meetings of the Society. These will be as follows;

1989 Dunoon, Scotland (on 9 December 1989)
1990 Bristol
1991 London

The Society would like to thank all the affiliated clubs, groups and societies which submitted proposals for venues for forthcoming Annual Meetings.

video tapes for circulation to Clubs and for sale to the general public.

(3) The writing of new books aimed at getting the non-technical person interested in amateur radio. A series of 12 publications is planned at present.

(4) The launching of a magazine aimed at introducing beginners into radio/electronics.

(5) The design/production/approval of simple kits for use by beginners.

(6) The raising of funds necessary to carry out the objectives of Project YEAR. It is in this context that the Society arranged a Conference with industry with the close co-operation of the Department of Trade and Industry.

It is immensely pleasing to note that many clubs around the country have already become interested in - and committed to - Project YEAR and are beginning to achieve encouraging results. However, the Project YEAR initiative is also heavily based on the requirement for a Novice Licence.

Why a Novice Licence?

It is an established fact that far fewer young people are coming into amateur radio than hitherto; it must follow that there are reasons why this is the case. Some of them are not hard to divine, and can be summed up in the sociologist's notion of "demographic drift". There are fewer young people around; equally, there are very many things which are interesting to young people in contemporary society but which require little or no study. RSGB research has also shown that many potential recruits to amateur radio are put off by the long time required to study for a full licence and the high cost of basic equipment. There are several other factors. Taken together, it is hardly surprising that the number of beginners has dwindled. It is not only the amateur service which has suffered; many of the UK's leading electronics companies now have severe skill shortages.

Having surveyed every member under 25 years of age in detail, and having asked our membership for its views, the Society is now convinced that a Novice Licence will be a positive benefit to the future success of amateur radio in the UK.

Novice training and qualifications

The proposed Novice Licence course requires approximately 30 hours of study, which is much less than is needed in most cases to obtain a full licence. This in itself should encourage more people to try out amateur radio for themselves. Attendance at a course given by an approved instructor - and the satisfactory completion of certain objectives within the course itself - are necessary qualifications for the Novice Licence. By this means, basic operating standards and disciplines will be taught and tested: the maintenance of standards is considered an essential part of Novice training. A certificate will be issued to all those who complete the course.

In principle, the Society believes that any full A or B licensee will be able to teach the new Novice course. This implies that many A or B licensees will be able to put something back into amateur radio by passing on their knowledge to beginners; in itself this will be a most exciting and rewarding prospect to many amateurs.

The second requirement for the Novice Licence is satisfactory completion of a multiple-choice examination on licensing conditions, technical matters and operating techniques.

The Society proposes two types of Novice Licence; the "Novice A" and the "Novice B". The Novice A licence requires that a 5 wpm Morse Test be passed, which will give access to the Novice bands below 30MHz. Amongst other things, this will comply with the requirements of the International Radio Regulations. Whilst the passing of a 5 wpm Morse test will not be required for a Novice B licence, knowledge of Morse letters and numbers will form part of the Novice Training Course.

"Perhaps the greatest satisfaction forthe young enthusiast comes with the discovery that this hobby has provided a way into an interesting and rewarding job. That is why I am delighted to inaugurate the Society's Anniversary project, 'Youth into Electronics via Amateur Radio'... it's a thoroughly good idea and I hope it will be most successful."

His Royal Highness, Prince Philip, Duke of Edinburgh, Patron of the Radio Society of Great Britain.

Course Syllabus

The draft Novice Licence Syllabus, originally published in the September 1988 issue of *RadCom*, has been modified, although the original concepts are largely maintained. The revised Syllabus consists of 10 sections, viz: Receiving Techniques; Units, Components and Applications; Soldering; Measurements; Propagation; Operating Procedures; Morse Code; Station Layout; Home Construction and Licensing Conditions.

In each area of the Syllabus there is a heavy practical emphasis. Acquisition of the skills necessary to operate an amateur station on a variety of bands and modes is felt to be particularly important.

The Novice Licence as a stepping stone

The Novice Schedule proposed to the DTI will give limited access to sections of several amateur bands and a limited selection of modes. The maximum DC input power on all bands is restricted to 5watts.

The Novice Licence will provide an easily-approachable introduction to amateur radio as a stepping-stone to a full A or B licence. For the Novice Licence to be attractive, it must offer a range of amateur activities for novices to sample. At the same time, however, the licence must be so conceived as to encourage people to progress to a full licence. The full licence must continue to offer the next objective with far greater privileges.

The Novice Licence and Schedule

The Society has used the existing UK Amateur Licence Document as a starting-point, suitably modified by consideration of the level of skill and experience which would be appropriate for the holder of a Novice Licence. As a result, the Society wishes - in particular - to discuss the following aspects of the proposed Licence with the DTI:

(a) International emergency traffic facilities.
(b) Mobile and portable operation.
(c) Maritime mobile operation.
(d) Unattended operation.
(e) CEPT equivalence.
(f) Club callsigns for novices.
(g) Special facilities, eg NoV's.

The proposed Schedule will permit a range of bands and modes to be sampled. The microwave bands have been proposed because they will permit novices to experiment at school with projects such as low-power TV links; a mode which our surveys have shown is one of particular interest to young people.

Age limit and renewal

The Society recommends that there be no minimum age limit for a Novice Licence; merely that ability to hold this class of licence be demonstrated through attendance of the basic amateur radio course and by passing the appropriate examinations.

Current thinking within the Society is that the Novice Licence should be issued for a period of three years and renewed on application.

The issue of Licences

The Society proposes that the DTI issues Novice Licences using the M callsign prefix. This is so that the novice licensee is distinguished from a full A or B licence holder and hence is easily recognisable as a novice both nationally and internationally.

Final

This resume of the Society's Novice Licence Discussion Document presents some of the basic concepts and reasons for the new licence. The complete document is available to members in the form of a booklet, costing £3 post-paid to members. The payment covers the cost of production, package and postage. The document is available from RSGB HQ; please mark your envelope "DS - Novice Document".

UA9 QSL

Colin Horrabin, G3SBI, tells us that he's received a letter from Igor Finogenov, UA9AQN, saying that the following stations can be QSL'd via him:

UA9AQN/UH2A
UZ9AWD/UH1A or UH1W
RA9AUZ/UH3A or UH3W
UA9AUJ/UH4A (Oblast 191) or / UH4W (Oblast 045)

QSL via Igor G Finogenov
Box 49
Magnitogorsk
455044
USSR

MUSICAL CHAIRS

Don't expect to find the same names against the same *RadCom* staff titles next month; the changing structure of *RadCom* takes a new twist when I pass the role of editorship on to Dave Bobbett, G4IRQ - who currently is Deputy Editor.

For the past couple of months I've begun to share my responsibilities to *RadCom* with a new car/marine hi-fi consumer magazine being launched under private ownership. On 1 September the division of labour will be about 50/50, which is an appropriate juncture for me to hand the ultimate responsibility over to Dave. I'll still be on the team, but in the new capacity of 'Editorial Consultant'.

A new face will appear too - Giles Booth becomes Editorial Assistant, to help cope with the immense amount of paperwork and data files which move into, around, and out of the editorial office. Giles comes from a family of active radio amateurs, and so far has escaped being licensed himself. His days without a callsign are now, without doubt, numbered!

Unfortunately I cannot as yet announce the appointment of a News Editor. You have probably seen out staff advertisements, but alas the person we want obviously hasn't! The response has been poor; clearly it is difficult to find a prospective staff member with experience of news-gathering, writing, and - most important - a grasp of the goings-on in Amateur Radio.

My year with *RadCom* has been, well, interesting to say the least! Most certainly the task of turning the Society's journal into a magazine has been difficult, not only from the 'mechanical' points of view, but particularly the political aspects. Any change to a membership journal is regarded with mistrust, doubt, irritation and sometimes downright aggression. And it's amazing how those who oppose changes always seem to be the most vocal and violent! We've weathered the storms, however, and kept to the plan.

I firmly believe that the direction *RadCom* is taking is the right one, and that with further development the majority of members will be proud to receive it and keen to read it. It is the membership's most tangible asset, and it has to be very informative and presentable in order help to attract new members.

Despite the flak, everyone on the editorial team - and our background workers - have been incredibly diligent and patient. Unfortunately Dave and myself will be asking the same for some time to come, because the conversion to full Desk-Top Publishing on *RadCom* is now really only just beginning...

Highfields on the Air

On 17/18 June a special-event station, GB0CLM, was operated by Highfields Amateur Radio Club from its base at the Highfields Centre for the Physically Handicapped in Cardiff.

The station was marking the inauguration of Cardiff's Lord Mayor - Councillor Mrs Beti Jones, JP - who is seen keeping an eye on the HF operator, Malcolm Green, GW0GAI and his SWL 'logger' Stuart Hughes. The Club's chairman, Dennis Benson, GW3TQI, was also present. The photo was taken by Howard Badham, GW6JQS.

HF Convention hosts Young Amateur of the Year award winners

The RSGB HF Convention takes place on Sunday 1 October at the Belfry Hotel, Milton Common - just off the M40 at Junction 7. You'll find full details of the Convention elsewhere in this issue, but it opens at 9.30am and a full programme of lectures and presentations will commence at 10.30am. In a special ceremony at 3.30pm, the Department of Trade & Industry will announce the winner of the 1989 'Young Amateur of the Year' award - and the RSGB will introduce the runners-up.

This years' award has attracted a considerable increase in the number of entries. Those selected for the short-list by the judging committee were of an extremely high standard, and they fully reflect the Society's view that the very young are capable of some remarkable achievements in amateur radio.

The DTI, the Mobile Radio User's Association and Messrs Cirkit, Navico and Siskin Electronics will present their prizes to the finalists before an audience of Convention visitors. We hope that these will include both the sponsors and the parents of the lucky winners. See you there!

ISWL HQ QSY

The Honorary Secretary of the International Short Wave League, Ms Yvonne Blain, G-20041/G7DMN, has moved house, taking with her the League's headquarters. She and it are now at: 6 Moorhead, Preston upon the Weald Moors, Telford, Shropshire TF6 6DL. Anyone requiring membership details and awards can write to her at this address.

WAB News

Some wag we heard on the air the other day suggested that we ought to have a Worked All Britain column in this august (as opposed to August) publication and call it 'WabCom' - groan. Anyway, WAB's tireless publicity officer, John Fitzgerald, G8XTJ, tells us that the Awards Manager is now Dave Rogers, G4VID. His address is: 5 Braemar Close, Kettering, Northants NN15 5DD. All award claims and related correspondence should go to him.

The WAB membership secretary, Brian Morris, G4KSQ, has been busy sending out new books, and he tells us that the following DX stations are the first bookholders in their respective countries - BY4WNG, VU2GY and SV0GE. Also, the new and fully-revised edition of the WAB Book is now available from himself at £7.00 including postage and packing. Brian writes, 'In addition, with the launch of the 10,000 series books, we can also offer a package deal of WAB Book together with the AA Atlas of Great Britain and the AA Atlas of Ireland for a total of £16.00. The atlases are available separately - please contact me for prices. The atlases show WAB areas clearly and may be of interest to our overseas bookholders'. Brian will be delighted to send information on WAB to those interested, his address is: 22 Burdell Avenue, Sandhills Estate, Headington, Oxford OX3 8ED.

1990 sees the 21st anniversary of WAB, and they've decided to mark it by means of a special fund-raising effort. The aim is to provide sufficient funds to train a guide-dog for a blind amateur or SWL, and they plan to hand over the cheque at their 1990 AGM at Drayton Manor. The organizer of this project is Adrian Keeble, G4HPU, whose address is: 4 Manor Cottages, Debden, Saffron Walden, Essex CB11 3JY. He'd be delighted to hear from anyone who's prepared to donate a prize for the Grand Raffle, or from those who are willing to sell tickets. Adrian is currently looking for other good fund-raising wheezes, so send any ideas (or donations) to him at the above address.

Recent WAB Award 'firsts' include one to G4GEE, who received a Premier Large Squares Award; Frank Parkhurst, for 260 islands on 3.5MHz SSB; and G4ZUR, who received a Bronze for 500 areas worked on 50MHz. Finally, Wilf, ON7TH, is the first non-G station to reach Bronze and Silver (750 areas worked) on 144MHz SSB.

A bit of last-minute WAB news is that, by popular request, G0KSY and G0JAR will be out portable again in TR09 (Essex) on 3.5, 7 and 14MHz on 8 and 9 September. The action will start at 0800GMT on both days.

(left) The tent housing GB0YAS which demonstrated amateur radio to visitors to the Youth Action 89 exhibition at the Wembley Stadium Complex. The event was aimed at broadening young peoples' career prospects and leisure activities. The pictures (below) show some of the young people finding out about amateur radio thanks to the RSGB staff and Verulam Club members who kept GB0YAS on the air throughout the four days of the exhibition

Youth Action 1989

On Thursday 27 to Sunday 30 July Wembley Stadium Complex was the venue for a successful exhibition aimed at showing youngsters the vast number of career opportunities which are currently available to them. Representatives from many companies, youth organisations and Colleges of Further Education were present to give all who visited a chance to investigate any career or leisure activity they may have been interested in. The event had been organised under the umbrella of The Prince's Trust and, in his foreword to the event, Tom Shebbeare, Director of the Trust said that "Youth Action represents a slice of life. It hints at the range of opportunities for the young, emphasizes their achievement, celebrates their energy, recognizes their commitment and praises their concern... Young people from all parts of the country are here doing what interests them. Sharing their enthusiasm and commitment to encourage and inspire others."

The Scout Association was heavily involved and had timed the event so as to coincide with their 'Discovery 89' activity (see 'Discovery 89' story). The Association enlisted the help of the RSGB in setting up and running a demonstration amateur station; however as the Society was already heavily committed with the Data Symposium, the Verulam Club was asked to assist. The special event station, GB0YAS, consisted of equipment held at HQ; namely a 50' dipole with tuned feeders of 300ohm ribbon at about 25', and a TS930S transceiver. Headquarters G3JKB, and Tim Charles, G4EZA, manned the station on Thursday and Friday with much appreciated assistance being provided by Verulam Club members - GB0YAS was operational again on Saturday and Sunday when it was operated solely by Verulam Club members. Thanks go to H Claytonsmith, G4JKS (a current Council Member); F Claytonsmith, G3JKS; R Heath G3UJV; A Gray, G4DJX; R Mellor, G0EHO; and G Laming, G4JBD.

UK Scout Link

Many contacts were made with all corners of the earth, the most successful being a series of QSO's in which all the UK Scout Discovery Camps were linked together by amateur radio. John Fogg from the Scout Association headquarters was present and operated during the link up, later saying that it was the very first time that the complete link had been achieved and had been a major success.

As the Scout Association are playing such an important part in the success of Project YEAR, the event was considered a great success in the promotion of radio and electronic skills. The photographs show the RSGB marquees near the main exhibition area and the enthusiastic response from various groups of youngsters who visited the station.

Shetland Amateurs Provide Comms for Half-marathon

Our Regional Liaison Officer for that part of the world tells us that on Saturday 24 June, commencing at midnight, Shetland held a midsummer half-marathon race - a 13-mile-long route starting and finishing in Lerwick.

Following a request from the organizers, a team of four radio amateurs volunteered to provide the communications required. With Colin, GM0AVR, ahead of the pack and Frank, GM4SWU at the rear - together with Ian, GM0ILB and Pete, GM3XOQ, keeping an eye on things in between - the race was completed without incident despite the appalling weather. Full use was made of the GB3LU repeater, and by 0230 the box's PAs must have been very warm! Needless to say, internal heating for both competitors and organizers was provided in the traditional manner at the end of the race.

A few months ago Richard Diamond - one of the directors of South Midlands Communications and a keen VHF DX-chaser - managed a deft bit of arm-twisting. He persuaded the McKnight Crystal Company of Hythe, Southampton to donate a quantity of made-to-order crystals to the Six Metre Group for use in overseas 50MHz beacons. The photo shows Mr Derek Carpenter, Managing Director of McKnight, handing a card of crystals to Mike Walters, G3JVL. Richard and SMC have been good friends in the past to DXpedition groups and the like seeking to borrow equipment for trips to faraway places, and it must have been a nice change for him to see the boot on the other foot for once! The Society would like to thank McKnight Crystals for their generosity, which we're sure will be put to very good use.

South Wales Murders

As mentioned briefly in last month's edition, we greatly regret to report the double murder of Mr Peter Dixon, G0HFQ, and his wife Gwenda whilst on holiday in South Wales. Peter was a member of the Society, the Harwell Radio Society and RAFARS, and will be greatly missed; our heartfelt sympathy goes to their son and daughter.

The tragedy was widely reported in the media, and an artist's impression of a man the police wished to interview received considerable publicity. The Society was asked by Dyfed-Powys Police for assistance. An appeal for information from those who had been in radio contact with Mr Dixon was transmited via GB2RS, and it is understood that the response was helpful in assisting the police with reaching a conclusion in respect of the date of the murders.

As we went to press, the police were still interested in hearing from anyone who spoke to Mr Dixon on radio between 19 June 1989 - which is the day the couple left for Wales - and 29 June 1989, which is the day on which they are believed to have died. If you have a contact with G0HFQ or GW0HFQ/M in your log between those dates, please contact Dyfed-Powys Police on: 0437 3355/6.

New Products

Before we get into what's new, here's a thought to manufacturers, dealers, importers and what-have-you. We'd love to have more information on what's new for our readers; at the moment you don't tell us very much! We've a fax machine sitting here waiting for your press releases, and news staff poised over their keyboards to rattle in your words of wisdom. We can even do short informal reviews of what you've got on offer - not so much transceivers at a couple of grand, we leave those for our formal reviews, but little bits and bobs that we can try out in our shack and tell the members about. Dammit, you can even have them back when we've finished!

Anyway, to business. Cirkit has just published the Summer 1989 edition of their catalogue which is apparently 184 pages long and "...offers the electronics constructor a wealth of versatile new products for use at all skill levels" (it says here). They go on to mention that the publication has over 3,000 product lines, which are now arranged alphabetically for easy reference. These include a series of six digital multimeters with features such as frequency and capacitance measurement and on the top-of-the-range one, the TM175 - you get continuity, diode, hfe, logic and LED test modes in addition to the usual ones. No indication of price, though. Get your copy from: Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts EN10 7NQ; their phone number is 0403 211048.

Number One Systems

If you're well up on transmission lines and the like and the Smith Chart is as familiar to you as your breakfast cornflakes, you might be interested in a new product from Number One Systems Ltd. Whoever wrote the press release ought to be reassigned to a slightly less demanding job like sweeping the floor - it makes the Prophecies of Nostradamus look like a model of lucidity - but as far as we can tell the company has managed to produce a software version of the Smith Chart called 'Z-Match' for BBC micros and IBM compatibles. In addition, they say, Z-Match goes further than is possible on the paper chart by allowing for line losses, providing a reference mode, working in actual rather than normalized units and offering conversions and calculations on single keystrokes. For more information contact: Roger M Wareham, Technical Director, Number One Systems Limited, Harding Way, Somersham Road, St Ives, Huntingdon, Cambs PE17 4WR. Ring them on 0480 61778.

And that's your lot for this month. Remember - if you're anything to do with the commercial side of amateur radio, let us know what's new. Photographs are nice, and a press release which we can understand without asking GCHQ to decode it for us is even nicer. Better yet, fire your PR man and just tell us in your own words what you've got!

G7 QSL card crisis

The QSL manager for the G7 callsign series writes, "Unclaimed QSL cards for holders of G7 callsigns are presenting a problem of storage. I am proposing to destroy all QSL cards for G7s which have not been claimed and which have been held awaiting envelopes for more than three months. I am currently still holding all QSL cards which have been received to date for G7s - ie. since March 1988. I propose to destroy the cards at the end of September 1989".

If you are a G7 callsign holder and would like your cards, we'd suggest sending some envelopes pronto to: D J Hudson, G6OVO, 62 Derron Avenue, South Yardley, Birmingham B26 1LA.

DDRC 21st

In December 1968 a few keen amateurs got together in a public house in Dunstable High Street and formed the Dunstable Downs Radio Club. Twenty-one years later the club is still very active in all areas of the hobby and strives to maintain its high profile in the Dunstable area. To celebrate its 21st birthday, the club wishes to contact any old members with a view to inviting them to attend a special Celebration Dinner on 18 November. Overnight accommodation has been arranged with a local hotel at very reasonable rates.

The Committee would be very pleased to hear from any old members, whether or not they wish to attend the dinner. In the first instance they are asked to contact the Secretary, Tony Kelsey-Stead, G0CQQ, 'Rosedale' 44 Shelley Road, Luton LU4 0JA or on 0582 508259.

Perestroika comes to Park Lane

One of the offshoots of *Perestroika* is an increasing number of personal visits and DXpeditions.

In the July issue of *RadCom* we showed a pic of RB5JZ operating the station of redoubtable HF DX operator Al Slater, G3FXB. Al subsequently sent in an article giving some of the background to this piece of glasnost, and here it is:

Back in the early 1950s, just after I was licensed, there was a period when Soviet radio amateurs were only permitted to contact their own countrymen and amateurs in other Eastern Bloc countries. The ban was imposed in the days of Stalin, but when Nikita Khruschev came to power later in the decade it was lifted, and soon Soviet amateurs were working virtually everybody. I remember that when the ban was imposed I still needed the eastern Siberian zone (Zone 19) for WAZ, so the return to normality was very welcome! Most contacts were limited to exchanges of basic information - name, QTH, rig and the inevitable 'please QSL'. No doubt part of the reason for the limited nature of the contacts was the language difficulty - after all, can you conduct a QSO in fluent Russian? However, another reason was the restrictive nature of the Soviet regime, and many were the stories of USSR amateurs being closed down for being too communicative with their fellow amateurs in the west. Equally, not only QSLs but also contest logs and award applications for overseas destinations all had to be routed through the famous 'Box 88' in Moscow.

BACK TO THE USSR

About four years ago, some slow and subtle changes began to become apparent. In the summer of 1986 I ran across Stan, RB5JZ, who was one of the leading personalities in the UK5MAF contest station back in the 1970s. At that time my wife and I were planning our first-ever trip to the USSR and I was anxious to trace another member of the UK5MAF group with a view to meeting him in Moscow. As a result, RB5JZ and myself set up a regular daily schedule, which has now lasted for three years. This led to meetings with Stan in Moscow in 1987 and 1988, and a stay by Stan and his wife Svetlana at our home earlier this year. It is possible that this was the first purely private trip by a Russian amateur and his XYL as guests of a British amateur and his family. It was also noteworthy in that - thanks to the Society and the DTI - Stan was given permission to operate my station. Furthermore, our plans were all made on the air in the course of our daily contacts.

Reverting to my original trip to the USSR in 1986, it was apparent that things were changing - and they were not quite as we had been led to believe. It had been pointed out that I would have problems meeting Soviet amateurs; certainly it was not quite as easy as it is in the West, but on our first day in Moscow we were entertained at a six-course meal at the home of a well-known UA3. We were also royally treated at the Central Radio Club and at the home of a UA1 in Leningrad. These contacts have been built on in subsequent trips, and we have had many happy hours with groups of amateurs in Leningrad, Kiev and Yalta. Much of this ability to socialize more easily with Russian amateurs is the result of i) glasnost (openness) and ii) perestroika (reconstruction of society), which are all part of Mr Gorbachev's new look.

Media-watchers will be well aware of the many changes which have taken place in the Soviet Union in recent years, and in turn these have affected amateur radio. Russian addresses can now be published in the International Call Book; all classes of licence-holder can now contact all foreign amateurs; limited packet radio has been introduced; foreigners are now allowed to operate club stations on production of a copy of their home licence; and there have been a number of joint DXpeditions with foreigners, including the Russian/Canadian Trans-Polar Ski Trek, and the operation by Lloyd and Iris Colvin, W6KG/W6QL, from no less than 15 Soviet Republics. Finally, the first-ever USSR DX Convention was scheduled to take place in Leningrad last month.

To date. however, mobile operation is not permitted and there are no repeaters. Travel by foreigners is still restricted, and for our planned visit to RB5JZ's QTH next year we shall have to secure a special visa. Likewise, for Stan's visit here a great deal of paperwork was required to satisfy the Soviet authorities; these included the swearing of an oath at the local solicitor's office that the facts as stated were correct. Even our own Home Office was slow to move, and my local MP was called on to help expedite matters. In addition, passports for Soviet citizens are very expensive, currency restrictions are very severe and travel is costly and difficult to obtain. In the case of Stan and Svetlana, they came by train from Moscow to Dover - a journey of almost two days' duration. This, of course, involved transit visas - and to obtain one for the Federal Republic of Germany took no less than 4+ days of waiting in line at the German Embassy in Moscow. And you think *you* have problems at Heathrow and Gatwick!

Amateur radio itself is very different in the USSR - it resembles the state of the hobby in the West before the advent of the 'black box' era. Virtually without exception, all equipment is homebrew. Personally, I feel that this adds something to the hobby, and I well remember shack visits in the 1950s to inspect the latest piece of home construction. However, RB5JZ is an exception insofar as he has a Signal One CX7 which was taken over to him by a K6 in the 1970s. The problem here has been in keeping it going, the Signal One not being the most reliable of rigs. Fortunately the California gang have been very co-operative in digging-up the necessary spares to keep it performing.

RUSSIAN TVI

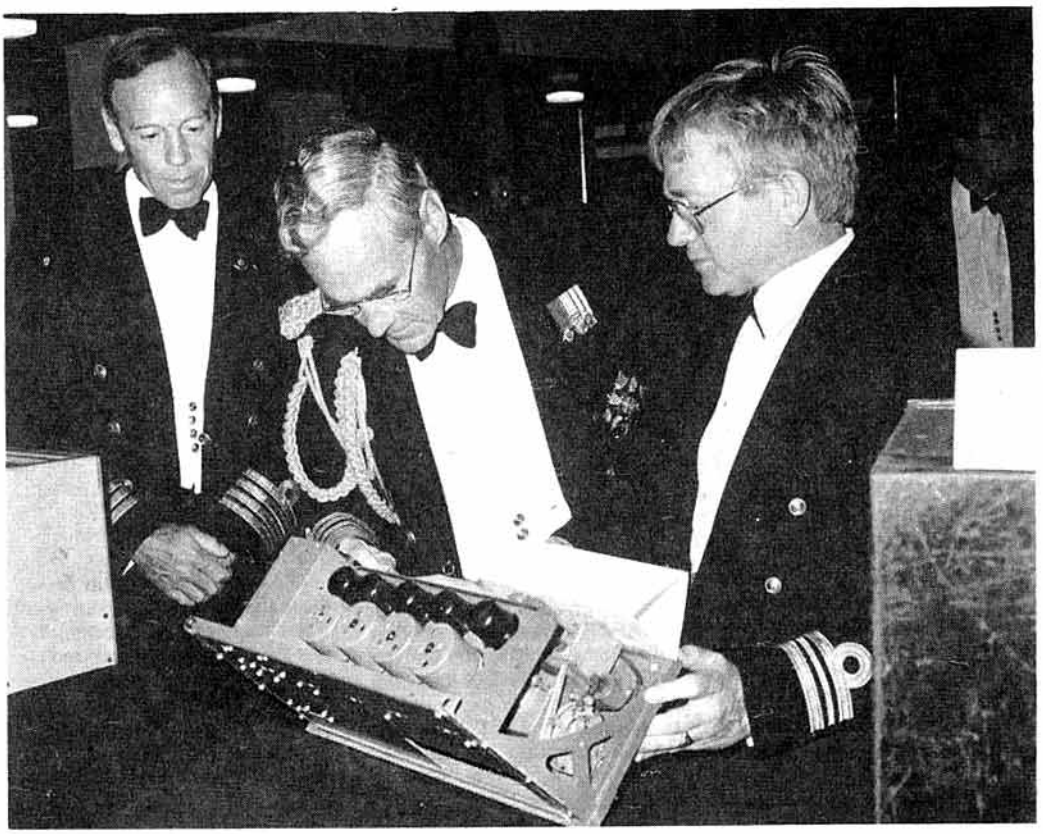
TVI remains a problem in the USSR since VHF is still in use, but there is not the vast number of home entertainment and other devices with which we have to contend in the West. Antenna planning does not seem to be an issue, and I have seen a number of large arrays installed on the roof of apartment buildings. In this connection, the majority of the population in the cities live in apartments; only in rural areas does one see much in the way of individual houses.

RB5JZ and his wife were here for almost six days, and we packed as much as we could into that short space of time. They met a goodly number of UK amateurs as well as our family and neighbours, and their visit culminated in attendance at the public gallery of the House of Commons - arranged by my MP. Stan and Svetlana originally lived in Lisichansk, at the centre of the Ukranian coal-mining industry, but poor health resulted in a move to Belogorsk in the Crimea. Here Stan built his own house, complete with stacked 4-element monoband yagis for 14, 21 and 28MHz. Stan is employed in the manager of a local quarry whilst Svetlana is a music teacher. They have a son, Alex, who is licensed as UB4JAZ and currently serving in the army, and a daughter - Polina - who is still at school.

Having travelled the world and met countless radio amateurs, it is very apparent that our hobby has an enormous amount going for it in the achievement of international

More Glasnost

In a tantalizingly brief fax message, we heard that Alexander Zhadan, UA6LHB and Anatol, UA6LTC, were due to arrive at Heathrow on 'Flight 241, Terminal 2' on 1 September. It said that they would start a tour of Southern England, Cornwall and Norfolk before going north to Ramsbottom in Lancashire, returning '...by way of the last QTH in the Peak District'. The visit is apparently being co-ordinated by Arthur Taylor, G4KLV. More on this when (if) we have it.



Lieutenant Commander Clive Kidd RN, G3YTQ and Past Chairman of the Royal Naval Amateur Radio Society, discusses a German World War II receiver (an 'Uberlagerungsempfanger RS1/20 DM/43' covering 394-826MHz) with the First Sea Lord, Admiral Sir Julian Oswald GCB ADC. The equipment was part of an exhibition on display in HMS Collingwood prior to a dinner marking the 50th anniversary of the commissioning of the establishment which is now the home of the Weapon Engineering Branch of the Royal Navy.

goodwill. As my neighbour commented, 'who else apart from you chaps could sit down and talk to a Russian - or for that matter any other nationality - on a daily basis?' Apart from technical matters, the main topics of conversation are families, one's work and the environment. One feels that if only the politicians would emulate the radio amateur in breaking down international barriers, the world would be a much happier and safer place. But alas! such is not always the case. Indeed, it seems to me that many radio amateurs do not take advantage of the wonderful opportunities and privileges that go with our hobby. Indeed, to listen to some of the DX pile-ups today and to read some of the letters in our publications makes one aware that intolerance and lack of understanding are becoming more and more evident as the years go by. That is a great pity, given the amount of goodwill we could generate. Radio amateurs can transcend political, ideological and national barriers and achieve close friendships with fellow enthusiasts throughout the world. Isn't that the real meaning of '73'?

Want to Fraternize?

The European CW Association's annual 'Fraternizing CW Party' will take place on Saturday and Sunday November 18-19 this year. This is EUCW's major event of the year; the press release says it is "intended to bring members of EUCW clubs and their friends on the air for a weekend of enjoyable CW activity, embracing all levels of operating ability" (*Embracing? Fraternizing? Must be something in this CW lark - Ed*). Apparently, "although mounted within a contest-style framework, individual participants are free to treat the Fraternizing Party how they wish. They can go all-out for contest-type points or take it easy and just enjoy meeting Morse friends, old and new, with more leisurely contacts. It is hoped, however, that all taking part will send in logs afterwards to demonstrate their enthusiasm for the event".

The press release adds that EUCW exists to support and encourage CW operating on the amateur bands, and it stresses that the Fraternizing Party is open to all CW operators and SWLs whether or not they are members of EUCW clubs.

A copy of the rules (presumably plus information about the European CW association if you ask nicely) can be obtained from: Tony Smith, G4FAI, 1 Tash Place, London N11 1PA - who happens to be its Chairman.

Famous Callsigns on the air again

Sixty years ago, on 30 September 1929, the first regular television broadcasts in this country commenced from the Baird studios in Long Acre, London and were transmitted from the BBC station 2LO on a wavelength of 361 metres. Up to that time only experimental programmes were available from the world's first television station operated by the Baird company and using the callsign 2TV, which was issued to them in August 1926.

To commemorate the occasion, members of the Baird Museum Amateur Radio Society will operate G2TV throughout the day on 30 September, using 3.5 and 7MHz. The BBC Ariel Radio Group is also intending to give G2LO an airing on the same day. It will be the first time since 1929 that these historic callsigns have been heard on the air together.

Uniquely, G2TV will have two of the original operators to run the station - Ben Clapp, ex-G2KZ and Ray Herbert, G2KU.

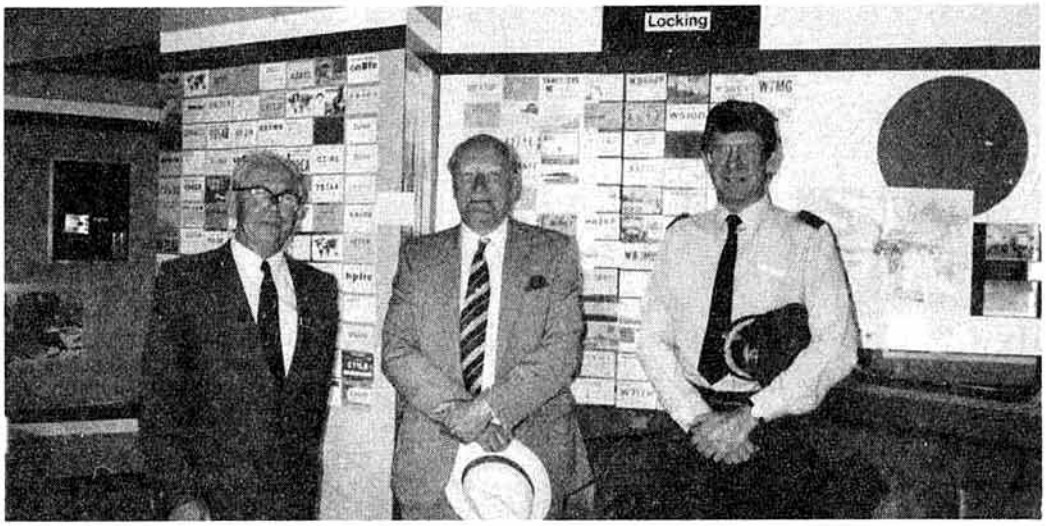
Sidebands

- The Society's Euro-MP for Hertfordshire - Derek Prag - recently visited HQ for a briefing on amateur radio. Main topic was the forthcoming EMC Directive.
- New licensing rules come into effect in the USA as of 1 September. Amongst other things, these permit the passing of third-party messages to and from the USA, provided that in the UK the message has been originated by a licensed amateur. Should be especially beneficial to packet operators.
- Still in the USA, on 15 June the FCC reaffirmed its decision to reallocate 220-222MHz to land mobile. The Commission rejected 700 petitions for a reconsideration.
- DTI now prepared to issue Notices of Variation to club licences to allow packet mailbox operation.
- New RLO for North Yorkshire (SW of the Ouse) is Gareth Foster, G1DRG, QTHR.
- East Cork Group EI7M failed in its bid to make direct contact with the USA across the Atlantic on 144MHz in early July - bad luck, nice try. Nothing known about how the RAF Finningley group did at press time.

Handicapped Olympics

Frank Elliott, G4PDZ, has contacted us recently to say that the Games, held in Leicester in August, were a considerable success from the amateur radio point of view. The special event station made 560 contacts with 46 countries by mid August and RAYNET were extremely active, with sixty operators being on call every day.

RAYNET's role was to provide a 'shadow' for each Games official, enabling instant communication between Games personnel and the organisers — some RAYNET members travelled from as far afield as Glasgow and Cornwall to help with the event. More details next month...



GB2RAF on the air

To mark the Golden Jubilee of RAF Locking, members of the Royal Air Force Amateur Radio Society (RAFARS) operated GB2RAF on 24 June. Contacts were made with many RAFARS members and other stations throughout the UK, Europe and North America. The station was visited by Air Marshal Sir Eric Dunn RAF (Ret'd), the Patron of RAFARS, who took the microphone to speak to RAFARS member W1BFA.

The photo shows Eric Palmer, G3FVC (RAFARS Council and editor of its magazine, QRV), Sir Eric Dunn (RAFARS Patron) and Group Captain R Holt (Station Commander of RAF Locking and RAFARS Vice-President) against a background display of QSL cards.

Three New Awards

Three new awards are being offered by the South Atlantic dependencies. These are:

The South Atlantic award.
This is available to stations who have worked at least one station on each of the South Atlantic dependencies, ie. Ascension, St Helena and the Falklands.

The Ascension Island award.
This award is available to stations who have worked at least three stations on Ascension Island.

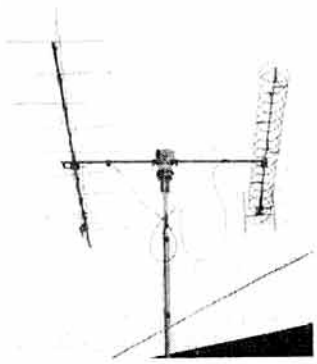
The Air Bridge award.
This award is available to stations who have worked one station in the UK, one on Ascension Island and one in the Falklands.

In order to qualify for any of these awards, applicants must list the relevant log entries and certify that the QSOs have taken place. Applications must be accompanied by 20 IRCs, US$10 or £5 sterling and should be forwarded to: Awards Manager, PO Box 2, Ascension Island, South Atlantic.

Harrogate Ladies' College

Special-event station GB2HC was on the air for 24 hours from Thursday 22 June from Harrogate Ladies' College - the ninth year in succession that GB2HC has been used during the school's open and sports day. They operated on 14, 21 and 28MHz using a TS430 and KW1000 amplifier into a TH3 at 50ft, and several hundred contacts were made. For the first time the College also operated via OSCAR 10 and 13. Fifty contacts, mostly with stations in the USA, took place by satellite.

The YL operators were Kate, G1WUE; Jane, G1WUC; Ruth, G1VRZ; Michelle, G1VSA; Julie, G1VRZ; Mabel, G7CTU; and Helen, G7BTZ. In the recent RAE results, six more girls (and one parent!) have been successful and will be applying for callsigns this month. The College has run an annual RAE class for the last nine years.



New goodies from muTek

In a recent press release, the newly-revitalized muTek company said that the first of a new range of linear transverters was now available. This is the MkII version of the popular TVVF50c, which gets you on 50MHz when driven from a 144MHz rig. Apparently it "...produces 25W output from a rugged power MOSFET. The transverter is fully protected against high VSWR and has RF ALC which enables a 40dB range of input drive level without internal adjustment. The maximum drive level is 10W, making it compatible with most 144MHz transceivers. The receive amplifier in the transverter is based around a balanced pair of BF988s, giving excellent sensitivity and good strong-signal handling"

muTek said that the new range of transverters will operate from a 28V supply and have 25W PEP output. The range will include models for 50, 144, 430 and 1296MHz, with 28 or 144MHz IFs. The company is also planning to introduce a replacement front-end for the evergreen IC202 portable transceiver, which will "...give a dramatic improvement in performance to this popular rig".

More details from muTek Limited, PO Box 24, Nottingham NG10 4NQ.

It's not my problem now . . .

Peter Chadwick, G3RZP, explains how to tactfully arrange for the disposal of late radio amateurs' radio equipment

This isn't going to be a funny or amusing article; in actual fact it's quite the converse — it's depressing and morbid. The only total certainty in life is that one day we all have to face the Big D; at some point every last one of us is going to feature in the Silent Key column. For those left behind there's shock, grief and mourning. At some point later on, however, the question of what to do with 'all that old junk' in the radio room will rear its head. It's with an eye to what to do next that this piece was written.

If there is another amateur in the family who can look after these matters, most of the problems disappear. However, in many cases reliance is placed on a licensed friend of the deceased — or a member of the local club — to organise a Silent Key sale, which will involve quite a lot of work; removing all the detritus which accumulates over the years, dismantling of antennas and so on. Additionally, there is the problem of disposal of logbooks, QSL cards, awards and similar items, some of which may be desired by museums and collectors. It's probably wise to do some preliminary planning for the inevitable, if only to stave off some tiresome times for those left behind.

The major items of station equipment may well be saleable for a fair amount of money. However, the worth of a particular item of equipment is not always that placed upon it by a proud owner, and a better idea of what can be expected will be obtained by looking at readers' advertisements in *RadCom* and taking an average price. At present, for example, late 1960s and early 1970s valved transceivers are fetching around £200, with proportionately more for later items. It may well save some recrimination later if you can prepare a realistic list of what major items in the shack are worth — especially if the subsequent sale at the club doesn't bring in as much as was hoped. It doesn't happen very often, but Joe at the club — who has an eye for a bargain — acquires the pristine AR88 which has sat in the shack since 1948 for £5 'because it's a bit ancient' — but it's not unknown.

There is an alternative to turning the station into cash, which is to give it to a deserving home. The local club might be delighted to have it as the nucleus of the club station, or perhaps it could go to a youngster just starting out in the hobby. Another very good home is the Radio Amateur Invalid & Blind Club (RAIBC), where modern up-to-date equipment is thoroughly checked and then issued to a member who might not otherwise be able to get on the air. This alternative is well worth consideration, but it should be discussed with the family first. If your widow is going to be left with a very small income, the cash may be needed for her. If, however, you happen to be a widower with no children — or with grown-up children who aren't interested in amateur radio — disposal of your equipment in this way can be an enormous help to a deserving amateur.

Hidden treasure

If you have been a radio amateur for some years, you may well have hidden treasure in the loft. Such things as the T1154 which you never got round to modifying and which is still sitting there in its Lisle Street packing with the £2/19/6 price tag can be worth a good deal to a collector. Rarer items of equipment, such as DF loops for the R1155, can be worth quite a lot in cash terms. However, they may also have considerable historical value to a museum, and it's well worth considering whether any of your equipment should go to one. Although in previous years the Science Museum was the usual place for such donations, it is a regrettable fact that very little of the Science Museum collection is ever on view to the public. It may be better to leave old or interesting items of equipment to one of the specialist museums such as Chalk Pits or the Communications & Electronics Museum. Even some cannibalised ex-Service items can be useful in providing spares for similar items which are under restoration, while handbooks are generally highly sought-after. Some discrimination is required, however; there are thousands of valves such as EF50s and PL81s around, and although some enthusiasts restore 405-line TV sets, the demand for spare valves for them is quite limited. Really old valves — such as French R valves, split-anode magnetrons and the like — are much in demand (anyone got a Leiben-Reisz tube?) and can either be sold or donated to a museum.

Bear in mind that, if a house is to be sold subsequent to a decease, it may be necessary to empty it fairly quickly. Someone then has to store all the contents until they are sold or otherwise disposed of. If valuable equipment is to be stored in this way, whoever gets the job has the responsibility of insuring it as well, unless it is clearly understood that storage is on a 'no liability' basis. This storage aspect is likely to be a problem if items such as large towers are involved, and it may be better to take a low price to facilitate quick disposal.

Home-built equipment

It's an unfortunate fact that the vast majority of home-brewed equipment is not very attractive to potential purchasers. Regardless of how much time, effort and cost went into it, very little cash is likely to result from its sale. All too often, the documentation (if any) which accompanies home-built equipment is so scrappy that it would be a major task for anyone else to use it or repair it. Its major value, alas, may only be either as a source of re-usable components or as scrap metal. It is possible that well-built linear amplifiers will provide the best return. Spare valves for them can be attractive if they're not useless because of a slow leak.

Antennas

Towers have already been mentioned. Beam antennas which have been up for some years are unfortunately practically worthless second-hand unless they were erected with suitable protection over their joints and traps. Rotators can require a lot of work before they're fit for re-use, which affects their value. Wooden poles are only worth anything to those who can transport and handle them, and their main value unfortunately may well be as firewood. Scaffolding and other tubular sections, on the other hand, are easily disposed of. Ropes, pulleys, and so on will fetch very little, although large glass insulators may be quite desirable. Above all, remember that someone has to dismantle the antenna system — which may involve a great deal of work.

Paperwork

Logbooks and certificates are practically worthless. If you have been an active and supportive member, the local club may like to have them or your family may wish to keep them; almost no-one else will. Your licence should be returned to RALU. QSL cards may well be desirable to a collector.

If you have any books which are rare (ie *Wireless Valve Transmitter* by W James, 1924) you should give some thought to their fate. Other books may be interesting to local amateurs or beginners. If they are in very good condition, the local library may be interested in taking them into stock. Of these, only the first alternative is likely to produce cash: the others just remove the problem.

If you do have historical items, it might also be worth talking to the Society's archivist — George Jessop, G6JP — about their disposal.

Another item to think about is your callsign. Callsigns are often re-issued on request from a friend, relative or club — although generally not immediately, and the family's permission is required. Do you want your callsign re-issued? Some amateurs feel proud that their identity is perpetuated in this way; others feel that the personality and reputation attached to a callsign should always remain theirs alone. If you have strong feelings either way, let the family know.

Summing-up

I'm sorry if the above has been depressing, and I hope it hasn't been offensive. However, for the sake of those left behind, it's worth making some plans for the disposal of your station. Leave an up-to-date list of major items and their worth. If you want them to go to specific places, make sure that someone knows that — and preferably include them in your will. Remember that if a house is to be sold or vacated, either rapid disposal or storage will be necessary.

No, it's not your problem now — but you can make it easier for those whose problem it might subsequently become.

RAE COURSES

The next season's courses for the Radio Amateur's Examinations are about to commence enrolment. We published quite an extensive list last month; here are the rest of the notifications:

Cardiff: British Telecom Headquarers, Coryton, Cardiff, will be running an RAE course on Tuesday evenings from 7.40pm to 9pm. Further information from Martyn Jenkins, 0222 379634, between 8am and 4.15pm.

Stockport: A correction to last month's notice about courses at the Avondale Centre — classes will be on Tuesday evenings, and not on Wednesdays.

Brighton: Enrolment for a course at the Brighton College of Technology, Pelham Street, Brighton BN1 4FA, will be on 11 and 12 September, between 1600 and 2000.

Chingford: A course for the Radio Amateur's Certificate starts on Wednesday, 20 September, at Friday Hill House, Chingford, London E4. Enrolment is on the first night. Further details from Alan Foss, G4EAY, on 01-529 3380.

Guildford: RAE course, as usual, at the Guildford College of Technology, Stoke Park, Guildford, Surrey GU1 1EZ. The new one starts on 18 September 1989. Enrolment will be on 11 and 12 September, between 1400-1600 and 1800-2000 hours. Further details from B. Purse, or the Departmental Secretary, during normal college hours on 0483 31251.

Orpington: Ramsden Girls' School, Tintagel Road, Orpington, Kent, is the venue for an RAE course on Tuesday evenings, between 7.30 and 9.30, commencing on 19 September. Post applications for enrolment to Bromley Adult Education, Aylesbury Road, Bromley, Kent BR2 0QR (01-464 5745). Or enrol on the first night. Tutor will be A E Betts, 0689 31123.

Stockport: Two courses — one for the RAE and another for the Morse Code — will be held at the Reddish Vale Evening Centre, Reddish Vale Road, Stockport SK 5 7HD. The RAE course will be on Monday evenings, between 7 and 9pm, and the Morse Code course will be on Thursday evenings between 7 and 9pm. Enrolment is scheduled for 18, 19 and 21 September between 7 and 9pm. Further details from David Wood, course tutor, on 061-480 9157.

Gosforth: A three-team course, including practical demonstrations, for the RAE will start on Tuesday, 19 September, at the Gosforth Adult Education Centre, 2 miles north of Newcastle-on-Tyne, next to the Gosforth metro station. Enrolment will be on 9 to 11 September, daytime and evening; there will also be a pre-enrolment 'explanatory' evening on Thursday, 7 September, from 6.30 to 9pm.

Broadstairs: Dr Ken Smith, G3JLX, will be leading a course, with practical projects, on Friday evenings from 7.30 to 9.30pm, at Hilderstone House AEC, St Peter's, Broadstairs, Kent, staring in late September. Either enrol at Hilderstone, or contact G3JLX for further details on Ashford 812723..

Bristol West: Two-courses — one for the RAE and the other for the Morse Test — will start in September under the auspices of the West Bristol Adult Education Area, at Twyford House, Shirehampton, Bristol BS9 1BN. The RAE course will be on Wednesdays from 7 to 9pm, starting on 20 September, and the Morse classes will be on Monday evenings, also from 7 to 9pm, staring on 18 September. The tutor will be B E Carr, M.Sc., G4UHQ. Further info from Mrs Davies on 0272 683112.

Brixton: Brixton College, Ferndale Road, will be running an RAE class from Wednesday, 13 September, from 1830 to 2100. Enrolment starts on Monday 5 September. Further details from the college on 01-737 2323.

Sandy, Bedfordshire: Morse classes commencing 8 November for 15 weeks. Contact John Wayman, G4DRS on 0767 80058.

If anyone else wants to tell the word about RAE courses, morse courses and what-have you, we'll be pleased to publish same.

RSGB MOBILE SAFETY RECOMMENDATIONS

1. All equipment should be so constructed and installed that in the event of accident or sudden braking it cannot injure the occupants of the car.
2. Mobile antennas should be soundly constructed, taking into account flexing at speed and possible danger to other vehicles or pedestrians. The maximum height must not exceed 14ft (4.3m) above ground.
3. Wiring should not constitute a hazard, either electrical or mechanical, to driver or passengers.
4. All equipment should be adequately fused and a battery isolation switch is desirable.
5. The transmit/receive switch should be within easy access of the operator and one changeover switch should perform all functions.
6. The microphone should be attached to the vehicle so that it does not impair the vision or movement of the driver.
7. A driver/operator should not use a hand microphone or double headphone.
8. All major adjustments, eg band change by a driver/operator, should be carried out whilst the vehicle is stationary.
9. Essential equipment controls should be adequately illuminated during the hours of darkness.
10. Logging must not be attempted by the driver whilst the vehicle is in motion.
11. All equipment must be switched off when (i) fuelling, (ii) in close proximity to petrol tanks and (iii) near quarries where charges are detonated electrically.
12. A suitable fire extinguisher should be carried and be readily accessible.

RSGB QSL Bureau

The Society has realised for some time that, with improving radio conditions, 50MHz and all the WARC bands, our Bureau staff could not, despite working long hours, hope to maintain the standard of service to which members have become accustomed over the years. A change of procedure has therefore been agreed, but this does not, at the moment, require any change in procedure on the part of members.

It has been decided that overseas QSL bureaux will henceforth forward their outgoing cards to Potters Bar, where they will be sorted and distributed to the Sub-managers.

It will naturally take time to recruit and train staff, and everyone is asked to bear with us until we are able to establish a regular service. It will assist if Club secretaries can explain the position to their members, in order to prevent letters of enquiry being sent to Headquarters or the Sub-managers.

UK members should continue to post their outgoing cards to Wimbledon, where Aileen and Ted Allen, G3DRN, will sort and despatch to the 170 foreign bureaux with whom we exchange cards. Aileen and Ted have also placed their interest and experience at the disposal of the Society until such time as he finally retires, when the entire operation will move to Potters Bar.

Members are thanked in advance for their forbearance in this matter.

Modular kits

A range of kits — all in modular form — which specialise in QRP and receiving are available ex-stock from Jandek, a two-year old concern under the proprietorship of D R Pearson, G3ZOM. The modular philosophy has been adopted to simplify construction and testing, particularly for 'black-box' operators intimidated by one-piece constructional exercises. Within the line-up are a couple of audio amplifiers, active filters, a product detector, front-end unit, VFO, a QRP transmitter, an output filter for same, T/R switches for CW or VFO, and a power supply. Each kit includes a tinned printed circuit board and all board-mounted components. Plus instructions, of course! Next on the list will be a range of test equipment.

Details and prices direct from Jandek at 6 Fellows Avenue, KINGSWINFORD, West Midlands DY6 9ET (Tel: 0384 299800)

First RSGB/DTI Industry Conference

"Help Project YEAR help you" was the message put by the Society to British industry at a conference held on July 20th. Held at Kingsgate House in London's Victoria Street, the conference was co-sponsored by the RSGB and the DTI and was attended by the leading electronics and communications companies in the UK.

The impressive list of delegates included senior staff to British Telecom, the BBC, Racal, Mercury Communications, Plessey, GEC, IBM, Thorn EMI, Marconi, Texas Instruments, British Aerospace and many others. In addition, there were representatives of the press, the amateur radio trade and the Scouts and Girl Guides. This conference was an important first for the Society. For the first time, it set out to sell amateur radio to the outside world - as opposed to discussing amateur radio within itself. Some 70 people were present in all. They heard that the RSGB had some thoroughly practical answers to the widely-acknowledged problem of shortage of electronics and communications engineers — those embodied in Project YEAR — and that this initiative was strongly backed by the government department responsible for industry, the DTI.

GOVERNMENT SUPPORT

Underlining the support of the government, the conference was opened by the Parliamentary Under-Secretary of State for Industry, the Rt Hon Robert Atkins MP. He said "I am very glad that RSGB have arranged this conference today in order to bring amateur radio before an audience particularly fitted both to appreciate its contribution to skills development and to benefit as employers

"There are a large number of people in senior positions in industry today who would, I'm sure, acknowledge the contribution of their early interest in the hobby to their success." Peter Blair, Dep. MD, Racal Research

PROJECT YEAR
Youth in Electronics Via Amateur Radio

from a swelling of its ranks." Mr Atkins went on to refer inevitably to Tony Hancock (a classic example of the maxim "all publicity is good publicity" since it at least keeps amateur radio alive in people's minds) and then described his own associations with radio.

In particular, he highlighted the spectacular growth in the mobile radio industry, to a level where the UK was the European leader in this field. This unprecedented growth had led to an urgent requirement for skilled radio engineers. "By 1995 the mobile radio sector may need some 6,000 extra specialist technicians" he said. Radio amateurs were just the sort of people who were most able to fill this gap. "Since radio's earliest days, amateurs have been at the forefront of technical advance — and their tradition of experimentation and pushing back the boundaries is still very much their hallmark. As individuals, amateurs acquire a lively interest in technology and impressive technical skills — skills that can be passed over into employment, and often are."

Robert Atkins said "I applaud RSGB's Project YEAR initiative and wish it every success. This is an ambitious and imaginative programme which is already beginning to yield fruit. I'd like to see more young people take up amateur radio. Their enthusiasm, self-discipline and commitment are all qualities that any employer would welcome."

NOVICE LICENCE

Following the Minister's opening address, Sir Richard Davies formally presented him with the RSGB's proposal for a Novice Licence - an integral part of Project YEAR.

David Evans, the RSGB's Secretary and Chief Executive, presented a comprehensively illustrated case for the existence of amateur radio in an industrial society. He went on to explain that Project YEAR (Youth into Electronics via Amateur Radio) was aimed at recruiting more people into the hobby, especially the young. He said "Project YEAR is a unique and practical scheme to enhance personal skills. There may be hundreds or thousands of budding young electronic whiz-kids out there, but they will never be discovered if they never get the opportunity to try out electronics - either because it is shrouded in mystery or because there are dozens of other things which seem to be more interesting and are easier to get into."

Jennifer Jackson (Girl Guides Association), John Fogg (Scouts Association), Mrs B Parker (Institute of Physics), with Sir Richard Davies, G2XM, RSGB Immediate Past-President

Peter Blair (below) G3CTF, challenged those present to raise their hands if they had enought skilled RF staff. Not one hand went up.

David Evans said that Project YEAR had six key points:

* The Novice Licence.
* Video tapes for recruitment and novice licence training
* A series of beginners books.
* A new magazine for the non-technical beginner *(DiY Radio)*.
* The design and construction of simple equipment.
* Fund raising and personnel.

He added that it was essential to encourage the young into the sort of hobby which allowed them to acquire knowledge and to learn skills motivated entirely by their own enthusiasm. These skills were frequently carried into the workplace, and there were many people in senior positions in industry who could cite an interest in amateur radio as having been a distinct advantage.

David Evans summed up by saying "Amateur radio is undoubtedly a medium for the encouragement of basic electronics. It can provide a very strong motivation to young people because it is creative, challenging, practical and fun. Many leisure activities attract sponsorship. Amateur radio is a leisure pursuit with a fundamental difference - it is undoubtedly a medium which can increase electronics awareness and which can provide a training ground for Britain's future engineers."

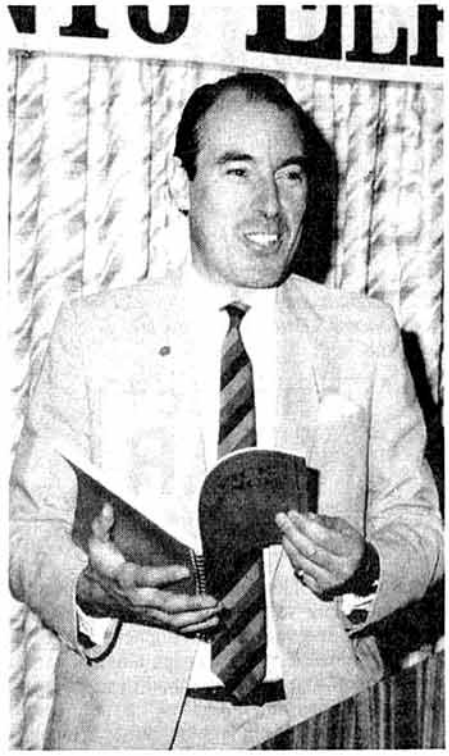
DTI SUPPORT

To press home the point that amateur radio — and in particular Project YEAR - had the full support of the DTI, the next speaker was Mike Coolican, Head of a branch in the Radiocommunications Division. He spoke of the widespread use of radio in modern society, often by those who are totally unaware that their messages are being conveyed by radio.

Mr Coolican said, "The Government is very keen that education should reflect the needs of industry. A great deal of effort has been put in by this government to changing the focus of education to make it something that it suitable for the 1990s and the next century, rather than - as it is still in many ways - very suited to the public examination system of the 1860s. And this Project is very much a part of that move". He referred to an article about Project YEAR which had appeared in *The Independent* the previous day. This had caricatured those attending the conference as "pin-striped". This, of course, was not a true reflection of senior industrialists - and in a similar way the Tony Hancock programme was not a true reflection of amateur radio.

GCSE SYLLABUS

Mr Coolican bemoaned the lack of reference to radio communications in school careers information. His Department was trying to get radio into the school syllabus. "We are beavering away trying to get specific radio questions put on the GCSE syllabuses and that is, I think, the key actually to get it studied in schools" he said. "In Radiocommunications Division we are looking particularly at how we can perform that magic trick of making youth want to go into industry in respect to radio, and obviously that means that radio amateurs are very much at the front of our mind in thinking of how we can achieve that trick". Mr Coolican added that one key portion of new radio legislation was concerned with EMC, and this was an area



"I'd like to see more young people take up amateur radio. Their enthusiasm, self-discipline and commitment are all qualities that any employer would welcome." Rt Hon Robert Atkins, Parliamentary Under-Secretary of State for industry

"In Radiocommunications Division we are looking particularly at how we can perform that magic trick of making youth want to go into industry in respect to radio, and obviously that means that radio amateurs are very much at the front of our mind in thinking of how we can achieve that trick." Mike Coolican, Head of Radiocommunications Division of the DTI

where amateur's self-training had provided a pool of expertise. "There is a whole raft of EMC legislation about to hit British industry. It is going to call forth a requirement for a vast amount of EMC engineering and I just wonder whether we are actually going to have enough engineers with EMC experience to cope with that."

It was perhaps unusual for a Government department to be so supportive of a hobby. "Clearly we have to encourage radio amateurs if we are to get the technicians, if we are to get the engineers. We will do whatever we can, whenever we can, to support the efforts of the RSGB in making Project YEAR a success, but in the end it does depend on you gentlemen giving time, perhaps giving money, perhaps giving equipment, but certainly providing some resource to enable the RSGB to carry this forward."

SWL TO MD

Following a coffee break, during which delgates studied a display showing the wide range of amateur radio activities, Peter Blair, G3LTF, gave an account of his progression from 10-year-old SWL to his present position of Deputy Managing Director of Racal Research. He emphasised that a hobby interest in technology can lead to interesting and rewarding careers. He knew of many staff members (including six directors in the Racal Group) who were radio amateurs. "There are a large number of people in senior positions in industry today who would. I'm sure, acknowledge the contribution of their early interest in the hobby to their success" he said. "The young enthusiast that we generate through Project YEAR will develop a feel for electronics which with the process of formal training at college, polytechnic, university, whatever, will lead them to interesting and rewarding careers. Rewarding not only in the financial sense, but also in contributing to systems which bring, for example, the benefits of communications, security and safety to many areas of our lives."

Illustrating his talk with slides, Peter commented that operating a field-day station running four bands simultaneously from a tent was a very effective and practical way of learning about EMC, electrical and mechanical reliability and the importance of testing things first. Making reference to his 1960s experiments with moonbounce communication, he stressed that amateurs were often in the forefront of technology. He challenged those present to raise their hands if they had enough staff skilled in RF matters. Not one hand went up.

THE BOTTOM LINE

What could be described as the "bottom line" of the conference was outlined by Victor Brand, G3JNB. He started by mentioning that it was not only engineers who benefited from an amateur radio background; he had found a knowledge of radio, electronics and computers to be invaluable in his advertising business. He said "When it came to producing a promotional brochure on a piece of radio equipment, typically for Farnborough, I was the only one who even understood what some of the signs meant. And throughout my career the association with amateur radio has enabled me not only to advance my career but to communicate with manufacturers and retailers. So it is not just electronics industry - design and manufacturing - that gains, it is all the supporting functions which

can gain as well." He suggested that the delegates should stress the broader training and recruitment opportunities of Project YEAR to their companies. Mr Brand added that the RSGB had invested heavily in Project YEAR but resources were limited. If the project was to be successful and benefit industry, additional funding and assistance were needed. "The budget to get us to first base" could not be less than half a million pounds.

Uniquely for a hobby, radio amateurs enjoyed the support of the government. Project YEAR was also supported by the vast majority of RSGB members. This, however, was not enough; help was needed from industry.

What was required was:

* Help with training manuals
* Help with training kits
* Help with publicity
* A "Mr Project YEAR" - a recognised personality and experienced businessman to front the Project.
* An administrator backed by the resources of a large company
* Engineering design for rapid construction self-teaching projects for novices.
* Experienced educationalists.
* Components
* A computer to manage Project YEAR and perhaps the Novice Licence
* Assistance in the distribution of material and kits
* Support of the media

Dr J. Thompson pledges support for Project YEAR, on his own account and on behalf of British Telecom

* Assistance in the production and distribution of *DiY Radio.*
* Funding of exhibitions

INDUSTRY RESPONSE

After the 'hard sell' from the RSGB and DTI, the turn came for industry to reply.

Dr J Thompson, British Telecom's Chief Engineering Adviser, said that he was very supportive of the idea of Project YEAR, both personally and as a representative of BT. He felt that companies should be more aware of which of their employees are radio amateurs.

Peter Forbes of STC urged using plain language when promoting amateur radio amongst the young.

Jennifer Jackson, of the Girl Guides Association, reminded delegates that girls, too, needed encouraging into amateur radio since they made excellent engineers.

Navico's Tom Crosbie commented that since radios no longer glowed in the dark, they were now less magical. Somehow, the magic must be put back.

The successful initial impact of the event was illustrated by the very many animated conversations on the topic of amateur radio and industry recruitment to be heard at the buffet lunch which ended it.

The proof of the pudding is, of course, in the eating. The success of the RSGB's first Industry Conference will be largely measured by the real support received from industry, in terms of cash, components, or assistance. Having already secured a substantial offer of practical support from Yorkshire Television, the Society is confident that many companies, with continuing encouragement from the RSGB and from the DTI, will rise to the challenge and help amateur radio help British industry under the banner of Project YEAR.

To obtain a copy of the Conference proceedings, please see p.5 for details

SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3 FKM

A news release from *Club Bouvet*, which I've just received, gives details of plans to repeat the highly successful 1987 expedition to Peter 1 Island - but this time making Bouvet Is the destination. This time the visit will be independent and will be organised by Einar, LA1EE; Erling, LA6VM; and Kaare, LA2GV. Starting capital of US$12,000 will come from the LA DX Group plus $1000 from each of the participants. The estimated cost of the trip is $200,000, half of which will have to come from donations from amateurs - this time the government-backed transport will not be available. The bulletin says:

"The stage resembles that of '87, with its isolated and remote location and surrounded by a virtually endless, cold ocean. Sea and air temperatures are near the freezing point. Visibility is poor most of the time. But many things are different: strong, frightening gusty winds on the lee side of the island, 'impossible' landing conditions with worst-case ocean wave heights up to 10m, making landing - and especially departure - very difficult. Multitudes of living creatures, weighing up to five tons, will be guarding the shore. They are savage, do not love DXing and will attack us during the landing. The smell of the penguin colony is disgusting. We may have to carry 1-2 tons of fuel and equipment about half a mile from landing to camp site. Local fresh water will not be available.....We wish you a warm (cold) welcome to Club Bouvet, paradise of philantropists. In our club each individual will contribute with a donation according to his or her desire and ability, to make sure the show is a success. Members may request to be on the mailing list for future important information. Will *you* join now and become a supporter? The address is Club Bouvet, Box 88, 1361 Billingstadsletta, Norway, and the bank account is no 7085.05.07382, at Den Norske Creditbank, Oslo". Sounds like a quite charming part of the world (just the place for the Squarebashers next year - Ed).

DX NEWS SHEET DXCC SPEED CHALLENGE

This worthy challenge is being mounted by the RSGB's *DX News Sheet* to assist the Club Bouvet project, and it will run from 0001 on 1 September to 2359 on 30 November. There are two classes - licensed amateurs and listeners. The object is to work (or hear) 100 countries on the . bands in the shortest possible time consistent with the DXCC rules. All HF bands except 10MHz may be used, but cross-mode and cross-band contacts are not allowed. All stations must be eligible for DXCC credit (e.g 1Z9A will not count). SSB, CW or RTTY may be used. Contest QSOs are acceptable. QSLs are not required but DXNS reserves the right to check on claimed QSOs. The winners will be the licensed amateur and listener who work and log 100 countries in the shortest time. *NB Entrants must be DX News Sheet subscribers at the time that logs are submitted.* There is a 2 entry fee for UK entrants - or US$5.00 or eight IRCs for those overseas. All money remaining after postage costs will be donated to the Club Bouvet project (or the next major DXpedition if this fails to take place.) Details of the contacts, plus fee, must reach the DXNS Office, 123 Reading Rd, Finchampstead, Wokingham, Berks RG11 4RD, by 12 December 1989.

This is a fun challenge and all entrants will receive a commemorative certificate. Work 100 countries in the three-month period and send a donation for Club Bouvet to claim a certificate recording your "challenge time".

DX NEWS

Good news for you if you are looking for **Solomon Is** - H44SH is back there for a further two years after a four-year absence in Africa. Look near 14.208MHz around 1200. ZL1AMO and ZL4DO are expected to be on the air from **North Cook Is** sometime between now and early November. According to the *DX Bulletin* SM0AGD is said to have a licence for a visit to **Banaba Is**, which will probably take place before the end of the year. The same bulletin says that the DX Advisory Committee has received an application for DXCC status for the Amazon rain forest area in order to draw attention to its plight !

The information which I published about QSLing stations using the special 6Z prefix from Liberia seems not to have been quite correct. I have heard from G3OCA (who is QSL manager for 6Z2DK and 6Z2WK) that he will, in fact, be dealing with requests for their cards for their many contacts as usual. Ken mentions that he keeps a weekly sked with 6Z2DK and 6Z2WK at 1215 on 28.695MHz, and that he is still offering his services as QSL manager to another DX station needing one (write to Ken Frankcom, 1 Chesterton Rd, Spondon, Derby DE2 7EN). According to the *DX Bulletin* ZS1IS, who is located in **Walvis Bay**, often appears on 28.610MHz at 1600 on Sundays and then moves to 28.2MHz CW at 1700. An application for separate DXCC status for **Walvis Bay** is being made and it is difficult to see how it can be rejected. KC1AG is also supposed to be going there for a three-week stay commencing about 21 August and he may still be there. There is yet another station on from **Somalia**. This is Yanick, F6FYD, who is now 6O1YD. T50DX is still very active and is regularly to be found on 28.585MHz at 1200. TL8CZ, in the **Central African Republic** is often on around 21.304MHz at 0600.

W9QQ and K2DOX are planning to operate as V44QQ from **St.Vincent** during the CQWWDX contest on 28-29 October. HC8JG on the **Galapagos Is** keeps a sked with his QSL manager WA6ZEF at 0500 on 14.155MHz every Wednesday, and will work others when he has finished. Dave Stenning, G4JA, is travelling south again to the **Falkland Is** and will resurrect his old call (VP8AQK) for four months commencing 15 September. He hopes to operate the following schedules: 28.510MHz when the band is open during week-ends and evenings; 21.325MHz between 1900 and 2000 and longer if possible each day; and 21.097 between 0530 and 0630, and 14.277MHz from 0630 to 0900 daily. He hopes to take part in the RNARS and RAFARS nets also, and he will try 3.5 and 1.8MHz if conditions are favourable. Dave says that he is looking forward to working as many people as possible.

Sorry to have to tell you that if you worked one of the recent "1A0KM" stations you probably contacted a pirate. The *Lynx DX Bulletin* says that there has been no legitimate activity since October 1988. There is another "new country" under consideration. This is **Basilica del Santo** and a group of seven, including WA2MOE, is said to be planning activity from there this month if DXCC status is

ALL TIME TABLE WITH DELETIONS

Call	1.8	3.5	7	14	21	28	Total
G3KMA	125	240	308	333	334	318	1658
G3GIQ	71	212	268	340	337	318	1546
G3XTT	162	211	263	303	294	271	1504
G3MCS	64	212	263	323	324	306	1492
G4GIR	100	215	252	297	287	269	1420
G4BWP	106	220	254	299	276	263	1418
G3UML	33	225	242	338	303	268	1409
G4DYO	66	186	233	313	305	287	1390
G4LJF	41	213	252	302	283	244	1335
GW3AHN	16	110	120	368	363	340	1317
G3XQU	58	184	213	307	284	264	1310
G4OBK	124	156	203	279	248	227	1237
G3TXF	66	163	201	290	259	222	1201
G3NOF	3	99	101	348	335	294	1182
GW4OFQ	54	231	218	245	225	196	1169
G3IGW	115	156	265	242	200	180	1158
G3YMC	80	109	180	245	250	191	1055
GM3YOR	75	139	187	221	200	183	1005
GM3PPE	69	165	169	204	197	152	956
G4ZYQ	0	121	69	195	210	188	783
G4NXG/M	1	29	56	188	197	186	657
G3JXN	16	40	100	152	125	179	612
Average	**66**	**165**	**201**	**279**	**265**	**243**	**1219**

Next deadline for current all-time - entries to reach G3GIQ by 8 October.

1989 28MHz COUNTRIES TABLE

G0CKP	167(CW)
G4MUW	165(SSB)
G0IHB	159
G4DXW	157
G4ZYQ	149
G4XAH	134(SSB)
GM4ELV	122
G4OBK	115
G0JSM	111
G4NXG/M	110
G0JHC	107
G0BXQ/M	104
GD4XTT	98
G4SJG	81
G4SDK/M	54
GM4OBK	37

granted - the callsign will be I2RBJ/3/HVA. **Svalbard**is being put on the air by SP6UFO/JW who should be on the island until the end of this month.

The 11th Convention of the Clipperton DX Club will take place at the Hotel Ibis-Paris La Defence on 23 and 24 September. There will be presentations of the FO/M and FO/A expeditions and other attractions. More details are available from Jean-Louis Dupoirier, 11 Rue Henri Barbusse, Cressely, F-78470 St.Remy les Chevreuses, France.

The Federated States of Micronesia has changed its prefix from KC6 to V6, and amateurs will use the V63AA-V63ZZ series. The Republic of the Marshall Is (KX6) has also changed to V7 and its amateurs will now be given callsigns in the V37AA-V73ZZ series.

PROPAGATION

Smithy has had problems this month - he received an empty envelope from Boulder, and SIDC seems to have lost his name from the mailing list... However, he writes, "The very abrupt rise in solar indices in early June was followed by an equally abrupt fall. As foreshadowed last month, the monthly average solar flux - at 242sfu - was higher than in any month in Cycle 21 but the daily values fell below the 200 mark on 1 July and remained there up to the last week of the month. At the same time the geomagnetic field continued to be generally quiet, giving mostly undisturbed HF conditions.

"September sees the beginning of the seasonal improvement in northern hemisphere MUFs, and this time we shall also be near to - or possibly already at - the peak of the solar cycle. Just how high that peak will be remains to be seen, but it will certainly be a lot higher than was being forecast a few years back."

1989 SECOND YEARLY TABLE

Call	1.8	3.5	7	14	21	28	Total
G4OBK	49	66	112	99	91	115	532
G3TXF	40	23	93	88	104	80	428
G4NXG/M	1	5	27	51	54	103	241
G3SXW	20	29	41	42	38	61	231
GM3YOR	0	21	71	16	58	23	189
GM4OBK	4	12	10	19	2	0	47

Next deadline - scores to G3GIQ by 8 October.

CONTESTS

Scandinavian Activity Contest
1500 16 September - 1800 17 September (CW)
1500 23 September - 1800 24 September (SSB)

Licensed amateurs and listeners. Single- and multi-operator multi-band, single-operator multi-band QRP (less than 10W input), and multi-operator multi-band. 3.5 to 28MHz observing IARU bandplans (this means that 3.560-3.600MHz, 3.650-3.7MHz, 14.06-14.125MHz, and 14.3-14.35MHz must be avoided). Exchange RS/T and serial QSO number (from 001) with Scandinavian stations only. Each QSO counts one point. The multipliers are Scandinavian prefixes - LA, LB, LG, LI, JW, JX, OF, OG, OH, OH0, OH0M, OI, LA, LB, LG, LI, JW, JX, OF, OG, OH, OI, OH0, OH0M, OX, OY, OZ, SJ, SK, SL, SM, and TF. Signed original logs (or copies) must be submitted and show date, band, time, station worked, exchanges, and if new multiplier. Separate logs must be sent for each band, and if more than 200 QSOs have been made on any band a "dupe" list must be included. Entries must be mailed by 30 September and sent to Trondheim DX Club, Box 5357, N-7002 Trondheim, Norway. Listeners have to log Scandinavian stations only and note date, time, number sent, SWL's own report, station being worked, and multipliers and points claimed.

Results of the **CQ WW WPX CW Contest** have been published. UK

HF F-LAYER PROPAGATION PREDICTIONS FOR SEPTEMBER 1989

The time is represented vertically at two-hour intervals 00(00)GMT for each band, ie 00=0000, 02=0200, 04=0400 etc.
The probability of signals being heard is given on a 0 (indicated by a dot) to a 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1.8MHz openings are indicated by a plus (+) sign in the 28 and 3.5MHz 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	...1343442..	...25666651.	...57888883.	1.1788888963	6357666678897	986433334799	864111.12578	+3.....25+
MALTA	...1443332..	...26655651.	1..588888841	3117888888974	865876667999	998643345799	987311112588	++4.....25+
GIBRALTAR	....121111..	....3433331.	...17766673.	1..388878872	642787777997	998754445799	998532112588	++52.....25+
ICELAND	.....	.....12112..	....1444452.	37767851	31.367777885	87.5754445688	887532122457	++52.....24
** ASIA								
OSAKA	...1341.....	...25531....	...365321...	...263222222	....3...3564	1562	.....24.	.....
HONGKONG	...2555531..	...36666531.	...255557631	1...33237863	2.....4786	1585	263	.....3.
BANGKOK	...4666663..	...45767861.	...135458842	2...13237874	4.....4798	3.....1588	1.....265	32
SINGAPORE	...4666664..	...45767861.	1..135458852	2....3237875	4.....4798	2.....1587	265	32
NEW DELHI	...566663...	..155667511.	1.2324457431	3121.2237764	73.....4798	62.....1589	4.....267	34
TEHERAN	...67677741.	..1666778621	214533558864	536311237887	865.....4799	862.....1589	73.....267	4.....34
COLOMBO	...56767741.	..1456678731	2.1114458864	521..2237987	83.....4799	71.....1589	4.....267	34
BAHRAIN	...67677741.	1.2766778632	314523458875	6462..237998	975.....4799	962.....1589	73.....267	4.....34
CYPRUS	...68777762.	1.1888888842	313877789975	746866678998	987633346899	9863..113689	873.....1378	+4.....45
ADEN	1..677778632	2.2755678854	635422358987	8662..137999	985.....4799	972.....1589	74.....267	42.....34
** OCEANIA								
SUVA/S	.....222.1..	....233323..	...24444462.	...45323582.	..1631..471.	...41...15..	...1.....2..	.....
SUVA/L	32.3211..174	3316432..374	223863311662	.1486221275.	..273...272.	...4.....5..	...1.....2..	.....
WELLINGTON/S	....2322....	...1344411..	...46544342.	..165323474.	..163...474.	...4.....151.	...1.....2..	.....
WELLINGTON/L	22.21.....44	331431....65	343752...274	134852...472	...373...164.	...4.....41.	...1.....2..	.....
SYDNEY/S	...355562...	...57666411.	..1675556441	...553237662	...22...4772	.....155.	.....22.	.....
SYDNEY/L	....2.....32	11.1411...54	221363211..85	111462111284	...34...2572	...11....44.	.....11.	.....
PERTH	...5777541..	..15777662..	2.1265557521	3...43237753	3...1...4787	1.....1586	263	.....3.
HONOLULU	.....2..	.....1..241.	....231.462.	...14311561.	..3541..33..	..341...1...	..12.....	.....
** AFRICA								
SEYCHELLES	1..666774332	2.2555776654	634212457887	855...236899	973.....4799	95.....1589	83.....267	5.....34
MAURITIUS	1..677778743	312656778865	634322458998	9641..226999	972.....4799	95.....1589	82.....267	5.....34
NAIROBI	2..677788754	412755678976	754512258999	9763...36999	996.....4799	983.....1588	861.....267	53.....34
HARARE	31.677788865	521765678987	864622257999	9874...26999	9971....3799	984.....588	872.....267	54.....34
CAPETOWN	3..587778875	52.776678987	852853257999	98472..26899	9975....3799	9962.....589	774.....267	45.....34
LAGOS	32.487778875	641676668987	974852227999	99783...5899	9987....2799	8974.....589	6751.....267	352.....34
ASCENSION Is	32..87667754	541186556886	874473224899	997661..1799	99873....599	8874.....289	6752.....57	442.....24
DAKAR	21.188777873	441387656986	874684223899	997862..1799	99973....589	88841....278	7752.....57	442.....24
LAS PALMAS	78776751	11.288888873	442598888996	774787767898	998865445799	998632112489	88731....268	++4.....3+
** S. AMERICA								
Sth SHETLAND	2...16888873	421127778886	753355447788	986653226688	99873...3357	79841.....25	5752.....2	242.....
FALKLAND Is	21.127777873	431247776785	774565443588	9967632221379	99973.....58	89851.....26	7852.....3	452.....
R DE JANEIRO	11.118766763	331227655785	764555312588	9867631..289	99973.....69	98851.....37	8652.....5	542.....2
BUENOS AIRES	11...7776763	331227755685	663545421378	8867532..168	99873.....38	89841.....5	7852.....3	452.....
LIMA	....1.765652	21..22764564	542253431136	77556321..17	89874.....5	79851.....2	5862.....	253.....
BOGOTA	2765652	11...3754454	431124421136	7644432...17	99864.....5	89851.....3	5862.....	253.....
** N. AMERICA								
BARBADOS	17765662	11..27744574	542255411267	7754632...48	99874.....17	99851.....5	7862.....2	453.....
JAMAICA	1654551	1....2654453	431114431136	6632332...17	897641.....5	79851.....2	5852.....	252.....
BERMUDA	4654651	1....5654663	421.25432366	65323321.148	997541....16	89851.....4	6852.....1	352.....
NEW YORK	1544541	2554553	32...3443355	642113221147	886431....16	79841.....3	4752.....	.42.....
MEXICO	144431	354442	32..1.342223	54212122...3	68643.....	3884.....	1652.....	.32.....
MONTREAL	1443431	2555552	31...3443465	541113221247	886431....26	78751.....3	4752.....	.42.....
DENVER	.....1222.	34331	21....144333	4311..123113	57542.....1	36741.....	.452.....	..2.....
LOS ANGELES	.....332.	25431	1.....36322	321....241.1	36432....2...	.5741.....	.252.....	..2.....
VANCOUVER	.....1.	.....112.	1.....13322	21.1...14212	35442....3...	.4641.....	.142.....	..2.....
FAIRBANKS	.....	.....1..	11112221	1..231123432	233531..3321	.2441....11..	..21.....	.....

The provisional mean sunspot number for July 1989, issued by the Sunspot Index Data Centre, Brussels, was 126.8. The maximum daily sunspot number was 197 on 22 July, and the minimum was 75 on 28 July. The predicted smoothed sunspot numbers for September, October, November and December are respectively: (classical method) 179, 178, 177 and 174; (SIDC adjusted values) 187, 186, 185 and 181.

QTH CORNER

A61AC	Dr Mohammed Hamdan, PO Box 4221, Dubai, U.A.E.
FP/K1RH	R.Hirsch, 172 Newton Rd, Woodbridge, CT, 06525, USA
GB0SK	G3XTT, 105 Shiplake Bottom, Peppard Common, Henley on Thames, Oxon, RG9 5HJ
H44SH	S.Honeysett, KFPL, PO Box 620, Honiara, Solomon Is.
VP8AQK	via G3JHI or via RSGB
3D2XV	(direct only) R.Crosby, Box 344, Forster

scores are as follows: Single-operator all-band **GB2FXB** scored 3,282,903 points and came world sixth and top European. In the QRP section on 7MHz **G3VMY** was world top score with 87,480 points. In the single-operator category and following GB2FXB in the all-band section were **GM3RAO (678,366), GW4UOL (623,447),** G4ZFE (364,320), G3ESP (343,952), G0/KB1CM (278,784), GM3CFS (262,104), G3DPX (79,456), G3YDX (40,449), G6NK (28,804), and G4ZME (23,296). (The table in *CQ Magazine* also lists GW4RHW with 797,588 points but under the GM entrants and in the wrong place in the table!) On 21MHz **G4CP** scored 1,034,004 points followed by **GW3NYY** with 142,676 and G0DJF with 52,324. On 14MHz **G4CNY** scored 1,662,918, **GD4EIP** 212,992, and G3SXW 937,975. The only other entrant was **G3XWZ/A** who scored 5,952 points on 1.8MHz. In the multi-operator single-transmitter section **GB2MM** was world 8th with 4,710,444 points, G3VER/P scored 802,343 and GB75WKS 57,378.

In the **1989 PACC Contest**, UK scores were as follows: **G5LP** (15,360 points), G3ESF (13,090), G4IQM (12,645), G2HLU (11,970), G3AEZ (9,204), G4ZIB (5,868), **GM3KLA** (5,544), **GW0HPQ** (5,247), G0CYL (2,574), G0/PA3ARW (765), and G0AOL (72)- In the listener section **RS87155** scored 1,521 points.

VK-ZL-Oceania Contest

1000 7 October —
1000 8 October (CW)
1000 14 October —
1000 15 October (SSB)

Operate for a maximum of 12h and take operating periods in one hour 'blocks' based on even hours (eg, 1200-1300 or 1300-1500). Transmitting and receiving sections. One contact per band per station allowed on all except WARC bands. Two points for each QSO with VK, ZL, or Oceania (the latter are those which count for Oceania for WAC). Multiplier is total of different prefixes worked on each band added together. Exchange RS/T and serial number (from 001). Listeners may operate for 24h and in their case the two contests are combined. Logs must reach WIA VK/ZL/Oceania Contest Manager, VK7BC, Frank Beech, 37 Nobelius Drive, Legana, Tasmania 7277, Australia, no later than 15 February 1990. I can supply copies of the rules (SASE please).

G4BWP has asked me to refer back to the results of the 3rd IARU HF World Championship as published in the April column. He wishes to point out that the entry mentioned by GB75DX was not representing the RSGB and was entered by the Mid-Berks Contest Association. It was wrongly listed in "*QST*" and as a result the error was copied by me. The entry was the leading multi-operator entry from the UK.

AWARDS

USA County Hunting

There are 3076 counties in the USA, including Hawaii and Alaska. A free information pack on county-hunting produced by MARAC (the Mobile Amateur Radio Awards Club Inc.) is now available from Eddie Scholes, G4KHG, who holds USA Worked All Counties Award 536. Anyone interested in obtaining county-hunting awards or WAS is asked to send a business-size SASE to him at 19 Castle Hill, Newton-le-Willows, Merseyside, WA12 0DU. Applicants from Europe outside the UK are requested to send two IRCs or US $1.00 for postage. The pack consists of eight pages on county hunting, county hunter nets, and a brief history of MARAC and its own awards.

BAND REPORTS

First of all, I should like to point out that calls listed here should be those of stations heard or worked since the closing date for the last month. Secondly - are the listings a justified use of space? Comments, please!

Thank you to Gs 1BWI, 2AKK, 2HKU, 3CDK, GM3CSM, G3s GVV, KSH, GJ3RAX, G3YRM, GM4ELV, GW4KGR, G4s MUW, NXG/M, GM4OBK, G4s UZN, ZYQ, G5MY, G0s FMM, IHB, and GM0KMJ. CW stations are in italics.

3.5MHz
2100 GB0SK(St.Kilda)

7MHz
0200 *J52US*
1200 TA3/G4JVG
2200 *UA6HZ/JW*

14MHz
0000 TT8CW
0100 J52US
0200 YK1AO
0700 FP5DX, W6-W7
1000 KC4USV
1900 A61AC
2000 TA3/G4JVG

18MHz
0100 *AL7KJ*
0600 KA7AIG, VK3,6, W2,6,9, ZC4JL
0700 VK2,3,6, YN3CB, W4EDE/YV6, ZL2
0800 VK3,4,6,ZL2APW
0900 *KL7U*, ZK2JD
1000 TU4DA
1100 ZL1BN
1200 9Y4KS
1400 W2AH/6, *6W6JX*
1500 VQ9QM
1600 W4, *9M2FS*
1700 VE6, W7FPG, *9V0VS*
1800 HZ1AB, JD6KLR, V85GA
1900 *FY5AU*, VP8BQE
2000 CN6OMC, LU, VP2s EHF, VM, VP5/KA4NYO, 9K2EC
2100 JA, ZD8BOB
2200 HC5T, PY
2300 AL7I, *JH1FNS/CE3*

21MHz
0600 *AP2MC, YK1AO*
0700 AL7GS, KH6, KL7, W6, W7, ZL
0900 FO5LU, T32AF, ZK1DD
0900 A35KB, AH6IO, JT1KAA, KH6LW/KL7, T20AA, *TT8CW*, UA0BDU/UA1O, 3D2XV, 6Z2BA
1000 FO5MC
1200 OY/G3MCN, T5YD
1400 *W6TZD (LP)*
1500 JT1BV, KG4UN, *TA3/GM3YOR, VE2EDK (Zone 2)*, VQ9TC
1600 FH5EF, ZS8MI
1700 FH8CB
1800 BY5RF, HS1BV, UA1OIL, FD1JYD/VE8
1900 *J79T*, KH6WW, VU
2000 KH6IJ, OX/OZ1LQH, V31HN
2000 JA, VK
2200 BY1QH *HL9OB*, ZL1SB
2300 AH6HY, FG5FC, VS6CT, ZL4BO

24MHz
0700 K6BRD, VK7GK
0800 W2, W4
0900 TL8CK
1000 W1
1200 WB5ADN, J37AJ
1400 FP/K1RH
1600 W2KW/KV4, TU4CO, YB0BAQ, VU2IN
1700 KH7/SM5KU, *PY7DH*, ZS6AOR, 9M2FS
1800 CN6MOC
2100 *VQ9SS*
2200 CE3ZW, *JH8RGQ, VK1FT*

28MHz
0000 *FG89/FD1OMP*
0700 ZL4, 9N1MC, 5H3ZW
0800 YI1BGD, 3B9FR
0900 BV2FA, BY5RCS, KC6BJF/DU3, ZS8MI, 5V4TM
1000 C53FB, VS6CT
1100 SU1DZ, TJ1MW, 3DA0AY
1300 A22AA, V9/ZS5S, ZD7VC
1400 HB0/PA3EPD, PA0GAM/9L
1600 FY0EK, VP8BWT
1700 ZD9BV
1800 C40A, *EA6ZY*, V85GA
1900 TR8SA, *VP8BWV*
1900 ZD8BOB, ZL4LZ

Thanks to the following for information — the *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), *CQ Magazine* (W1WY), the *DX Bulletin* (VP2ML), *DXNL* (DL3RK), the *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G4DYO), the *Ex-G Radio Club Magazine* (WA8GTA), and *DX Report* (VK9NS).

Closing date for material for November is **September 25.**

VHF/UHF

NORMAN FITCH G3FPK

THE TABLES

Apologies for the non-appearance of the tables in the July issue. The editing arrangements have since been altered to ensure this doesn't happen again. Only DXCC countries are recognised in our tables - so IT9 doesn't count, and North and South Humberside are counted separately even though Humberside is a single administrative county. This may be different for Society awards, though. If anyone wants a copy of the rules for participating in the tables, please send me a SASE.

BEACONS

The **Cornish beacons** recommenced operation on 12 July from IO70OJ. The details are 50.0425MHz, 40W, folded dipole; 70.030MHz, 40W, 2-element Yagi; 144.915MHz, 40W, 3-element Yagi; 432.970MHz, 5W, 4-element Yagi and 1296.860MHz. As of late July, the 432MHz beacon was QRT due to a blown PA transistor. G8ROU has built a beacon TX for 70MHz which is due to operate in the Shetland Islands. Initially it will be at the QTH of Andy Steven, GM4IPK; eventual callsign, location and QRG to be decided.

The **Gibraltar beacon**, ZB2VHF, (IM76HE) on 50.035MHz was running 30W to a quarter-wave ground-plane when Dick Hide, G0LFF, (SXW) was in the colony earlier this summer. He switched it on on 10 June; it had been switched

off in May because of storms. Keeper Jimmy Bruzon, ZB2BL, had not received any reception reports from G up to that time.

An addition to the new UK licence was to permit unattended operation. We discussed this at a special meeting of the VHF Committee on 22 July, one suggestion being QRP personal beacons in the 430MHz band. These would be very useful in serving a local area, providing signals for receiver, preamplifier or converter alignment. Your comments, please.

REPEATERS

The brief mention of repeater abuse and the responsibilities of managing groups in the July VHF/UHF has generated some correspondence. The main point arising from this is that, short of closing down all repeaters, there is no way that abuse can be eliminated. When members of a particular group are heard to be persistent abusers, they can be expelled. However, since all relays are open to anyone - members, non-members, licensed visitors and pirates alike - the problem will remain.

One reader stated that the facts were slightly distorted, but all that was done was to quote from correspondence sent to VHF/UHF by the Repeater Management Group; I myself had no new facts to offer. It was judged to be an important matter, and I also felt that members should be aware of the DTI and RMG views on the subject.

The July Newsletter from the Aylesbury Vale Repeater Group mentions that members (of whom there are 169) ignore the occasional jammer and comments made by stations not giving a callsign. The group's repeaters - GB3VA, GB3AV and GB3BV - seem to be very reliable, the only down time being due to mains failures on site. For details of the AVRG, write c/o Hunters Moon, Buckingham Road, Hardwick, Aylesbury, Bucks, HP22 4EF.

The GB2RS News Bulletin broadcast on 23 July included an item that, "..the south London VHF repeater, GB3SL, was closed down on 6 July for a cooling-off period of 28 days following extensive abuse by a few of its users."

SOFTWARE

The word-processor/computer workhorse at Chateau 'FPK is the Amstrad PCW8512, one of its regular tasks being to compile and transmit this feature to the editor. I have many useful amateur radio programs for the PCW8000 series, including a couple for meteor scatter (adapted from the DL5MCG one in DUBUS issue 1/86), the usual locator, distance and azimuth efforts, and satellite prediction programs. Recent additions are the WA1JXN Moon and Noise Source programs. If anyone wants the latest list of available software, send me an SASE.

Paul Kerslake, G4NDG, is seeking moon and sun programs for the Spectrum 48k machine and wonders if anyone can help. If all else fails, those in the RSGB's 'Amateur Radio Software' are perfectly adequate.

ANNUAL VHF/UHF TABLE

January to December 1989

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Call	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Points
G1SWH	58	21	41	5	88	19	44	6	-	-	282
G8LHT	58	14	19	4	83	26	45	14	7	4	274
G6HKM	59	26	-	-	70	27	38	13	23	7	263
G0IMG	62	21	26	4	49	10	23	4	-	-	199
G4XEN	24	9	17	2	71	21	35	9	-	-	188
G1DOX	26	3	33	6	57	13	20	3	2	1	164
G4PIQ	-	-	-	-	78	28	36	15	-	-	157
GM1SZF	41	11	-	-	71	16	7	6	-	-	152
G8PYP	28	16	-	-	47	24	18	9	-	-	142
GM4CXP	28	11	4	1	60	19	4	3	-	-	129
G0EVT	24	19	-	-	39	26	6	6	-	-	120
G3FPK	-	-	-	-	72	24	-	-	-	-	96
GW4FRX	-	-	-	-	63	32	-	-	-	-	95
G4OUT	-	-	27	5	40	18	-	-	-	-	90
GJ6TMM	28	12	-	-	23	9	1	4	-	-	77
G7CLY	-	-	-	-	54	14	4	1	-	-	73
G4TGK	-	-	-	-	44	14	-	-	-	-	58
GM0JOL	-	-	-	-	34	11	-	-	-	-	45
G0HDZ	-	-	-	-	38	7	-	-	-	-	45
GM1ZVJ	4	3	-	-	22	11	-	-	-	-	40

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.

50MHz

First some items from Ted Collins, G4UPS (DVN) who keeps very comprehensive, daily details of all band matters. JX7DFA will be on Jan Mayen island till 10 October and hopes to get his gear from Norway; QSL via LA2KD. For crossband operators, Y21AAB (JO61FH) was heard on 6 July, on 28MHz presumably, working Gs. LX1SI suggests that selected Luxembourg operators are awaiting permits. According to VK3OT, all Australian stations can now use 50.05-50.20MHz. Those in VK5, 6 and 8 can run 400W, those in VK1, 2, 3 and 7 being restricted to 100W. (What about VK4, though?)

Next the 'Jolly Roger' news. After the legal Algerian operation by FC1EAN/7X, who returned to France on 26 June, FD1NLQ/7X has been heard. That call is not in the official list of French permit holders and signals didn't beam up in the right direction. It seems that the joker who used the call T77A has now allocated himself 5B4LP and was heard working many Gs on 6 July, although he once lapsed to T77A. He asked for dollar bills, not IRCs, with the QSLs! The genuine 5B4LP has no 50MHz gear.

Ray Cracknell, G2AHU (HWR) sent a report covering the reception of 28MHz beacons and 50MHz signals in Britain during June. On 50MHz, ZB2VHF was received on 90% of the days from June 10. Other results were: CT0WW and CT/EA amateurs 60%; 9H1SIX and 9H amateurs 60%; LA, OH and SM 50%; F, I and T77 63%; 5B4CY 37%. British station were heard and/or worked crossband in DL, HB9, OE and OZ for 33% of the month.

From Greece, SV1DH/SZ2DH reports the only poor days as 23, 24 and 26 June - with the beginning of the month providing TEP propagation to ZS3, ZS6, 5H1, S79 and ZD8. The most consistent Es propagation was to France on 69% of the days, followed by G - 52% and PA - 45%. Other notable paths were to TF on 7, 12, 13, 17 and 18; to SM on 10 and 18 and to OH on 15, 17 and 25. The best Es days were the 10th and 18th.

In the July VHF/UHF, the reproduction of the CX4HS QSL correctly confirmed the first G/CX 50MHz QSO with David Evans, G3OUF. However, Michael Thomson, GM4JEJ (TYS) points out that the caption was wrong since he made the first UK/CX contact with CX4HS on 29 March at 1328 using SSB; he enclosed the card as proof. I am pleased to put the record straight.

I would like readers' opinions about recording of the many 'firsts' on 50MHz. I can appreciate their being recorded on 70MHz and above, but since at present the band is more akin to 28MHz than the higher VHFs, do we need to record them? I reported the first G/VK contact which was to VK6. When others occur, should I then record the first G to VK1, VK2, etc. where do we draw the line? In any case, is anyone recording all these achievements on behalf of the RSGB or IARU? If not, and a majority would like a list to be compiled, we need a volunteer to go through VHF/UHF and VHF columns in other magazines - quite a task!

In the August VHF/UHF, I mentioned the complete list of French 50MHz permit holders which F9LT sent to G4UPS. I have now put this on disc in correct alphanumerical order, giving names, ERP, department number and town. It's in LocoScript 1 for those with Amstrad PCWs. If anyone wants a copy, send me a formatted three-inch disc - drive A or B - in a 'Jiffy Bag' with return postage.

Next a couple of reports from overseas. G0LFF contacted over 600 stations in 53 squares from Gibraltar at the beginning of June, using the call ZB2/G0LFF. The QTH was 12m ASL at Sandy Bay, on the eastern side of the rock. Dick used an FT726R running up to 10W to a single-wire loop antenna. On 18 June he operated from the summit of the rock, 400m ASL, using up to 100W and a wire dipole. The countries worked were CT3, DL, F, G, GD, GI, GJ, GU, GW, I, LX, PA, SV, T77, ZB2, 3A, 7X and 9H. He reports the standard of operating in pile-ups in northern Europe as excellent. The only sour note was when some Mediterranean French stations 'pirated' his frequency, causing confusion when the Gs started working them. Dick says the Buxton beacon is received as strongly in ZB2 as is ZB2VHF in G.

Simon Wise, G1FHY (LDN) was in Spain from 2 to 14 June and listened on the band from JN01 in the EA3 region. He sent copies of 29 log pages, from which I have extracted the following data. British Isles stations were heard on 4-6 and 10-13, best days being 5, 6, 10 and 13. On the 10th, between 1405 and 1603, he copied auroral signals from GD3AHV, G3KEN, GM0HSC, GB3NGI, GI4OPH, G8GXP and G0GKC. On some days, when signals from Gs were quite weak, those from GI and GM were very much stronger. ZS signals were only recorded on the 2nd between 1623 and 1703, when ZS3VHF was S9 plus. The only day when LA and OH stations were reported was the 12th, 1538-1707. Other countries heard included PA, CT, CT3, SV and 9H.

Now to the reports from UK readers, starting with John Hoban, G0EVT (YSW) who commenced

operation on 9 April. He uses a PW Meon transverter, home built QQV06-40 PA giving 20W and a 3-element MET Yagi. He worked UK stations in VHF NFD and F/PA0ERA (JN09). On 7 July CX4HS gave him an RS42 report at 1954 from GF17, while on the 12th TK/HB9CXZ (JN41) and T77C were contacted. On the 17th John copied W2CAP/P2, but his take-off is not good to the north-west.

Neil Carr, G0JHC (LNH) was "..prompted to write due to lack of input from north of the Watford gap." In June he worked SV1OE, OH2BOZ/OH0M, OK and HG crossband, T77C, SM6PU, FC1EAN/7X, SM0HP, 9H1GP and ZB2B. July successes included TK/HB9CXZ on the 4th, CX4HS on the 7th, EA8/G3JVL on the 8th and many PAs on the 12th via backscatter. He would like to know the QSL address for HG1YA.

From home, G0LFF (SXW) worked KA1PE (FN53), K1GPJ (FN44) and W4NJP (EM84) - who runs 1.5kW to four 8-element long Yagis - on 3 July. On the 7th and 16th Dick contacted CX4HS and on the 12th TK/HB9CXZ, SV1OE and T77C. The 5B4CY beacon was S3 in the morning and afternoon of the 15th.

Bob Nixon, G1KDF (LNH) worked the TK station on 6 July and heard the suspect FD1NLQ/7X on the 12th, when he worked T77C and assorted Fs. SV1DH was copied on the 13th and CTs were worked. The 15th brought many Fs, plus CTs and GJ and the next day Bob contacted ZB0D. He mentions many OHs on the 22nd and the 23rd brought QSOs with LU7AEN, LU2EIO, CX8BE, CX4HS, LU8YYO, LU1DMA and PA0DYY/MM.

G4NDG (DVN) heard K7KV at 1428 on 24 June when beaming at 240°. 15 minutes later he worked W1GCI, WA1VRH, K1PE and WA1OUB, all between S6 and S9 on CW. On the 27th he heard KP2A working stations in the north of England and Paul contacted him at 1413. On 5 July N4EJW was heard at 1700 and on the 7th, CX4HS was copied from 1720 to 1847, also EA8/G3JVL. Next day, LU2DEK, LU7DZ and LU3EX were heard and/or worked from 1814.

Paul copied ZS3VHF and ZS3E on the 10th and worked SV1OE at 0716 on the 14th and at 1648 on the 15th. Between 1935 and 2109 on the 17th he heard/worked K1ZX, W2IDZ, KA1MFA, WB4WTC, K1RSA, VE1YX, N4MM, K1TOL and KA1MVB, but this opening favoured the Midlands and northern stations. From 1833 on the 18th a beacon/keyer, LU1MA (FF57), was heard on 50.086MHz for about 30 minutes.

G4UPS reports fairly regular tropo QSOs with G3CCH (HBS) and G3ENY (SPE). Ted received ZS3VHF on July 2, 3, 7, 10, 14, 16, 19 and 20. He heard/worked the usual Es countries in Europe, and further afield I note N4MM and N4PAE - heard at 2250 - and VE1YX, worked at 2302 on the 3rd; N4EJW (EL97) worked at 1636 on the 5th; CX4HS at 1721 and EA8/G3JVL at 1750 worked, and FY7THF at S5 for well over an hour from 1840 on the 7th.

On the 8th, JH4IOU was heard calling CQ on 50.11MHz at 0812. Later, KP2A was heard at 1300 and 1410-1430, EA8/G3JVL was worked at 1655, LU6DLB and LU2DEK were heard at 1812 and LU7DZ (GF05) was worked at 1822. On the 9th, pings were heard from ZD8VHF at 1810. Next day Ted worked his 47th country thanks to TK/HB9CXZ at 1707, then ZS3E (JG89) at 1757. 5B4AZ was copied at 1720 on the 12th after QSOs with CR8LN (IM67), TK, 9H, T77 and F stations.

At 1920 on the 17th, Ted heard W2IDZ, K1GPJ, WB4WTC, W2BXA and K1TOL. K1RSA (FN43) and VE1YX were contacted from 2015, KA1MVB was heard at 2040 and K1TOL was audible until after 2100. VE1YX worked 20 British stations including GI. A large solar flare was noted at 1125 on the 18th. At 1808, CX4HS was working GWs but he faded out at 1830. At 1915 G4UPS worked CX4HS, who made QSOs all over the UK.

Ela Martyr, G6HKM (ESX) added seven more squares. On 6 July SV1DH (KM27) was a new country, followed by SV1EN (KM18). 9H4W (JM76) on Gozo was new on the 11th, as was TK/HB9CXZ on the 13th. Ela found some new French squares, too. Ian Harwood, G8LHT, (YSS) worked six new squares in the Trophy contest on 18 June, while NFD provided more 1989 counties.

Geoff Brown, GJ4ICD, reports an opening to W4 around 2230 on 3 July. On the 5th at 1700, N4EJW was S3. From 1400 on the 8th, KP2A was heard for an hour and at 1630 he had a partial QSO with VP5D. EA8/G3JVL at 1815 was the first GJ/EA8 contact, but the best came later, from 1820, in QSOs with LU2DEK, LU6DLB, LU3EX, LU7DZ, LU8AJK, LU1DMA and at 1844, CX8BE (GF15) - Geoff's first CX. The opening finished at 1905.

GM4JEJ reckons the band is not very good for tropo contacts but comes into its own during auroral and Es events. Recent Es QSOs for Michael include T77C and 9H1G on 17 June and 9H1CG on 8 July, but there were no significant auroras in the month up to 10 July.

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	144MHz	430MHz	1.3GHz	Total
G4RGK	-	284	126	51	461
G3IMV	38	416	124	48	626
G4KUX	-	384	120	-	504
GJ4ICD	205	256	119	59	639
G6DER	43	183	114	82	422
G4XEN	66	274	111	-	451
G6HKM	93	210	107	45	455
G4SSO	-	251	95	-	346
G8ATK	-	143	94	52	289
G8LHT	60	169	88	10	327
G4RRA	-	277	80	-	357
G4PIQ	-	229	78	-	307
G0EVT	58	197	57	-	312
GJ6TMM	62	151	47	-	260
GM4CXP	-	198	31	-	229
GM0GDL	-	81	22	-	103
G8PYP	47	95	19	-	161
G1DOX	33	61	11	3	108
G7CLY	-	38	1	-	39
G4IJE	207	338	-	-	545
G4SWX	-	333	-	-	333
G0CUZ	-	316	-	-	316
G3FPK	-	240	-	-	240
G0LFF	83	153	-	-	236
GW4FRX	-	226	-	-	226
G4DOL	-	206	-	-	206
G4XBF	-	150	-	-	150
G4TGK	-	136	-	-	136
G0JHC	117	-	-	-	117
G1WPF	-	101	-	-	101
GM0GEI	94	-	-	-	94
G0HDZ	-	64	-	-	64
G6MEN	48	-	-	-	48
GM1ZVJ	5	33	-	-	38

No satellite, repeater or packet radio QSOs. "Band of the month" 430MHz.

70MHz

Ian Cornes, G4OUT (SFD) operated in NFD and added GM3WOJ/P (DGL), G4UJS/P (YSN), G4IGY/P (HBS), G4FUU/P (KNT), GD0IOM/P, G4HRY/P (YSS), GW4WSE/P (CWD), G5RP/P (AVN) and GW3ZTZ/P (GWT) in the SSB period. His fifth 1989 country was EI2WW/P. Mervyn Rodgers, GM0GDL (CTR), with GM0LWD and GM0GMD, did a one-day portable stint to put Central region on the band. He didn't mention the date, but I think it was probably 23 July. He lists 34 QSOs and thanks G4SEU and G4WND for the loan of the equipment.

Roger Banks, G4WND (SFD) has produced the sixth issue of *QSB: The Newsletter for Four Metres* which has over 130 subscribers. His editorial mentions the high level of activity in NFD, when the leading stations were exchanging serial numbers well over 100. He states that an analysis by Jack Hum, G5UM (LEC) revealed that many of the new stations on the band are B licensees. To encourage more general activity, he proposes to contact the WAB Committee to suggest it organises a 70MHz contest. Geoff Grayer, G3NAQ (BRK) thinks 70MHz is an ideal band for WAB fans.

There is a fair amount of PMR surplus around suitable for conversion to the band, and QSB includes an article by Robin Hickmott, G8MFV, describing the modification of the Nolton Nova transceiver. Roger Ray, G8CUB, describes a GaAsFET preamplifier using the Siemens CF300a device. A noise figure of 0.8dB, including circuit losses, is claimed. The next issue will be in October; articles on transverting from 50MHz to 70MHz, 70MHz propagation and converting the Pye Westminsters are promised. Write to G4WND (QTHR) for subscription details.

144MHz

Since the extensive opening on 17 June, there have been no sustained Es events - just tantalisingly fleeting affairs, more than likely missed by most who cannot spend all day tuning the band. Meteor reflections have been quite good, and more operators are exploiting this mode to boost their scores.

Eddi Ramm, DK3UZ (JO43) was mobile on 22 July using 25W and a 'Big Wheel' antenna and worked UB5LNZ via Es. From home he worked three new countries in Asia - UD6, UG6 and UL7, with distances around 3,300km. His best-ever Es DX was to EA8 some years ago, though.

Colin Morris, G0CUZ (WMD) covered the period 20 June to 20 July in his report and, although Es propagation was disappointing, other modes made up for this. On 22 June he made tropo QSOs with SK6HD and SK6EI (JO68), SM6CMU (JO57) and SM4KYN

(JO79). On 3 July he caught GW0KZG/MM in JO14, the next day bringing OZ QSOs and LA6HL (JO28). More tropo on the 5th resulted in contacts with SM7FWZ (JO77), SM5MIX (JO78) and SM6CLU (JO57), while LA1T (JO37) was a nice one on the 8th.

The GB4XT group were always very busy and Colin worked them on the 11th. EA2AWD/MM has been active most weekdays from a fishing boat in the Bay of Biscay and was contacted in IN64 and IN74 on the 19th. There was a half-hour Es opening from 1417 on the 13th to Spain and EA5YB, EA5OE and EA5MR (IM99) and EA6VQ (JM19) were worked. At 1543 Colin heard 9H1GB (JM75). MS completions were with CT/F6EYM (IM56) on 11 July on random, and YU7EF/2 (JN83) on the island of Vic on the 18th.

G0EVT operated in NFD, making QSOs with F, G, GM, GW, ON and PA stations. On 3 July John contacted GW0KZG/MM in JO14 and JO15, both new squares. Tropo on the 4th brought OZ1BUR and OZ1KLU (JO46) and the next day SM7FWZ was new; others were SM6KKX and SM6EHY (JO67). On the 8th, LA1T was new as was LA1BM (JO29) on the 9th. In a brief Es opening from 1800 on the 12th, John contacted IW8BZN and IC8BNK (JN70), while I8OMA and IC8EJG were heard. OZ1KLU/P (JO46) was worked on the 18th.

Angela Sitton, G0HGA (HFD) is a confirmed CW operator and asks me to remind readers that Monday night is CW activity night. She suggests that if those calling CQ DX on 144.050MHz don't get a reply after a couple of transmissions, they might QSY a bit to leave the frequency clear for others. She feels that calling on .050 and then QSY-ing is now unnecessary and is all for scrapping the calling frequency. Your comments, please. She is now running a bit more power and an Rx preamplifier and hopes to improve her antenna soon. 10 June brought Angela's first Es QSO with YU1AFS (KN04). On 17 June she worked YU7CV (JN95), LZ1KDP (KN12) and LZ2XU (KN23) from 1838.

G0LFF says that the big Es opening on 17 June never quite reached ZB2 although he could hear the EA7s making QSOs. He attempted a couple of MS skeds with I5JUX - from whom he gots pings - and 3A1LU, from whom he got nothing. G1KDF was another of the many who worked LA1T on 8 July. The following day Bob found LA6HL, LA1BM, LA7RU and LA1ZE (JO28) and GB4XT.

Peter Atkins, G4DOL (DOR) telephoned his report of Es QSOs made in July. On the 12th he worked YU2AKL (JN83) and YU2GH (JN75) around 1747. On the 21st at 1915 he heard I5CZE in what may have been an MS burst, and at 1930 EA6FB was RS31. The more significant event started very early on the 22nd at 0641 with HG7PT. From 0657 to 0743 he made a further 19 QSOs, including two HGs in JN87 and JN96, then Italian stations in JN44, 52-54, 61 and 63-66, in the I0 and I3-6 call areas.

G6HKM's report began on 25 June when Ela worked GM1JNC/P (DGL), then on 1 July she contacted GW0KZG/MM (JO05), and GM4HAM/P (SCD) in NFD. On the 3rd she had an unexpected QSO with GD8EXI/MM in the Irish Sea. On the 6th she heard GM4CXM (SCD) on the indoor halo and then worked him from the main rig. Later, in a very brief Es opening, she worked YT5G (KN11) again. The Spanish Es session on the 13th produced EA5DIT (IM98) for a new square, then EA7CVD (IM86). Best DX was GB4XT, contacted at 1829 on the 18th after a week's patient monitoring.

G8LHT listed Es QSOs with four LZ2s (KN33), HG8ET (KN06) and YO2IS (KN05) between 1630 and 1700 on 17 June, followed by YU1, 2 and 7 1830-1900; I0, 6, 7 and 8 1915-1950 and IS0DKU and IS0QDV (JM49) at 2030. On 5 July Ian had tropo QSOs with SM5MIX, SM6SUH (JO78), SM6MKH (JO68), SM7FWZ and SM7RME (JO77), Y24LA (JO64), LA3TL (JO58) and OZs and DLs. He found NFD conditions poor but did contact EI7DJ/P (IO52), EI4GRC/P (IO53) and GI8FQB/P (DWN). GB4XT was worked in the evening of the 12th. He still needs ARM, GNS, SRK and TYR from his 'new' QTH.

For GJ4ICD, 17 June seems to have been the highlight of Geoff's amateur radio experience, so far. He wrote, "At 1600, all hell broke loose! I have never heard so many stations in such a widespread area on ANY amateur band before." He reckons there must have been a contest group operating in Bulgaria, "..as there were many, if not hundreds, of LZs on the band." He worked 117 YUs in apparent DXpedition style. He reckons he heard an OD5 among all the QRM from France. In summary, in about five hours, Geoff reports working over 400 stations - that's about 16 log pages - so the Propagation Studies Committee should have a ball going through that lot.

GM0GDL (CTR) enjoyed the tropo lift on 9 July working EI7M (IO52), OZ1s OF, BEF, KLU and IWE (JO46), SM6AEK (JO66), SM6KKX and SM6KJX (JO67), LA8AK (JO37), OZ1KYM (JO45), DF8LC (JO53) and DG6LS (JO54). John Lincoln, GM0JOL, (HLD) sent a nice postcard of Bettyhill with his QTH marked thereon. Not surprisingly he reports that GB4XT worked "..all the resident stations in IO78 - GM4NGY, GM7ASN and himself." John operated portable from IO78WN working into PA and reports that GM7ASN is now QRV on SSB.

John Hilton, GM1ZVJ (LTH) operated during NFD, best DX being G8MNY/P (IO91) and EI7M/P (TIP). On 3 July he worked G8VZT (SPE); on the 6th SK6HD; 7th at 0110 LA0DT/MM (JO06); 8th LA1T; 12th GB4XT and the 14th GM4DMA/P (JO08).

Little excitement from G3PFK, the only new squares being GW0KZG/MM (JO14) on CW on 3 July - quite a struggle with deep QSB and computer hash - and LA1T on Skernoey Island on the 8th. Operator Egil, who was taking things at a very leisurely pace, said that a large group goes there every year operating on many bands.

430MHz

Jack Moseley, G2CIW (GLR) is concerned about the general lack of activity on the band mentioned in the July VHF/UHF. Were it not for using it for Oscar 13, he would probably have given up. He doesn't think TVI is the culprit - more likely that people have forsaken the band for 50MHz. Since 50MHz is now available to B licensees, a large number now use it for worldwide DX-ing without having had to pass the morse test. He feels that activity would be higher if B licensees were restricted to 430MHz and above, as was the case many years ago. That is bound to raise a few hackles!

Jack doesn't think that contests are the answer, since they only result in "hello and goodbye" QSOs degenerating into little more than a 'bingo game' with everyone disappearing immediately the event is over. He doesn't think that cumulative contests are the answer either but offers no solutions to encourage more general activity.

G0EVT worked local Gs in NFD using a 144MHz Yagi. On 8 July John contacted LA1T, also using the 144MHz beam. G1KDF caught LA1T on the 9th, along with LA1BM, LA1ZE and SM6ESG (JO67). Once again there were some odd beam headings since pointing in the great circle direction produced only very weak signals. When LA1BM aimed due south to OZ, signals increased to S4-9. The same experiment was tried with LA1ZE. Bob managed GB4XT on the 14th.

Keith Hewitt, G6DER (YSS) contacted GM4IPK (IO99) on 18 June. During 3-6 July there was a good path to OZ and SM, and SM6CEN/M (JO66) was worked. The 8th brought LA1T to make Keith's tally 114 squares. G6HKM worked GM4TXX/P (DGL) during NFD for the first Scottish station this year. On 16 July a QSY from 144MHz gave Ela G4VCJ (CVE), which is a bit rare on this band.

G8LHT also used NFD to winkle out some new ones including GI4GTY/P (ATM), EI2WW/P (WKW) and G3SWC/P (SXW). On 3 July Ian made several QSOs with north European and Scandinavia, including SM4KYN and SM6CEN/M. He also found weird beam headings with G4NPH (CBE) who was aiming at SM, being strongest when Ian beamed due east. Shortly after, G0DVY in Mablethorpe gave him S9 plus 20dB when beaming slightly north of east but well under S9 on a true WNW heading. On the 6th his QSOs included SM4s KYN and KRK, SM6s EUP/M (JO67) and JEH (JO68), LA8AK and LA1YCA (JO38), LA9RAA (JO28) and three OZs.

On 16 July, GM0GDL found GD6ICR calling on 144MHz saying he was QRV on 430MHz. After a quick QSY, Mervyn worked him for a new square and country. He is still short of a square in southern G and wonders, "Does anybody listen to the north?"

1.3GHz

Although conditions were good on 9 July, G1KDF failed to work LA6HL. In the period 3-7 July, G6DER found signals on the band better than on 430MHz with strong OZ, SM, northern PAs and DLs worked. Keith found two new squares - OZ/DK2UO/P (JO45) and OZ1GMP (JO56). A nice catch was LA1T on the 8th. G6HKM added eight more counties in NFD including her own, Essex. A gotaway was GM4BYF/P.

Dave Bullock, G6UWO (NOT) reckons he's discovered a new law, viz. the amount of activity on 1.3GHz is inversely proportional to the sophistication of one's equipment. He and John Wood, G6JQL, have been constructing state-of-the-art gear since January 1986 when activity was much higher. Now, though, the only activity is during contests or openings, and nobody seems interested in working IO92 square. They are QRV portable each Monday night in summer to little avail.

I hope G4NDG won't be put off by that, especially since he can concentrate on the low sunspot cycle has p

He has a pair of 2C39s in a cavity PA and hopes to water-cool them as per the N6CA design. A dish antenna is planned. Perhaps we may see renewed interest in activity when there is nothing to work on 50MHz. In NFD G8LHT only made very local contacts, using one watt and a poor antenna. However, on 3 July conditions opened up, enabling Ian to work OZ1JXY and OZ1KLU (JO46), OZ/DK2UO/P, SM6HYG (JO58), SM6KXN/P (JO67) and PA3DIJ (JO33). He is trying to improve his station.

DEADLINES

I've had to omit some very interesting observations on tropo propagation and the possible link with auroral events from John Eden, GM0EXN, and G3NAQ. I hope to include them when there is less activity to report because they are the real stuff of Spectrum Analysis. Please note the **October** deadline **22 September:** for **November,** it's **21 October.**

SWL

BOB TREACHER BRS32525

ALL QUIET ON THE VHF FRONT

After last month's hectic activity on the VHF bands and the copious comments which came in as a result, the period between mid-June and early July seems to have been very ordinary indeed according to VHF reports received this time round. Late in July, however, some LUs, CXs and Ws were heard on 50MHz - more on those next month.

Harking back to the momentous events of 17 June, I now have a long report from Martin Parry, BRS52543. Martin logged 12 Frenchmen on 50MHz, together with FC1EAN/7X. Most were above 50.2MHz, so maybe most of them even had permits! Receipt of QSL cards should confirm their status one way or the other. Martin seems to have missed most of the fine conditions on 144MHz on the same day, unfortunately; he logged only IC8CQF, IC8EGJ, I0LYL, I8YZO, IS0QDV and IS0OZK.

David Whitaker, BRS25429, reported a poor spell on 50MHz but he caught CX4HS at 1910 on 7 July. Elsewhere on the band, his only noteworthy loggings were ZB2BL on 28 June and GD0IOM/P on 1 July. On 144MHz he heard SM5MIX (JO78) and OZ1EZD (JO46) on 22 June. 4 July brought LA6HL (JO58), and the following day saw SM6EHY (JO67) and OZ6CE (JO55) finding their way into the RX.

At this QTH, things were just as bad! 50MHz only produced 9H1B, 9H5EE, several Frenchmen in JO03, 23 and 33, FC1EAN/7X, CR8LN (IM67) and OH1YP (KP10) in the period between 18 June and 11 July. Admittedly, I lost a lot of listening time during the period because of excessive hours at the office, but I didn't hear loads of amateurs commenting on the exotic DX they'd been working either. I know that there were several brief Stateside openings and also one to LU; maybe Norman's column will be giving details of what we all missed (you must be kidding - NASF). Some PA0s were heard via backscatter around 1945 on 12 July. Band I TV DX reception was also pretty poor during this period. Are there any TV DX types out there who can provide more information on this topic and some photos? Let me know.

On 144MHz, I heard LA9LS in JO38 on 22 June and GW0KZG/MM in JO12 on the 24th. There were some good MS reflections on the 29th, and I identified OE3OBC.

HF NEWS

Moving down to the HF bands, conditions also seem to have been pretty ordinary and reporters this month weren't exactly dishing out the superlatives. However, it seems that if you were in the right place at the right time, you could have picked up something worthy of note. The 28MHz band appears to have provided what amounted to the best DX, but you certainly had to pick your days to monitor the band since very little was on offer on some of them. Reports mentioned quite a few DX stations, the best of which were FR5GN, TL8HW, TT8GW. V85GA. VP8BWT, VQ9MC, YI1BGD, ZD7BJ, ZD9BV, 5H3TW, 5V7TM and 9N1MC.

On the basis of DX-type activity, the best band was 21MHz; lots of stations were reported but most of them weren't the rarest of the rare. Looking through the information which came in, the following were around; A35SA, C6ANX, CN60EK (CN operators were allowed to use CN60 between 9-15 July), FO5LN, J79T, KN0E/KH3, TU2JL, ZF2DR, ZS8MI and 9X5NH. Overall, the busiest band was of course 14MHz - but lots of loud (and, in too many cases, wide) Europeans made it difficult to copy some of the DX on offer. A61AC, FP5DX, FR89EL, KC4AAA, TT8CW, TU2JL, V85AH, V31PC and YK1AA were reported. On 7MHz, the only noteworthy stations were OH2AP/OH0M and ZS8MI.

Some interesting QSL cards which have made their way into reporter's shacks this month were from VP8BUB (South Georgia), 3W0A, 3D2XX (Rotuma), KH0AC (on 7MHz), BV/ON5SY (28MHz) and 6D2AF (heard in 1980!)

David Whitaker mentioned listening on 18MHz following full release of the band to UK amateurs in July. David heard very few G stations but lots of DX was about; 9M2RI, AL7I, YN3CB, KL7EN, TI5GLF and WP4AGW. He's heard 58 countries on 18MHz to date.

DXCC SPEED CHALLENGE

Brendan, G4DYO, who edits the DX News Sheet, is sponsoring this challenge. The full rules appear elsewhere in Spectrum Analysis, but there is a section for SWLs and I thought it would be worthwhile to outline those applicable to listeners.

The challenge runs for three months, starting on 1 September and ending at 2359 on 30 November. The object of the exercise is to hear 100 DXCC countries on the HF bands in the shortest possible time. All bands between 1.8 and 28MHz except 10MHz can be used, and all stations must be acceptable for DXCC credit - so you can't count 1Z9A, for example. SSB, CW or RTTY loggings will count, but cross-band or cross-mode contacts will not. Contest contacts are acceptable. QSL cards are not required. A special plaque will re awarded to the outright winner of the SWL section, and logs must be received by Brendan by 12 December.

The entry fee to take part is £2, and all proceeds will go to the 'Club Bouvet' project; the aim is to get an expedition to mega-rare Bouvet Island by the end of the year. It'll cost in excess of $200,000 to do so - hence the challenge, which is one way the DX fraternity can provide support.

Finally this month, I have obtained details of the stations for which F6AJA is (or has been) QSL manager. In the hope that it'll help someone somewhere obtain a much-sought-after card, here's the list:

FC0BKZ/FS7 (Dec 81/Mar-Apr 84)
TR8JD and TR8YL (1982-4)
FY0HVL, FM0HVL, FG0HVL, FG0HVL/FS7 (Jun 83) and FY0HVL (Jun 84)
FY0HVM, FM0HVM, FG0HVM, FG0HVM/FS7 (Jun 83)
C31MD (CQWW SSB 1984)
TR0AB (Banie Is - Jan-Feb 84)
FD1HVQ/GLE (Glenan Is - Aug 85)
F6AXN, F6BBJ, F6CWT, F6EDF and F9IE (all /Mar: Marcouf Is - Mar 86)
FV6NDX (1986)
FV6NDX/Bat (Batz Is - Aug 86)
FP/F2JD (Dec 86)
TK5BL/FS (Jan-Feb 87)
3C3CR (Jul 87)
TW0A, TW0B, TW7C (WPX SSB Mar 87)
FF1LQU (WPX CW May 87)
TR8CR (from 22 Jul 87)
FV7NDX
FV7NDX/Mar (Marcouf Is - Jun 87)
FV7NDX/Re (Re Is - Jun-Jul 87)
FV7NDX/Gra (Ile Grande - Nov 87)
BY1PK by F2JD (29 Sep 87, 0715-0828Z only)
FJ5BL F2JD/A6 (Jan-Mar 88) TG9/F2JD (Jun-Jul 88)
FV8NDX
FV8NDX/P (Les Sept Is - May 88)
FV8NDX/Re (Re Is - Jul 88)
FV8NDX/Noi (Noirmoutier Is - Aug 88)
F2JD/J6L, F2JD/J7, VP2M/F2JD and J79CD (Oct 88-Mar 89)
FG/F2JD (Mar 89)
FV9NDX

The address for all these is F6AJA, J M Duthilleul, 515 rue du Petit Hem, F-59870, Bouvignies, France.

RSGB NATIONAL HF CONVENTION

A ONE DAY CONVENTION WITH LECTURE PROGRAMME

SUNDAY, OCTOBER 1st 1989

BELFRY HOTEL, MILTON COMMON, OXFORD.

DOORS OPEN 9.30 A.M. ADMISSION £3.50

RSGB Bookstall
QSL Bureau Posting Box
Worked All Britain Stand
BYLARA Stand
2 Licensed Bars
RSGB Committee Stands
Presentation of RSGB Trophies
1.8 MHz Get Together
Chiltern DX Club
DX Quiz
Pile-Up Copying Competition
Dr DX Computerised Contesting
G-QRP Club Stand
ISWL Stand
Car Boot Sale (no additional charge)
Constructors' Advice Booth
Young Amateur of the Year Award
RNARS QRQ Tests
FDC Room
Southern UK FM Group

This programme is provisional. RSGB Committee stands include HF, HF Contests, EMC, and Propagation Studies. Planning Panel clinic will be dependent on availability of panel member. If you plan to use the QSL Bureau posting box, cards must be pre-sorted according to normal bureau rules.

LECTURE PROGRAMME

1030-1130 "HF Yagis" by John Devoldere, ON4UN. Well known LF operator and author of "LF DXing".

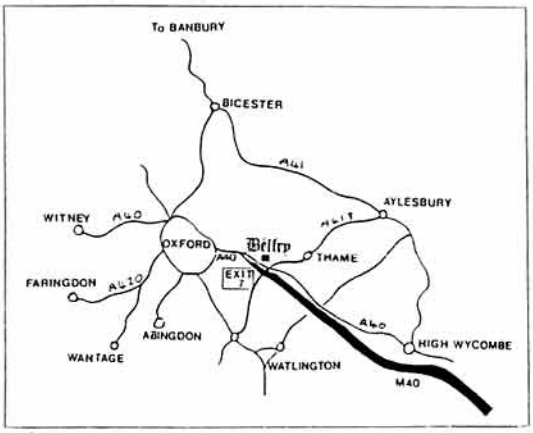
1145-1245 "Are our rigs good enough?" Back by popular request is the forthright Peter Chadwick G3RZP.

1330-1415 Trophy Presentation by RSGB President Julian Gannaway G3YGF.

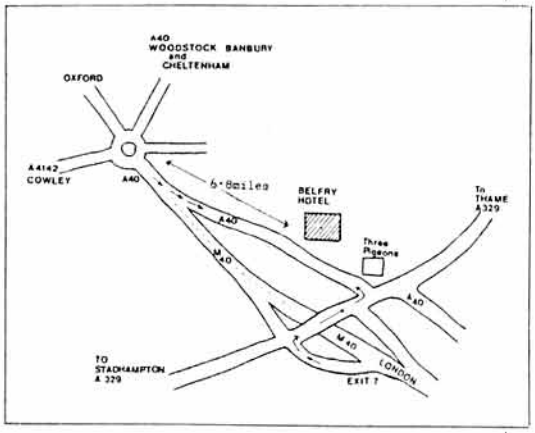
1415-1515 HF Q & A Forum to members of RSGB Committees. Chaired by John Forward, G3HTA, of the Western and Chiltern DX Clubs.

1530-1600 **Young Amateur of the Year Presentation.** A special ceremony at which the DTI will announce the 1989 winner. The RSGB Will announce the names of YL and YM runners-up and of the successful sponsors of all winners. Presentations of Awards & Prizes by the DTI, RSGB, Navico, and Cirkit to be held in the presence of VIP guests including winners, sponsors, parents and the 1988 winner, Andrew Keeble, G1XYE.

1600-1800 DX Slideshows including:
— Marquesas and Austral Islands by F6EXV.
— Cocos Keelng DXpedition by Steve Telenius-Lowe G4JVG.
— XF4L Revilla Gigedo expedition (DK9KX invited)
— 3D2CR Conway Reef expedition (DK9KX invited).



Light lunches and snacks will be available at the hotel for a modest charge. Tickets should be purchased from reception on arrival. Dinner bed and breakfast is available for Saturday night at £37.50. Bed and breakfast costs £23 per person. Telephone Great Milton 381 for reservations. Note that these prices do not include the £3.50 admission charge.



There will be a short programme of DX slides at the hotel on Saturday evening.

Back (l to r): GW4TTU, G8ROU, GW4LXO, Carol, G0DAZ. Front (l to r): GW8TVX, G4VXE, G4HGT

SUN, SCANDAL AND DX – the Squarebashers in Madeira

In previous years we've run a feature on the annual exploits of the Squarebashers – probably the best-known of the groups on the VHF DXpedition scene. The 'Bashers made themselves exceedingly popular with most of the VHF types in Europe last year as a result of their pilgrimage to Gibraltar, from where they seemed to have worked almost everyone active on 50MHz at the time – not to mention most of the 144MHz DX brigade. At the height of the Es season this year they went to Madeira, and hopes were high that CT3 would feature in many 50 and 144MHz logs shortly afterwards. As ever, we were waiting on the tarmac to greet the returning group and to threaten them with unmentionable tortures if they didn't produce a feature about how they got on. Here it is, from ***Tim Kirby, G4VXE:***

Shortly after our return from Gibraltar in June 1988, the question on everyone's lips (we exaggerate slightly) was "where will they go in 1989?" As always, our selection criteria were quite simple; a rare DXCC country on VHF (and one on which we could use 50MHz) with excellent weather and cheap food and drink. By means of what passes for thought processes, I arrived at considering Madeira (CT3), which looked pretty attractive – it counts as Africa for a start, and it ought to be within Es range of quite a bit of Europe. Richard, GW8TVX, managed to obtain a map of the place and we pored over it looking for possible sites. However, at this early stage the omens didn't look at all good. All the accommodation seemed to be in the southern part of the island and all the mountains in the north, which would have left us with a terrible take-off to the UK. Nothing daunted, we turned our attention to the island of Porto Santo – about 45km east of Madeira itself. As well as being a bit more topographically friendly to amateur radio, there was some reasonable accommodation available in the shape of a villa with plenty of ground and even a hotel. Definitely promising.

Having established that something might be possible, I wrote to the Membership Services Department of the RSGB to find out about reciprocal licensing arrangements. They wrote back with two addresses – one in Lisbon and another in Funchal, the capital of Madeira. I wrote to the Lisbon one asking for details and also whether it would be possible to obtain a permit for 50MHz. A couple of weeks later a very helpful letter arrived – thankfully in English – saying that the cost of the licence would be 1220 Escudos (about £4.20) and that I was welcome to use 50MHz as long as I did not interfere with any other services. Brimming with enthusiasm at this positive reply, I rang Jon, GW4LXO to give him the good news. Jon was delighted, but I detected slight anguish in his voice and asked him whether anything was bothering him.

"Well – it's just that I've been looking at some of the tourist literature about Porto Santo. There seem to be an awful lot of donkeys and windmills – do you think they use the windmill to generate electricity? For all we know, there might not be any mains on the island."

"Er..."

Good point. Visions of trying to get a 10kW generator past Customs flashed through my mind, closely followed by visions of the Squarebashers collectively incarcerated in some dank dungeon surrounded by mouldy bread and bat droppings. Reeling from the shock, my mind went numb for a minute or two. Then I suddenly remembered that I'd seen the address of a station in Porto Santo somewhere recently. Where could it have been? Got it, the *DX News Sheet*. Feverishly thumbing through my back numbers I found it. CT3FT (GI3IVJ/CT3) was QRV from the island. Great, all I had to do was drop him a line and ask about the electricity supply. I could check a few other things at the same time. I made a mental note to do just that.

There then followed one of those coincidences which bring you up short. A few mornings later I crawled out of bed and turned the radios on with one hand while activating the kettle with the other. Who's that on 28.885? – doesn't sound familiar. Good grief! It's CT3FT, Cedric, talking to GI4GPC. I wait for the QSO to finish and then call CT3FT and introduce myself. Cedric is immensely helpful, and reassures me about the mains; it's 220V AC, although it sags a bit at meal times! I explain that the Squarebashers are planning a trip to Porto Santo and ask about the location of the villa where we plan to stay.

"From CT3FT – well, it's not bad, but my place is better. I shan't be here in June; would you like to use my house, over?"

It must have taken a good three nanoseconds for me to press the PTT to reply. I promise to write with all the details and sign off, thoroughly elated.

THE WHEELS TURN

At this stage I decided that everything was beginning to look rather promising and that it was time to start signing people up and get the wheels turning. Chris, G8TFI and Dave, G4FRE – both stalwart Bashers – couldn't make it this year because of their impending nuptials (no, not to each other, silly) and Walt, GW3NYY, would be in Canada on business. On the positive side, Colin, G0DAZ, was determined to make it this year come hell or high water after the problems he'd had with getting to Gibraltar (or rather, failing to get to Gibraltar) and Carol – Mrs 'DAZ – was also very keen to come after joining us on our November trip and seeing the fun we had. Apart from those, the line-up would be the same as last year; step forward John, G4HGT, Jon, GW4LXO, Kelvin, GW4TTU, Tim, G4VXE, Dave, G8ROU and 'Captain' Richard, GW8TVX.

One trip to the travel agents and the villa which we'll be staying in (Cedric's villa will be the main operating base) is booked. Colin

and Carol book a room at the Porto Santo Hotel, no problem. I apply for my licence - looks as though we're in business.

It's all going very well, isn't it? Scene shifts to 6 April (my birthday, as it happens) with me idly gazing at the 'Holiday' programme on the box. Towards the end, Desmond Lynam announces that the company which owns Suntours has gone bust and that the holidays would be lost. As they say in third-rate thrillers, my jaw dropped. That was the company which was supposed to be taking us to Porto Santo. I was still in shock a minute later, when the phone rang. "Hi Tim, it's Carol, have you been watching...?" Next morning I was waiting on the travel agent's doorstep for them to open. I was fearing the worst, but in fact they were helpful and quite reassuring. Although the company had indeed gone under, they were subject to a takeover bid - so the holidays booked could well be honoured. They promised to ring me when more information was available, so I could breathe again for the moment.

Major panic No.2 ensued the following day. In the light of the horrific events at Lockerbie I'd written to Air Europe outlining who we were and what we wanted - but next morning's post brought a letter from them saying that no electrical equipment could be carried as hold baggage. Which put us right up the creek. To add insult to injury, the very same post brought the latest issue of *RadCom*, in which was a piece outlining our plans for Madeira in great detail - complete with dates, times, frequencies, the works. Aaaargh!

BIGGEST HAND-BAGGAGE YET!

Another fine mess I've got myself into. In a moment of weakness I wondered why I didn't confine my amateur radio activities to going on 3.7MHz once a week and regaling all and sundry with the latest on why my tomatoes wouldn't grow. Depression and gloom. But then - a vision of a super VHF station on a beautiful island in the sunshine, with excellent company and with the sound of a monster pileup coming out of the speaker. There just had to be a way round this, and it was time to find out what it was. I reached for the phone and rang Air Europe; I explained what we were trying to do and after some discussion it was agreed that we could carry the rigs and whatnot as hand baggage and that the aerials and cables, etc, could go in the hold.

This was great news, but it left us with another snag. All the equipment now needed to be capable of being passed off as 'hand baggage' and there was no way on the Lord's earth that the QRO 144MHz VHF amplifier we'd planned to take would fall into that category; it probably wouldn't even have gone through the cabin door. Solid-state amplifiers would have to be the order of the day. In turn this meant that although Dan, HB9CRQ, had very kindly offered to ship a 144MHz EME array out to Porto Santo for us to use, we couldn't really do anything with it.

As with last year's expedition, Colin 'DAZ took on the job of organising the loan of equipment from various suppliers. I'm sure that if Colin ever decided to become a salesman, he'd be one of those who could sell the proverbial fridge to an Eskimo; in what seemed an incredibly short space of time he'd rustled up enough equipment for several DXpeditions, let alone one. Andrew Sharp, of BNOS Electronics, turned up trumps again and provided us with solid-state amplifiers for all the VHF bands, together with a variety of high-current PSUs. I'm delighted to report that everything performed flawlessly in what were sometimes difficult circumstances - thank you, sir. Alan Kelly Electronics supplied us with MET antennas for 50, 70 and 144MHz; so well did these perform that they were all subsequently purchased by the Bashers! Raycom were kind enough to supply us with a couple of 144MHz handhelds, which we used for communications between the various parts of the island. We'd like to thank everyone who assisted us for their help.

Preparations went on apace, and before long there were only a couple of days to go before blast-off. At this point I received a letter from Hern, CT3BX, who had heard that we were en-route to Madeira. Hern very kindly offered to do anything he could to help, and indeed he rang me the night before departure. We had a long chat about various things, in the course of which I expressed some doubts about my ability to deal with the Customs formalities at the Funchal end: I'm not exactly fluent in Portuguese, and bitter experience tells me that a load of Squarebashers wandering around the airport reception carting a strange assortment of radio equipment and miscellaneous aluminium-mongery aren't usually mistaken for innocent British holiday-makers after a bit of sun and sand. No problem, said Hern, I'll have a word with them beforehand and try and meet you at the airport to sort out any snags.

The day before departure saw me in the usual state of pre-expedition stress. What have we forgotten? How the devil are we going to get all this junk on board the aircraft? Dave 'ROU and John 'HGT arrived late in the evening and we decided that the only thing which would calm our nerves was a short expedition to the local. When we got back, we thought a few minutes' practice with the Portuguese phrase book would be in order. Unfortunately, we were unable to find any Portuguese equivalents for phrases we thought we might be in need of.

"I would like to hire your donkey"

"This valve has cathode poisoning"

"Have you any curry powder?"

"We do not agree with your assessment of the forward transfer admittance of this field-effect transistor"

"Why are you washing your socks in the bidet?"

and so on. Oh well.

HARDLY HOLIDAY-MAKERS

Next morning we rose early in order to be at Gatwick by 0900. Imagine the scene - a busy morning at an airport, with the Bashers surrounded by what seemed to be half the population of the UK. Equipment was scrutinised for serial numbers to put on the carnet, then strategically placed in the most advantageous piece of hand baggage. Poles were strapped together and various other items padded with beach towels. This done, we trooped to the Customs office to have the carnets stamped - no problem, amazing. At this point we bade farewell to Colin and Carol, who were to travel to Porto Santo on a separate flight. The Bashers are a bit like the Royal Family in this respect - it isn't good for them to travel on the same flight in case of accidents! The expedition must go on, you know. Actually it wasn't like that at all - just a quirk of the way we'd booked...

How is it, I wonder, that I always seem to be at the head of the group when there's some explaining to do? Advancing towards the X-ray machine with my bag containing an IC740 and a few other goodies, I tried to look like the epitome of confidence. "Sorry," I said to the officer in charge, "I think this is going to look a bit interesting on your machine." Obviously having heard it all before, said gentleman said "Just shove it through. Ah. Oh. Mmmm. What is it?" I explained what it was all about and produced both my English and Portuguese licenses. He seemed satisfied and turned his attention to David and Kelvin, both of who got The Treatment. Eventually we sorted out

Villa Adelaide — home to Bashers, bugs and lizards

all the problems and collapsed in a heap in the departure lounge.

Unlike Colin and Carol, we flew via Funchal. This was highly enjoyable, and several Bashers visited the flight deck to see what was going on (probably also working out where to sprinkle the magic DX Dust that we were teased about last year). On arrival in Funchal we reclaimed the baggage; as you can imagine, this was a fairly lengthy process. Just as we picked up the last bag, a Customs officer - who had been watching us with considerable interest - came over to us and ushered me and the carnet towards a small window in the wall. Oh boy, I thought, this is where we get thrown out neck and crop and put on the next flight to the UK. But without me saying a word (which in the circumstances was just as well - I didn't know that many), the form was inspected and completed. Just as this was being done, a head popped round the corner of the 'red' channel and there was Hern. With impeccable timing, he was able to confirm that all was well. We later found out that one reason we'd got through with no trouble was that the Customs officers were apparently on strike!

MOUNTAINOUS OBSTACLES

Hern welcomed us to Madeira and we chatted about what might be expected on 50MHz. He explained that he'd never worked into North America except for a contact via F2 with KP2A earlier in the year. Propagation to Europe was tricky, mainly because of his poor take-off through the mountains. In contrast, Hern said that the path to South America and South Africa often opened up via trans-equatorial propagation. In spite of the fact that our stay wouldn't be at the best time for TEP, Hern thought that we would probably make some contacts to the south.

As well as Hern, our tour rep - Manuela - was there to welcome us as well. She'd managed to book us on an earlier flight to Porto Santo than we'd expected. So we had to check in all the baggage again - including the poles and such - in double-quick time; these latter had to be carried out of the check-in area via a side door since they wouldn't go through the normal route! At this stage we had to part company with Hern, which was unfortunate since it left us with a security check mounted by a very thoroughly armed guard to negotiate all by ourselves. How on earth am I going to explain this, I wondered, wishing that Hern was still around to do the talking in the right language. I essayed a smile and said "Radio" in what I hoped was the proper accent, and he waved us through! Muttering "Obrigado" I vanished round the corner and waited for the others to appear.

The flight to Porto Santo was on a rather elderly HS748 - the type known to readers who live in the Highlands and Islands of Scotland as the Paraffin Budgie. The trip took only about 15 minutes, and as we approached the island we could see its three largest peaks towering into the sky and the beautiful beach which is about 9km long. We approached low over the sand dunes and palm trees and landed; welcome to Porto Santo.

It certainly is Africa, I thought, looking round. Dry, dusty, with occasional patches of greenery, the heat was rising off the apron and making the view shimmer. We made our way to the baggage reclaim area, which consisted of a room with a large table and a hole in the wall, through which a truck offloads the baggage from the aeroplane. Porto Santo Airport is hereby awarded the Bashers Prize for Brilliant Baggage Reclaim - within a couple of minutes, we had the lot, poles and all! No carousel to cause chaos here! Next job was to find a taxi - no problem, they were just like the celebrated Yellow Cabs of New York. Our luggage was crammed in the boot, with the poles forming what the British police would refer to as an "overhanging load" - about 4 feet worth! The driver wasn't in the least perturbed by this state of affairs and we were soon heading through the town, passing on our way an interesting establishment named the 'Big Boy Disco'. Hmmm. We arrived at our villa, which looked splendid, and after a brief rest made our way to the Hotel Porto Santo to find Colin and Carol. Both were a bit fed-up; in complete contrast to our experience, they'd had major problems with security at Gatwick and come within an ace of both missing the flight and having their equipment impounded. Happily, Air Europe had sorted it all out and they'd just made it. We left them to a well-earned meal at their hotel and set off to find Cedric's villa; this took some time but eventually the HF dipole gave it away. Cedric had left some bottled water, biscuits, tea bags and beans, which were just what we needed. Jon and I placed this manna from heaven into the baskets of our hired bicycles

G4HGT and the tireless GW4LXO on VHF

(known locally as Iron Mules) and set off back down the hill to the other villa.

The trip back was very strange, and - to my mind - not a little sinister. Grass and flowers had been placed on the road outside most of the houses, and whole families were quietly waiting for someone (or something), each bearing a lighted candle. We hadn't a clue what this might mean, or even whether it was disrespectful to be around at the time. Not knowing anything like enough Portuguese to ask, and feeling most intrusive, we cycled past very slowly in the profound hope that we weren't offending anyone. Happily, no-one seemed to be angry with us on either the terrestrial or the celestial planes and we arrived back at the villa unscathed. Just as we did, we heard the sound of a procession. A brightly illuminated truck carrying a statue of the Virgin Mary headed up the road, followed closely by the faithful in cars, on foot and by moped.

A QUIET BEGINNING

While Jon and I were blundering around in this fashion, the others had been beavering away at base. A mast and 50MHz beam had been erected, together with a 28MHz dipole, and indeed we got back just in time to witness the ceremonial switch-on of the 50MHz station. Unfortunately, no-one replied to our tuning-up this year (where were you, Bill?) but the Windhoek beacon, ZS3VHF, was a steady S5. The keyer was duly dug out and a number of calls made on 50.110 but the silence was deafening, and indeed the inaugural contact of the expedition took place on 28MHz CW with TU4CO. Oh well - at least it all works; time for bed.

Next morning we headed into town early to do some essential shopping. Most importantly, we collected our licences from the local post office; there were no snags and I was delighted to find that mine had been duly endorsed for permission to operate on 50MHz. Kelvin had hoped that his might contain clearance to use 70MHz, but alas it wasn't his day. Next on the itinerary was the supermarket. I wouldn't normally bother to mention anything so

GW8TVX finding solar disturbances on HF

mundane, but on arrival it became evident that there was some small problem with the shop's electrical installation. The local handyman was in attendance, and as we arrived he seemed to be wielding a large power drill with great enthusiasm. We idly looked up to see what he was drilling into and were horrified to notice that it appeared to be the main fusebox! Supplies were hastily obtained and we departed quickly before the sparks started to fly.

We took a yellow cab back to the villa and arranged for the driver to return in half-an-hour to collect us and the VHF equipment and take us back to Cedric's. This wasn't as simple as it sounds, since (a) road access to Chateau Cedric wasn't awfully good and (b) real-time navigation isn't easy if you have to keep referring to the phrase book to instruct the pilot where you want to go before he goes there! You will not be in the least surprised to learn that we ended up some distance from where we wanted to be. However, we knew where we were and it wasn't far, so we decided to unload and pay the driver off. Talk about an old-fashioned look - I strongly suspect that he was thinking something along the lines of "these English are even crazier than people say they are" as he drove away. This feeling was to become distinctly familiar over the next fortnight!

At last we got our act together. The 50MHz station consisted of a 3-element beam driven by an Icom IC551 with amplifier, and to go with this we rigged a 28MHz talkback station. Incidentally, this was useful as a link between the villas, especially when the batteries faded on the handhelds. Those who keep a careful ear on 28.885 may have heard good-natured arguments about food and how best to keep rice; SWL reports to G8ROU! Back on 50MHz, though, things were exceedingly quiet. No beacons, no stations, no video buzz, no nothing - time for lunch. We kept at it all afternoon but there was no propagation to Europe at all. However, we did make our first 50MHz contact of the trip - with Kosie, ZS3E.

WALKMAN TO THE RESCUE

Next day didn't seem to be any better on 50MHz, but at about 1030 I was tuning across the band and heard some weak SSB. After a certain amount of shouting, I established contact with FC1AIO and we managed to complete. However, it was another six hours before we had a 'proper' opening into France. During this, we also heard the GB3IOJ beacon from Jersey but no stations. HF conditions didn't seem to be up to much either, and solar disturbances appeared to be taking their toll. 'El Capitan' 'TVX was particularly disappointed by this. Despite his Class B callsign, he's a most experienced HF SSB operator and was looking forward to some ferocious pile-ups; unfortunately, there weren't any to be had. Things were better on CW, but the problem here was that two out of the three experienced CW ops were spending most of their time on 50MHz. All we could do was to keep HF contacts coming along and hope that conditions would improve. Still, life wasn't so bad. There we were, on a beautiful and sunny island with good company, a beach to laze around on, loads of sun to soak up and a 'Walkman' to listen to some suitable music. We couldn't have asked for much more, apart from a bit of propagation from time to time.

Back at the 50MHz station, things got a bit more interesting on 3 June. We worked CT4KQ in the morning, and he was very strong. We took this as our cue to get the 144MHz station on the air, thinking that the MUF might be high enough for some contacts, but nothing materialised. However, at 1218 we heard Eric, G2ADR on 50MHz making a long call; unfortunately it was a bit too long and he sank gracefully into the noise before we could make the contact. After this the band apparently died completely and umpteen hundred CQ calls produced no results at all.

At 1436, yet another CQ went out - and we collectively fell off our chairs as G3KOX boomed out of the speaker in reply. We were in business! In the course of the next half-hour or so we worked about 40 stations - to the delight of Hern, CT3BX, who with impeccable timing had arrived to see us just as the fun began. What was interesting was there there were never any pile-up. Only one or at most two stations calling us were audible at any one time; the odd bit was that I subsequently discovered that we were being heard over quite a wide area of the UK but our signals were very weak. This apparent lack of symmetry about the path was characteristic of propagation between CT3 and the UK all the time we were there.

Although daytime conditions on HF seemed very poor, 14MHz perked up considerably in the evenings and by 2100 it was going very well. We kept skeds with Walt, GW3NYY, who by this time was back home in Cardiff, and by about 2300 we had the luxury of propagation both to Europe and the USA on this band. Both Jon and I thoroughly enjoyed our sessions on 14MHz CW, which seemed to generate quite a lot of interest. 'Twenty' was also in good shape when we got up, at about 0700; there were always some insomniac Americans to talk to, together with some G stations. One sad morning we worked GB4RIE - an expedition station in the Scottish islands - who passed on the news that Alan, GW0BIC, had died. Alan was a keen DX-chaser and a good friend of several Squarebashers; he will be sorely missed in the GW8GT contest shack.

We had some difficulty in coming to terms with the African wildlife. As last year, 'Small Game Hunts' had to be instituted in order to get rid of cockroaches, and by the time we left the villa was a cockroach-free zone. Lizards were extremely common all over the island and gave us an anxious moment or two. One managed to get into Cedric's bathroom, and after a certain amount of searching it was discovered to be having a snooze in the bottom of the bath. The only equipment available with which to remove it was a saucepan and spoon. Feeling slightly foolish, I tempted it into the former with the latter, making what I hoped were soothing comments of the form "here, lizard, nice lizard, what a good boy" and put it outside. Mind you, Derbyshire Curry was on the menu once again this year and we were sorely tempted...

CYPRUS OPENS UP

Back on 50MHz, the contacts were coming slowly but surely. On most days there was at least one opening to the UK, and GJ4ICD must have been bored stiff by the sound of our keyer. Working into the south of England was relatively easy, but for some reason it was much more difficult to get further inland. The multi-hop openings were extremely interesting. One which we noticed more than once was to Cyprus; while this path was open we could hear both the Maltese and Greek beacons coming in, suggesting that a number of hops might have been involved. Other interesting openings included one to Finland which cropped up at the same time as we were working into southern England. And right out of the blue one morning we worked Bob, VE1YX, to give him his 92nd country on 50MHz. In the end we made a total of 362 QSOs on this band, which we felt to be reasonable. Much of the credit for this has to go to Jon, GW4LXO, who kept the station on the air even when conditions became desperate and when we lesser mortals had long since departed for the beach or the pool (to keep Carol company, you understand).

By now you'll probably be expecting tales of wonderful Es openings all over Europe on 144MHz. Come on, own up - you're absolutely itching to read the heroic saga of how the Squarebashers gave a new country to hundreds of 144MHz DX barons, aren't you? Imagine the scenario. Massive stacked and bayed arrays unwaveringly trained on Madeira for a fortnight. Patient 144MHz men hardened by a lifetime of weak-signal operation crouching low over their rigs with headphones clamped to their ears, amplifiers in standby from dawn to dusk poised ready to fling kilowatts in our general direction at a moment's notice. Anxious telephone calls; quick, hushed voices. The silence, the tension, is palpable; anyone so much as emitting a squeak on 144.3 or the DXpedition frequency is threatened with murder or worse by half-a-dozen DX-chasers simultaneously. They wait - and wait - and wait...

A 2M-FREE ISLAND

Well - it wasn't quite like that. In actual fact, 144MHz was the major disappointment of the trip. We had a grand total of - wait for it - two contacts on this band. One was with a local; the other was with Salvador, EA8XS, who was 5 and 5 off the back of the beam over the 600km path. Apart from that - zilch. Lack of propagation was the problem, pure and simple, and we're still shedding tears about it. But what do you do? It's an object lesson in both English vocabulary and amateur radio operating; 'sporadic' means just what it says,

To summarise, we had 6 contacts on 3.5MHz, 61 on 7MHz, 565 on 14MHz, 217 on 21MHz, 409 on 28MHz, 362 on 50MHz and 2 (!) on 144MHz. The grand total was 1622, and if you were one of them you're welcome to QSL either via G4VXE at the bureau or via PO Box 136, Cardiff CF4 6YL.

THANKS TO SPONSORS AND FRIENDS

There are a number of "thank you's" I'd like to add. Firstly, to all our sponsors and friends back in the UK. To all the people who called and worked us; to those who didn't make it, there's always another time! Most of all, to the other Bashers. You'd have to go a very long way to find a better bunch with which to spend a fortnight on a desert island. □

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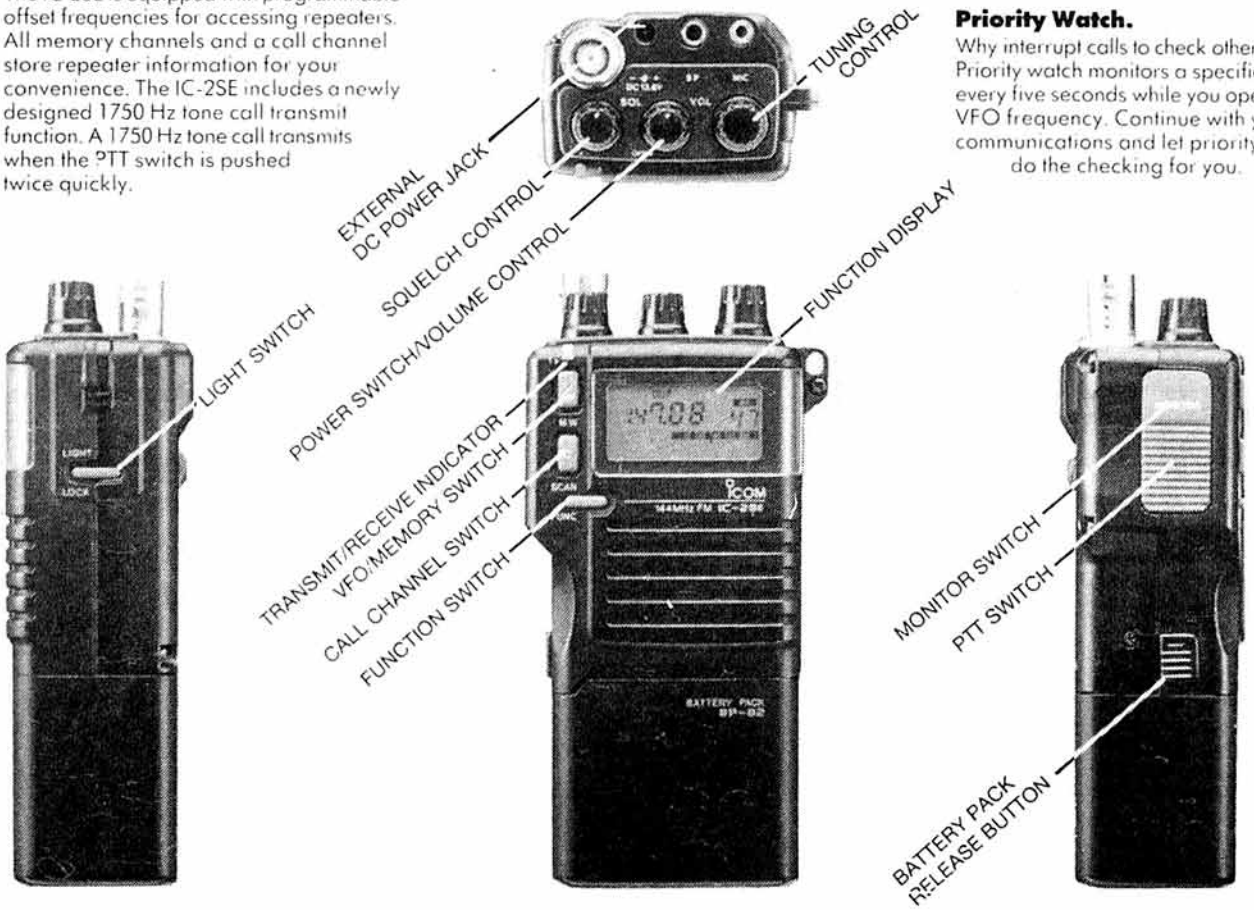

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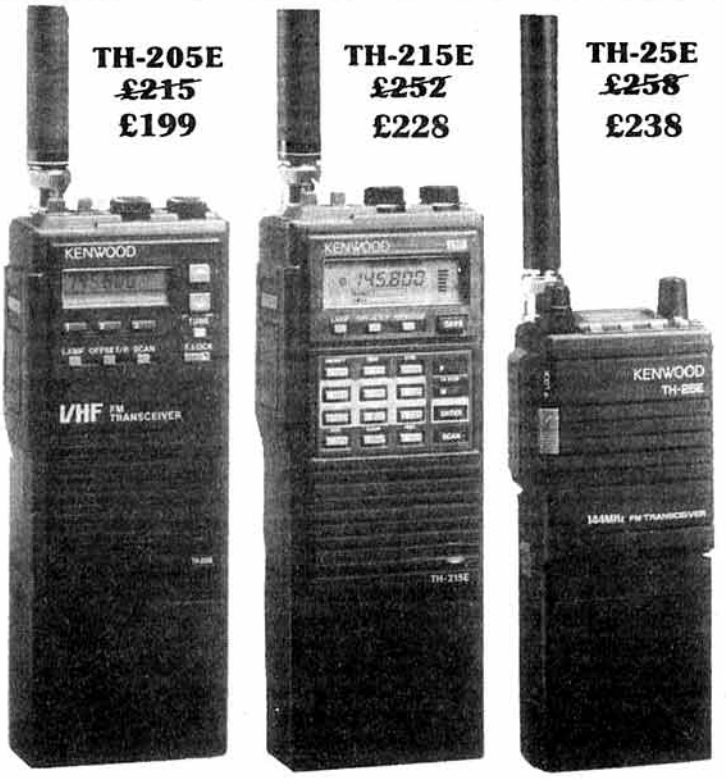

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YAESU FT 411 VHF TCVR 1-5W H/held.
YAESU FT 212RH 2M mobile FM 45W.
YAESU FT 290R 2 Multimode portable TCVR 2.5W.
ICOM IC 2SE FM handheld
ICOM IC 2GE FM handheld 3-7W
IC Micro 2 Mini handheld 10 mems 1.5W.
ICOM IC 2E FM handheld Thumbwheel freq. entry.
ICOM IC 228E FM Mobile multi coloured LCD 25W.
ICOM IC 228H FM Mobile multi coloured LCD 45W.
ICOM IC 275E 25W multimode base station c/w int psu.
ICOM IC 275H 100 Multimode base station, Reqs ext PSU.

TRANSCEIVERS UHF

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ICOM Micro 4 FM Mini handheld 10 mems, LCD 1.5W.
ICOM IC 448E 25W FM mobile with 21 mems.
ICOM 475E Multimode base station c/w psu 25W.
ICOM IC 475H 74W base station requires ext psu.
ICOM IC 12GE 23cm FM handheld 1W.
ICOM IC 1201E 10W FM 23CM mobile 21 mems.
ICOM IC 1275 23cm multimode base stn c/w psu 10W.
YAESU FT 712 35W mobile transceiver FM.
YAESU FT 73R 70cms FM TCVR up to 5W. handheld.
YAESU FT 790R 70cms portable TCVR multimode 2.5W.

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YAESU FC 757 GX Auto coupler.
ICOM AT 100 HF Ant coupler 100W.
ICOM AT 500 HF Ant coupler 500W
AMTECH 9000 HF (all feeders) 100W.
CAPCO RANGE
MFJ RANGE
TOKYO HP RANGE.

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AD 370 Active dipole for outdoor use.
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FL3 Audio filter c/w auto notch filter.
ANF Automatic notch and cw filter.
D70 Audio Morse tutor, Variable speed and spacing.
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ICOM IC EX 627 Auto Ant Selector.
AMP RANGE ALL 3-500.

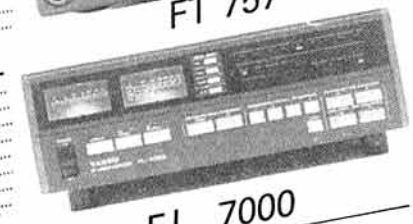
IC 781

IC 735

IC 765

YAESU

FT 757



FL 7000

AOR 3000

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BANTEX RANGE
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TONNA RANGE
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BNOS L144-3-100 2mts 3W in 100W out.
BNOS L144-10-180 2mts 10W in 180W out.
BNOS L144-3-180 2mts 3W in 180W out.
BNOS L144-10-180 2mts 10W in 180W out.
BNOS L144-25-180 2mts 25W in 180W out.
BNOS L144-3-50 2mts 3W in 50W out.
BNOS LP 144-10 5 2mts 10W in 50W out.
BNOS LPM 144-1-100 2mts 1W in 100W out.
BNOS LPM 144-3 -100 2mts 3W in 100W out.
BNOS LPM 144-10-100 2mts 10W in 100 out.
BNOS LPM 144-3-180 2mts 3W in 180W out.
BNOS LPM 144-10-180 2mts 10W in 180W out.
BNOS LPM 144-25-180 2mts 25W in 180W out.
BNOS 70cms Full range available.
BNOS LP50-3-50 6mts 3W in 50W out.
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BNOS LPM50-10-100 6mts 10W in 100W out.
BNOS LPM70-10-100 4mts 10W in 100W out.

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SU 2000 Bell type rotary dial.
G-250 Kenpro Bell type Twist and switch control.
AR40 CDE Bell type turn and push control.
RC5-1 Create Bell type Rnd Mtr 360 deg varispeed.
G600RC Kenpro Bell type rnd meter 360 deg.
HAM 4 CDE Bell type meter read out.
G800SDX Kenpro Bell type 450 deg varispeed.
G400 Kenpro Bell type Mtr control +/- 180 degs.
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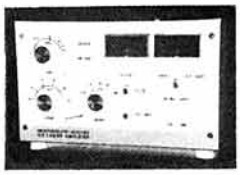

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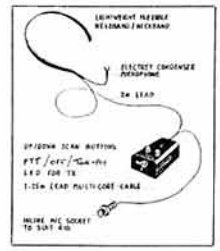

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TECHNICAL TOPICS

PAT HAWKER G3VA

WHATEVER HAPPENED TO AMATEUR RADIO?

Few readers born before 1940 will need reminding that September 1939 — 50 years ago this month — marked the beginning of the second world war. An event, for those radio amateurs who survived intact, that inevitably changed attitudes to radio communication as well as proving a forcing house for changes in the technology. It underlined that a radio link can be a vital, life-saving facility; yet, as was so often the case in those hectic years, a link that often failed when most needed. This was for a variety of reasons: unreliability of equipment in difficult environments; failure of batteries or generators; use of unsuitable frequencies; propagation conditions; lack of operating skills; hostile action and so on. If truth is told, radio failures were common and cost many lives. The near complete failure of communications during the 'Market Garden' operations at Arnhem has passed into history, but there were many similar episodes that have been lost in the mists of time. Most of the Resistance operators survived only a few weeks, RAF aircrew W/T operators often only a few flights. It left many of us with a strong feeling that there is more to amateur radio, as a self-teaching medium, than just a 'fun hobby'. By comparison the early months of 1939, as reflected below, were an age of innocence. How fortunate it is that amateur radio could potentially be as useful for a world at peace as for a world at war!

The special April 1989 issue of *Electronics Australia* marked the 50th anniversary of a magazine that began life as *Radio & Hobbies*. The enlarged 260-page issue was supplemented by a reprint of its complete first 72-page issue which vividly brought back memories of pre-war radio. It included such nostalgic articles as 'Your first transmitter — 50 watts on three bands' (6L6G tritet crystal oscillator and 809 neutralised triode power amplifier, rack constructed), **Fig 1**.'The 2JU Special Six amateur receiver', a 'high-frequency buzzer for code practice' and 'an antennna relay, how to make and use it'. There was also a page advertisement for a new Brimar (STC) range of 1.4-volt battery valves 'specially designed to operate economically from a single dry cell' — forerunners of the miniature 1.4V series Introduced by RCA about a year later that made possible such wartime receivers as the MCR-1 miniature communication receiver, built for SOE by Philco (GB) Ltd.

In the anniversary issue itself, an article that caught my eye was 'Whatever happened to amateur radio?' by *EA's* editor Jim Rowe, a long-time licensed amateur. He writes: "This month I'm really going to stick my neck out, and tackle a subject that to some is almost sacred: amateur radio. The question is, does it still exist? Is there any real difference nowadays between hams and those dreaded CB operators — apart from the number of fancy knobs, pushbuttons and dials on their transceivers?".

He points out that, like many other hobby-electronics magazines, *EA* for several years has published few specifically amateur-radio projects. He finds that even in those magazines devoted entirely to amateur radio the amount of actual amateur radio gear described for construction is "quite modest. Most of the technical material (and there really isn't much of it anyway) deals with reviews of the latest commercially-made gear, while the rest of the magazines seems to be devoted to endless reports of operating contests. The other thing that became pretty clear was that most of the advertisements were offering fully built-up, all-singing, all-dancing, whizzbang transceivers. Multi-band, multi-mode marvels offering almost every conceivable technical feature in either a desktop or handheld package. Very neat, very elegant, very impressive — but also very complete in almost every detail. Nothing much left to do except hook them up to an aerial, plug them in and twiddle the knobs... there really isn't much difference between this equipment and that sold for CB — essentially pre-packaged *appliances*. The 'amateur-radio' gear tends to have more knobs and buttons, and carries a bigger price tag... The main activities of today's radio amateurs seem to be very little different from that of the CB operators they've traditionally viewed with such scorn. They both seem to use the equipment almost exclusively as 'black boxes' for communication with each other. The only obvious difference is that CB-ers seem to be interested in 'socialising' over the air, while amateurs seem mainly interested in notching up the largest possible number of token and ever briefer contacts in the shortest possible time — or to/from the weirdest-possible locations. Whatever happened to the original idea of amateurs as people interested in experimenting with radio and communications technology?"

I should make it clear that Jim Rowe is not attacking the hobby. He recognises that not *all* radio amateurs "have become appliance operators and/or contest freaks... there are still a small

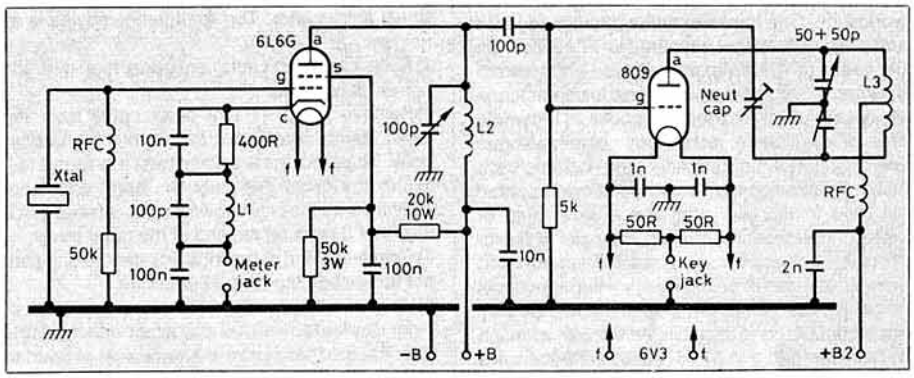


Fig 1. 50-watt three-band CW transmitter from the age of innocence. Without having to worry about TVI construction was easy and the component count, including PSU, less than one per watt! From the first issue of *Radio & Hobbies* reissued to mark the 50th anniversary of *Electronics Australia*.

SIMPLE TWO-TONE GENERATOR

Jack Hollingworth, ZF1HJ in Grand Cayman, British West Indies, noted the inclusion in G3KKD's item on setting up VHF/UHF SSB transmitters (*TT*, March 1989, pp34-36) of a *Radio Handbook* design of a two-tone generator using an LM324 device as two Wienbridge oscillators. He writes:

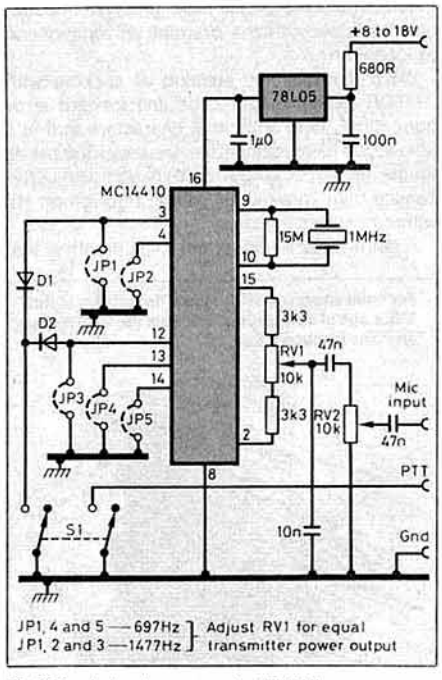


Fig 2. Simple two-tone generator (ZF1HJ).

"I feel that information on an alternative 'quick and dirty' two-tone generator suitable for checking SSB transmitters may be of interest. The design **(Fig 2.)** utilises a readily available 'touch-tone' generator IC (MC14410). Whilst the output waveforms may not be quite as clean as those from the *Radio Handbook* design, they are quite adequate for most purposes and the component count is much lower.

"By temporarily jumpering the points indicated, single tones of 697 or 1477Hz are generated, enabling the balance of the tone levels to be set using RV1. This is best done by observing the transceiver output power rather than by looking at the output level from the generator. Closing S1 produces simultaneous 697 and 1477Hz and also keys the transmitter. The output is adequate to drive most HF transceivers from the microphone input but a simple op-amp buffer amplifier could be added if desired.

"In some transceivers it is possible to replace the built-in tone generator by this two-tone unit, thus producing a two-tone drive whenever 'tune' is selected.

"The jumpers may be replaced by two sets of three diodes (anodes to MC14410 pins 3, 4, 12 and 3, 13, 14 respectively), with the cathodes of both sets commoned and grounded via single pole (normally-open) switches or push-buttons. This is more convenient if frequent adjustment of the balance control is required when using the unit with different transceivers."

number of hardy experimenters, carrying on the old tradition of amateur radio with work in areas like 'QRP', microwaves, moon-bounce and so on. I just have the feeling that these people represent no more than about 5% of all amateurs — quite a small minority... It's a great shame that the old spirit of amateur radio seems to have almost gone." He recalls the many major contributions made in the past by amateurs to radio communications, but accepts that *EA* is now publishing few amateur radio projects. This stems from what he feels has happened to the hobby: "Because radio amateurs have largely lost interest in experimenting and building their own gear, and turned to buying and using 'appliance' equipment, they have neither asked us to publish such projects nor submitted any for publication. It's as simple as that."

It could be argued that Jim Rowe has got it wrong; that he underestimates the continuing technical interest of Australian and amateurs worldwide. One thinks of many interesting ideas and projects that have appeared in *TT* culled from the pages of WIA's *Amateur Radio* — and also of the interest still shown everywhere in new antenna ideas, in unusual propagation modes, in the whole area of developing technology, both analogue and digital. But, undoubtedly there is some truth in Jim Rowe's comments and we should applaud his wish to discover that "the original kind of amateur radio isn't really dead, after all." Make no mistake. If amateur radio loses the support and interest of those in positions of media or political influence, then the future outlook would be very uncertain. CB, introduced in the UK with so much hype in late 1981, soon had over 350,000 licensees — yet by April 1988 (the latest date for which I have seen figures) the number of licences in force had fallen to only just over 100,000 and were still falling, the UHF 902MHz allocation had been withdrawn, and the hobby now seems almost in limbo.

If editors, professional engineers, spectrum administrators and/or the politicians were to become convinced, rightly or wrongly, that experimental amateur radio is dead or dying, inevitably this will come to happen. It is perhaps fortunate that the ITU World Administrative Radio Conference now scheduled for 1992 will not, after all, involve a complete revision of the 1979 International Table of Frequency Allocations.

RECEIVING EXTREMELY WEAK SIGNALS

In the August *TT*, I claimed that for normal amateur operation, manual CW remains not only the simplest but also the technically most effective transmission mode, capable of outperforming in poor conditions such automatic data transmission systems as RTTY, AMTOR-RTTY and HF Packet as well as SSB. In this connection, the Editor of *QST*, Paul L Rinaldo, W4RI, in 'The Great 1989 HF Packet Design Quest' (*QST*, May 1989, pp54-55) underlines the difficulties involved with the present AX-25 ASCII protocol on HF now being used not only by amateurs but by an increasing number of commercial and official services. He stresses that while packet radio can be effective on VHF, the current protocol is too demanding for ionospheric transmission in rejecting all packets that contain even a single error: "The problem is efficiency, ie. too many retries to get past the dragons: multipath, intersymbol distortion, group delay, QRM,. QRN. bursty errors etc." He believes that the time has come for serious designers to make a valuable contribution to HF packet radio by introducing modifications that would make this system better able to cope with the dragons of ionospheric propagation.

W4RI dimisses the solution of sticking with AMTOR (with five-unit code and forward error correction). With only three characters sent at a time at 100 bauds rather than the usual 300 bauds for the longer packets, AMTOR has a much better chance than "packet" of getting through on HF without endless repeats.

A point I was trying to make last month is that when it comes to very weak signals it is important to be able to reduce drastically the speed of signalling and hence permit the use of very narrow receiver bandwidths to improve the signal-to-noise ratio. Carried to the extreme, signalling at rates of minutes per word rather than words per minute, it *is* possible to receive data automatically without the use of the human ear/brain combination even on signals that would be buried deep in the noise of a normal bandwidth receiver. The problem is that if you reduce the bandwidth of the receiver to the region of 1Hz, this imposes extremely stringent requirements on the frequency stability

FITTING CONSUMER COAXIAL PLUGS

TT has noted several times that there are various categories of coaxial plugs and sockets, some designed not to introduce any impedance mismatch even at high microwave frequencies. But many of us use, for less demanding purposes, the standard type marketed primarily for plugging into television sets. A 12pp leaflet 'Handy Tips' published by Antiference Ltd, the largest UK manufacturer of domestic TV and FM radio antennas, provides a clear illustration and text in a section 'fitting a coaxial plug' that may be useful to some readers. I would however emphasise that for most amateur radio applications, soldering the centre core connection should be considered mandatory rather than 'ideally'. In practice, many TV set installers do *not* solder these plugs, leading to signal losses later. The Antiference advice is as follows:

1) Slide cap over cable, ensuring that it is the correct way round.
2) Remove 25mm (1") of outer cover from the cable, being careful not to cut into the copper braid. Tease out the braid and twist it to form a tail.
3) Slip the cable grip over the braid and inner insulant with the claws towards the cap and place it so that it rests on the end of the outer cover.
4) Remove 20mm of the inner insulant taking care not to damage the centre conductor.
5) Wrap the braid around the remaining 5mm of inner insulant so that it is in contact with the cable grip. Ensure that there are *no* whiskers of braid to short to the centre conductor.
6) Slide the pin moulding over the centre conductor and push it down so that it compresses the copper braid between it and the cable grip.
7) Fit the body of the plug and screw the cap firmly onto it. This tightens the cable grip securing the plug. Ideally the centre core connection should be soldered as signal losses may occur as the copper wire oxidises.

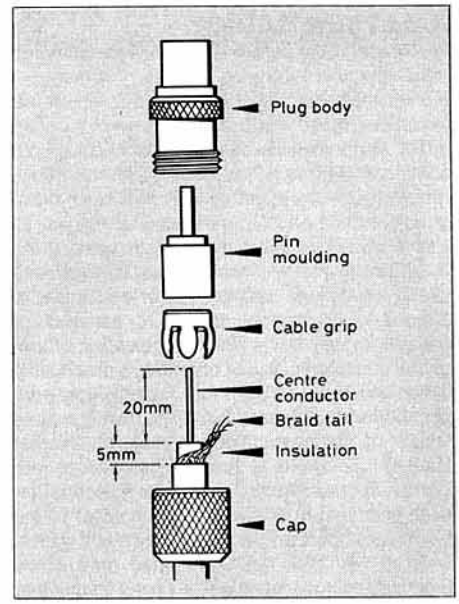
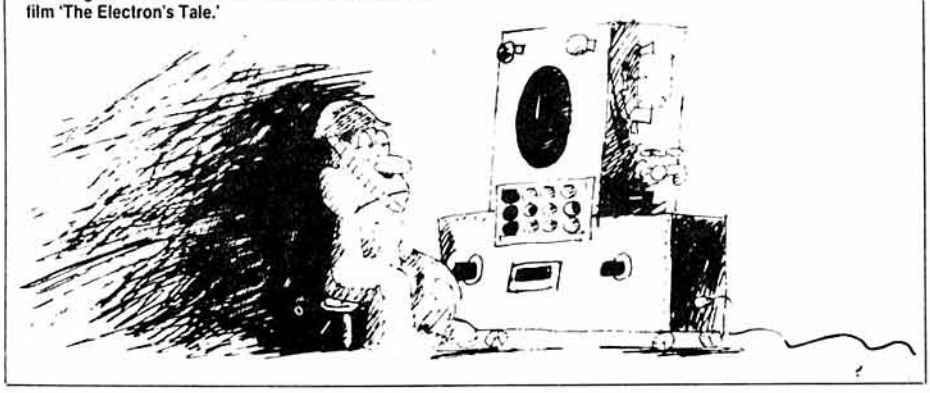


Fig 3. Exploded view of the Antiference coaxial plug type TVP2.

Antiference market through local retailers the standard plug type TVP2 but also a coaxial socket (TVS4) for joining cables; a coaxial coupler TVS5 for coupling a coaxial plug with another: and an interference filter TVI/U designed primarily to attenuate at UHF any 27MHz CB signals but useful against HF interference generally. They also produce a range of attenuators TVA/* with 3, 6, 10, 12, 18 and 24dB values available to prevent receiver overload.

For radio amateurs, 1939-45 saw the passing of that 1930s age of innocence. A still from the 1970 Mullard film 'The Electron's Tale.'



of both the transmitter and the receiver.

Many years ago, RCA showed that a 100mW HF pocket transmitter could be reliably received automatically over ranges of 2,000 miles or more with a receiver bandwidth of about 1Hz (low-frequency crystal filter). Recently, Ray Scrivens, GW3LNM of Minisig Systems Ltd of Aberystwyth has developed and is marketing a VHF telemetry system capable of collecting slow-changing measurements over distances of the order of 20 miles or so (not necessarily line-of-sight) from VHF transmitters having an output of only 1mW to a simple dipole antenna (this power level means that it can be operated, as DTI approved equipment, in the de-regulated 173MHz band without requiring a licence). The receiver bandwidth is about 1Hz and the signalling rate is only one bit every seven seconds!

For amateurs, an interesting point about GW3LNM's work on the development of special techniques pemitting the use of such narrow bandwidths for remote sensing is that the idea originated in amateur radio from his desire to exploit tropospheric scatter propagation using low power transmitters. He writes: "This was successful in that we were able to operate between mid-Wales and Sussex on 144MHz in 'flat' conditions using a 5-watt transmitter and simple antennas. Admittedly, communication was slow; it took about three minutes to send a three-digit number! As you would expect with tropo-scatter, the signal exhibited considerable fading and for most of the time the system was operating on a signal which was completely inaudible even through a narrow-bandwidth CW filter. Error correction coding was also used to ensure that odd missed 'bits' would not corrupt the whole message. We have done some calculations which indicate that it ought to be possible to operate moon-bounce with the system with quite reasonable transmitter powers and antennas. All we need is the time to do it!"

For commercial reasons, GW3LNM is not at present disclosing full technical details of how he has overcome the problem of the receiver automatically identifying and locking on to very weak signals in a reasonably short time. He writes: "In a normal receiver bandwidth the telemetry signal is well below the noise level and, due to oscillator inaccuracies at both transmitter and receiver, its precise frequency is indeterminate. It is here that digital signal processing has provided the answer at quite low cost. The bandwidth of the transmitted signal is extremely narrow (less than 10Hz) and channel spacing is determined almost solely by the frequency stability of the transmitter oscillator. This means that very good spectrum occupancy can be achieved. At present we are able to operate on five sub-channels, spaces at 2.5kHz intervals within each standard 12.5kHz channel."

With such slow signalling rates, one would expect such systems to be attractive for normal amateur contacts except for special modes such as tropo-scatter, moon-bounce etc, but the system provides a striking example of the advantages that slow sending can bestow. Alongside the existing HSC Club perhaps we should start a slow-senders club!

Another approach to weak signal reception at more conventional speed lies in the use of coherent (synchronous) CW systems in which the start and finish of each symbol is accurately anticipated by the receiver. Such a system was developed for amateur QRP operation by Raymond Petit, WA7GHM, in the mid-seventies. It was described initially in *The Milliwatt* and subsequently in *QST* etc (brief mention in *TT* June 1975 and July 1976). coherent CW is claimed to provide an effective advantage in SNR of the order of 20dB but has never gained wide acceptance by amateurs, primarily because it requires that both ends of the circuit are equipped for this mode and have accurate time-synchronisation (much easier to achieve now than in 1975).

Peter Lumb, G3IRM, (2 Briarwood Avenue, Bury St Edmunds, Suffolk, IP33 3QF) together with G3RHI is currently trying to get going on Coherent CW and to revive interest in this mode of communication. He writes: "It will be some time before we are able to operate but we would be interested to find out if there is anyone else who may like to join us. We have a fairly complete set of articles on this subject. These are sufficient to get started using the mode and we are now building equipment."

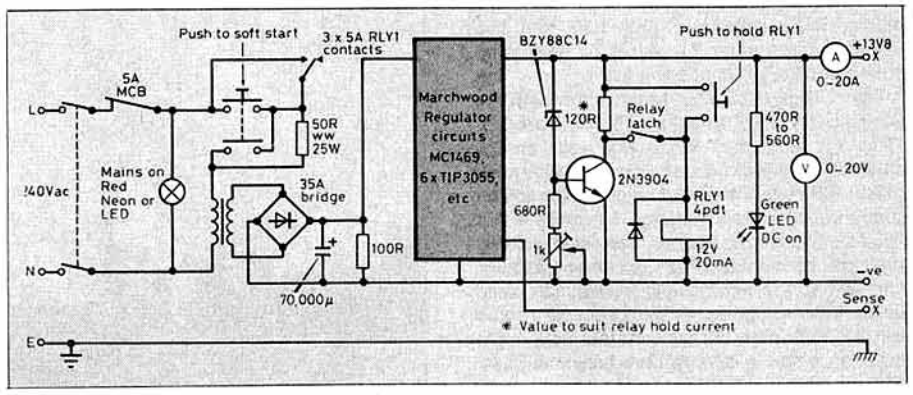


Fig 6. ZS6BVO's soft-start system for a heavy-current 13.8V power supply unit.

SOFT START FOR 13.8V PSU

In the past, *TT* has included a number of ideas and circuits designed to overcome the very real problem of the large in-flow of current at the instant of switching on a hefty power supply. Most of these were intended primarily for high-voltage supplies although due to the extremely high-value of the reservoir capacitors used in high-current, low-voltage PSUs, these units can offer serious switch-on problems.

John Woodcock, ZS6BVO writes: "The peak current demanded by large value filter capacitors can be enormous at switch-on and puts avoidable strain on the components involved. The arrangement shown in **Fig 4.** has been in use for about four years without problems and provides a 'soft' start that limits the peak current transient at switch-on. It really does remove that worrying switch-on 'thump'.

"The arrangement also provides an overvoltage-protection system utilising the same latching relay used for 'soft' starting. It should be noted that switching the low-current primary circuit is less demanding on the relay contacts than the high-current DC circuit, albeit an inductive load. A suitable RC combination across the contacts will suppress arcing on opening. The 'soft start' and 'hold' switches are biased double-pole 'make and break' panel-mounted, push-button types.

"The 'switch-on' sequence is as follows: **1)** AC mains 'on', 'red' indicator 'on'. **2)** Push 'soft start'. This switches the AC mains to primary via series 50-ohm wirewound 25-watt resistor, thus providing suitable surge limiting as the filter capacitor(s) charge. DC appears on output line and 'green' indicator comes 'on'. **3)** Push to 'hold' energises relay from DC output line and the latching contact holds relay energised. Release both push button switches and the 'soft' start switch puts a short-circuit across the primary surge-limiting resistor. The system is now ready. **4)** AC mains 'off'. Red indicator 'off' and DC output line drops to zero volts. 'Green' indicator goes out and the latching relay de-energises ready for a new switch-on cycle.

"This system has certain advantages over a manually-switched system, one of which is that an AC mains interruption will cause the power supply to shut down and so avoid mains on/off surges.

"The over-voltage protection operates as follows: **1)** DC output voltage exceeds 14.5V and BZY88c14 zener diode conducts. This causes the switching transistor(2N3904) to conduct dropping the collector and relay supply voltage to near zero and the relay is latched out. Sensitivity is adjusted by the preset 1k resistor in the base circuit. **2)** The three pairs of 5A relay contacts in parallel, open-circuit the mains input and the DC output circuit decays to zero. The system is ready for another switch-on cycle.

"For example, a short-circuit condition in one of the regulating 2N3055 transistors can be investigated without the trauma of the conventional crowbar system. Although no overvoltage fault has occurred on my power supply, which runs an Icom IC730 transceiver at 13.8V, this condition has been simulated with an external voltage supply and works well."

The 'Marchwood' design for a high-current 30A power supply unit was originally described by G4JET in *Practical Wireless* June-July, 1983 and the circuit diagram reproduced in *TT*, May 1984, p402.

FEEDBACK AND COMMENTS

Unfortunately, three errors crept into the circuit diagram of PA0FRI's 'Frinear Linear' (*TT*, June 1989, p35, Fig 9). The polarity of two of the four diodes between chassis and the screen grid of the PL519 was shown incorrectly and a 10nF coupling capacitor in the grid circuit was omitted. The relevant part of the amended diagram is shown in **Fig 5.**

QST (May 1989, p51) has published an important correction to the circuit diagram of W1FB's 12-

watt RF amplifier using power-FET switches. This diagram was included in *TT* (July 1989, p39). The RF input transformer T1 should be earthed at point 3 and the RF input applied at 1.

Peter Chadwick, G3RZP comments on G4IDE's 50MHz QQVO6-40A amplifier (*TT*, July, pp36-37): "This has getting on for enough volts on the anode. The valve was rated for around 2400V peak (600V, 100% modulated) but I feel that the screen supply could prove a bit dodgy. As shown with a 450V supply rail, the BU208A transistor is sitting right on the manufacturer's second-breakdown line, so that its reliability and reproducibility could be open to question. In practice of course it could last G4IDE for years but someone less lucky might experience device failures. Dare I say that EL84, 5763 or even a 6L6 valve regulator might serve better? It was this problem that, John Nelson, GW4FRX to use MOSFETs which are immune to secondary breakdown as their gain *reduces* with rising temperature. Just a thought!"

Just too late for inclusion this month, a considerable amount of information on power supply units, including comments on some aspects of the G4WAS and G4IDE designs in the July *TT*, has arrived from John Brown, G3EUR. *TT* will return to this subject hopefully in the October issue.

The idea of kite-supported antennas stretches right back to Marconi's work at the turn of the century. But this practice could be given a new boost by the findings of Dr Clive Eastman, a clinical psychologist at Birmingham University who believes that kite flying is therapeutic and excellent for reducing stress in executives: "As opposed to watching a bowl of goldfish, which is a passive pastime, kite flying gets you out into the fresh air and in tune with the elements. Kites are very colourful which is positive. People feel they are in control of them, which is very important... Adults are now getting over the embarrassment of admitting that they are kite flyers, though some still bring their kids and pretend the kites are for them." Good show, but what about the stress caused when the wind drops just as the band opens? And somehow I doubt if those German WW2 kite-borne observers at sea felt stress free while towed behind a U-boat, though that was a rather different kind of kite-flying to what Dr Eastman has in mind.

Joe Moell, K0OV (PO Box 2508, Fullerton, CA92633, USA) writes in support of the recognition by Mr Wilson that many of the popular beliefs about nicad 'memory' (*TT*, June, page 34) are nothing more than myths. He recalls making many of the same points in an article 'Forget Memory' (*Ham Radio*, January 1983, pp62-64) based on some mid-1970s publications by General Electric research engineers *Nickel-Cadmium Battery Application Engineering Handbook* 2nd Ed 1975. He writes: "This shows that the truth about 'memory' has been well known in the battery industry for many years. The research described in these primary sources has never been challenged. Yet myths and incorrect statements about 'memory' and the desirability of fully discharging nicads continue to pop up regularly in electronics magazines and manufacturer's instruction books. Apparently the writers of these pieces read only each other's articles instead of the primary sources. I have had great success achieving rapid charging and long battery life on a variety of nicad sizes by using simple chargers which produce constant voltage (1.43V per cell) with current limit at about 3C rate. I disagree with AG6K when he states that insufficient current is supplied near the end of the charging process using this scheme. When the current falls below 0.1C charging is complete. The deep parts of the plate are charged by then. I get full capacity charges with no heating this way."

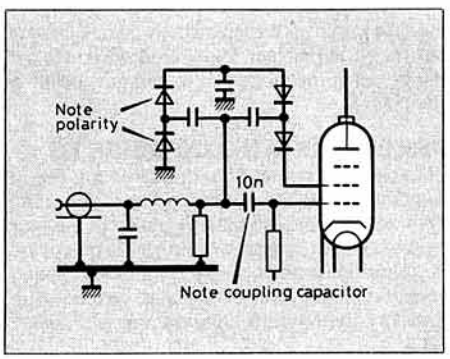


Fig 4. Amended part of the circuit diagram of PA0FRI's PL519 linear amplifier described in the June TT.

On 12 December, 1901, Guglielmo Marconi and his assistants used a kite-supported antenna on Signal Hill, Newfoundland for the first-ever DX feat in hearing signals transmitted from Poldhu, Cornwall, 2,200 miles away. Leading scientists of the day had declared that reception over such distances was impossible because of the curvature of the Earth. Marconi was later to declare: "You know I have always considered myself an amateur." *(Marconi Company)*

K0OV takes the opportunity of mentioning his recent 323-page book *Transmitter Hunting — Radio direction-finding simplified* (published by TAB books) written in collaboration with Thomas N. Curlee, WB6UZZ. Although amateur DF contests are organised on rather different lines in the USA to those in the UK, he feels that this book would be of general interest. It is available (price $17.95) from the retail outlets for TAB books and also by mail order from ARRL, *Ham Radio* and *73* Magazine. I have not seen a copy but it sounds a useful book. To my mind, HF DF remains a uniquely fascinating topic owing to the great difficulty in obtaining reliable bearings on sky-waves which do not always arrive on a direct bearing from the transmitter Some interesting work on an improved algorithm for use with the large Wullenweber arrays has *recently* been reported by a team at the University of Leicester in conjunction with practical experience with a Canadian array. With a large Wullenweber array it is possible to get bearings accurate to better than 1° on transmitters hundreds of miles away. But we have yet to meet an amateur who could contemplate building a full-size HF Wullenweber array!

Rod Craddock, GW4SLK draws attention to a publication which he believes represents money well spent for anyone interested in solidstate RF design and construction. He writes: "Readers may be interested in my experience with the Motorola UK Literature Distribution Centre whose address you gave in *TT:* 88 Tanners Drive, Blakelands, Milton Keynes MK14 5BP. I recently sent them a very long request list. Next day they telephoned me 'yes, I could have most of what I had asked for but would I sent them a cheque for the one chargeable item.' This was for *RF Device Data*, 5th edition, 1988, £38.73). By return of post I received an enormous parcel including some useful items that I had not asked for. The *RF Device Data* book is in two thick volumes and I can honestly recommend it to RF constructors as it is not just a data book for Motorola devices but a text book in its own right. Vol 2 includes over 60 application notes, article reprints and engineering bulletins, including all the H O Granberg designs referred to in *TT* as well as comprehensive notes on impedance matching networks for RF transistors, RF design procedures using two-port parameters etc. Also included is a good cross reference to other makes of RF devices. Compulsive reading for anyone building a solid state linear."

THE PYE RADAR IF STRIP

G6HD's recollections reminded me of a paper by M Cosgrove outlining the contribution over many years of the Pye Group of companies to television history (prepared in connection with the 1986 IEE 50th anniversary conference but not included in *IEE Conference Publication No 271*). This paper includes a timely story that will bring back memories to the many pre and post-war amateurs who were concerned with wartime radar:

"A new (receiver) model had started in production, but had not been released for sale, when the war started (and the TV service, like all British amateur activity, closed down — *G3VA*) in September 1939. All assemblies, including 10,000 EF50 valves, were placed in store. All production and develop-

ment activities were concentrated on radiolocation (RDF, later 'radar') and radio-based proximity fuses. The RF amplifier (TV receivers then used single-channel 'straight' configuration) of the stillborn receiver became the basis of a standard radar IF strip, operating at the AP vision frequency of 45MHz, and using EF50 valves.

"This valve, which was conceived at Pye and produced by Philips (Eindhoven), had a red metallic screening can surrounding the glass envelope to improve stability. However the valves used in early airborne radar units were resprayed grey to disguise their origin (Holland was a neutral country until May 1940). The production jigs and tools for the EF50 were moved to Mullard (a Philips company) in the UK in 1940, just before the invasion of Holland.

"Instead of Mullard building a new 'shadow' factory, as requested by the British government, decentralisation of production was achieved by the then novel use of nearly 14,000 out-workers in local villages and individual homes to minimise possible disruption in the event of air raids..." So, in effect, many of the many EF50 valves used in the post war period were 'home-brew'. Today, two German enthusiasts have been overcoming many problems in successfully producing replicas of vintage bright-emitter radio valves in a garage, though handicapped in their work on more modern dull-emitter types by lack of tungsten filament wire containing about 1.5% of Thorium (*Vintage Wireless*, Vol 14, No 2, 6/89 pages 16-17).

DO's AND DON'TS WITH ATUs

John J Schultz, W4FA/SV0DX, in *CQ* (April 1989, p34) provides a succinct outline of 'Some general do's and don'ts regarding antenna tuners' that squeezes into seven items a lot of practical experience, based on a talk he gave to a local club. He recalls that "practically since the beginning of amateur radio, various forms of antenna tuners have come and gone along with various opinions as to their value in a station installation." The following notes are a brief digest of his main findings:

1) Don't use an ATU to disguise a poorly dimensioned or improperly constructed antenna. (In other words if a conventional dipole or other antenna which should provide a good match to the transmitter results in an excessive SWR find out why rather than using an ATU to overcome the problem — *G3VA*).

2) Don't waste power in an ATU by using a short random length of wire as an antenna if this can be avoided. The shorter the length of the antenna wire, the greater the proportion of output power that will be dissipated in the ATU. It is better to get out more wire even if it has all sorts of twists and turns than to use a very short (in terms of wavelength) length of antenna wire.

3) Do be kind to your ATU when using a (voltage-fed) random length of wire about a half-wave or multiple thereof in length antenna. Avoid arc-overs by increasing capacitor/component ratings or increase the length of the antenna to provide current feed.

4) Do use a good ground (earth) with an ATU even if the antenna itself does not 'work against ground'.

5) Don't rely on an ATU alone to provide harmonic attenuation. The amount of attenuation provided by an ATU can vary enormously from band to band, with the ATU providing insignificant attenuation with some antenna loads.

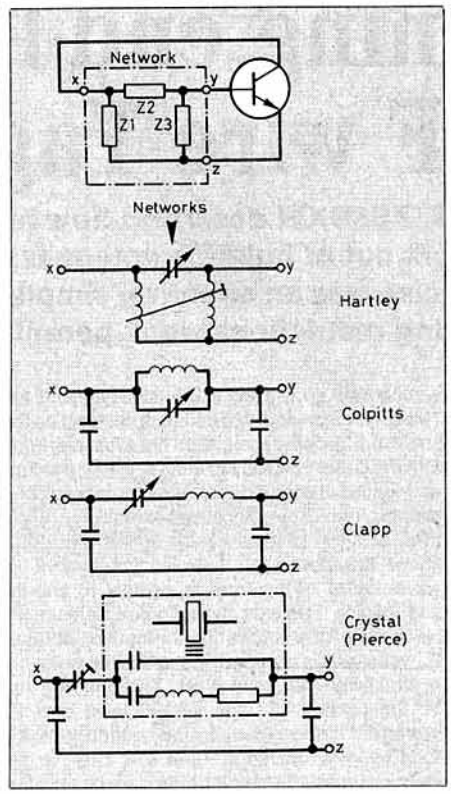


Fig 6. Basic single-transistor oscillator networks (G3LHZ).

OSCILLATORS — FUNDAMENTAL LIMITATIONS

Recently on 7MHz, I found myself eavesdropping on a net discussion between a group of retired BBC/IBA transmitter engineers. They were talking about the use during the second world war of a high-stability VFO as a broadcast transmitter drive, recalling that it was fitted with an HRO-type tuning mechanism. But nobody in the group seemed to know the bitter-sweet story behind this VFO which should have carried the name of its British inventor into posterity; Geoffrey Gouriet who in the early 1940s developed the series-tuned configuration later rediscovered and described in *Proc IRE* by the American engineer J K Clapp. If it had not been for wartime secrecy preventing publication, it would have been known as the Gouriet oscillator; only a few pedants still call it a Gouriet-Clapp oscillator.

Despite the development of frequency-synthesisers, there is still an important role for the tunable VFO with its significantly lower phase noise. But all oscillators, unfortunately, have limitations. At the IEE Conference 'Frequency Control & Synthesis' held at Leicester University last April, Professor M J Underhill, G3LHZ (MEL-Philips) gave a tutorial paper 'Fundamental limitations of oscillator performance' (*IEE Conference Publication No 303*, pp18-31) from which the following brief extract is taken:

"There is a continuing need for better purity and stability of oscillators particularly as the frequencies of operation of communications and radar systems continue to extend ever higher. In principle, oscillators can be made more and more stable by better control of the physical elements that determine the frequency of oscillation. However the presence of phase noise on an oscillator **Fig 6** is fundamentally inescapable. The price to be paid for better phase noise is higher power or at least higher stored energy (PQ^2) in the oscillator system. Both these eventually are limited by physical breakdown of components... Temperature, as for example the expression for Johnson noise kT, is probably the only parameter which remains to be fully explored for the reduction of phase noise in oscillation. A reduction in temperature not only reduces the amount of noise that a given resistor produces but also in general reduces the value of the resistor... Although cryogenic temperatures remain an interesting area to be explored in the search for better oscillators it is highly probable that further physical barriers and limitations will prevent the perfect oscillator from ever being achieved."

At the same conference (of which Peter Chadwick, G3RZP was chairman of the organising committee) D Salt (Hy-Q International (UK) Ltd) provided a tutorial review of the use of quartz crystals as frequency controlling elements. He emphasised that compared to other resonators, such as LC circuits, mechanical or ceramic resonators, the quartz crystal still provides a unique combination of properties. Its material properties are extremely stable and highly repeatable. The internal friction (acoustic loss) is particularly low, leading directly to its extremely high Q. The intrinsic Q of quartz is 10^7 (ten-million) at 1MHz, with mounted crystals having Q factors ranging from tens of thousands to several millions. The Q of even the best wound inductors does not exceed a thousand (10^3) and that of ceramic resonators is at most ten-thousand (10^4).

The paper stated that the long term stability of crystal resonators depends on the manufacturing techniques used rather than the intrinsic properties of quartz. Ageing rates of about 5 parts per million per year or less are typical for commercially manufactured crystals; 2 to 3ppm can be achieved relatively easily. Precision quartz resonators can have ageing rates as low as parts per billion (10^9) though such crystals are costly: "The short term stability of quartz crystals is less well understood. From the experimental data there again appear to be a number of factors involved but identifying these with specific physical mechanisms is a matter of uncertainty."

6) Do be aware that some ATU networks can show false resonances. Obtaining a near unity SWR does not necessarily mean that all the power is going to the antenna. Occasionally it may indicate that much of the power is being 'dumped' into the ATU coil. In general, tuner settings should be such that the minimum amount of inductance is used that permits the system to tune-up properly. 'Dumping' can often be detected by the coil running warm — a sure sign that power is being wasted.

7) Don't expect too much from 'automatic antenna tuners' which are meant to cope with only moderate SWRs (1:3 or, at most, 1:5) as may be encountered at band edges with a beam array or sometimes with a dipole: "if such tuners are grossly mistreated, their components can readily arc over or burn up. Just by the nature of their compact size, the components used in such tuners cannot be 'jumbo' size." □

Designing end-loaded HF wire Yagis

Brian Austin, G0GSF/ZS6BKW describes how he used a computer to take the guess-work out of building antennas. The design which prompted this exercise was an effective, simple antenna for a QTH where space or planning restrictions won't permit towers or big arrays.

Ideally, a rotatable multiband Yagi or cubical quad at least 10m above the ground is a pre-requisite for serious DX working. However, many of us have to make do with less ambitious (and less conspicuous) antennas as a result of the size of the backyard and the proximity of neighbours. These restrictions shouldn't totally destroy your capability for working DX; they may just cause you to concentrate your efforts on one band and in a favoured direction. A simple two-element wire Yagi with shortened elements, hanging vertically from light nylon line, is one way of solving the antenna problem.

BACKGROUND

The antenna to be described is not new [1] but its design in the past has been somewhat empirical because it is less easy to analyse than those of more conventional shape. However, the availability of a personal computer and a program like MININEC changes all that. The antenna designer can now evaluate a new configuration or confirm the performance of an old trusted design without building either. MININEC is the little brother of NEC - the Numerical Electromagnetics Code, a powerful piece of antenna analysis software requiring a mainframe computer. MININEC is a cut-down version of NEC for the IBM PC and compatibles but no less accurate — only somewhat less flexible, and only capable of handling relatively simple geometrical shapes like the antenna described here.

Les Moxon, G6XN, in his book *HF Antennas for All Locations* [1] (p193) describes a three element vertical Yagi array using end-loaded elements for 7MHz. He comments that optimum design data for such end-loaded elements are not available. With MININEC it is now easy to analyse either a single end-loaded element to determine resonance conditions, input impedance and directivity, or an array of such elements making up the Yagi. **Fig 1** shows the relationship between the lengths, in wavelengths, of the antenna element (l) and its end-loading elements (w) in order to maintain resonance. It also shows how the input resistance, R_{in}, varies with a change in l as well as the variation in directivity, expressed in dB$_i$. This unit may not be too familiar to some readers used only to seeing dB. It refers, as all decibel relationships do, to a specific reference — in this case to an isotropic or so-called point source which radiates uniformly in all directions. The halfwave dipole for example has a directivity of 2.15dB$_i$.

Antenna gain, G, is related to directivity, D, and the two are equal if the radiation efficiency of the antenna is 100%. For this wire antenna it is reasonable to assume that its efficiency is close to 100% because no lossy, inductive loading is used. Hence gain and directivity can be used interchangeably here, but the reader should beware of always doing so, particularly if an antenna is electrically small.

The curves in Fig 1 were computed for a wire antenna and include the necessary correction to account for end-effects. If, for example, you decide that the maximum VSWR on a 50 Ohms transmission line is to be 2 to 1, then R_{in}(min)=25 Ohms. Hence the minimum antenna length (l) is about 0.19λ while the end-loading sections (w) are 0.24λ in length. A perfect (1 to 1) match to 50 Ohms can be achieved when l = 0.3λ and w = 0.12λ .There is thus a fair degree of latitude available in choosing the dimensions. At 14MHz the values for a 50 Ohm match translate into a length l of 6.4m with w = 2.6m. Lengths for other bands can be worked out just as easily.

TWO ELEMENT END-LOADED YAGI

A number of such end-loaded elements will function effectively in an array whose gain (G), front-to-back ratio (F/B) and input impedance (Z_{in}) depend on both the number of elements and on their relative separation. For most applications, particularly where space is limited, a two element array consisting of a driven element and an identical reflector is an effective solution. A number of computer simulations with MININEC soon show that a practical configuration for the 14MHz band is that shown in **Fig 2.** The wire elements are light, almost invisible, and their wind loading is minimal. They are easily supported by nylon fishing line attached to small insulators made of bare fibreglass printed circuit board, and the whole array can be raised and lowered for adjustment or maintenance in a matter of minutes. The computed performance of the array is discussed below.

From the dimensions given in Fig 2 we can determine two simple equations from which an

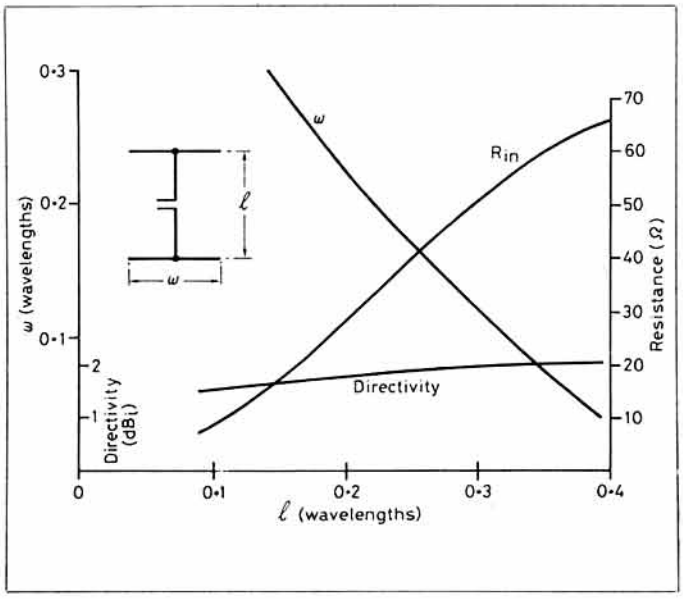


Fig 1. (left) Computed relationship between l and w at resonance as well as the variation in the input resistance and directivity of the end-loaded dipole

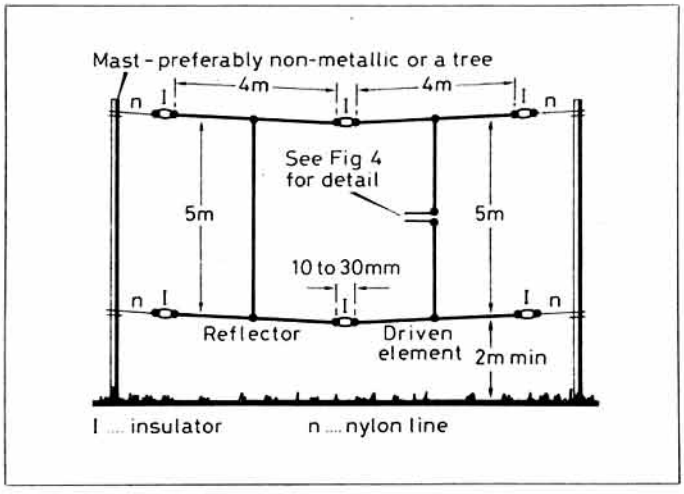
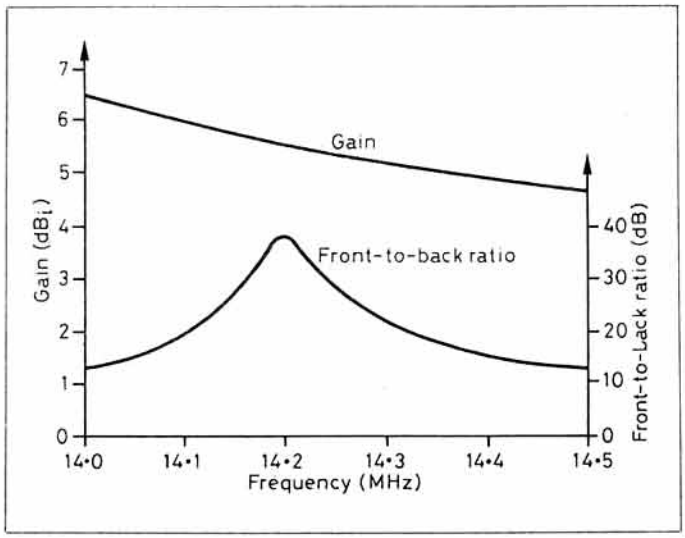


Fig 2. (above) Two element end-loaded wire Yagi for the 20 metre band



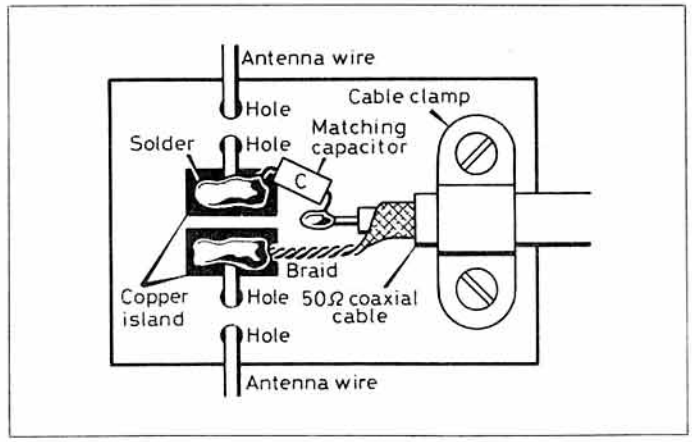


Fig 3. (left) Computed gain and front-to-back ratio of the two element end-loaded wire Yagi for the 20 metre band

Fig 4. (above) Single sided fibreglass PCB at the feedpoint, potted in silicone rubber

antenna can be designed for use on the other bands. Thus l(metres) = 71/f(MHz) while w(metres) = 57/f(MHz). The gain and front-to-back ratio of the antenna are plotted in **Fig 3** for the 14MHz dimensions. The fairly flat gain response and sharp front-to-back performance are typical of all Yagi arrays. These figures are for the antenna in free space. Naturally, when it is erected close to a reflecting surface like the ground, all its characteristics change somewhat. MININEC computes the performance either in free space or over a perfectly conducting groundplane. **Table 1** shows the effect of such a surface on gain and front-to-back ratio for various heights of the lower wires above ground at the frequency where the free space F/B ratio is a maximum.

Table 1 — Performance with height of the lower wires above perfect ground

Height (λ)	G (aBi)	F/B (dB)
0.05	9.4	15
0.14	10.8	22
0.24	11.5	24

These are the maximum computed F/B ratios along the axis of the antenna. The mutual coupling between the antenna and its image in the ground alters the currents in all the conductors and this causes the variation in F/B ratio particularly, because this parameter is most sensitive to the currents in the elements. An excellent discussion of all these points is given by JL Lawson, W2PV, in his book on Yagi design [2].

An important factor when considering such a light structure like this is the method of feeding it. Any cumbersome form of impedance matching at the antenna would defeat the object we set out to achieve, namely simplicity. So, in the computer simulation, an important performance criterion was the input impedance to the driven element which would allow a simple impedance matching network to be used. **Table 2** shows the computed variation of input impedance across the 14MHz band of the antenna in Fig 2.

Table 2 — Input impedance versus frequency for the antenna in free space

Frequency (MHz)	$R_{in}(\Omega)$	$X_{in}(\Omega)$
14.0	41	+42
14.1	50	+47
14.2	57	+50
14.3	61	+51
14.4	63	+53

An excellent match to 50 Ohms is possible simply by including a capacitor in series with the driven element to remove the (positive) inductive reactance. This can be done easily, as shown in **Fig 4**. A value of 220pF is suggested from the table for matching in the 14MHz band. In practice the actual reactance will be affected by the antenna's immediate surroundings, and in my case a 100pF silver mica capacitor produced the best match. Try various values in this range and measure the VSWR with the antenna at its normal height. No balun is shown in Fig 4, however, in the interests of good EMC practice, one should be included between the matching capacitor and the coaxial cable. A 1:1 trifilar balun, as described by G6XN [1] p51, would be ideal for suppressing the outer braid current on the coaxial cable and thereby reducing the possibility of breakthrough on nearby TV receivers.

ADDING MORE ELEMENTS

A third element could be added to the array as a director. This was examined using MININEC but was shown not to be worthwhile in terms of the extra gain obtained at the expense of increased constructional complexity. The director would be electrically shorter than the driven element. This is achieved by reducing its end-loading for the same element length. A maximum increase in gain of about 1dB over the two element array was achieved when the end-loading elements were 0.14λ long with the director 0.16λ ahead of the driven element. If the space is available then, just as is the case with conventional linear element Yagis, a multi-element array could be erected. However, there may then also be scope for other configurations such as a long wire, a vee-beam or even a rhombic, if you really have the space! Clearly all the options should be examined before making a final decision.

HOW WELL DOES IT WORK IN PRACTICE?

I have used this antenna successfully on both 14 and 21MHz, using the design formulae given above to determine the wire lengths. The impedance match is excellent — even my TS120V, which is critical of VSWRs above about 1.5:1, accepted the antenna without the need for an external impedance matching network. In addition the VSWR bandwidth is greater than 350kHz typically, and so covers the bands well. There is no doubt too of the actual radiating performance of the antenna — regular contact with ZS using 50 watts of SSB bears that out.

CONCLUSION

A simple wire Yagi-Uda array has been analysed with MININEC and design criteria established. The program also yielded the performance characteristics to be expected from the antenna. For the amateur with limited space this effective antenna may well provide a useful solution to a common problem. □

REFERENCES

[1] LA Moxon, *HF Antennas for All Locations*, RSGB, 1982.
[2] JL Lawson, *Yagi Antenna Design*, ARRL, 1986.
The MININEC system 'Microcomputer Analysis of Wire Antennas' can be obtained from Artech House, London.

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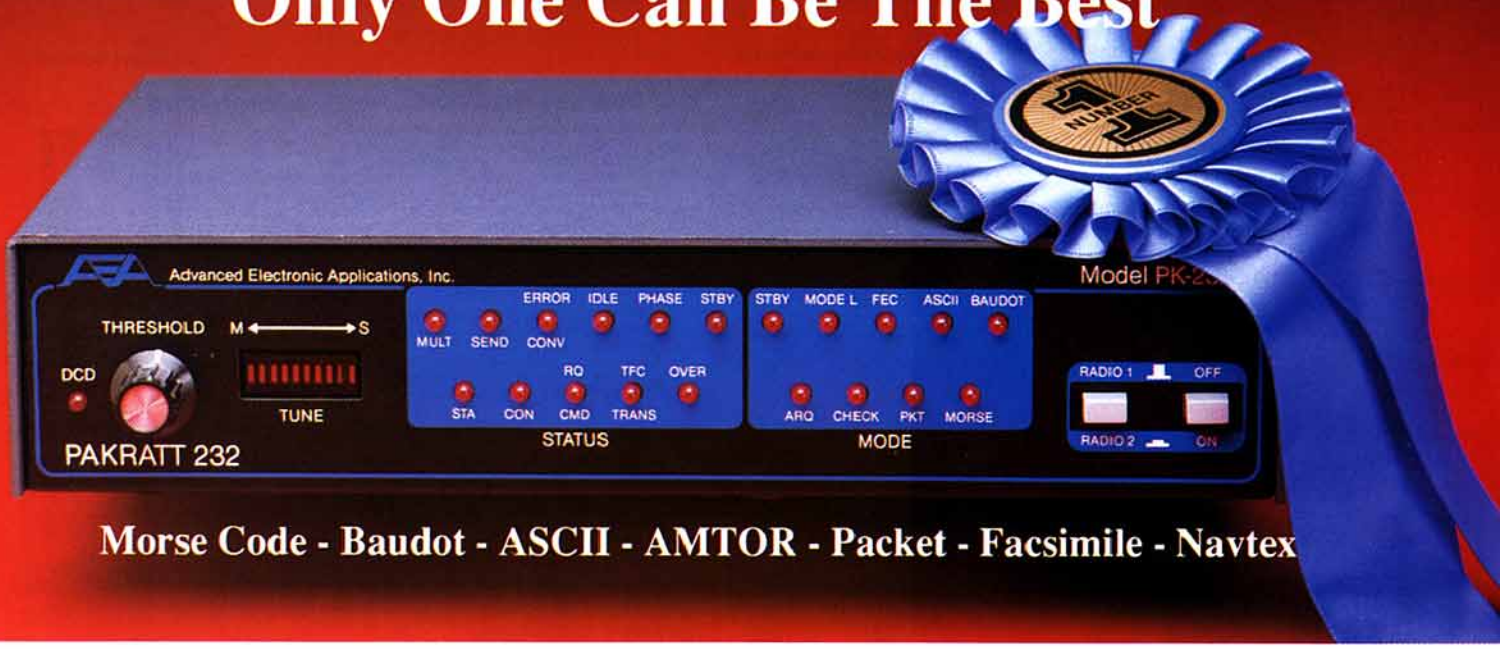

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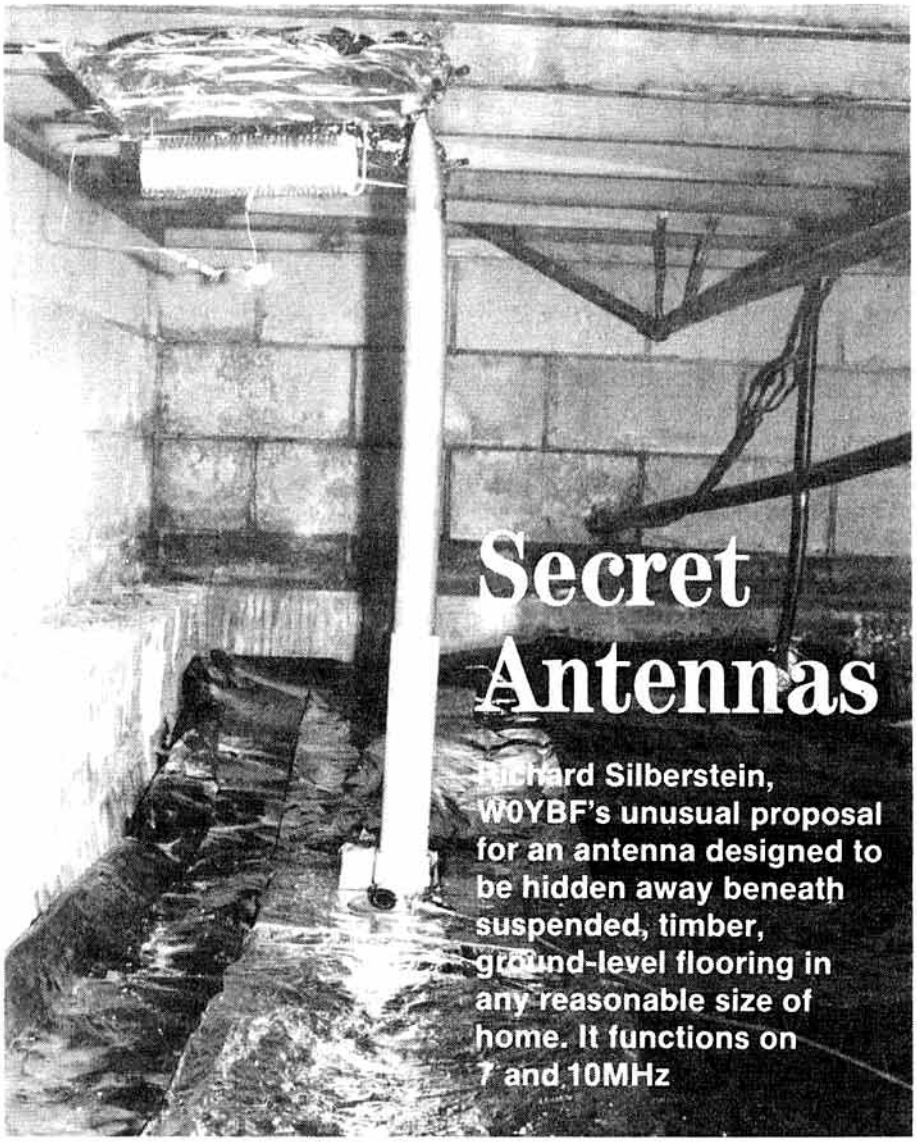

Secret Antennas

Richard Silberstein, W0YBF's unusual proposal for an antenna designed to be hidden away beneath suspended, timber, ground-level flooring in any reasonable size of home. It functions on 7 and 10MHz

We all strive to adhere to the basic philosophy of keeping all antennas free from obstructions which could reduce their efficiency. Only the most well-favoured radio amateurs — usually living atop hills in the countryside — can erect antennas of any type with impunity, and most of us have to compromise to some degree or other in order to pacify neighbours who regard any metal structure reaching into the atmosphere as unsightly. It is rare that any of us become compelled totally to banish any aerial from view, but such conditions are bound to occur.

Some time ago I embarked upon meeting the challenge of totally banishing an aerial from view through experiments to support communications from nuclear or other sub-surface shelters. Many people would not imagine that any reasonable results could be obtained at frequencies as high as 10MHz, but my earlier career in radio propagation research with the National Bureau of Standards and the US Army provided the knowledge and confidence, and later experiments in an amateur capacity yielded the proof.

This article is not aimed specifically at affording members with a formula for equipping their own fall-out shelters — such an article would probably have too little practical application to warrant several pages of *RadCom*. What follows are design parameters to allow anyone with a suspended timber floor in their house to incorporate a fully concealed, remarkably efficient, 7 and 10MHz band antenna system, which will happily work with inputs as low as 1 watt.

In America we call a suspended floor, with perhaps about 3ft of space beneath, a 'crawl space', and forgive me for continuing to name it thus in this article, because I cannot find an equivalent British term. The space certainly isn't a basement, which in fact is less of a problem to equip.

A crawl space poses the awkward problems of close proximity of the radiating element to ground, and the need to work in particularly cramped quarters during installation. In my house the living room floor beams are 3'4" above a rocky dirt floor covered with black plastic sheets, and some ducts clear less than 2'8". Probably the most severe problem, however, is the presence of many RF energy-absorbing objects needed to sustain a high standard of living in a modern home. These include electric wires, telephone lines, water and gas pipes, a water pressure tank and heat ducts.

To make an antenna function in this type of environment it is vital to ensure the minimum amount of coupling to objects which might absorb power, remembering too that power and telephone lines can conduct RF to places where it is not desired.

In discussing the performance of antennas, reciprocity is assumed. Consider that adjacent antennas A and B under test are matched to their cables and that they receive signals from antenna C at a distance, which is also matched. Now if the directive gain of A in the direction of C, compared to that of B, is such that A receives a signal from C which is 10dB stronger than that received at B, then it is assumed that when A and B are transmitting with identical power input on the same frequency, A's signal noted at C will be 10dB above that of B.

Comparing A and B, if there is outside noise, the signal-to-noise ratio in reception of C can sometimes be even better on antenna B which receives a weaker signal from C than does A, if B has sufficiently poor directive gain in the direction of the noise source. However, if B's efficiency is very poor, then receiver noise will govern.

CHOICE OF ANTENNA TYPE

A physically small antenna was desired in my case. A short length of vertical conductor over a perfect earth can theoretically be made to radiate almost as much power as a quarter-wave monopole, if losses are not considered, and thus will have almost the same receiving capability. This short monopole must be resonated by means of a loading coil, which may have a section of the antenna, or even just a plate with capacity to ground above it, often called a 'top hat'. **Fig 1** illustrates the latter arrangement.

All resonant antennas can be shown, as in **Fig 2**, to have a radiation resistance R_r in series with a resistance R_d which represents ohmic losses in the conductors and the near field. If the antenna is a quarter-wave monopole the value of R_r is 36ohms and by comparison the ohmic losses in the conductors and the nearby ground, with a good ground plane, may be very small.

A similar situation exists for a half-wave doublet made of good wire or tubing, high above the ground. Here in free space R_r is 72ohms. Both antennas must be clear of absorbing objects. When the antenna radiating section is made shorter, R_r becomes smaller so that for a given power radiated the current must increase. Also, as R_r gets smaller it becomes more comparable with

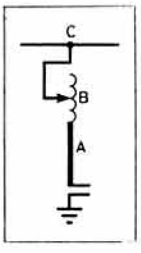

Fig 1. A typical short monopole
A — short radiating element
B — tapped loading coil
C — capacitive top hat

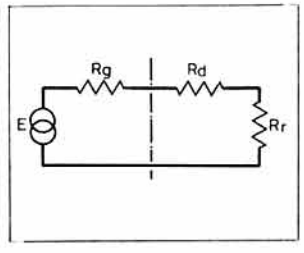

Fig 2. (far right) A circuit representing power distribution in a resonant antenna.
E and R_r are the equivalent voltage and internal resistance of the RF power source.
R_d is the dissipation (loss) resistance.
R_r is the radiation resistance.

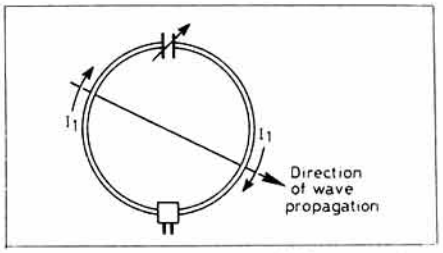

Fig 3. A small, balanced, tuned loop. I is loop current.

R_l which would tend to increase with the increasing size of the loading coil (in the compact-monopole case) needed to resonate the circuit. When R_r and R_l are equal, the power loss is 3dB over the perfect case. Clearly then there is a need to make all the circuit elements low-loss. When this is done the circuit Q goes up, which means that the bandwidth is narrowed: this is the price one pays for compactness.

Besides using a compact monopole, another way is a loop antenna [2]. A small loop has a very low radiation resistance. It is easy to obtain a general idea of why this is so by thinking about **Fig 3** showing a balanced loop very much smaller than a wavelength in diameter. Considering the plane of the paper, in any direction one tries to propagate a wave, such as along the direction of the arrow, radiation from current I in any loop section is almost completely balanced out by I in an opposite section on the other side of the loop. Cancellation is not quite complete because of the phase delay caused by the spacing.

Normal to the centre of the loop everything cancels completely, giving the familiar doughnut-shaped radiation pattern. Near cancellation of radiation from any loop section means near cancellation of radiation resistance. In an average loop it is very likely that the radiation resistance R_r will be much lower than the circuit resistance R_l with consequent inefficiency. For this reason good commercial loops like those mentioned in Reference [1] are made with great care so as to make R_l as small as possible in relation to a small R_r. This may mean large circuit elements (4" diameter copper tubing), silver plating, streamlining at joints, etc. Loop versus monopole efficiencies are treated in Appendix [I]. Because of the very low total resistance, Qs are very high and bandwidths small, making it necessary to resonate and match for small frequency changes. This may be done automatically, however. High Qs mean high voltages in transmitting; in some cases vacuum capacitors must be used for tuning.

Relative to the problem of coupling to surrounding objects it should be noted that high-Q compact antennas will couple energy at a much greater distance than large low-Q antennas, just as is true with tuned, coupled LC circuits. However, stringing out a long antenna in the type of environment exemplified by a crawl space entails very close positioning relative to absorbing objects, so a compact antenna appears to be the choice.

APPENDIX I
COMPACT-MONOPOLE VS LOOP EFFICIENCY

Referring to **Fig 1**, the total measured resistance $R = R_r + R_l$, radiation resistance plus loss resistance of the subsurface compact monopole was about 28ohms at 7MHz. The theoretical resistance of the short radiating element was about 4ohms [3], making the loss resistance approximately 28-4 =24ohms. Efficiency of power use is obviously

$$E = 100\ \frac{I^2 R_r}{I^2 (R_r + R_l)} = \frac{100\ R_r}{R_r + R_l}$$

In this case efficiency is about 14%, or a loss of 8 or 9dB. Some losses may occur in the loading coil; when a coil is operated near self-resonance the capacity between turns plays a large part. The dielectric formed by the cement and the ribs may be lossy. However, the greatest losses seem to be due to the fact that some near-field lines of force go through lossy material. The vertical radiating element is only two feet from a cinderblock wall facing the soil.

A loss of 8 or 9dB below the ideal looks bad but is no worse than what can be expected outdoors with a short whip and a relatively poor ground.

The compact monopole occupies an area in the vertical plane of about 4½ square feet or less than ½ square metre. By using a standard formula for small loops [4,5] it was found that a loop antenna in that area would have a radiation resistance R_r under 0.05ohms, or little more than one percent of the radiation resistance of the compact monopole. So in order for the loop to have the efficiency even of the experimental short monopole it would have to have a loss resistance about 1% of the loss resistance of the monopole, or something like 0.25ohms, requiring considerable care in construction. Also this low-resistance high-Q system would have the narrow-bandwidth problem already discussed.

A small vertical loop in a reasonable cavity immediately below ground would suffer no near-field ground losses. Its directivity (gain over an isotropic radiator not counting ohmic losses) in free space would be 1.5 in power, or 1.76dBi, the same as for an elementary dipole [4]. Adding 3.01dB for low-angle ground reflection when directly over a perfect earth would give 4.77dBi, or about 0.4dB less than that for a quarter-wave vertical monopole over a perfect earth. But then there are the loop-efficiency and bandwidth problems.

For a first practical antenna to be installed in the crawl space I chose a compact antenna, a loaded monopole rather than a loop because in addition to the above-mentioned problems with a loop, construction and tuning would appear to be much less critical for a limited physical volume in which reasonably low unwanted coupling could be assured. Also, most energy absorbers run horizontally in a crawl space. Emphasis was placed on vertical polarisation so as to ensure reliable ground-wave propagation. Although space was limited vertically, there was enough space horizontally for a good capacity 'top-hat' and especially for a large ground plane.

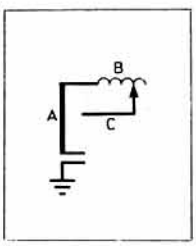

Fig 4. A short monopole adapted to a low height (notations as in Fig 1). Capacity plate is actually in two halves, one on each side of the coil, and positioned for nearly minimum capacity to the coil and radiating element.

CONSTRUCTION DETAILS

Fig 4 is a modification of Fig 1 for limited-space applications. Since it was desirable to use the tallest vertical radiating element consistent with the height available, the actual radiating element was made 3'1" from the feed point to the top, which meant that the loading coil had to be horizontal. The capacitive 'top hat' was brought back along each side of the coil with minimum capacitive coupling to the turns. **Figs 5a, 5b,** and **6** show the antenna and ground plane details, and the caption briefly describes each component.

The whole radiating element, A is a piece of aluminum irrigation tubing 2" in diameter (a much smaller diameter could have been used). This fits into a PVC sleeve B of non-critical length, which seats in a PVC fitting, C, which in turn keeps the aluminium tube from grounding. C screws into a galvanised flange D which attaches to the ground plane as described below. The feed point E is reached via a ¼-20 bolt (US size) through a hole in the PVC fitting. F is the ground lead, which is actually held to the flange by a hose clamp.

The loading coil G measures about 2⅞" in diameter and 1' long. It was made using aluminium clothes-line wire. The coil itself was mounted on a coil form consisting of PVC tubing Schedule 40, 1½" inside diameter, upon which four ribs (three is plenty) had been screwed at 90° intervals to carry the wire. The coil itself was hand-wound on a 1' length of 2" ID schedule 40 PVC tubing mounted on a lathe with one end in the three-jaw chuck and the other in a 'steady rest'.

The coil was wound to 35 turns (25 would have been sufficient) and sprung back a bit (watch your eyes if the free end snaps around) producing a slightly larger diameter coil purposely still too narrow to slide easily over the coil form. It had to be slid on turn-by-turn applying some reverse torque by hand, but in that way the turns were made to grip the ribs. If the aluminium is soft enough, the turns can be spread uniformly and then cemented. My wire was fairly stiff and did not go on very uniformly. A previous coil made of a softer wire had uniform spacing, but upon testing was found to have a skilfully-applied coat of clear plastic, rendering it useless for tapping turns. The turns of the completed coil were fastened down by the use of an acrylic cement. This bonds to the acrylic ribs and bridges over the wires.

The measured Q of the coil across 100pF was 318 at 3.4MHz before cementing, and 309 a day later. An old Boonton 160-A Q Meter was used.

The coil was mounted under the acrylic board H by means of long 10-32 bolts through the ends of one of the ribs, being offset by means of nuts and lockwashers. The board was mounted to the flattened, bent end of the vertical aluminium tube by means of three screws, only one being shown. The centre screw is used for a direct connection to the aluminium coil wire. For connections like these it is a good idea to make an eyelet at the end of the wire and hammer it flat.

Inductance adjustment is made by means of clip-lead I joined to aluminium bar J, 42" long, which supports a dual capacitive 'top hat' T_1 and T_2. Each section is an area of aluminium foil 14½" by 18" supported by an aluminium-wire frame to which the foil is held by clips. A later model uses sheet aluminium.

With the coil near resonance it was assumed that the high-voltage end, connected to the capacity plates, would be low-current, so that the clip-lead I could be thin and the clip itself made of steel.

Actually, fine tuning was later donee with an auxiliary small coil and clip lead between the large-coil tap joint and point J.

APPENDIX II

SOME USEFUL FACTS CONCERNING SUBSURFACE ANTENNAS GROUND WAVES

One use of the compact crawl-space monopole is in reliable short-distance propagation via ground wave between two subsurface positions; ground waves are not affected by ionosphere disturbances. Very little is said about ground waves in the *ARRL Handbook*, so it is appropriate to mention some salient facts.

Discussing ground waves is like discussing subsurface antennas in that analytical descriptions are produced and understood by a very small group of specialists. Most of us who build and use ground-wave systems have to limit our comprehensions to broad generalities. A few qualified readers might want to refer to References 2 through 5 of *Subsurface Antennas and the Amateur*, the present Reference [1]. There are other sources, including papers by James R. Wait and Richard K. Moore.

There are three components to a ground wave, as shown in **Figs 2** and **3** of Ref [1]. Where the transmitting and receiving antennas are within line of sight the two main components are the direct wave and the ground-reflected wave. **Fig 3** of Ref [1] shows a third component known as the surface wave (or Norton surface wave) which arises from the fact that the little wavelets coming from each elementary length of antenna are curved, the earth is curved, and as a wave travels along the ground it must tilt forward to pump energy into the lossy earth. For antennas above the surface, the surface wave becomes important after line-of-sight is no longer possible beyond the bulge of the earth as distance increases, thus eliminating the other two modes. An antenna below ground can generate a surface wave, and a straight wire along the ground will generate one.

The surface wave from an antenna above ground also appears below ground but attenuates rapidly with depth. In the 1950s an experiment was conducted in the USSR to determine the conductivity and capacitance of soil by measuring the received field strength of broadcast stations as special receivers were lowered into wells.

Some Principles for Subsurface Antenna Design

Those of us who experiment with subsurface reception and transmission and are not theory experts can fortunately resort to generalities which the theorists have made known, and proceed to build our systems around a few simple principles.

The first principle is that the lower the frequency the better the surface-wave propagation and the lower the loss in propagating from the buried antenna. However, the larger antennas needed at the lower frequencies are more costly and less efficient. Again, atmospheric noise increases as frequency decreases. So various compromises must be made.

A second principle is that a vertical electric field (or horizontal magnetic field) produces the best surface wave, so one designs with this in mind. For small space one can use a loaded vertical antenna as described, or a loop (magnetic dipole). With more space available a horizontal resonant wire or a long wire can produce a vertically-polarised surface wave off the end. A resonant wire several wavelengths long becomes a long wire. Its usefulness will depend upon the radiation pattern. Note that in the ground, resonances will depend on ground constants, wires becoming much shorter than above ground, and resonances may be poorly defined if ground losses are large.

Another principle is to minimise local losses in a buried antenna by the use of low-loss insulating space, which may be anything from a low-loss cylinder around a wire to an entire cavity.

For skywave propagation from buried antennas, vertical polarisation is probably better at low angles (long distance). Here the same antenna considerations as described for surface waves apply. For short-distance high-angle skywave a horizontal resonant buried doublet would probably be best.

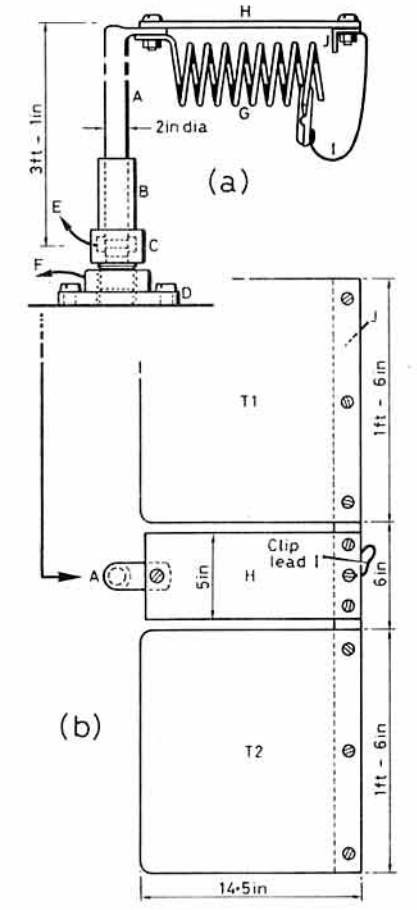

Fig 5. Compact monopole detail (but not to scale).
a) Elevation view, with the capacitive top hat not shown.
b) Top view (coil not shown).

KEY:
A — aluminium conductor, 2" in diameter, 3'2" to bottom. This is the radiating element
B — Sleeve, Schedule 40, 1½" PVC water pipe, length not critical
C — Insulating adaptor, PVC plumbing, threaded
D — Galvanised iron flange, threads to match adaptor
E — Feed point
F — Ground point
G — Loading coil. See text for details
H — Acrylic board, 5" × 14" × 1¼"
I — Clip lead and tap
J — Aluminium angle strip connecting coil to top hat
T1, T2 — Capacitive top hat sections, each 14½" × 18" aluminium foil or sheet, supported by an aluminium wire frame or by short struts anchored to acrylic board not too close to A.

Fig 6 illustrates the ground system. The floor of the crawl space is dirt with some protruding rocks, all covered with black plastic sheet as a moisture barrier. For a ground plane I used two rolls of 18"-wide heavy-duty aluminium foil. I laid a square piece of wood under the crossover point, which is where the antenna was positioned, and screwed the metal flange onto the board, making a tight connection to the foil. Each strip of foil is about 24' long.

TESTING AND ADJUSTMENT

The first requirement was to position the compact monopole to ensure a minimum of coupling to absorbing objects. Most ducts, wires and pipes are horizontal, so the vertical radiating element had an initial advantage. Then, to minimise coupling, the coil and top-hat had to be as far away from metal objects as possible. The chosen position as shown in **Fig 6** was about 2' north of the south foundation wall and in the middle of an area bounded by two overhead north-south heat ducts separated by 5'6".

For adjustment it was first necessary to find the approximate tap points for resonance. Frequencies chosen were 7050kHz and 10150kHz. These points were found easily using a grid-dip meter.

The next task was to bring the unit close to resonance and determine the equivalent series resistance, in order to design a matching unit. Significant readings could not be obtained with a professional RF bridge and signal generator, but a noise bridge (mine was a Palomar) gave results which made it easy to move the tap for a purely resistive reading. This reading was near 25ohms on 10MHz but closer to 30ohms on 7MHz, which made it possible to design a simple ferrite matching transformer for the 50ohm line. The transformer utilises an Amidon FT 114-61 ferrite core, adequate for low power. The antenna side consists of 12 turns of 16 gauge enamelled wire, within which turns are inter-wound 18 turns of 18 gauge starting at the ground point of the antenna side, extending beyond the other end of the antenna winding and terminating at the centre conductor of the cable.

Final adjustments were made using a transceiver at reduced power, reading an SWR meter in the line, and making frequent and painful trips into the crawl space for fine tuning. The bandwidth at 7MHz was 180kHz between points of SWR = 2.0.

Later a near-duplicate of the subsurface antenna and ground plane were installed on a flat lawn outside the house so that it would be possible to estimate received field strengths just above and just below ground. Laying the aluminum-foil ground plane was followed by placement of wooden planks and bricks to protect against high winds in this area. Because of lower losses in the new antenna, the bandwidth to the SWR = 2 points was only 48kHz. The higher losses of the subsurface antenna were probably caused by the fact that the vertical portion was only two feet from the cinder-block foundation, which rests against the outside soil.

PERFORMANCE TESTS

Good two-way communications from the subsurface antenna were had by ground wave on 7 and

10MHz with fixed amateur stations at distances out to 4 miles using 10watts of output power. In tests on 7MHz with a mobile station, CW signals of the same power were audible above noise at distances in excess of 10 miles.

Attempts to receive ground wave at distances of 25 to 30 miles gave inconsistent results between our location north of Boulder, Colorado, and regions to the south and southeast, toward which the land falls and then rises. It was evident that sometimes one could be receiving via sporadic-E skywave (short skip), long-distance backscatter, and even in one case of signals from a site 30 miles to the south, obstructed by a hill, reflection from tall mountains to the west, which produced very strong signals on the subsurface antenna.

Referring to Appendix II, the surface wave is that portion of the ground wave which creeps along the air-ground inter-face, the other two portions being the direct wave and the ground-reflected wave. It was desired to learn a little bit about the performance of the subsurface antenna on surface waves since, with ideal flat terrain and antennas close to the ground, especially as distance increases, the surface wave becomes important. Our terrain was not ideal.

A comparison was made between the subsurface antenna and its near-replica described above. A battery-operated signal generator was placed on flat terrain near the two antennas. Using a method of generating surface waves which possibly originated in England in the 1940s or earlier, a long insulated wire was laid on the ground, connected to the signal generator, and pointed toward the two antennas, each of which was about 2½ wavelengths away from the far end of the wire.

Tests indicated that, correcting for the differing efficiencies of each antenna, the strength of the signal just below ground was comparable to that just above ground. The subsurface antenna was of the order of 7 to 19dB worse than an 'average' vertical monopole nearly a quarter wavelength in height in some ground-wave tests. The smaller differences appeared to come when path geometry gave a greater surface-wave component, a tall antenna being more responsive to direct and reflected waves. There was also some evidence, though insufficient, that the above-ground compact offered greater output in comparison with the subsurface compact in the presence of some direct-wave components in a total ground wave.

Skywave capability is important since it is generally known that some kind of ionosphere exists under nuclear-blast conditions [8]. Summer-night skywave communication was demonstrated on 7MHz with 10watts of power into the subsurface antenna, to a distance of nearly 1000 miles. With the same power, daytime sporadic-E (short skip) communication was had on 10MHz at 60 miles.

WARNING

Transmitting with appreciable power from an antenna in a crawl space might be dangerous if there could be gas leaks. Accidental resonance of wiring, pipes, and ducts in attics, crawl spaces and basements, causing sparks, could take place on rare occasions.

CONCLUSIONS

It should be feasible to communicate for a few miles between basements, crawl spaces, or emergency shelters by HF ground waves, using only 10watts of battery power and a small loaded monopole antenna with a good ground plane.

APPENDIX III

Another View of Subsurface Propagation

Further light has been cast upon the subject of subsurface propagation by Bob Eldridge, VE7BS [6]. Eldridge performed several experiments with antennas in salt water, one of which proved that propagation between two loaded dipoles was best when both were horizontal, and that signals stopped when they were removed from the water in this orientation. In a personal contact he mentioned an important theoretical paper of use to the practical experimenter [7]. The paper gives the angle of tilt from the horizontal for best propagation between two subsurface electric dipoles. This angle usually corresponds to the angle of total internal reflection described in college physics text books for a light ray going from a dense medium to a less dense one. The angles shown in curves in the text are, 0° (dipoles horizontal and in line along the direction of propagation) for sea water, 8.3° from the horizontal (dipoles tilted toward each other and also in the plane of propagation) for moist soil, and 30° for dry soil. However, the authors' figures show useful propagation over a wide range of angles.

In the above study the authors call the surface wave a 'lateral wave'. This term has come into use to describe the surface wave which runs along an interface between two media and is generated at or near the critical angle described above. This wave, like the Norton surface wave (Ref. [1] p 134 including Fig 3) has vertical electric polarisation.

Eldridge has verbally mentioned an experiment in which he transmitted between two submerged antennas at 900MHz, blocking the signal by means of a metal plate held just above the surface of the water. This and other experiments he described further bear out the concept that transmission between stations in a lossy medium is accomplished by a surface wave along the interface, stronger in the less lossy medium. This applies also to one station in each medium.

Eldridge did experiments on 144MHz as did others on 27MHz, showing that divers could communicate with each other and to the surface at some distance using helmet antennas cut for the correct velocity of propagation. Vertical polarisation was said to be best in this experiment. This would appear to be correct at short enough distances.

Small antennas located just below ground should be usable for skywave communication out to several hundred miles at least. In a shelter with a reinforced concrete roof but no metal in the foundation, communication by groundwave but not skywave should be possible. In reception atmospheric noise and interference would, in general, be attenuated by the earth as much as the desired signal, until such attenuation becomes sufficient for the receiver noise floor to govern.

Compact monopoles of the type described should be preferable to loops in places where the height is very low and yet there is room for a good ground plane and capacitive top loading. With reasonable bandwidths compared to loop bandwidths, they can be used without continual tuning.

The strength of the surface wave just below ground is comparable to that just above ground, so that HF surface-wave communications of several miles between two basements or shelters should be feasible in many cases with little more signal attenuation than that noted in tests between a compact antenna just below ground and one just above ground. The below-ground antenna should be placed in a reasonably loss-free space.

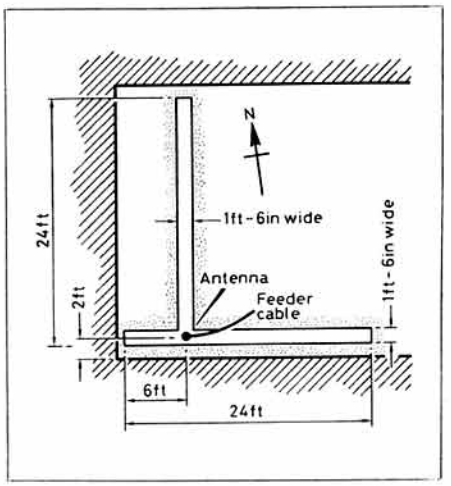

Fig 6. Plan view of crawl space ground-plane aluminium foil conductors.

Compact vertical monopoles of the type described should also lend themselves to usage in an attic, where it is possible to spread a ground plane.

In plastic enclosures and with remote tuning, this antenna should be useful atop cars, campers, and trucks.

The antenna might be usable in residential rooms and offices, provided that a good ground plane be placed under a rug, but electrical wiring might cause problems. □

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ICOM IC-725 HF TRANSCEIVER

Peter Hart, G3SJX, considers the Icom offering intended for the burgeoning budget market.

During the last two years the three principal suppliers of amateur transceivers have all unveiled new ranges of budget priced HF transceivers. The Kenwood TS-680/140 and Yaesu FT-747GX were reviewed earlier this year (March and May 1989 *RadCom*), and now we can tackle the latest arrival - the Icom IC-725.

FEATURES

The IC-725 instruction manual quotes the receiver frequency range as 500kHz to 30MHz. In fact, it operates up to 33MHz and down to 30kHz, although the sensitivity drops as the frequency tunes down below 500kHz. Transmit operation is confined to segments around the amateur bands with full 100W output on all modes (40W carrier on AM) and variable down to 10W.

SSB and CW modes are provided as standard, with AM on receive only. FM transmit/receive and AM transmit are available with the optional UI-7 AM/FM board fitted.

The usual comprehensive frequency control functions are provided. The rotary tuning knob tunes in either 10, 20 or 50Hz per step as selected by the user. This corresponds to 2, 4 or 10kHz per revolution of the control knob. In addition, the radio will tune in 1kHz or 1MHz per step for rapid frequency or band changes (100kHz or 10MHz per revolution of the control knob respectively). When operating with 10Hz or 20Hz step sizes, turning the tuning knob fast engages speed-up which automatically selects the 50Hz step size.

Amateur bands are most conveniently selected in band change mode using the rotary tuning knob. As each band is selected, the frequency and mode are set to the conditions prevailing when that band was last used - a most useful feature, described as the band stacking register.

Twin VFOs are incorporated which may be operated split in the usual fashion. There are 26 memories included to store frequency and mode. Two memory channels (23 and 24) will each store independent transmit and receive frequencies for split frequency operation. Scanning between two frequency limits or across the memory channels is provided, memory scanning may also be limited to a single mode. The memories and VFOs are backed by a lithium cell with a five year life.

A backlit LCD display panel is bright and easy to read with a wide viewing angle. The display indicates frequency to 10 or 100Hz resolution (user selectable), mode, memory number and status VFOs, scanning and memories.

Receiver functions include a noise blanker, switchable input attenuator, switchable input preamplifier, all mode squelch, fast/slow AGC and RIT. The RIT operates on receive only, over a range of ±1kHz and the offset may be added onto the displayed frequency. There is no RF gain control, notch or variable bandwidth facility.

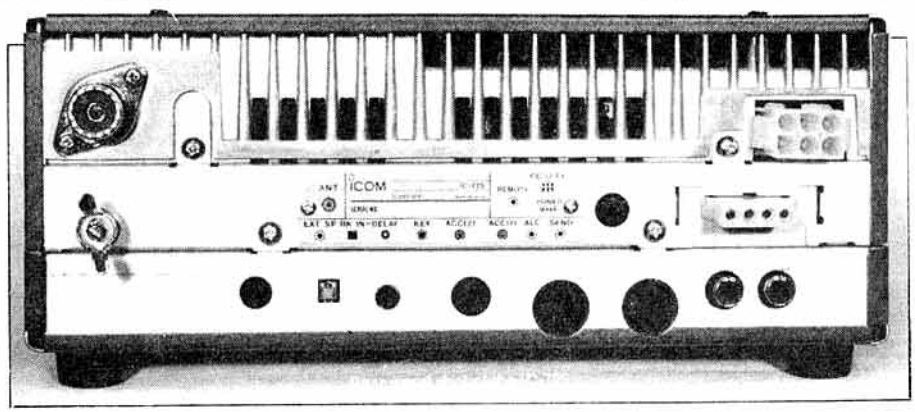
On transmit, CW break-in is incorporated with variable delay, at minimum delay this gives full break-in. The rig is cooled by an exceptionally quiet fan which comes into operation when the heatsink temperature rises. Metering is for S-meter/relative power output only. No provision is made for speech processor or VOX. The hand microphone supplied uses an electret insert which is polarised to 8V DC via the active mic line. This includes up/down buttons for frequency or memories. Other microphone types are likely to require a DC blocking capacitor.

The rear panel carries the usual connectors for DC power, antenna, key and external speaker. Relay controlled T/R switching and ALC is provided for external linear control. There are three main accessory sockets: one interfaces to the AH-3 automatic antenna tuner, and the other two provide comprehensive interfacing lines for RTTY, AMTOR and packet TNCs/terminal units, AF, mod, squelch, ALC and send lines. There is no provision for low power RF output to drive transverters.

A serial computer interface is provided (Icom CI-V standard) which interfaces to a personal computer RS232 port via the external CT-17 accessory. The CT-17 is a level converter and will control up to four Icom rigs equipped with the CI-V interface. Data is transferred at 300, 1200 or 9600 baud with an address + data packet format.

An excellent 36 page instruction manual is provided. This gives a most clear description on operating the transceiver, external connections and installation of options.

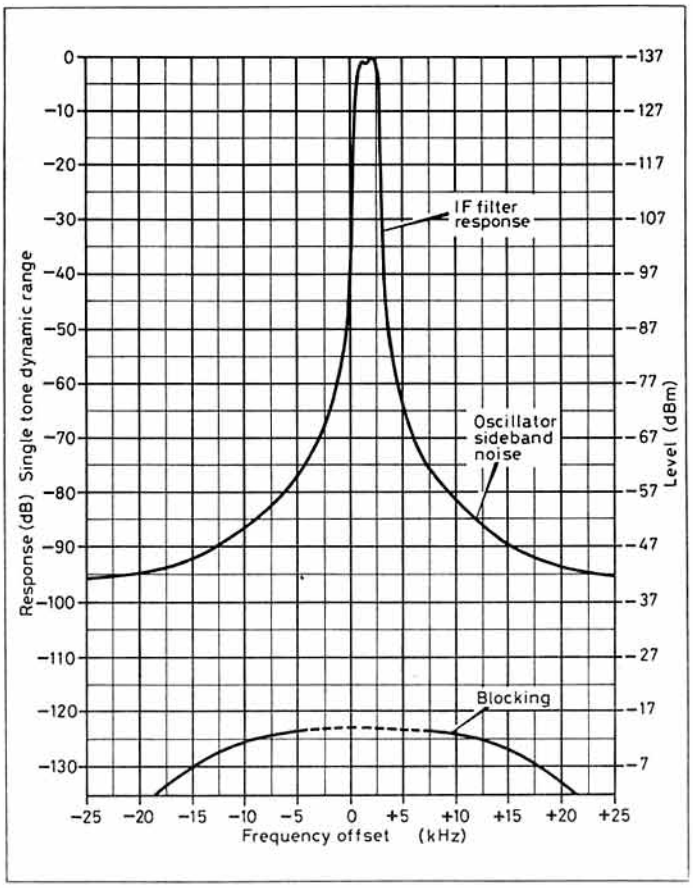
Internal options available at extra charge include narrow CW filters for 500Hz and 250Hz bandwidth, high stability reference oscillator, AM/FM board already mentioned and carrying handle. The options are easy to fit. A wide range of external accessories are available and it should be noted that a carrying handle and feet are not included in the standard unit.

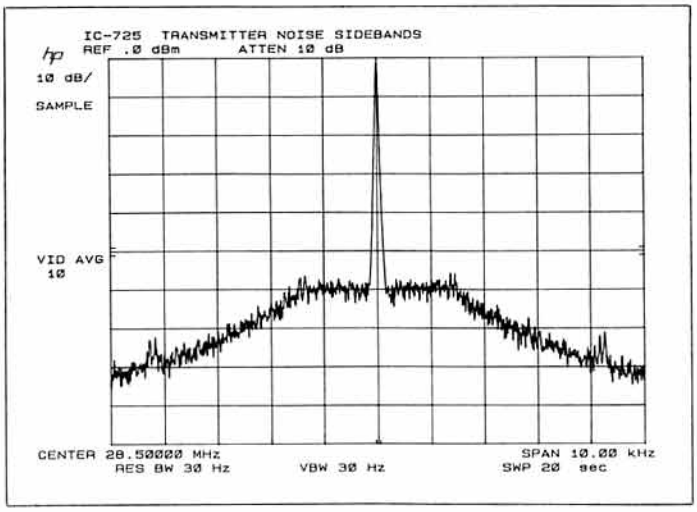


DESCRIPTION

The IC-725 measures 24.1(W) by 9.4(H) by 23.9cm(D) and weighs 4.6kg. The transceiver is ruggedly constructed in three sections. The lower section contains two large PCBs on either side of a supporting frame. The photo shows the main unit PCB. The upper section is an aluminium diecast assembly containing the power amplifier, output filter and fan. A 6.5cm diameter speaker is mounted upward facing using the diecast assembly as a baffle. The third part is the front panel assembly comprising a plastic overlay on a metal frame containing the front unit PCB.

The receiver is double conversion on SSB, CW and AM with IFs of 70.45 and 9.01MHz. A third IF at 455kHz is used on FM. The main selectivity is achieved at the second IF. The transmit signal is generated at 9.01MHz and mixed via 70.45MHz to the final frequency. A single microcontroller is used to control all functions. The frequency synthesiser uses a combination of conventional





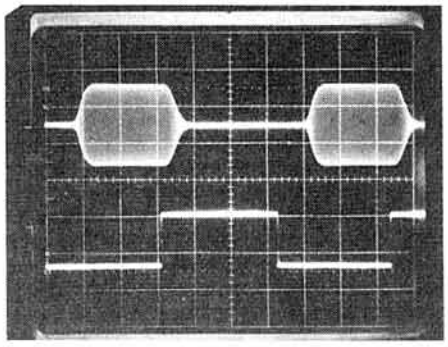


Fig 1. (left) IF Selectivity and Reciprocal Mixing plots

Fig 2. (above right) Transmitter noise sidebands

Fig 3. (right) CW waveform at 40WPM

PLL techniques and direct digital synthesis (DDS). DDS is a new technique which digitally generates a parallel data stream and then produces a sine wave LO signal by passing this into a D/A converter (there are some similarities with a CD player). DDS has the advantage of achieving a small step size coupled with rapid frequency changes and an excellent close-in phase noise performance. The disadvantage is a relatively high level of discrete spurious outputs, and current technology is limited to about 30MHz. In order to generate the first mixer LO, tuning 70.5 to 100.5MHz in 10Hz steps with low spurious outputs, the DDS is used as an offset within a single PLL design. The exact operation is unclear from the block diagram in the operating manual.

MEASUREMENTS

Measurements were made with the IC-725 powered from the PS-55 PSU. Results are as follows.

RECEIVER MEASUREMENTS

Sensitivity

With the preamp switched in, the sensitivity is excellent. The sensitivity reduces by about 8dB with the preamp switched out and a further 18dB with the attenuator switched in.

S-Meter Calibration

This is fairly typical of most rigs. On FM, the range and linearity are poor.

Spurious Rejection

Rejection of the IFs, submultiples of the IF, images and indeed all other spurious frequencies were all extremely good - in excess of 90dB. The image and first IF rejection figures degraded by up to 10dB with the preamp switched out.

AGC Performance

The AGC had an abrupt threshold and a very level response above the threshold.

Selectivity

Reciprocal mixing limited measurements to only about -50dB. The skirt selectivity on AM and FM is rather wide and on SSB, the skirt selectivity widened noticeably at about -60dB.

Strong Signal Performance

The input intercept and front-end dynamic range is good but not quite up to the 105dB dynamic range claimed in the adverts. With the preamp switched out, the dynamic range improves by about 2dB. The close-in blocking and intermodulation performance degrades but not as much as some rigs. Inband linearity measured with 200Hz tone spacing is poor.

The main limitation on strong signal performance is reciprocal mixing due to oscillator sideband noise. This came as a great surprise as Icom usually achieve an excellent performance, even in their cheaper equipment. The performance is particularly bad close to the carrier. **Fig 1** shows the combined results of IF selectivity and reciprocal mixing.

TRANSMITTER MEASUREMENTS

Power Output

About 120W output is delivered on CW and SSB, which is a little more than most rigs.

Note also that the power output holds up well into mismatched loads - much better than many other rigs, which an important factor for mobile operation. The power output is reducible down to about 10W. The power output meter, although calibrated in percentage output, reads remarkably close to the true power in watts.

Spurious Outputs

The harmonic output is good but the level of in-band non-harmonically related spurii is excessively high on some bands. The worst band is 21MHz where a moving spurious signal beats with the carrier every 128kHz and is at worst only 30dB down on the carrier.

SSB Distortion

The third and fifth order products are good. Higher order products were -60dB at ±10kHz and -75dB at ±20kHz. It was not possible to measure carrier or sideband suppression or AF distortion owing to transmitter noise output.

Transmitter Noise Output

The poor receiver reciprocal mixing performance is also mirrored in the high levels of transmitter noise sidebands. See **Fig 2**.

CW Keying Performance

Fig 3 shows the CW keying waveform at 40WPM. This characteristic is ideal with very little distortion and nicely rounded edges.

Transmit-Receive Switching Speed

These figures are the fastest measured so far for any rig and should permit entirely satisfactory operation on all data modes.

ON-THE-AIR PERFORMANCE

I liked the ergonomics of this rig. The controls are well placed and easy to use - in particular it's quick to change bands and quick to home in on any frequency. The band stacking register, storing the last used frequency and mode on each band, is a convenient feature. Users of the WARC bands will most appreciate this, when switching between 18 and 24MHz which are at the opposite ends of a normal 500kHz tuning range.

Auto speed-up comes into operation with the 10Hz and 20Hz tuning steps, but I found this rather annoying, having an effect akin to backlash. For this reason I tended to use 50Hz steps most of the time because this does not adopt speed-up. This

is entirely satisfactory on SSB and even on CW for most of the time.

The synthesiser is completely free of clicks and, with a 10Hz step size, indistinguishable from an analogue VFO.

The memories are plentiful and easy to use although a preview feature would be a useful addition. This would allow the memory contents to be checked and displayed without interrupting operation in VFO mode, perhaps by displaying the memory contents for a few seconds when the UP/DOWN buttons are pressed. The receive sensitivity was excellent, useful for mobile operation with small antennas.

The receiver sounded a little noisy on crowded band conditions, which was a consequence of the synthesiser noise. The narrow CW filter was not fitted to the review model, and this really is essential for serious CW. I never experienced conditions where it became necessary to use the input attenuator. Switching out the preamp was sufficient but not always necessary on the LF bands. Audio quality was good although the internal speaker rattled a little at high levels. The receiver functioned well on AM on the broadcast bands. The noise blanker was effective at silencing the 'Woodpecker' - a scourge which seems to have been more prominent recently.

On SSB, the transmission was generally clean and narrow. The audio quality was reasonable too, although lacking a degree of bass. The measurements of audio frequency response confirm this. The driving level for SSB transmitters is set according to the ALC indication. This is usually a meter but on this transceiver, the TX LED indicator brightens on peaks. There appeared to be barely sufficient audio gain and it was necessary to speak close to the microphone. There is no audio processor to assist here.

On CW, the transmission was free of clicks but local stations reported noise sidebands several kHz either side of the carrier. At minimum break-in delay, full break-in operation could be achieved up to about 25WPM. However, this is not described in the manual and the T/R relay may not be suitable for this use.

CONCLUSIONS

For a budget-priced transceiver, the IC-725 is attractive. Icom seem to have the ergonomics about right and, with the exception of the synthesiser noise, the electrical performance is excellent. It is a pity that the synthesiser noise is so poor; this is an area where Icom usually excels. The list price, current as of July 1989, for the basic transceiver is £759. This represents good value for money. The UI-7 AM/FM unit costs £40, and FL-100 or FL-101 narrow CW filters £57 and £55 respectively. For mains operation, a 12V PSU is required. The PS-55 costs £192. All prices are inclusive of VAT. Since writing this review, Icom have announced a new model, the IC-726, which will be available shortly. This is identical to the IC-725 but also includes 50MHz coverage with 10W output power and the FM unit as standard. This should be an interesting rig. □

ACKNOWLEDGEMENT

I wish to thank Icom (UK) Ltd of Herne Bay for the loan of the equipment.

POSTSCRIPT

The transmitter noise performance of a second IC725 has recently been checked. This showed an improvement of some 5-7dB for close-in noise bands.

ICOM IC-725 MEASURED PERFORMANCE

RECEIVER MEASUREMENTS

Frequency	Sensitivity Input SSB 10dBs+n:n	Image for S9	70.45MHz IF rejection	rejection
1.8MHz	0.12μV (-125dBm)	32μV	100dB	87dB
3.5MHz	0.11μV (-126dBm)	25μV	97dB	103dB
7MHz	0.1μV (-127dBm)	22μV	100dB	103dB
10MHz	0.12μV (-125dBm)	28μV	96dB	97dB
14MHz	0.12μV (-125dBm)	28μV	99dB	96dB
18MHz	0.11μV (-126dBm)	28μV	106dB	94dB
21MHz	0.11μV (-126dBm)	25μV	106dB	94dB
24MHz	0.11μV (-126dBm)	22μV	103dB	90dB
28MHz	0.12μV (-125dBm)	22μV	107dB	91dB

AM sensitivity (28MHz): 0.7μV for 10dBs+n:n at 30% mod depth
FM sensitivity (28MHz): 0.2μV for 12dB SINAD 3kHz pk deviation
AGC threshold: 1.8μV 100dB above threshold for +1dB audio output
AGC attack time: 2ms (fast) 2ms (slow)
AGC decay time: 0.2 - 0.8s (fast) 2 - 4s (slow)
Max audio before clipping: 2.7W into 8ohm at 0.5% distortion
Inband intermodulation products: -26 to -30dB

Intermodulation Frequency	(50kHz tone spacing) 3rd order intercept	2 tone dynamic range
1.8MHz	+7dBm	95dB
3.5MHz	+11dBm	98dB
7MHz	+6dBm	95dB
14MHz	+8dBm	96dB
21MHz	+7dBm	96dB
28MHz	+4dBm	93dB

S-Reading (14MHz)	Input level SSB	FM
S1	4μV	0.5μV
S3	5.6μV	1.6μV
S5	8μV	2.5μV
S7	14μV	3.5μV
S9	28μV	5μV
S9+20	220μV	8μV
S9+40	1mV	12μV
S9+60	11mV	50μV

Tone spacing (7MHz band)	3rd order intercept	2 tone dynamic range
5kHz	-18dBm	79dB
10kHz	-8dBm	86dB
15kHz	0dBm	91dB
<20kHz	+6dBm	95dB

Selectivity response	Bandwidth SSB/CW	AM	FM
-6dB	2.25kHz	6.36kHz	8kHz
-50dB	3.95kHz	21.5kHz	22.9kHz

Frequency offset	Reciprocal mixing for 3dB noise	Blocking	TX noise WRT carrier in 2.5kHz bandwidth
3kHz	60dB		
5kHz	72dB		-63dB
10kHz	83dB	-13dBm	-74dB
15kHz	91dB		
20kHz	94dB	-2dBm	-86dB
30kHz	102dB	+5dBm	
50kHz	110dB	+10dBm	-99dB
100kHz	121dB	+10dBm	
200kHz	127dB	+10dBm	

TRANSMITTER MEASUREMENTS

Frequency	CW power output	SSB(PEP) power output	harmonics	Intermodulation products third order	fifth order
1.8MHz	120W	120W	-62dB	-32dB	-38dB
3.5MHz	120W	120W	-64dB	-30dB	-38dB
7MHz	120W	120W	-65dB	-30dB	-36dB
10MHz	120W	120W	-68dB	-32dB	-34dB
14MHz	120W	125W	-54dB	-30dB	-32dB
18MHz	122W	128W	-62dB	-27dB	-30dB
21MHz	125W	128W	-64dB	-26dB	-32dB
24MHz	128W	130W	-65dB	-28dB	-30dB
28MHz	115W	118W	-62dB	-32dB	-32dB

Carrier suppression: see text
Sideband suppression: see text
Transmitter noise: see table above
Transmitter AF response at -6dB: 600-2600Hz (LSB and USB) **Transmitter AF distortion:** >1% (noise limited) **Microphone input sensitivity:** 6mV for full output FM peak deviation: 5kHz

T/R switching speed (SSB): mute-TX 7ms, TX-mute >1ms, mute-RX 17ms, RX-mute >1ms
Power into load mismatch: 2:1 VSWR 73-110W, 3:1 VSWR 57-68W
Frequency accuracy (transmit and receive): within 60Hz at room temp.

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB with the receiver preamp switched in. All two-tone transmitter intermodulation products quoted WRT either originating tone.

KEMSOFT PCB DESIGNER

Dr P Stewart, G7 EAH, introduces a CAD system for the Sinclair Spectrum — with a special offer for Society members

Programs for printed circuit board design by computer abound; most are for professional applications, and the cost is commensurately very high in most instances. The race to market the 'best' software entices each one towards full-blown CAD systems, with alarmingly efficient features such as auto-routing of tracks from analysis of the circuit itself.

Radio amateurs usually make PCBs for the fun of it - or if not actually for fun, for economy. And it makes no sense to spend a fortune on some form of CAD system under these circumstances.

IBM-standard computers, despite Amstrad, have a relatively high starting price still, and real enthusiasts tend to own BBCs, Spectrums and Amigas. PCB software for these systems is sparse, but I recently familiarised myself with one dedicated to the Spectrum, and offer my observations to readers in this review.

PCB Designer is a £30 package for the Spectrum and a selected range of Centronics printers. It comprises five programs in all, plus a library, which allow you to plot the tracks on your PCB, import a library of special components, produce a schematic version of the layout for component identification, draw a genuine circuit schematic, create your own library of symbols of all types, and print the results in several modes to create the right density for photo-processing. Any size of board can be produced, up to maximum dimensions of 6.4 × 4.4".

The core of the system is its program appropriately named 'PCB'. This functions in a similar fashion to a word-processor, but allows you to manipulate lines and shapes as well as text. The main function is a 'plot' mode which produces tracks ranging in width from 0.3 to 5.1mm at a variety of speeds - with a pen switch ON or OFF. There's a 'text' mode too, which allows you to print letters and numbers - and correct them very easily. Embellishments include the facility to capture a block of text or lines and move it, copy it, or rotate it through 90° and even mirror it across a horizontal or vertical line. A 'fill' facility helps you to produce, say, an earth plane or inductors and capacitors on a microstrip line within a closed contour.

Of course, there are many repetitive and special symbols which go to make up a modern PCB, and Kemsoft have included a library of such symbols. It is part of a central library file, each program being able to call the symbol set appropriate to its function. 'PCB' calls a variety of single, TTL IC and circular IC pads, board corner locators, edge connectors and bus lines (including a complete dynamic RAM bus). These copy onto the main diagram quite easily.

The next stage in the process of designing a PCB is to produce an overlay of the PCB track layout, to be printed (usually) on the reverse side, with symbols and references of the components identified, another program, 'layout' addresses this feature.

Your saved PCB layout is loaded by 'layout' and tracks and connection points thinned down to a background level to allow you to strip in foreground representations of the components to be soldered or plugged in place. A symbol set lurks within the library offering a wealth of physical shapes for various resistors, capacitors, diodes, ICs, trimmers etc, and outline shapes for standard transistors and voltage regulators.

A program entitled 'diagram' helps you to fabricate a circuit diagram, of the same physical size of the PCB. Again, this calls on a third section of the library and offers resistors, capacitors (normal and electrolytic), inductors, diodes, transistors (NPN, PNP, FET and MOSFET), logic gates, thyristors, amplifies, switches and a loudspeaker symbols. Surprising omissions are the zener diode and FET.

All three programs have some features in common. To aid alignment of lines and objects, a 0.1" pitch grid can be switched in and out. Most work is done at the higher of two resolutions, and in this mode the board or diagram is divided into four sections, or 'pages'. There are times, especially at the completion of a project, that you will want to examine the complete drawing for accuracy, which can be accomplished by switching to 'preview'.

The library is an important element for speed and convenience. The symbols provided are comprehensive, but it is inevitable that you will need to add some of your own custom designs. Unfortunately, in some respects, the existing library cannot be modified or expanded. But all is not lost; there are two methods for saving your custom-symbols.

One is to save a complete board, as a file, and simply extract the components as needed. This really is the lazy way, and not very efficient if several special components are involved.

The proper method is to introduce another program entitled 'iconmaker'. This allows you to draw up your own images on a twin-size square grid. A large grid places your components, and a small half-inch grid allows to draw lines with perfect accuracy and symmetry, down to a line thickness of 0.3mm. Ten such icons can be produced and saved onto disk as a single file, and

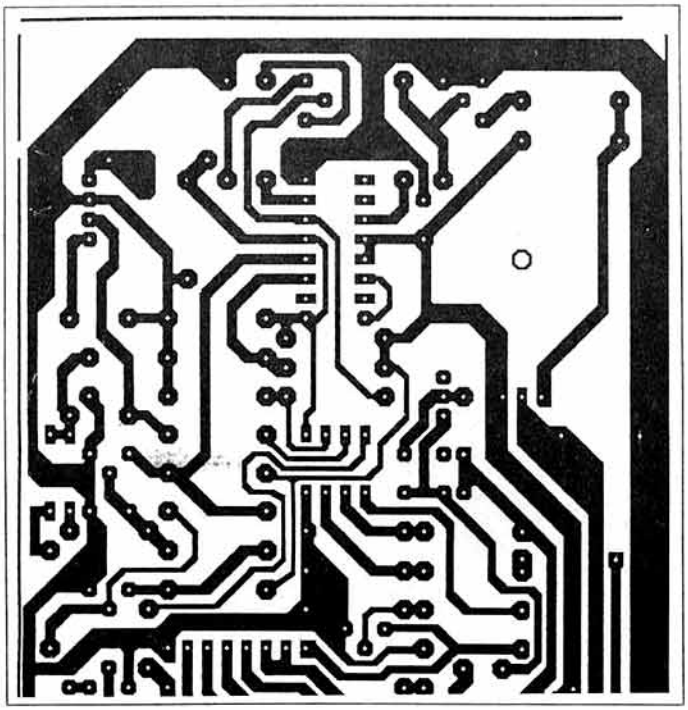


Fig 1. Enlarged portion of PCB artwork produced by the programme.

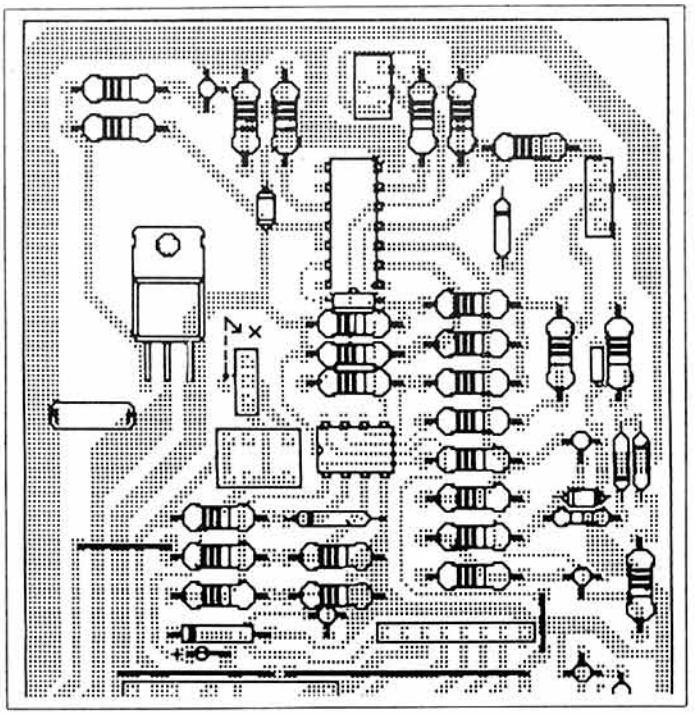


Fig 2. Component overlay print-out.

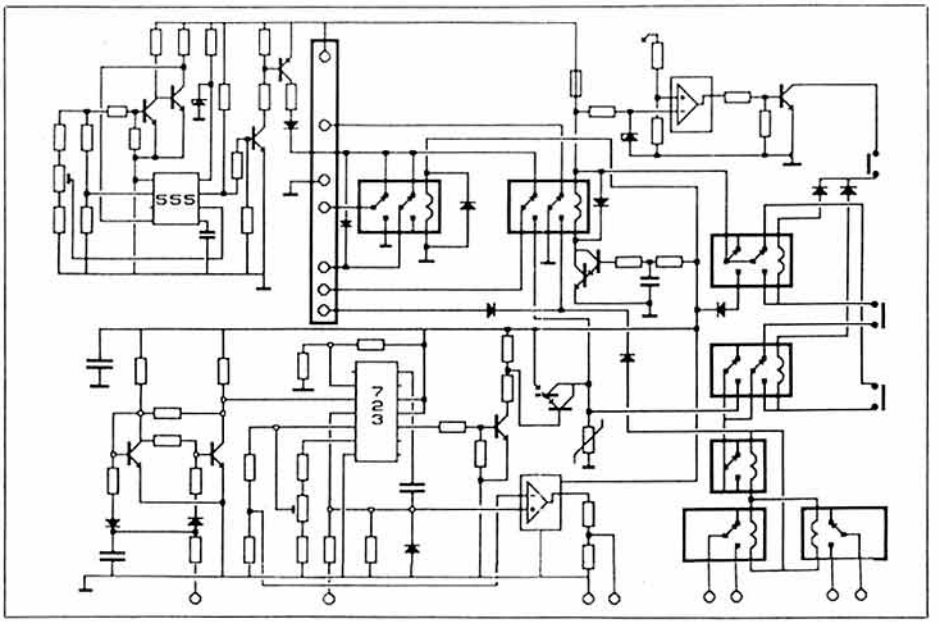


Fig 3. Circuit diagram print-out.

then loaded in to 'PCB', 'layout' or 'diagram' as appropriate.

Once the drawings are complete, the next stage is to print. Logically, the program to execute this is 'printer'. Some prearrangement of this part of the process is necessary prior to purchase. You will need to inform your supplier which printer configuration you will be using; options are Opus Discovery, Disciple, Tasman, Kempston E (an early version), Datel Interpreter, ZXLPRINT III, *Everyday Electronics* and Spectrum Hardware Manual Centronics interfaces.

'Printer' is invoked to produce, from a saved drawing, a high density image suitable for photographic reproduction. To help attain the right spec the density can be selected and overprinted once, twice or three times to compensate for ribbon wear. A 2:1 image reduction can be utilised to enhance much higher definition on small boards if desired. The results with a reasonable printer are fine for UV photocopying onto photosensitive boards.

This software package has performed well, taking into consideration the modest hardware costs of a 48k Spectrum and £30 for this package. It would certainly cost several orders of £s more for software and hardware of significantly greater scope; you can forget auto-routing on a typical amateur's budget.

The software comes complete with a 50-page well-documented manual that is a considerable improvement on the pre-1989 version. It contains a series of simple lessons on using the programs, and includes a list of hints on the photographic post-operations. Dimensions have, on my Panasonic KX printer, been reproduced faithfully at the 0.1mm level. **Figs 1** to **3** show, respectively, track layout using the 'PCB' program, component overlay using the 'layout' program and a circuit diagram using the 'diagram' program.

The normal retail price of the program is £30, but Kemsoft is making the package available for only £24 as an exclusive offer to RSGB members. The ordering address appears below – please ensure that your call sign or RS number is clearly marked in order to qualify for the special offer price. □

MANUFACTURER:

Kemsoft Micro Software
28 Main Road, KEMPSEY, Worcs.

IN PRACTICE

Somewhat to our pleasant surprise, we've had quite a lot of letters about practical technical problems in response to the last 'In Practice' so this month we thought we'd start off by answering a few of them. If you want to write in with a technical query, please feel free; we'll do our best to sort something out for you and print it here for the benefit of others who might have the same problem. We kick off with a nice easy one.

S Meter Bulbs

'The S-meter bulb in my rig has quite a short life, and spare ones cost an inordinate amount from the distributors. Could I replace it with a LED, and if so how do I go about it?' W K, Alton.

Seems like a cue for a little general item about using LEDs (incidentally, the initials are short for Light Emitting Diode). It's very simple to replace an existing filament lamp with one of these; however, you'll need to find out first of all whether the bulb is fed with AC or DC. Check the circuit diagram or test with a multimeter. Next, if it isn't clear from the circuit diagram or any markings on the bulb, measure the voltage of the supply and make a note of the result. Then work out how you're going to mount the LED - things like grommets of various sizes are useful here. Finally, obtain a LED which will fit in the space available. You can get them in a wide variety of sizes and colours these days, and you should have no trouble finding something suitable at a rally or from one of the component suppliers.

Having sorted out the mechanical side, you can think about wiring-up. All LEDs must be used with an external series resistor (or driven from a constant-current source) to limit the current through them. As a rule-of-thumb, most red LEDs need somewhere between 5 and 25mA through them - the higher current gives a brighter light - and the green and yellow varieties need a bit more, maybe 10-40 mA. If your lamp supply is DC, all you need to do is to connect a suitable resistor in series with the LED - it doesn't matter which lead it's in - and make sure that the cathode of the LED goes to the negative rail of the supply. In the vast majority of LEDs we've come across, it's the cathode lead which is identified in some way: if the two leads of the LED have different lengths it's usually the shorter, or there's a 'flat' on either the lead or the body of the LED itself. If the supply is AC, you still use the series resistor but reduce its value by about half. Also, you connect a 1N4001 or similar diode in inverse parallel with the LED - ie its anode is connected to the LED's cathode and vice-versa. In this case, of course, it doesn't matter which way round you connect the LED to the supply; the parallel diode forces the polarity of the current through the LED to be correct.

Here's an example. Suppose you have a 12V DC rail for meter illumination and you want to use a small yellow LED instead of a filament lamp. Assuming you decide that 20mA is about right and gives you enough illumination, you apply Ohm's Law and deduce that you need 600ohms in series with the LED. The nearest preferred values are 560 or 620ohms, and either will do fine. If it's 12V AC, remember to wire the diode in inverse parallel with the LED and in this case you'll need a 270 or 330ohm resistor in series.

To be precise, slightly less current flows through the diode than you would expect from the simple calculation we've given above since the LED has a small forward voltage of its own - typically about 2V. This is only significant if you need to run a LED from a very low voltage supply, when the forward voltage drop is a large fraction of the supply voltage. One other point is that most LEDs don't like being connected the wrong way round; if you do and then re-connect them correctly, you tend to find that they've either failed completely or are giving reduced light output and may fail after a few hours' use. Double-check that the cathode goes to the supply negative - or that on an AC supply the parallel diode's anode is connected to the LED cathode and vice-versa - before switching on.

You'll certainly find that the LED has a much longer life than a filament bulb; most sources suggest anything up to 100,000 hours!

Back to Capacitors - bleeding and equalizing

'You wrote about choosing and using electrolytic capacitors last month. You said that it was OK to use them in parallel, but you didn't say a word about using them in series - as you do in high-voltage supplies, for instance. You need to bear quite a lot of things in mind here, which weren't mentioned at all. Many of the things one reads are not very clear, and people can make some bad mistakes. Shouldn't you have gone into that, and said something about bleeder and equalizing resistors and how to choose the value of them? J E, Manchester

Well, we can certainly have a try. Here's a hypothetical example, which we'll use to illustrate some of the issues involved in using electrolytics in series. Let's assume that we need 1kV or so for a particular transmitting application and that we have a 0-750V transformer in the junk box (propping open the shack door in the hot weather, probably). On the basis of our reasoning in last month's piece, the peak voltage which this will produce is ($\sqrt{2} \times 750$), which is about 1060. Allow a 10% safety factor to cater for high mains (more than that if you're a contester whose equipment is habitually on the other end of a wayward generator) and another 10% to allow for the off-load condition when the transformer will inevitably produce rather more than 750V. Allow another 20% for a little in hand - remember that we don't use electrolytics at their full rated working voltage in the interests of reliability, unlike certain hi-fi amplifier manufacturers. So we need the working voltage of our reservoir capacitor to be about 1500V as a minimum, and anything higher will be a bonus.

The problem is that electrolytic capacitors don't come with that sort of voltage rating; the highest you can usually get nowadays is 450V, so we'll assume that we have some of those available. So the question is, how can we achieve a capacitor with a working voltage of 1500 using 450V working components? As you might expect, the answer is that we put enough capacitors in series to meet the requirement. How many do we need? Three would give us (450×3) which is 1350V and not nearly enough for real reliability. In this case it looks as though we need four of them, which will give us a total working voltage of (450×4), ie. 1800V. That's fine, and gives us a good margin in hand for the sake of perhaps a pound or two more on the cost.

At this stage it's worth mentioning that it is best to use capacitors of the same type and value (and age) when putting them in series and that if they're surplus or ex-equipment it's prudent to 're-form' them before putting them into service. Also, don't forget that capacitors in series lead to a reduction in capacitance, not an increase. Suppose that in our example we plan to use four 100µF 450V components; the ultimate value of capacitance we will have is ($100 \div 4$), which is 25µF. Is this enough for the application? If not, higher-capacitance components will be needed.

Having got this far, can we simply connect the capacitors in series (ie. connect the positive of one to the negative of another and so on down the chain) and apply the rectified output of the transformer to the combined component? Not yet - there are some other things which must be considered before we can do that. Firstly, bear in mind that the can of an electrolytic capacitor is almost always connected to its negative terminal, the cans of the four series capacitors will be at different potentials - in our example they could be about 370V apart - and three of those cans will be sitting at a voltage which is well above earth or the negative rail.

This implies that you'll need to mount them on a non-conducting support of some kind, such as a sheet of Perspex or Paxolin, and also to make sure that the cans and mounting clips are well isolated from each other. Whatever you do, **DON'T** assume that because the can may have a plastic sleeve around it, you can mount the capacitor on the chassis as normal. The sleeve wasn't designed to provide anything like enough insulation to meet the requirements of series operation, and indeed it won't. It's best to forget the sleeve and pretend that you're dealing with a bare metal can.

Bleeding and Equalizing

Now that we've worked out the values of component we need and how to mount them in the PSU, we need to ensure that each capacitor has more-or-less equal voltages across it when the supply is powered. Since there are very wide tolerances on

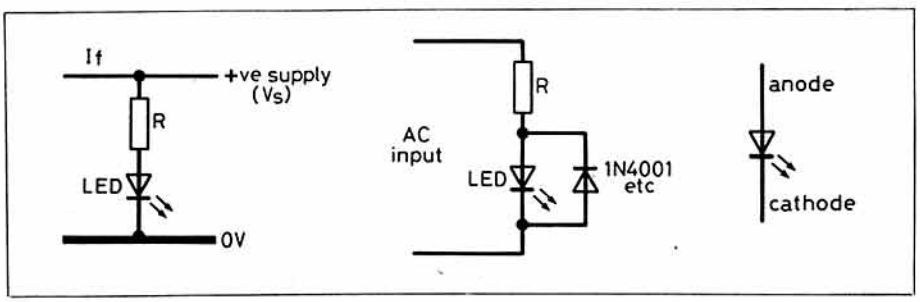


Fig 1. (1) LED replacement for S meter bulbs using a DC supply. Fig 2. (centre) Wiring for AC supplies. Fig 3. (r) LED lead identification.

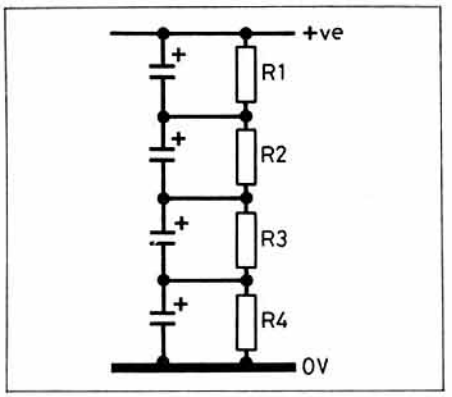


Fig 4. Equalising resistors fitted to a high voltage capacitor chain.

the values of electrolytics (even modern ones are often specified as being only within -10 or +30% of their marked value at best), each component in our series string of four could have very different capacitance values - so the voltage from the rectifier output could divide itself unequally between the capacitors. This is potentially disastrous, since one component could therefore have many more volts across it than it should have - and possibly more than its working voltage. As we saw last time, that's a recipe for a loud bang and a frightful mess.

All we have to do to stop this happening is to fit an 'equalizing' resistor in parallel with each capacitor. The resistors must have the same value so that they force the voltage across each capacitor to be the same, but it isn't critical; I tend to choose their values so that when the 'chain' of resistors is in place it will draw about 10mA from the supply. In this case we'll require four of them, and their value is given by Ohm's Law. The total value will be 1060 (the transformer peak voltage) divided by 0.01 (the current in milliamps), which gives 106kΩ, and there are four resistors. 106 divided by 4 is 26.5, so 27kΩ components would be ideal here. However, we also need to consider their power dissipation. Equalizing resistors must be exceedingly reliable because if one of them goes open-circuit you could have a loud and smelly problem - so under-run them by as large a factor as you can. In our example, each one would be dissipating not far short of 3W when the unit is running, which means that wirewound components will be necessary; the long rectangular ceramic-bodied white ones frequently seen at rallies and rated at 7 or 11W would be ideal for the job, but don't hesitate to use higher-wattage components if you have them to hand. Remember that resistors have voltage ratings as well; check the specifications in a catalogue before using a particular type.

The other reason why equalizing resistors have to be very reliable is that they have an important secondary function. Electrolytic capacitors are very good at holding their charge for a long time after the power has been switched off, even though in this respect they can't hold a candle to oil-filled paper devices; these can retain a lethal charge for several months. To digress slightly, if you're lucky enough to have some high-capacitance high-voltage oil-filled components in your spares box, make sure that you keep their terminals joined together with a piece of wire. If you don't do this, even the natural movement of dry air past the terminals over a period of time is enough to give this type of capacitor a charge which will make your eyes water if you touch its connections without thinking. Whether it's electrolytic or oil-filled paper, however, it's good practice - and it ought to be considered obligatory - to connect a resistor across any type of capacitor used in a high-voltage supply so that the said capacitor is discharged within ten or fifteen seconds of the PSU being switched off. This avoids the receipt of an unpleasant surprise a few hours later when you decide that you want to do some work on the PSU and begin unsoldering some portion of the high voltage circuitry. Such a resistor is usually known as a 'bleeder' since its function is to bleed the capacitor's charge away.

You might think that since the equalizing resistors are connected in parallel with the capacitor string and hence across the supply rails, they will fulfil this function well enough - and indeed they do. However, as well as the preservation of the electrolytics, we now have to consider the infinitely more important matter of your personal safety. So you must make sure that your equalizing resistor chain is properly and solidly connected and uses the best components you can possibly find. But in big high voltage supplies you should also play safe by having another - and entirely separate - resistor chain across the supply rails. This one can be arranged to draw only a milliamp or so from the supply and can therefore use smaller components, but it forms a back-up bleeder resistor in case one of the equalizing resistors fails.

Even so, I always use a dedicated voltmeter on the front panel of any high-voltage supply and watch it when I switch the supply off. I also don't work on any high voltage equipment unless and until the high-voltage capacitors have been discharged to chassis with a large insulated screwdriver and two lengths of wire with large alligator clips at each end have been applied between both capacitor terminals and earth. This makes sure that both ends of the capacitor stack are earthed and remain so. Remember that many metering schemes in high voltage power supplies use a high voltage negative rail which is maintained a few ohms above true ground: the reason is to keep the meter and its associated circuitry near earth potential rather than up at some enormous voltage. If you were working on the metering (or there was a fault) and the bleeder and equalizing resistors were returned to this rail as well, the negative of the capacitor could be floating and could give you an unwelcome surprise if there was any charge left in it. The bleeder and equalizing resistors should always be connected to chassis or true earth, of course, not a negative rail which is primarily there for metering or sensing - but at least two manufacturers of commercial valve amplifiers have forgotten this little nicety. The shorting cables should only be removed when you've completely finished any work on the supply and ready to put the top cover back on.

It's worth mentioning that if you're using a high-voltage supply which has rectifiers in series and the appropriate equalizing resistors and capacitors across them, the resistors will also form a bleeder for the reservoir capacitors. The only snag is that if there's a fuse (or anything else, for that matter) anywhere between the rectifier and the reservoir capacitors and it goes open-circuit, you've lost your bleed resistors - so don't count on the rectifier equalizing resistors to do the bleeder's job as well.

One final thought on this topic. If you're having to think about stacking electrolytics in series to get enough working voltage for something or other, you're clearly going to be involved with some high voltages. I wouldn't have been doing my job properly if I hadn't said something about the safety aspects of working with high voltage supplies. Now there's no reason at all why you shouldn't build high-voltage PSUs capable of supplying several thousands of volts if you're sensible and quite clear in your mind about what you're doing. However, you only have one life... and high voltage can be **extremely dangerous** if you don't stay sharp. Nothing else anywhere in amateur radio is one-millionth as important as making sure that you're around to do it tomorrow. You **MUST** - not 'ought to' or 'should' you **ABSOLUTELY MUST** - take very great care when working on high voltage supplies.

Making a nice PCB

'I'm a keen home-brewer, but I don't know how to get the flux off the track side of my printed-circuit boards after I've finished mounting the components on them - or whether or not to coat them with something to stop the tracks tarnishing after a month or two. How do commercial builders get that lovely finish on their PCBs?'

By spending a lot of money, unfortunately. However, there are various ways in which you can make home-brew PCBs look rather nice and also gain a bit of reliability. Here's what we do. First of all, buy a can of printed circuit board cleaner. This is a degreasing solvent based on a chemical called 1.1.1.trichloroethane; you can get an ozone-friendly aerosol can from Electromail (their reference is 567-660) or any of the usual suppliers. Before we go any further, note that this must *never* be used in an enclosed space: the fumes will make your head swim or worse. Be warned also that it has approximately the same effect on some plastics (especially polystyrene) as the summer sun has on a strawberry sundae, so be careful where you wave it about. Take the board outside and give the track side a thorough spraying; this will remove all the flux and other residues which collect on the board and leave both the PCB tracks and the soldered joints bright and shiny. At this stage I usually have a look at the joints with a magnifying glass to see if there are any dry or otherwise suspect ones. There usually are.

Having cleaned it, you can then spray it with something suitable. There are various proprietary spray PCB lacquers available, and for low-voltage applications these are all excellent. The Electromail reference for their PCB lacquer is 567-496. Alternatively, nip along to your local car accessory shop and buy a can of 'Spectra' Clear Lacquer; a couple of thin coats of this makes a superb finish. If the board has more than 1kV or so on it - suppose it's a rectifier stack for a big linear amplifier, for instance - try some 'anti-corona lacquer'(567-468). This has slightly higher dielectric strength than the ordinary PCB lacquer and doesn't craze when three or four coats are applied to make a really sound and damp-proof job. It's a good move to apply some to the component side of a high-voltage board as well.

For a Rolls-Royce finish, you can use what's known as a 'conformal coating'. This also comes in a spray (the Electromail reference is 567-682) and the beauty of it is that you can solder through it for repairs or component changes without making a mess of the board. It also has very high

dielectric strength, but at about £5 a can it's somewhat expensive. It should also be cured at somewhat higher than room temperature for best results.

Whatever you choose, the combination of PCB cleaner and a suitable spray makes for a good reliable job which should win the club's construction contest hands down!

Still with PCBs

'I built a PCB and then needed to change some components on it. I tried heating the pads with a soldering iron and levering up the ends of the components (which were bent over, as suggested in the original article) but after a while the pads and a length of track started to lift off the board - which ruined it. Is there a proper way of getting components off PCBs?' L L, London

There are two good ways of unsoldering PCB-mounted components, but you always need to take a modicum of care when you're doing so. The reason is that the copper side of a PCB is only glued to the substrate, and too much heat can easily cause the tracks and pads to peel off. You can repair them with epoxy adhesive if your manual dexterity is of the calibre displayed by those whose other hobby is putting ships in bottles; the rest of us tend to drill holes in the damaged tracks and run wires from them to the undamaged areas, which is crude but effective.

The first method of unsoldering is to use something called 'solder wick' which you can get from most component shops or the usual sources. This looks a bit like the flattened braid from some scrap UR43, but it is impregnated with a magic secret ingredient (probably chemically akin to the Squarebashers' much-praised 'DX Dust') which gives the braid an extraordinary ability to soak up molten solder. Solder wick is very easy to use. Place the free end of the wick on the PCB pad from which you wish to remove the component lead. Then clean the tip of a hot soldering iron by wiping it on a piece of damp sponge, lightly tin it and apply it to the section of wick which is on the soldered area. You'll find that all the solder on the PCB pad is absorbed into a few millimetres of the braid after a few seconds. At this stage, cut off the part of the wick which has absorbed the solder so that fresh wick is available for the next application. If you've finished with it for now, always fold the free end of the wick into its carrier so that it is sealed away; the magic ingredient seems to lose its effectiveness if it is continuously exposed to air.

You should then be able to move the component lead by gentle wiggling; if you can, just ease it gently back through the hole with pliers from the component side of the board. If it's been bent over, the best technique is to go to the component side of the board and cut off the lead a millimetre or so above its surface. You should then be able to push gently with the pliers and the cut end should fall away from the pad. If it won't co-operate because a trace of solder remains on the pad, just heat the lead from the component side with the soldering iron and push gently - that should persuade it to depart. Incidentally, it takes far longer to read about this technique than to do - and I've never yet damaged a PCB since a kind soul introduced me to the delights of solder wick some years ago. A little practice on a scrap board and you'll be an expert in no time.

Solder Suckers

The other method of desoldering from a PCB is to use a nasty-looking device known as a 'solder sucker' which resembles an overgrown syringe and works on a similar principle in reverse. The thing is prepared for use by pushing down a handle against a strong spring, which in turn pushes down a piston and expels air out of the tool's nozzle. The plunger is retained against the spring by a latch. You then apply heat to the pad, place the nozzle on the pad and press a button on the implement; the plunger flies back, sucking the solder away with a loud whoosh. I'm far too clumsy to make solder suckers work for me, although I've watched professional engineers desoldering very deftly with them; try one if you can't get on with solder wick. Having desoldered the pad, the rest of the procedure is as already described.

If you can't get at the track side of a PCB for some reason - or if you really can't cope with solder wick or solder suckers - the only other way to change PCB-mounted items is to cut their leads as close to the body of the old component as you can and then use these as anchor-points for the leads of the new one. The textbooks always recommend this method but I'm wary of it, for several reasons. One is that because you apply heat to the wires when you solder the new component in, you run the risk of heating up the area where the lead is soldered to the pad and thus creating a magnificent dry joint where there was none before. The other is that you can't use this method for many modern components intended for PCB mounting since they sit tight on the board and there are hardly any leads to get at. With most PCB-mounting capacitors, for example, even if you crush the old component with heavy pliers in an attempt to leave some wires sticking up to which you can solder a new one, you'll have problems. You tend to find that there's only about 2mm of wire there to solder to: heat that up and it'll probably drop off the board altogether. It's also obviously impossible to change most transistors in this fashion.

Loud bangs and three-terminal regulators - again

We had a few letters which commented directly on the items we discussed in last month's *In Practice*. One said that the can of an exploding electrolytic embedded itself an inch into a substantial roof beam in one laboratory some years ago; apparently it's been left there as a mute reminder to junior engineers to watch what they do with these devices! Unfortunately the signature on this letter wasn't legible, thanks to the vagaries of our fax machine; many thanks to the writer and we're sorry for the forced anonymity. Another letter - from Mr J W Hill, G3JIP - had some points to make about both electrolytics and three-terminal regulators; here's what he said: *"I would confirm the dangers of wrongly rated or wrongly connected electrolytic capacitors. However, it is not unknown for electrolytic capacitors to fail even when they are of good quality and properly used. A few years ago I was servicing an audio amplifier in which the power supply had been correctly designed. The fault, which was in a low-level stage, had been corrected and the amplifier was being given a soak test before putting it back in its cabinet. Suddenly there was a loud bang and the can of the main smoothing capacitor shot across the room. It struck a door leaving a dirty mark which resisted normal cleaning, ricocheted and finished up some fifty feet from the place where it started its unexpected flight. When the can was recovered, it was badly crushed at its strongest part. If someone had been in its path, it is likely that he or she would have been injured. As it happened, I was behind the amplifier and only suffered a ruined shirt. My spectacles were covered with a mixture of metal foil, paper and tar and it is possible that they may have saved my sight. Investigation of the remains of the capacitor showed that when it had failed, the pressure relief valve had not opened"*

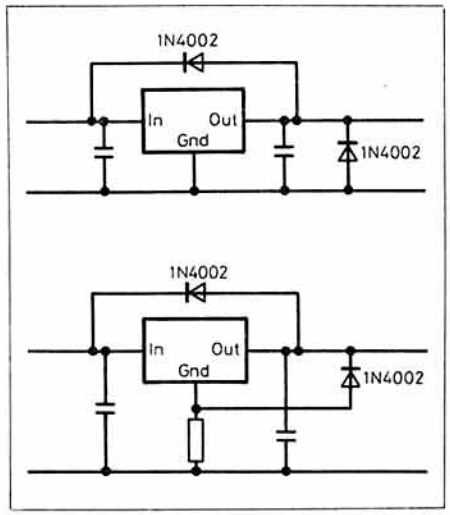


Fig 5. (top) & 6. Addition of reverse biassed diodes can help protect three-terminal regulators against fault conditions

Nasty, and it just shows what can happen even if you do the design work properly. Mr Hill went on to make a good point about three-terminal regulators which we'd neglected to mention. He wrote:

"When using three-terminal regulators there is a simple tip which can improve the chance of their survival in fault conditions. It is to connect a reverse-biased diode between the input and output terminals and to connect a second reverse-biased diode between the output and common (or ground) terminals as shown in the diagram. These two diodes, which can usually be 1N4002 or equivalent, will protect the regulator against reverse voltages which might occur because of fault conditions or, in the case of a bench power supply, incorrect connections'.

Note that you can do this with any three-terminal regulator, not just the 320/340 family - just reverse the polarity of the diodes depending on whether it's a positive or negative regulator.

That's all we have space for this month, except that I can't resist another sidelong glance at the wonderful world of hi-fi. Last time I sarcastically observed that someone was bound to go back to thermionic rectifiers in valve amplifiers because they sound better. Well, a certain British manufacturer has brought out a Mark II version of his solid-state amplifier. This has different heatsinks for its output transistors, and the press release said that this alteration *"brings a startling and profound improvement to the width of the soundstage in the vital upper-middle section of the frequency range and gives infinitely better depth and dimension to solo instruments in an orchestral context"*. The new heatsinks *"also give better slam and weight in the bass"*!

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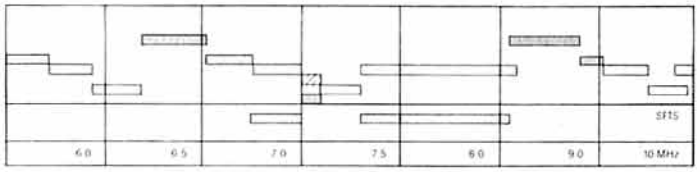

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Designed and built to the specifications of the American National Bureau of Standards (N.B.S.), these British made Yagis are ideal for the discerning amateur radio enthusiast, offering both quality and performance, whilst remaining extremely durable.

Due to a massive stock purchase, SMC are pleased to offer a fantastic 20% discount on the manufacturers R.R.P.

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		Gain (dBd)	RRP	SMC	CARR
2m Antennas					
144/5	5 ele	9.2	24.20	**19.35**	7.50
144/7T	7 ele	10.0	29.85	**23.88**	8.00
144/8T	8 ele	11.0	38.65	**30.82**	8.00
144/14T	14 ele	13.0	57.75	**45.20**	8.00
144/19T	19 ele	14.2	69.10	**55.20**	8.00
144/Gx	6 ele crossed	10.2	49.15	**39.32**	8.00
4m Antennas					
70/3	3 ele	7.1	37.25	**29.60**	8.00
70/5	5 ele	9.2	56.55	**45.24**	8.00
6m Antennas					
50/2	2 ele	4.7	34.40	**27.52**	8.00
50/3	3 ele	7.1	42.95	**34.36**	8.00
50/5	5 ele	9.2	64.40	**51.52**	8.00
70cms Antennas					
432/58	5 ele	9.2	20.95	**15.75**	3.75
432/17T	17 ele long	15.0	48.45	**38.75**	8.00
432/19T	19 ele	14.2	44.00	**35.20**	8.00
432/17X	17 ele crossed	13.4	60.00	**48.64**	8.00
Power Splitters					
144-2	2m 2 way		32.90	**28.32**	2.75
144-4	2m 4 way		37.10	**29.68**	2.75
432-2	70cms 2 way		25.25	**20.21**	2.75
432.4	70cms 4 way		29.65	**23.72**	2.75

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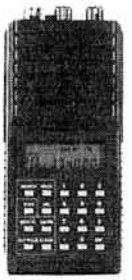
CHALLENGER BJ200

A remarkable pocket scanning receiver which receives both AM and FM (Narrow band) transmissions 26-29.995MHz, 50-88MHz, 115-178MHz, 200-260MHz, 350-520MHz .....**£169.00 Inc**

BJ200

SKYVOICE AIRHANDY

(KE-3000), airband monitor 118-135MHz/AM720 channels ..... real value at **£129.00 Inc**



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A lightweight but tough little monitor receiver 141.0-179.99MHz with accessories ..... **just £99.00 Inc**

REGENCY HX 850E

20 Channel memory AM/FM selectable scanner 60-89MHz, 118-136MHz, 140-174MHz, 406-495MHz .....**£179.00 Inc**

STOCK CLEARANCE ITEMS

SP980P	Extension L/S C/W Phone Patch	**75.00***	D3000337	FTV901 Mod Kit for use with FT980	**10.00**	S72	FT720R Band Switch Box Unit	**5.00***
FT770RH	70cm FM Transceiver 25 Watts O/P	**259.00***	D3000071	FT301D Improved Counter Unit	**19.95**	E72L	FT720R Extension Cable 4m	**9.50**
FT270RH	2m FM Transceiver 45 Watts O/P	**SOLD**	D4000006	Cable FTONE to FL2100Z	**1.50**	MMB3	FT720R RF Deck Mount	**5.00**
FT230R	2m FM Transceiver 25 Watts O/P	**SOLD**	D4000007	Cable FTONE to FTV107R	**1.50**	DIG221RMOD	FT221R Digital Display Buffer Kit	**3.00**
FT790R	70cm Multimode 1 Watt O/P	**SOLD**	D4000008	Cable FTONE to FC707	**1.00**	78B	2m 7/8 Wave Mobile Antenna	**15.00***
144TV	2m Unit for FTV901/107/707 Transvertor	**69.00***	YF107F2.4	Xtal Filter 10.7MHz 2.4kHz 6 pole	**15.00**	88F	2m 8/8 Wave Mobile Antenna	**18.00***
430TV	70cm Unit for FTV901/107/707 Transvertor	**149.00***	YF107H12	Xtal Filter 10.7MHz 12kHz 6 pole	**15.00**	GP23	2m Colinear 3 × 5/8 Wave Base	**45.00***
144/726	2m Unit for FT726R	**169.00***	YF107H600	Xtal Filter 10.7MHz 600Hz 8 pole	**15.00**	HF3VNB	12-17-30m Vertical Base Antenna	**73.15***
21/24/28	HF Unit for FT726R	**SOLD**	YF90H12	Xtal Filter 9MHz 12kHz 8 pole	**15.00**	MEM901	FT901/2 Memory Unit	**SOLD**
FP80A/FYP80	Yaesu PSU 4.5 Amps 13.5v	**39.00***	TF30F12	Xtal Filter 3.18MHz 12kHz 6 pole	**15.00**	RFP/B	FL101 Speech Processor S no after 308001	**19.00**
FV700DM	External VFO Unit for FT77 or FT707	**139.00***	TF30H12	Xtal Filter 3.18MHz 12kHz 8 pole	**15.00**	SETONE	Service Kit for FTONE	**39.00**
MMB11	Mobile Mount FT290R/790R	**29.00**	XF30B	FR101 AM Filter	**15.00**	QTR24D	Yaesu 24hr clock	**29.95**
MMB1	Mobile Mount FT101/FT901 etc	**10.00**	XF30D	FR101 FM Filter	**15.00**	VOX/CAL	Vox and Calibrator Board FT301S	**15.00**
MMB7	Mobile Mount FT7/7B	**7.50**	XF455C	FT102 500Hz CW Filter	**29.00**	BHFRG7	Battery Holder for FRG7	**1.50**
NDH518	Memory Unit for NRD515	**159.00***	XF455CN	FT102 270Hz CW Filter	**29.00**	JD110	SWR/PWR Meter 1.5-150MHz	**12.50**
FMUT77	FM Unit FT77	**SOLD**	XF8.9GA	AM Filter FT101Z FT901/2	**10.00**	FS711V	SWR/PWR Meter 50-150MHz 2/200W Remote Head	**35.00**
FMUT901	FM Unit FT901/902	**29.00**	XF8.9GF	FM Filter 12 kHz FT901/2	**19.00**	401B	Shure Hand mic Low Impedance	**19.95**
AMUT77	AM Unit FT77	**12.50**	XF8.9HC	CW Filter 600Hz FT101Z, 901/2, 707, 980	**29.00**	SP4+SPV1002	Speech Processor + Mains PSU	**29.00**
AMFMUT102	AM/FM Unit FT102	**SOLD**	XF82GA	FT102 6kHz AM Filter	**15.00**	FF5	500kHz RX Low Pass Filter	**2.50**
MRKT77	Marker Unit FT77	**10.00**	XF82HC	FT102 600Hz CW Filter	**15.00**	WARC/101Z	FT101Z Warc Mod Kit	**SOLD**
D3000105	Bandscope Unit for Y0901	**19.50**	XF82HCN	FT102 300Hz CW Filter	**15.00**	FP4	Yaesu PSU 13.5v 4 Amp	**SOLD**
D3000253	NB Mod Kit for FTONE	**7.50**	XF82HSN	FT102 1.8kHz SSB Filter	**25.00**	FYG1	Yaesu Crystal Checker	**5.75**

Carriage on the starred (*) items £5.75, on all other items £2.20.
All offers subject to availability. Free finance is not available on these special offers.

SMC NORTHERN (LEEDS) CLOSED SATURDAY AFTERNOONS

***FREE FINANCE ON SELECTED ITEMS**
On many regular priced items SMC offers Free Finance (on invoice balances over £120) 20% down and the balance over 6 months or 50% down and the balance over a year. *You pay no more than the cash prize!* Details of eligible items available on request
*Subject to status.

Free interlink delivery on major equipment
Small items, Plugs, Sockets, etc by post £1.75. Antennas, cables, Wires & larger items, Lynx up to £5. Interlink delivery available upon request for items other than radios from £7.30 depending on weight. Same day despatch whenever possible.

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Importer warranty on Yaesu Musen products. Ably staffed and equipped Service Department, Daily contact with the Yaesu, Musen-factory. Tens of thousands of spares and test equipment.

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STRUMECH VERSATOWER

MINITOWER 10M10 Series

10M10P3030FT POST MOUNTING	£482.50
10M10BP3030FT BASE PLATE MOUNTING	£511.00
10M10FB3030FT FIXED BASE MOUNTING	£475.00

STANDARD 13M20 SERIES

13M20P2525FT POST MOUNTING	£392.50
13M20P4040FT POST MOUNTING	£536.50
13M20P6060FT POST MOUNTING	£652.00
13M20FB2525FT FIXED BASE MOUNTING	£300.00
13M20FB4040FT FIXED BASE MOUNTING	£448.00
13M20FB6060FT FIXED BASE MOUNTING	£571.00
13M20BP2525FT BASE PLATE MOUNTING	£477.50
13M20BP4040FT BASE PLATE MOUNTING	£623.50
13M20BP6060FT BASE PLATE MOUNTING	£741.00
13M20M2525FT MOBILE TOWER	£2176.00
13M20M4040FT MOBILE TOWER	£2393.00
13M20M6060FT MOBILE TOWER	£2553.00

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16M20P6060FT POST MOUNTING	£911.50
16M20P8080FT POST MOUNTING	£1426.50
16M20FB4040FT FIXED BASE MOUNTING	£644.50
16M20FB6060FT FIXED BASE MOUNTING	£763.50
16M20FB8080FT FIXED BASE MOUNTING	£1219.00
16M20BP4040FT PLATE MOUNTING	£851.00
16M20BP6060FT BASE PLATE MOUNTING	£953.00
16M20BP8080FT BASE PLATE MOUNTING	£1531.00
16M20M4040FT MOBILE TOWER	£2790.50
16M20M6060FT MOBILE TOWER	£2965.50
16M20M8080FT MOBILE TOWER	£3681.00

ALL TOWERS EXCEPT MOBILES ARE AVAILABLE FROM STOCK. 10M10 AND 13M20 SERIES SUPPLIED WITH STANDARD WINCHES. 16M20 SERIES SUPPLIED WITH AUTO BREAK WINCHES. ALL ARE SUPPLIED WITH HEAD UNIT DRILLED TO TAKE GS-065 BEARING. HOLDING DOWN BOLTS FOR BP AND FB TOWERS ARE AVAILABLE AT £28.75 PER SET EXTRA.

ALTERNATIVE WINCHES AND HEAD UNITS ARE AVAILABLE AT EXTRA COST.

DELIVERY IS BY QUOTATION DEPENDENT UPON DISTANCE.

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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	£279.95	FOC

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

ROTATORS		
AR200XL	OFFSET TYPE 3 WIRE	£38.50
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
CD45	BELL TYPE METER CONTROLLER	£218.90
HAM1V	BELL TYPE METER CONTROLLER	£327.00
T2X	BELL TYPE METER CONTROLLER	£449.00
G-800SDX	BELL TYPE 450 DEG VAR. SPD	£325.00
G-1000SDX	BELL TYPE 450 DEG VAR. SPEED	£368.00
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KR500	ELEVATION METER CONTROLLER	£149.95
KR5400	AZIMUTH/ELEV DUAL CONTROL	£279.00
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

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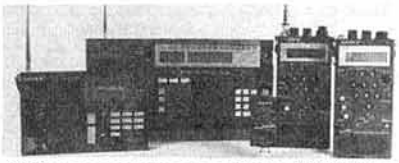
KS505	ROTARY BEARING 1 1/2" MAST	£19.95
GS-065	ROTARY BEARING 2" MAST	£29.95
GC-038	LOWER MAST CLAMP G-400, 600 etc	£16.95
9523	CHANNEL MASTER BEARING	£19.95
CK46	ROTARY BEARING 1.5 - 2.5 MAST	£34.95
MC1	LOWER MAST CLAMP RC5 SERIES	£25.00

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

SONY RECEIVERS



SMC are pleased to be able to offer the SONY range of Multiband Receivers. They feature all the latest technology allowing unequalled coverage of both broadcast and shortwave bands, yet remaining both compact and easy to use. All the models illustrated cover VHF Broadcast, SW broadcast and some SW or Air bands (only on certain models).

ICF7600DS
Compact, synthesised portable receiver covering FM Broadcast, AM Broadcast (LW & MW) and SW bands with SSB. Large LCD display, Keypad entry and memory scanning.

ICF200ID
Compact, lightweight synthesised receiver including FM Broadcast, AM Broadcast (LW & MW) Airband and SW Bands with SSB. Keyboard entry, memory scanning and numerous other functions.

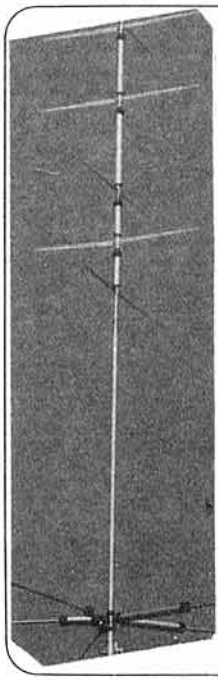
ICFPR080
Compact, handheld scanning receiver covering 150 KHz to 108 MHz and 115.15 to 223 MHz. SSB, FM (W & N), AM modes. 40 memories and PRO80 8 way timing system.

AIR-7
Compact, handheld scanning receiver AM/FM reception covering, VHF broadcast airband and AM Broadcast (MW). 30 channel memory and Keypad entry.

ICF7600DS ... £159
ICF200ID £299
ICFPR080 .... £299
AIR7 ..... £299

A full range od accessories is also available
Carriage free on all above Receivers (not accessories)

COMET & HOKUSHIN ANTENNAS



New from Comet the GTi range of antennas for those of you who don't want your hot hatchback to look like a porcupine. Comet have created the new CHL21J and CHL23J mini dual band antennas, for best performance we recommend you use the matching mounts TBR, RS17 for hatchbacks and coming soon the RS16 mini gutter mount and CK-3LX mini cable assembly.

CHA5	WX1	CA2X4WX	CF416MN
HF Vertical	VHF/UHF Base	VHF/UHF Base	Duplexer
80-10M 5 Band	144/432 MHZ	144/433MHz	1.3-150MHz/
C/W Radials	4.5/7.2dB Gain	6.5/9db Gain	400-540MHz
200 W Pep	200W Max	200W Max	PL VHF/HF 'N' UHF
£210.00	**£49.95**	**£79.00**	200W/100W UHF **£25.50**

MOBILE ANTENNAS

2QW	2M 1/4 WAVE	£4.95
2NE	2M 5/8 WAVE FOLD OVER	£13.25
2VF	2M 1/2 WAVE FOLD OVER	£16.13
78B	2M 7/8 WAVE BALL MOUNT	£15.00
78F	2M 7/8 WAVE FOLD OVER	£21.50
88F	2M 8/8 WAVE	£24.10
258	70CM 2 x 5/8 WAVE	£29.37
358	70CM 3 x 5/8 WAVE	£33.73
268E	70CM 2 SECTION COLINEAR	£32.80

DUAL BAND MOBILE

70N2M	2M 1/2 WAVE 70CM 2 x 5/8	£24.95
70N2DX	2M 6/8 WAVE 70CM 3 x 5/8	£37.75
CHL-21J	MINI DUAL BAND MOBILE	£14.95
CHL23J	SMALL DUAL BAND MOBILE	£16.90
CA2X4KG	2M x 5/8 70CM 4 x 5/8	£39.95

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GP23	2M 3 x 5/8 COLINEAR	£45.00
GP144W	2M 2 x 5/8 COLINEAR	£42.00
GP144DX	2M 2 x 5/8 COLINEAR S/ST	£53.13
SQ144	2M SWISS QUAD VERT/POL	£53.13
GP432X	70CM 3 x 5/8 WAVE COLINEAR	£88.20
WX1	2M/70CM COLINEAR	£55.00
CA2X4WX	2M/70CM COLINEAR	£79.00
CA2X4MAX	2M/70CM COLINEAR HIGH GAIN	£99.95
CF416MN	DUPLEXER 1.3-150/400-540MHz	£25.50

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FT690 MK2, 6M multimode	£389
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FEX767/6 6m card for FT767	£159
FEX767/2 2m card for FT767	£159
FEX736/1.2GHz card for FT736	£399
FEX736/50 6m card for FT736	£219

ICOM

IC32E dual band handie	£379
IC3210 dual band mobile, 25w	£479
IC2400E NEW dual band mobile plus dual receive	£599
IC2SE miniature 2m handie, plus extended coverage	£269
IC4SE 70cms miniature handie, plus Cellular Rx	£299
IC725 economy HF transceiver	£699
IC735 HF transceiver	£899
ICR71E HF receiver	£799
ICR7000 25-2GHz receiver	£899
ICR7000HF as above with HF general coverage	£989
IC 228H 45w mobile transceiver	£369

STANDARD

AX700 wide band RX with band scope	£499
C112 miniature 2m RX plus extend gen. coverage	£199
C412 as above, but 70cms plus extend gen. coverage	£229
C520 NEW dual bander, plus dual RX (Replaces C500)	£389

KENWOOD

TS940S HF Transceiver inc auto ATU (display models)	£1,895
TS680S HF plus 6m transceiver	£929
TS140S HF transceiver	£799
TS440S HF transceiver, ex ATU	£1,039
TS440S with ATU	£1,199
SP430 matching speaker for above	£39.95
PS430 medium duty PSU for above	£175
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AT250 auto ATU for above	£349
TH75E NEW dual band handie, dual RX complete	£389
TM701E NEW dual band mobile	£449
TM731E dual band, dual RX new mobile	TBA
MC80 desk microphone	£53
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MC85 desk microphone	£95
MC43S hand microphone	£22

SCANNING RECEIVERS

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AOR2002 base scanner	£469
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ICOM ICR7000	£899
ICOM ICR7000HF	£989

SECONDHAND GOODIES AT KNOCK OUT PRICES ALWAYS AVAILABLE. CALL 01-997 4476.

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All our products are designed and made in Britain.

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VISA — *VISA AND ACCESS WELCOME* —

TX-3
RTTY/CW/ASCII TRANSCEIVE

Split-screen, type-ahead operation, receive screen unwrap, 24 large memories, clock, review store, callsign capture, RTTY auto CR/LF, CW software filtering and much more. Needs interface or T.U.

BBC-B/Master and **CBM64** tape £20, disc £22.

SPECTRUM tape £35, + 3 disc £37 inc. adaptor board (needs interface/T.U. also).

For **VIC20** we have our RTTY/CW transceive program. Tape £20.

RX-4
RTTY/CW/SSTV/AMTOR RECEIVE

This is still a best-selling program and it's easy to see why. Superb performance on 4 modes, switch modes at a keypress to catch all the action. Text and picture store with dump to screen, printer or tape/disc. An essential piece of software for trawling the bands. Needs interface. **BBC-B/Master, CBM64** tape £25, disc £27. **VIC20** tape £25. **SPECTRUM** tape £40, + 3 disc £42 inc. adaptor board (needs interface also). The SPECTRUM software-only version (input to EAR socket) is still available £25, + 3 disc £27.

TIF1 INTERFACE Perfect for TX3 and RX4, it has 2-stage RTTY and CW filters and computer noise reduction for excellent reception. Transmit outputs for MIC, PTT and KEY. Kit £20 (assembled PCB+cables, connectors) or ready-made £40, boxed with all connections. Extra MIC leads for extra rigs £3 each. State rig(s). Interface only available with TX-3 or RX-4 Software.

BBC LOCATOR with UK, Europe, World maps £10, **MORSE TUTOR** £6, **LOGBOOK** £8, **LOCATOR** £7, **RAE MATHS** £9 for BBC, Spectrum, CBM64, VIC20, Electron. All **BBC** and **CBM64** programs are available on **DISC** at £2 extra.

NEW!!
RX-8 FOR THE BBC COMPUTER

FAX, HF and VHF PACKET, Colour SSTV, RTTY, CW, AMTOR, UOSAT, ASCII.

Receive them all with every possible feature and superb performance. Full printer and disc support. The best receive system ever.

Complete system of EPROM, interface, instructions, all leads and demo cassette **£259.** Send for our brochure on this amazing product.

PEP BOARD. Converts any RF power meter to read p.e.p. Assembled and tested PCB, + mounting kit and full instructions. **£12.**

Prices include VAT and P&P, 1st Class inland, airmail overseas, normally by return. Eire, C.I., BFPO deduct 13%.

technical software

Access

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VISA

GUIDE TO FACSIMILE STATIONS
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Packet 9600 Baud

All is not lost yet!

I have still to date had no response from my appeal to any stations who have a working link on 9600 baud - that is, over a path greater than a few miles. I began to wonder whether it was due to the complexity of setting up a 9600 baud modem with a commercial transceiver that was the root of the problem. Well, to our rescue will be two new blackboxes, both designed for 9600 baud operation.

The first is from PacComm who have exhibited a prototype of their Narrowband 96 Packet System which includes their IPR (Integrated Packet Radio). It features a Tiny 2 packet radio controller, a 9600 baud modem and a commercial-duty crystal controlled RF deck all in a box that measures 3 x 6 x 7 inches. I must add that they are also about to release a new range of TNCs, which include some clever software. Their intention is to give an *on screen* status display, giving a ten-element bar graph tuning display and all the LEDs normally found on the front panel. This display can be moved to any position on the screen or removed while still providing a connect alarm.

The second is imminent from TAPR (Tuscan Amateur Packet Radio); at the moment it is being offered in the USA for 144MHz or 220MHz (neither ideal for this country), but they say that they hope soon to offer versions for 70cm and possibly 1.3GHz. The units available now have five crystal-controlled channels, 25W RF, switchable between 1200/9600 baud, full duplex capabilities and they claim switching times of one millisecond. An option available will also allow 19.6kBits/sec.

As you can see 9600 baud *is* alive and well and will soon be available without the problems of interfacing or major surgery (apart, of course, to the bank balance!).

TAPR vs NORD<>LINK

TAPR stays in the news this month; it has been reported in *Gateway* (the ARRL Packet Newsletter), that, in light of NORD<>LINK's response to the allegations that their system TheNet is a direct copy of TAPR's NET/ROM, the Board of directors at TAPR have asked for the return of their software development system. At a meeting earlier in the year Ron Raikes, WA8DED, NET/ROM's author, claimed that NORD<>LINK, purveyors of TheNET firmware, had copied his code. Ron presented an independent analysis by Thomas Allen, WA6IGY, which supported his allegations. It was the reply to these allegations "that TheNet is not an original development but rather a direct copy of NET/ROM" that did not satisfy the board.

Network Node Corruption - 13-18th July

As groups in the SW Midlands will know, many of the nodes in their area suffered a corruption of node tables; this started on 12th July.

The format of the corruption was deletion of the first character of the node's callsign and its alias; a corrupt digit was gained prior to a new corrupt SSID. It appeared to the onlooker that all the information had been moved left by one byte.

Various attempts were made to trace the source of the corruption, but all to no avail. It was decided that the best approach was to shut down all affected nodes in the area, clean out the tables and reset to 'known safe' neighbours.

In all, 30 ports were closed, purged, and reset by a large group of operators co-ordinating via GB3MH (voice) repeater. Slowly the links were remade and the network brought up again. But after a few hours the problem returned. An answer had to be found!

Using Thor TNC-2 software which decodes level 3/4 traffic the

Beginners

As promised here is the end of the glossary R-Z.

Radio port - the TNC port that is connected to a radio transceiver.

Random-access memory (RAM) - data storage device that can be read and written to. Note that this memory is volatile and is lost on removal of power.

Read only memory (ROM) - data storage device that can only be read.

Receive Not Ready (RNR) - an AX.25 frame that indicates the receiving station is not able to accept more information.

Receive Ready (RR) - an AX.25 frame that indicates the receiving station is now ready to accept more information. This frame cancels the condition set by RNR.

Reject (REJ) - An AX.25 frame sent by the receiving station asking for a retransmission of the previous frame.

RF Modem - a communication device consisting of a modem and a radio transmitter/receiver.

Roundtable - a part of some mailbox software ie W0RLI that permits more than two stations to hold a conversation.

RUDAK - Regenerativer Umsetzer für Digitale Amateur Kommunikation, a digipeater built for use onboard the Phase III-C satellite by AMSAT-DL.

SSID (secondary station identifier) - a number after the station callsign to differentiate between two or more stations operating under the same callsign.

Send sequence number - a number in sequence sent to a destination callsign with the packet; it is compared with others received to ensure that the packets are received in the correct order.

Serial interface - the communication port of the terminal emulator that transfers bit-encoded data bit-by-bit.

SABM (Set Asynchronous Balanced Mode) - An AX.25 unnumbered frame that initiates a connection between two packet stations.

Source - originating station.

Start bit - an extra bit that precedes a transmitted character to indicate its beginning in asynchronous communications.

Stop bit/s - one or two bits added to the end of the character to indicate its end in asynchronous communications.

Stream - one connection in a multiple connection application.

Stream switch - a character used to switch between stations in a multiple connection application.

Supervisory frame - an AX.25 frame that controls the communications link.

Synchronous - a method of transmitting data using the timing of the modem's clock to synchronise data.

System Operator (SysOp) - an individual or member of a group who is in charge of maintaining a mailbox.

TAPR - Tuscan Amateur Packet Radio Corporation.

TI timer - the timer that causes an AX.25 system to interrogate the linked TNC after a set time of not receiving a packet. Also known as the acknowledgment timer.

TCP/IP - abbreviation for Transmission Control Protocol/ Internet Protocol. Protocols proposed as possible network and transport layer amateur radio protocols, by Phil Karn, KA9Q.

Terminal - short for data terminal equipment or a computer emulating such equipment.

Terminal emulation software - the software that allows a computer to act as a terminal.

Terminal Node Controller (TNC) - an amateur radio packet assembler/ disassembler which may or may not contain a modem.

TNC 1 - the first general public TNC based on 6089 microprocessor.

TNC 2 - the second TNC available to the general public based this time on a Z80 microprocessor. This design has proved to be the most popular.

Turnaround - the time taken to switch between receive and transmit in a half duplex situation.

Unconnected packets - a packet or packets sent from the source station with no destination information. Used for beacons, CQs and round table communications.

Unnumbered Acknowledge (UA) - An AX.25 unnumbered frame that acknowledges receipt and acceptance of a SABM or SConnect.

Unnumbered Information (UI) - An AX.25 frame sent with data from the source station with no destination address.

Upload - to send files to a mailbox or PBBS. Can also be used between two packet stations.

User interface - the set of TNC commands and status messages that are available to the user.

Virtual circuit - the appearance of a direct connection between the source and destination.

Virtual circuit protocol - a Network layer protocol that sets up and maintains a clearly defined path between two stations.

W0RLI mailbox/gateway - Public domain software for PBBS/Mailbox currently the most used in this country, written first in Z80 Assembler language and then in C by Hank Oredson W0RLI and David Toth VE3GYQ. This software formed the base that most mailbox software followed. It was followed by Jeff Jacobsen WA7MBL who wrote his software in Turbo Pascal.

Zero bit insertion - a process that prevents any other AX.25 packet from having the same unique contents in the flag field, it is also known as bit stuffing.

Well that brings me to the end of the jargon. Next month we can get down to real packet radio, with the first in "How to get on the air" which will explain what you need and how to set it up.

group logged over 2 hours of activity on 70cm to disk and then sifted through it. With some clever calculations it appeared that one possible source was G0DXX. The question was "how?"

It was noticed that corrupt entries only occurred at G0DXX part way through receiving a UI frame. Further investigation showed that the corruption occurred after a record containing a route quality of 113. During reception the BPQ node would lose the quality byte and accept the rest of the data, giving the shifted effect.

The ASCII character represented by 113 is lower case 'q'. The TNC at G0DXX was now suspected to be the problem because missing 'q's had been seen before.

Basically the problem is the TNC-220 when in KISS mode does not function correctly with BPQ network node software on the PC. The resulting effect is that decimal 113 "lower case 'q' " is not passed back to the PC, resulting in corrupted data.

The real problem is that KISS mode has no error checking and can allow corruption to occur.

As far as the group can tell there is no bug within the BPQ code but John Wiseman, G8BPQ, is aware of the problem and further checks are being made.

The group wishes to thank all amateurs who were directly or indirectly involved in this massive operation to reset all the nodes, and apologise for taking the network down for a considerable time.

In turn, I would like to thank G8TIC/Mike and G8VPQ/Robin for the above information; I believe that this is the first major upset the network has had.

Licences

With the quantity of new GB7 licences being issued I have decided not to print them when they are granted but instead as they become operational. For this reason the only one to report this month is GB7WP, Huddersfield, 1.3GHz which was switched on in June. If you have been granted a licence and it is now operational please let me know. A packet message will suffice to G6HIU @ GB7HIU.

Software

Latest versions at this time of writing are:
G4YFB ver 2.14: Version 3.xx should be with us by Christmas.
W0RLI ver 10.10: Slightly quicker with a few bugs fixed.
G8UFQ ver 0.95.
G8BPQ ver 3.23: works with AA4RE; allows separate alias calls on individual bands.

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

DATASPACE '89

This event is, of course, now well out of the way for this year, but as I write this on 3 August there's little doubt that the show was a big success, judging by the telephone calls and letters that have already been received at the office of AMSAT-UK. We have also had a few congratulations from users of the AMSAT Nets. Thank you to all who attended, as it was you that made the show the best ever. We had 211 people in attendance on the Saturday, plus members of UOSAT staff.

Now I'll give you a quick run down of events within DataSpace '89. Thursday 27 July got off to a good start as the International Forum. We put this on as a follow up to the 1st International Meeting at Godalming last year. Subjects were wide ranging, and intentionally left 'loose' so that a forum atmosphere would be created. I'll elaborate on that meeting next month. Suffice to say it was chaired by yours truly, and the principal speaker was C Van Dijk, PA0QC (Chairman of the VHF/UHF Committee, Region 1 IARU).

Friday 28 was given to the Packet/Data subjects. I was disappointed to see that only a small proportion of Packet men were at this meeting; there was a large number of Satellite/Packet users, but some of the big names of Packet were conspicuous by their absence. I wonder why? Did all of the 100-plus SysOps who turned up at the SysOps meeting a few weeks ago go on holiday, or take their wives potholing?

Saturday 29 July was another very hot day, and we were all glad of the fact that the meeting was held in the larger 250-seat lecture hall. It comprised a mix of packet and satellite subjects from speakers from the UK, Europe and USA. During the evening AMSAT-UK's AGM occupied about an hour, followed by some serious relaxation, drinking, and setting the world to rights. The colloquium's Saturday social get-together is a sight to behold: everyone from the twenty-one nationalities represented at Dataspace '89 had a point to make, and did so! The later part of Saturday evening was taken up with the usual Junk Sale, which made a few bob for satellite funding. I was personally disappointed that the trade did not, this year, provide one item for this 'sale of the century' considering the amount of publicity afforded to the item and the company.

Sunday, 30 July - a satellite day - was in full swing by 0930. We started off with such famous names as Leonid Labutin, UA3CR; Geoff Perry of Kettering fame, the right Hon. Patrick Gowan, G3IOR; Martin Sweeting, G3YJO and many more.

The full programme and the Proceedings of the Dataspace '89 have been printed, are available *now*, and in fact were available before the events took place.

If any non-member of AMSAT-UK would like a copy, then a quick call to me will get one on the way if you have a Visa or Access card.

This brings me to the point of Prestel. AMSAT-UK are *not* on the Prestel system any more. As I paid for this, and BT have seen fit once again to increase the price for the yearly subs, I have had to call a halt to it. Communications with me are therefore now by fax, phone or mail.

Satellite info

Oscar Ten

There are still a few, but very few, folk using this old 'gal. I wonder why? Signals from Oscar 10 have been excellent in the last month, but only about two people on the bird. I made one QSO a few weeks ago when the transponder was 5/9 for hours. A lot of newcomers probably do not know that the Transpond up/down frequencies are not the same as Oscar 13. In which case let me print them here.
Centre Frequency for UPLINK is 435.100MHz. Bandwidth: 150kHz.
Centre Frequency for DOWNLINK is 145.900 MHz. Bandwidth: approx. 170kHz (the bandwidth is a bit unpredictable at the ends of the passband).
You may use the satellite at all times, except when you hear the Beacon on 145.810 FM'ing.
Frequency Cards, in pocket card form, are available at a very reasonable cost from you-know-who. Also available are the full set of frequency cards for *all* satellites now in orbit.

Oscar 13

This bird is still surprising me with it good, very good and poor days. Mostly, of course it is a matter of picking the correct squint angle (bore sight). I personally do not complain as I only use AO-13 on a "If time permits basis." But from a few remarks were heard at the colloquium about Mode B, like "It's a funny old bird," I must mention the excellent demonstration provided by a portable station by Freddy, ON6UG. The list of equipment - portable remember - comprised a two metre collapsible dish, full mode L transverter, cables, helix feeds to the dish and a full kit of tools.

The station, GR2SAT, was set up by Freddy in one of the small lecture rooms at the University of Surrey and some 20 QSOs were made during the three days. Remember it was all on mode L, not mode B. It proved to be a very fine piece of gear - ON6UG is at this date writing it up for Oscar News and other AMSAT groups. RSGB provided the prime mover, the FT726, from RSGB-HQ, for which many thanks. I would like to thank the few radio amateurs who helped Freddy set up the station during the weekend.

Incidentally, by the time you read this I will have sent QSL's to all stations worked on both sites, ie, GB2SAT and G0AUK/P.

MIR

News just arrived indicates that the Russians will send up another crew to the MIR space station in the next few weeks, but I understand from sources near the launch site that no radio amateur operation will be available for the first few weeks.

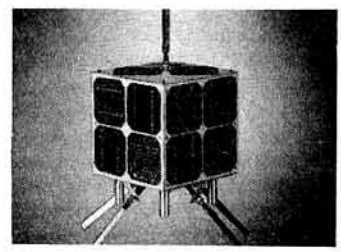
RS12/13 and RS14

There appears to be a good chance of these satellites being launched at the beginning of 1990. More as and when it happens.

Schedule for Oscar 13:
16 Aug. to 16 Nov.
Blong.210. Blat 0.
Mode B 003-160 MA;
Mode L 160-200 MA;
Mode B 200-240 MA;
Off 240-003 MA;
Mode S 150-222 MA

As already stated in past issues, the full daily schedule is available from me for the courtesy of an SASE. I have had no takers as yet.

That's all for now. Any up-to-the-minute information must of necessity be given in *Oscar News* (five days) or on the Amsat Nets (one day or less). If you want me to continue this column I need some feedback from you, the readers, on what you require.



Pictured above is the new satellite which has been constructed by the ARI (Associazione Radioamtori Italiani) in Italy. Based on MicroSat technology, the spacecraft was developed in co-operation with AMSAT-NA and Dr Alberto E Zagni, I2KBD. (Photo from: *Radio Revista*)

MIKE DIXON G3PFR
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The Summer Recess

This is a very sparse month for news: maybe it's because, as I write, it is the beginning of the summer holiday 'high season' and people are far too busy getting ready for the traditional break to think about operating. Or is it really as suggested recently, that people have 'emigrated' to other, lower frequency bands where there have been some quite spectacular ionospheric fireworks? Whatever the cause, this months' column reflects the fact that things have been a little quiet.

Martlesham Round Table

The next round table at the British Telecom Research Laboratories, Martlesham, courtesy of the management and Martlesham Radio Society, will be held on Sunday, 12 November. It is hoped to have Arie Dogterom, PA0EZ, the Veron VHF Manager present and that he will address the meeting on the state of microwave development and use on the nearer continent: long an advocate of narrowband techniques at higher microwave frequencies, Arie will, no doubt, exhort UK microwave operators to adopt some of the newer devices and techniques which are easier to get there than they are here! Details of the meeting arrangements are available from Dave, G4FRE or Sam, G4DDK.

Local Oscillator Source for 2.3GHz

Some while back, I mentioned that Sam, G4DDK, had designed a local oscillator source for the 13cm band and had produced a few copies of the information which was available at the Sandown Convention. There has been some interest in this design and it has been decided that if funds permit, we will have some boards produced for the design. I can't yet give a time scale for this, although I expect it will be later this year. Meanwhile several more 'prototypes' of the strips have been produced, all with satisfactory results. So watch this space for developments!

Apology

Some members of a packet group from Kent asked for more details of the well established G4DDK 1.3GHz local oscillator strip and companion amplifier whilst at the Sandown Convention. Unfortunately, in the welter of paperwork which followed this event, I lost the callsign and address given to me. If the persons concerned would like to get in touch, I have produced a short collection of information on these two designs which will prove useful to them if they will make themselves known!

From Here and There

From Ian Cornes, G4OUT, our VHF Awards Manager, comes the news that Keith, G6DER, has just hoisted his 1.3GHz Squares Award to 70 Squares (Award No.4, 13 June 1989) by working the following new squares/stations: JN06, F1EAN; JN16, F6HEO/P; JN35, F6HYE/P; JN36, F6HYE and JN79, OK1KKH. John, G4BYV, lamented the use of 1296.200MHz by G6LEU and G3VVB for 'nattering' – this was, as corrected last month, my misinterpretation of Cyril, G3VVB's, letter. John also said that he looks forward to trying to work Chris, G6CHW, on 9cm just as soon as Chris is fully operational on that band. It appears that John has been heard by Chris who now only needs to complete his transmitter in order to make a two-way contact over an all-land path, rather different to the paths which John is used to working across the North Sea. John added that he had "managed to work one OZ and three SM stations on 6cm (5.7GHz)" during a recent Scandinavian Activity Contest. He also reported that Simon, G3LQR, had worked LA6LCA on 23 May for a G to LA 'first' on 6cm.

Other Countries

News of flourishing interest in microwaves in other parts of the world has come indirectly from several sources. First via Angus, G3OSS, a specification sheet for some of the microwave amplifiers produced by Hi-Spec (PO Box 387, Jupiter Florida 33468, USA). These are a range of professional standard RF units covering the range 900MHz to 2.45GHz and offering between 50 and 200W+ output from one or two valves of the 7289 series. Our American colleagues now have a band at 900 to 930MHz (33cm) which, although strictly UHF, uses and benefits from the employment of microwave techniques. Other products include power dividers, 90° and 180° hybrids and interdigital filters, amongst others. Don't forget that Cyril James, G3VVB, offers a similar service, although somewhat less ambitious, in the UK.

Dave, G4FRE, (news via G4DDK) has just returned from a business trip to Japan. Whilst there he was able to survey the amateur scene and noted a good deal of interest in microwaves via published constructional articles in the amateur press and, I understand, via a wide choice of easily obtainable GaAs devices available over-the-counter at amateur prices. This aspect of supply has always been something of a problem in the UK, of course.

The July issue of *Radio Rivista* (the Italian national society's equivalent of *RadCom*) carried a two page article on the construction of a high performance two stage 1296MHz preamplifier, designed by Peter Riml, OE9PMJ and described by Michele Senestro, I1TEX. Using stripline techniques in a simple sheet-metal enclosure, the use of Mitsubishi GaAsFets result in a gain of some 35-36dB with noise figures of either 0.6dB (MGF1402/MGF1200) or 0.25dB (MGF1404/MGF1412-07). Quite simple constructional techniques are used which result in performance pretty close to 'state-of-the-art'.

Avantek have introduced a new low-cost, low-noise GaAsFet (the ATF13284) which is usable as an amplifier from 2 to 16GHz or as an oscillator to 25GHz. At 4GHz the performance is quoted as 0.7dB noise with 15dB gain, whilst at 12GHz the corresponding figures are 1.6dB noise with 8dB gain. Further details and data sheets from Avantek distributers (eg. Bonex).

Barry, G8AGN, is the keeper of a 10GHz beacon at Emley Moor (GB3MLE). Until recently reports of beacon reception had been limited to fairly local distances – up to about 100 to 150km. On Friday, 7 July, GB3MLE was heard on the LA coast by a number of Norwegian amateurs who were working from a lighthouse, exact position not known. Nevertheless, propagation conditions must have been quite phenomenal, particularly remembering that the beacon is a wideband device and therefore quite possibly difficult to find on an exact frequency!

Microwave Newsletter

Issue 3/89 has just appeared and, as promised last month, herewith is a brief summary of its contents. The editorial bemoans the lack of activity and reports and pleads for support for *your* microwave contests and activity periods. There was some feedback on the earlier articles on microwave oven magnetrons and laser sources. Sam, G4DDK, related recent 10GHz narrow-band experiences, his interest in the mode having been re-kindled by listening to the 70cm talkback and relayed 10GHz signals when G3LQR recently worked a number of Continental stations.

His article covered some of the difficulties encountered whilst trying to get a recent 'simple' DC0DA design working, the eventual solution being to use a 2556MHz output (from the board mentioned earlier) fed into a DK2VF (waveguide/coaxial) multiplier to supply the local oscillator needs: this led to successful copy from a number of PA/PE beacons and sked signals from ON7YK. A useful plot of local oscillator power versus noise figure and gain was given in the article.

At the other end of the 10GHz technology scale, there was the first part of a useful two-part article by Mike, G3LYP, on 'The design, construction and testing of a 10GHz wideband system'. The first part covered receivers, much of which has been said before, but it was refreshing to see the approach described differently. The next issue will deal with transmitters. Finally there was a report on the Winchester Round Table, which I briefly covered last month, a number of readers' ads. and a short operating news section.

BOB TREACHER BRS 32525
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Contests

As we head into September, we enter the autumnal HF Contest season. There are quite a few weekend contests designed to attract many amateurs onto the bands which will make it easier for listeners to log some good DX. Why not look at the Contest Calendar and spend some time logging some DX in these events. Then let me have your reports.

One Listener Contest that will not have an SWL event in 1990 will be the Derby and District ARS Contest. SWL support has been poor in recent years, so the Committee have decided to shelve the SWL section next year. This is a timely indication of what is likely to happen if SWL support for contests dwindles below its current level.

One event which is back in the Calendar this year is the Cray Valley SWL Contest. This has been missing for a couple of years, but the Society decided the time was right to promote it again, and I hope that listeners will give it their support. Copies of the full rules are available from Owen Cross G4DFI, whose address was given last month. The dates are 16/17 September for the CW event, and 23/24 September for the SSB section. Please give the event your support otherwise the CVRS might decide not to run their contest in 1990.

HF Awards

Readers will recall that mention was made last month of several listeners who were interested in how to claim HF Awards. GW4BKG has been in touch and hopes to have some details with me soon. Hopefully, details will appear next month.

WWLF

The World-wide Listeners Foundation is a new organisation on me. It is based in France and run by two French SWLs called Mike and Steven. I am trying to find out more about the organisation. In the meantime, the WWLF are inviting SWLs around the world to elect the 'Best DX'ER of 1989'. I take this to mean that they want SWLs to put forward nominations for the 'best amateur of the year'. More information will cost you 2 IRCs, but listeners are invited to write to Mike and Steven at: PO Box 124, 28113 Luce Cedex, France. I have no information about a closing date for entries, so get your letters off to WWLF as quickly as possible.

RTTY Challenge

Jean-Jacques Yerganian ONL383 asked me last year to run one of my challenges to coincide with an RTTY contest as he felt that there was quite some interest in RTTY among SWLs now. As I try to provide something for everybody, I am quite prepared to organise such a challenge to coincide with the big CQWW RTTY over the weekend of 23/24 September.

The rules are quite simple. One point for every station heard on each band, multiplied by the number of different countries heard on each band. This scoring system is the same as my annual SSB and CW Challenges in October and November. Logs should be sent to me and should be postmarked no later than **31 October.** I will be interested to see what response there is to this challenge as it is the first time that RTTY interests have been encouraged in the column.

Connectors and Cables

GW4HBZ had sent details of his firm, Waveband Electronics, and their made-to-order coaxial leads service, which he felt might interest some listeners. They can supply almost anything, so an sase to the firm seems the best course of action. The address is: Waveband Electronics, 3 Lon Howell, Denbigh, Clywd LL16 4AN.

Antenna Noise Bridge

My June column carried details of an antenna noise bridge. As a result, I have had a large number of requests for a circuit diagram. I have therefore included one here (see below) and hope it will satisfy those who expressed an interest in such a project.

Pen Picture

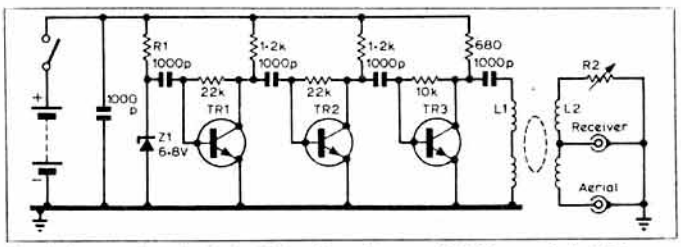
This month's pen picture is of Arthur Miller BRS88969. He started listening to short wave radio in 1950 at the age of 13, concentrating on the broadcast bands with a domestic RX for two years. Since 1952, he has mainly been an amateur bands SWL. His first communications RX was an ex-RAF R1155A with a separate power unit/speaker. In 1948 he exchanged this for an Eddystone S640 which served him well until 1973 when he bought a Trio JR-310, which he kept faith with until 1977, when an FRG-7 was acquired. He bought a JRC NRD-525 this year.

His antennas have always been end-fed long wires and he currently has 33', 66' and 132' wires. The 33' has been particularly successful, even when used indoors. He is an avid amateur bands SWL now and listens on all bands from 28-1·8MHz. His favourite band has always been 7MHz. His all-time countries tally is 348. He still needs FO/X, T31, Heard Is, ZA, ZK1/N, 3D2X and Bouvet Is. His band scores, starting from 1·8MHz are — 89, 232, 252, 338, 317 and 279. He has 320 countries confirmed, but not send out reports any more. He likes contests but has never been particularly interested in Awards.

The shack of Arthur Miller BRS88969 showing FRG-7, JR-310 and S640. A PS is that the table doesn't always look that tidy!

SWL Interest in Marconi Day

My July column referred to G3FWE's comment that there had been no SWL claims for the 'International Marconi Day' Award.



Circuit diagram of a typical noise bridge. Transistors are 2N2222 or equivalent; R1 (4k7) is adjusted for maximum noise output at the highest frequency. It may be necessary to select the zener for best noise output. L1 and L2 are wound on a toroid core. The unit will run off a 9V battery.

A couple of months ago, I ran a feature on 144MHz Squares Awards. By way of showing listeners what dx can be heard on 144MHz, this photo shows the DXCC countries confirmed at this QTH.

Anthony Tuite, a G-QRP Club SWL wrote to put the record straight. It appears that he had claimed this Award and at the time of writing had not received the certificate from the Cornwall ARC. He sent me a copy of his log which shows loggings of GB2IMD, GM4IMD, IY4FGM, EI2IMD, GB4IMD, K1VV/IMD and GB0IMD. This would seem to have qualified him for the Award, and I hope that he has now received it.

Finale

This month's SWL is shorter because of holidays. The column will be back to its usual length next month, and will include details of my annual CQWW Challenge. News, photos, etc for the November issue to reach me no later than **16 September** please.

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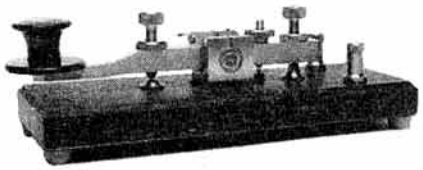

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CONTEST NEWS

RULES

COMMONWEALTH CONTEST 1990 RULES

(Participation in this contest will count towards the HF Contest Championships for UK entrants)

1. Date and time. 12:00GMT Saturday 10 March to 12:00GMT Sunday 11 March, 1990.

2. Aims. The Commonwealth Contest is intended to promote contacts between stations in the British Commonwealth and Mandated Territories.

3. Sections. Single-operator entries only from RSGB members resident in the UK, and licensed radio amateurs within the British Commonwealth or British Mandated Territories. Entries may be single OR multi-band (single-band entries should claim points on one band only; details of contacts made on other bands should be in the form of a checklog and will not score points or bonuses; multi-band entries will not be eligible for single-band awards). Entries will not be accepted from GB prefixes, nor marine/aeronautical mobiles.

4. Bands and mode. A1A only in the 3.5, 7, 14, 21 and 28MHz bands. Entrants should operate in the lower 30kHz of each band, except when contacting novice stations that operate above 21030 and 28030kHz. Crossband contacts will not count for points or bonuses.

5. Operation. Entrants must operate from the same location during the contest and strictly within the terms of their amateur licence. Entrants may not receive any assistance whatsoever during the contest, including the use of spotting nets or other bonus assistance.

6. Exchange. Contacts may be made with any station using a British Commonwealth prefix, except those within the entrant's own call area. A contest exchange consists of RST and serial number (starting at 001 and increasing by one for each successive contact).

7. 'Headquarters' stations. Commonwealth society HQ stations active during the contest will also send 'HQ' after the serial number to identify themselves. Every HQ station counts as a separate call area (and thus attracts the 20 point call area bonus), and entrants may contact their own HQ stations for points.

8. Scoring. Score 5 points for each completed contact, plus a bonus of 20 points for each of the first three contacts on each band with a given Commonwealth call area (as shown in the accompanying list). Note that all UK prefixes count as one call area, and UK entrants may not contact other UK entrants. Duplicate contacts must be clearly marked as such and no points or bonuses may be claimed (unmarked duplicates will be penalised at ten-times the claimed points plus the points themselves, and entries with more than five such dupes may be disqualified). Dupe sheets would be appreciated by the adjudicator.

9. Documentation. Use separate log sheets on each band, in the IARU standard format. RSGB HFC1 contest log sheets are preferred, although overseas entrants may use similar sheets from their national societies. Computer-printed entries should follow the same format, showing GMT, callsign, RST/serial number sent, same received, bonus points and QSO points claimed against each contact. Complete a cover sheet with details of the station and operator, total claimed scores on each band and grand total, plus your correspondence address. All entries should include a signed declaration as follows: "I certify that the station was operated within the terms of my amateur licence and that I observed the rules and spirit of the contest".

10. Entries. Send your entries to the RSGB HF Contest Committee, PO Box 73, Lichfield, Staffs WS13 6UJ, ENGLAND to arrive before 9 April 1990 (overseas entrants are advised to forward their logs by airmail as late entries will be treated as checklogs). To receive a personal copy of the 1990 results and 1991 rules, overseas entrants should include a self-addressed envelope and sufficient IRCs for return postage. Entries become RSGB property. In the event of any dispute, the ruling of the Council of the RSGB shall be final.

11. Receiving section. Rules as for the transmitting section except that: (a) Holders of transmitting licences for frequencies below 30MHz are not eligible. (b) To count for points, stations outside the entrant's own call area must be heard making contest contacts (CQ or test calls, non-contest contacts and station in the entrant's call area do not score points). (c) Logs should show: GMT, station heard and RST and serial number sent, station worked, and points claimed. (d) Score 5 points for each station heard, plus 20 bonus points for each of the first three stations heard in each Commonwealth call area on each band (all UK prefixes count as one call area). HQ stations count as separate call areas. A given 'station heard' may only be logged once on each band, and a given 'station worked' may only appear once in every three contacts logged. If both stations in contact are heard, they may both be logged separately as 'stations heard'.

12. Awards. (a) Multi-band section: overall leader wins the Senior Rose Bowl; runner-up wins the Junior Rose Bowl; leading UK entrant wins the Col. Thomas Rose Bowl; leading stations in each call area receive certificates of merit. (b) Single-band section: certificates of merit to the leading overseas and UK entrants on each band. (c) Receiving section: winner receives the Receiving Rose Bowl; leading entrants in each continent win certificates of merit.

Commonwealth Contest 1990 Call Areas

The following call areas are recognised for the purpose of scoring in the Commonwealth Contest 1990.

A2	Botswana
A3	Kingdom of Tonga
C2	Nauru
C5	Gambia
C6	Bahamas
G,GB,GD,GI, GJ,GM,GU,GW	United Kingdom (all one area)
H4	Solomon Is.
J3	Grenada
J6	St. Lucia
J7	Dominica
J8	St. Vincent
P2	Papua New Guinea
S7	Seychelles
T2	Tuvalu
T30	W.Kiribati
T31	C.Kiribati
T32	E.Kiribati
V2	Antigua, Barbuda
V3	Belize
V8	Brunei
VE1	Maritime Provinces
VE1	Sable Is
VE1	St. Paul Is.
VE2	Province of Quebec
VE3	Province of Ontario
VE4	Province of Manitoba
VE5	Province of Saskatchewan
VE6	Province of Alberta
VE7	Province of British Columbia
VE8	North West Territories
VK1	Australian Capital Territory
VK2	New South Wales
VK3	Victoria
VK4	Queensland
VK5	South Australia
VK6	Western Australia
VK7	Tasmania
VK8	Northern Territories
VK9L	Lord Howe Is.
VK9M	Mellish Reef
VK9N	Norfolk Is.
VK9X	Christmas Is.
VK9Y	Cocos (Keeling) Is.
VK9Z	Willis Is.
VK0	Heard Is.
VK0	Macquarie Is.
VK0	Antartica
VO1	Newfoundland
VO2	Labrador
VP2E	Anguilla
VP2K	St.Kits, Nevis
VP2M	Montserrat
VP2V	British Virgin Is.
VP5	Turks & Caicos
VP8	Falkland Is.
VP8	S.Georgia
VP8	S.Orkneys
VP8	S.Sandwich Is.
VP8	S.Shetland Is.
VP8	Antarctica
VP9	Bermuda
VQ9	Chagos
VR6	Pitcairn
VS6	Hong Kong
VY1	Yukon
VU	India
VU7	Lacadive Is.
VU7	Andaman & Nicobar Is.
YJ	Vanuatu
Z2	Zimbabwe
ZB2	Gibraltar
ZC4	Cyprus (UK bases)
ZD7	St.Helena
ZD8	Ascension Is.
ZD9	Tristan de Cunha, Gough Is.
ZF	Cayman Is.
ZK1	Cook Is.
ZK1	Manihiki
ZK2	Niue Is.
ZK3	Tokelau
ZL0	New Zealand
ZL1	New Zealand
ZL2	New Zealand
ZL3	New Zealand
ZL4	New Zealand
ZL5	Antarctica
ZL7	Chatham Is.
ZL8	Kermadec Is.
ZL9	Aukland & Campbell Is.
3B8	Mauritius
3B9	Rodriguez Is.
3D2	Fiji
3D6	Swaziland
4S	Sri Lanka
5B4	Cyprus
5H	Tanzania
5N	Nigeria
5W	Western Samoa
5X	Uganda
5Z	Kenya
6Y	Jamaica
7P	Lesotho
7Q	Malawi
8P	Barbados
8Q	Maldives
8R	Guyana
9G	Ghana
9H	Malta
9J	Zambia
9L	Sierra Leone
9M2	W.Malaysia
9M6/9M8	E.Malaysia
9V	Singapore
9Y	Trinidad & Tobago

GB5CC RSGB HQ station
Various Other Commonwealth HQ stations

SECOND 1.8MHZ CONTEST 1989 RULES

1. Date and time. 2100GMT Saturday 18 November to 0100GMT Sunday 19 November 1989.

2. Sections. Single-operator entries only. British Isles entrants must be members of RSGB. (a) British Isles, (b) Overseas (including EI).

3. Band and mode. 1820kHz - 1870kHz, CW only.

4. Exchange. RST plus serial number starting 001. British Isles stations must also give their county code as shown in Contest News, *RadCom*, January 1989.

5. Scoring.

(a) British Isles section: three points for each completed contact, with a bonus of five points for the first contact with each British Isles county and for the first contact with each country outside the British Isles.

(b) Overseas Section: three points for a contact with a station in the British Isles (not EI), with a bonus of five points for the first contact with each British Isles county.

6. Documentation. Logs to be headed: date/GMT; callsign; RST/number sent; RST/number received; code received; bonus; points. Duplicates must be clearly marked without claim for points. Unmarked duplicates will be penalised at the rate of 10 times number of points claimed, and logs containing more than five unmarked duplicates, for which points have been claimed, would normally result in disqualification. 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 agree that the decision of the Council of the RSGB shall be final in all cases of dispute.

7. Name and address for entries. Address logs to "HF Contests Committee" as follows: British Isles entrants to J.C.Burbanks, G3SJJ, "Southlands" 16 Cotgrave Road, Plumtree, Nottingham NG12 5NX. Overseas entrants to PO Box 73, Lichfield, Staffs WS13 6UJ, England.

8. Date for entries. Logs must be postmarked not later than 15 days after the end of the contest.

9. Awards.

(a) The Victor Desmond Trophy will be awarded to the winning station in the British Isles section, and certificates of merit to second and third placed entrants.

(b) The Maitland Trophy will be awarded to the Scottish entrant with the highest aggregate number of points in this contest combined with the First 1.8MHz Contest 1990. **(c)** Certificates of merit will be sent to the first three stations in the overseas section.

10. Receiving section.

(1) Transmitting section rules 1,2,3,5,6,7,8,9 will apply.

(2) A station may appear only once in the column headed "Station heard". The callsigns of the stations being worked may only repeat once in every three contacts logged. Logs to be headed: date/time GMT; callsign of station heard; RST/serial number/county code sent by that station; callsign of station being worked. **(3)** Certificates of merit will be awarded to the leading three entrants. **(4)** Holders of UK Class B licences may enter the receiving section.

LOW FREQUENCY SSB CONTEST 1990 RULES

As a result of many requests from UK and overseas, this contest is being introduced to replace the 7MHz SSB event. It is expected, in particular, that the addition of 3.5MHz will improve the contact rate during the early morning hours and ease congestion by increasing the available spectrum for operation.

It will be seen that the rules follow those of the 7MHz SSB contest closely; participants are encouraged to include any suggested amendments with their entries for consideration by the HFCC when the rules for next year's event are drafted.

Although activity in the 7MHz SSB contest was generally high, the number of entries received, especially from the UK, was often disappointing. With the introduction of 3.5MHz, it is hoped to find space for a more detailed results analysis to include band as well as overall results. All entries are welcome, whether you operate for the whole period or just for an hour or two and the HFCC would particularly appreciate entries from new contest participants. Please include comments on conditions, activity, etc with your entry to assist the adjudicator in preparing the contest report.

The contest rules are as follows:

1. Date and time: 1200gmt Saturday 3rd February to 0900gmt Sunday 4th February 1990.

2. Sections: Single-operator entries only. British Isles entrants must be members of RSGB.

(a) British Isles
(b) Europe
(c) Rest of World

3. Frequencies and mode: 3600kHz — 3790kHz and 7040kHz — 7100kHz SSB. Cross-frequency contacts within the same band, up to 4MHz and 7300kHz are permitted. Entrants are requested to ensure that the width of their signal is kept to an acceptable minimum.

4. Exchange: RST plus serial number starting 001.

5. Scoring:

(a) *British Isles*: Five points for each completed contact with Europe. 15 points for each completed contact outside Europe. British Isles stations may not work each other.

(b) *Europe*: Five points for each completed contact with a British Isles Station.

(c) *Rest of World*: Fifteen points for each completed contact with a British Isles station.

5.1 Multipliers:

Section (a). One for each ARRL DXCC Country worked on each band; in addition, W, VE, VK and ZL call areas will count as separate countries.

Sections (b) and (c). One for each different British Isles prefix worked on each band. (Note that GB prefixes do not count as multipliers).

5.2 Final Score:

Total contact points multiplied by total of multipliers.

6. Documentation: Logs to be headed: GMT; Callsign; RST/number sent; RST/number received; Multiplier; Points.

Duplicate contacts must be clearly marked without claim for points. Unmarked duplicates will be penalised at the rate of 10 times number of points claimed, and logs containing more than five unmarked duplicates, for which points have been claimed, will normally result in disqualification.

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 the terms of my licence and agree that the decision of the Council of the RSGB shall be final in all cases of dispute." Please include a summary sheet of multipliers worked on each band and a copy of your dupe sheet.

7. Name and address for entries: Address logs to "HF Contests Committee" as follows:

British Isles Entrants:
Peter Hobbs G3LET
22 Outram Road
SOUTHSEA
Hants
PO5 1QY

Overseas Entrants:
PO Box 73
LICHFIELD
Staffs
WS13 6UJ
ENGLAND

8. Date for Entries: UK logs must be received by 5th March 1990. Other logs by 2nd April 1990.

9. Data Protection Act: Entrants should note that the contest adjudicator may enter information from their logs into a microcomputer for the sole purpose of checking for duplicate contacts and preparing tabulations. If any UK entrant objects to this they must clearly state their objections on the cover sheet.

10. Awards:

(a) A Trophy will be awarded to the leading British Isles station in the transmitting section.

(b) Certificates of Merit will be awarded to entrants placed first, second and third in each section providing that a minimum of ten logs are received for that section. For less than ten logs, then a Certificate of Merit will be awarded to the leading station in that section.

11. Receiving Section:

11.1 Transmitting section rules 1, 2, 3, 5, 6, 7, 8, 9, 10 will apply.

11.2 (a) British Isles listeners should only log overseas stations in contact with British Isles stations.

(b) Overseas listeners should only log British Isles stations participating in the contest.

11.3 A callsign may only appear once in every three contacts logged except when the logged station is a new multiplier for the receiving station.

11.4 UK and overseas holders of transmitting licences that exclude operation below 30 MHz are encouraged to enter the receiving section.

12. HF Championship: Participation in this contest by British Isles stations will count for the RSGB HF contest Championship for 1990/91.

COUNTY / COUNTRY MULTIPLIER CONTESTS

This information sheet is intended to expand on the general rules published in the January issue of *RadCom* and should be read in conjunction with them.

It has become obvious over recent contests that few entrants fully understand the requirements for marking the logs or how to provide a suitable Multiplier Check List in accordance with the published rules. The task of adjudicating the logs would be made much easier if the following guide lines are followed and the risk of losing hard earned points would be greatly reduced.

The Contest Exchange:

This must include the full county name or county code letter in addition to the usual RS(T), Serial Numbers and LOC.

To avoid ambiguity it is advisable to use the full county name in phone exchanges and leave the code letters to CW exchanges for which they are intended. It is surprising how many points are lost because of this when entrants try to convert from one to the other. It is also much quicker to say "Berkshire" than "Bravo Romeo Kilo" (or even just "BRK"!).

EXAMPLE CONTEST LOG SHEET (LFVHF)

TIME	CALLSIGN	RST (sent)	RST (rec)	LOC	COUNTY		PTS
1642	GW30XD/P	57001	58141	IO82JG	Powys	+ MULT x 2 +	9
1644	GI4VIP/P	58002	59139	IO74DO	Co. Down	+ MULT x 2 +	19
1646	G4WAR/P	59003	58099	IO92LM	Leicestershire	+ MULT x 2 +	3
1648	G4LIP/P	59004	57205	JO03CE	Lincolnshire	+ MULT +	5
1649	G1EHJ	53005	55022	IO92EO	Staffordshire	+ MULT +	5
1659	G6FJF/P	57006	58403	IO920G	Northants	+ MULT +	3
1701	G8LNC/P	57007	54090	IO90JO	Isle of Wight	+ MULT +	9
1704	G4UHF/P	59008	59177	IO91LT	Oxfordshire	+ MULT +	3
1706	G8CA/P	57009	55077	IO80LV	Somerset	+ MULT +	11
1710	G4WVM	59010	59036	IO91VS	Herts	+ MULT +	3
1711	G0FBB	59011	59145	JO01EH	Kent	+ MULT +	5
1714	GW6GW/P	55012	57150	IO81KS	Gwent	+ MULT +	9
1715	G0AEN	51013	51062	IO81UJ	Avon	+ MULT +	7
1718	G3SFG/P	57014	56144	IO91MA	Hampshire	+ MULT +	7
1719	G3FKF/P	57015	59081	IO91BD	Wiltshire	+ MULT +	7
1721	G4CAN/P	55016	55155	IO80SQ	Dorset	+ MULT +	11
1724	GW4NXO/P	59017	59211	IO81LQ	Gwent		9
1730	G1LXA	53018	55008	IO81PB	Somerset		11
1731	G4DFI	59019	59065	JO01BL	Gtr London	+ MULT +	3
1732	G1ESX	52020	53022	JO02OV	Norfolk	+ MULT +	5
1733	PA0FRE	55021	55010	JO21FW		+ MULT +	13
1734	G4WSL	59022	59017	IO91VQ	Herts		3
1735	PA3EFC	51023	51028	JO21NW			13
1736	ON1KBV	52024	51027	JO20DX		+ MULT +	13
1737	G1CRH/P	55025	59010	IO92XI	Cambridge	+ MULT +	1

TOTALS:- MULTS = 24 PTS = 185

NOTES:- 1) There is a space after every fifth contact and that the log is subtotalled at the end of the page to conform with the standard layout of the current LSVHF log sheet.
All computer derived logs should follow this format.
2) The log is based on a station operating from Cambridge. Note that the last contact with its own county counts as a multiplier.
3) Below is a suitable check list for the above short log.

COUNTY	QSO No.	C/S	COUNTY	QSO No.	C/S
Avon	013	G0AEN	Gtr London	019	G4DF
Cambridge	025	G1CRH/P	Norfolk	020	G1ESX
Dorset	016	G4CAN/P	Northants	006	G6FJF/P
Co. Down	002	GI4VIP/P	Oxfordshire	008	G4UHF/P
Gwent	012	GW6GW/P	Powys	001	GW3OXD/P
	017	GW4NXO/P	Somerset	009	G8CA/P
Hampshire	014	G3SFG/P		018	G1LXA
Herts	010	G4WVM	Staffs	005	G1EHJ
	022	G4WSL	Wiltshire	015	G3FKF/P
Isle of Wight	007	G8LNC/P			
Kent	011	G0FBB	PA 021	PA0FRE: 023	PA3EFC
Leicester	003	G4WAR/P	ON	024	ON1KBV
Lincs	004	G4LIP/P	G, GI, GW		

TOTAL MULTIPLIERS = 19 Counties plus 5 Countries = 24
CLAIMED SCORE = 185 . 24 = 4440 Pts

What Is A Valid Multiplier?

The first valid contact in each county or country can count as a multiplier. It is essential that each claimed multiplier is *clearly* marked as such in the log.

Note:- 1) If you work a station in your own county or country this can be counted as a valid multiplier.
2) The first contact with a station in another G — Prefix area can count as *BOTH* a county *AND* a country multiplier.
3) In the case of Scottish contacts up to a maximum of three multipliers can be claimed per Region for contacts with different stations within that Region.

Completing The Log Sheets

The example log sheet shows just one way of marking the multipliers. The easiest way is to highlight the contacts with a bright coloured marking pen, this makes it very easy for the adjudicator to spot quickly. Providing the method you choose is clear no penalties will be incurred, but if you fail to mark the logs at all you will not receive any credit for the multipliers in the results.

Working Out The Claimed Score

First score the contest in the normal way (ie radial ring etc).

This score is then multiplied by the *TOTAL* number of counties plus countries worked to achieve the final claimed score.

EG: Claimed Score = Radial Ring Score x (Counties + Countries).

Multiplier Check List

The sample check list shows the preferred method. If a log is received without a check list then no credit will be given for any multipliers. Whilst you need only show the first QSO for each multiplier if this is invalid the adjudicator won't look for an alternative one unless you list a "reserve" in your check list so you could lose credit for a multiplier even though there might be other valid contacts elsewhere in the log.

It is therefore advisable to list at least the first two QSO's with each multiplier. There is no objection to listing every contact made in the check list if you want!

RSGB CLUB CALLS CONTEST 'CCC'

(Was Verulam Contest)

Aims of contest:

To encourage contacts between Affiliated Societies.

To put club callsigns on the air.

To encourage 'B' class operators to operate under supervision of their club members.

Rules:

Eligibility: The contest is open to all licensed amateurs and shortwave listeners. Portable, mobile and fixed stations may take part.

Period: 20:00-00:00gmt Saturday 11 November 1989.

Frequency: 1900-1990kHz. Mode — any.

Exchange: RS(T), aerial number (com-

EXAMPLE MULTIPLIER CHECK-LIST

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

PLEASE NOTE:- 1) The example above shows all the eligible counties together with their appropriate code letters for those with ambitions to work them all.
A valid check-list need only list those multipliers actually worked in the contest.
2) The check-list can take any form you like provided that it lists all your claimed multipliers in alphabetical order together with the callsigns and serial numbers of the claimed contacts.

mencing 001 and incrementing by 1 per QSO), name of your club (or no club), or name of club + 'club station' if you are operating a club station.

Scoring: Three points per contact (in points column). A bonus of 5 points for the first ordinary member worked from each new club (in bonus column). A bonus of 25 points for working an affiliated club station (in bonus column). A bonus of 50 points for working the RSGB HQ station.

Totalling logs — a full page of contacts is 40x3(=120) + total of bonus points = page total.

Logs: Standard RSGB HF logsheets should be used. Logs must include gmt, callsign of station worked, RS(T)/serial number sent, RS(T)/serial number received, club name received (or non).

Definitions: Members of more than one club may claim membership of whichever one they prefer, but must use the same one throughout. Club names should be kept brief. All club calls must belong to bona-fide affiliated societies as listed in Amateur Radio Callbook.

Entries: Entries should include an RSGB HF cover sheet, giving the following information: callsign and station address, equipment used, entrant's address (if different), full name of club with abbreviation if sent, and a signed declaration that the rules and the spirit of the contest and the terms of the entrant's licence were observed. Entries should be postmarked no later than 15 days after the event and sent to Mrs M H Claytonsmith, G4JKS, 115 Marshalswick Lane, St Albans, AL1 4UU.

SWL entries: Scoring will be the same as for the transmitting section with the following differences: (a) Only stations taking part in the transmitting section will count for points. (b) Logs must include gmt, callsign of station heard, callsign of station being worked, serial number and club name sent and points claimed. A particular station may appear only once in the 'station heard' column.

Certificates: Awarded to: the leading radio club/society call; the leading individual club member; the leading SWL; individual non-club member giving away most points.

RESULTS

ROPOCO 1 1989 RESULTS

Activity during the April ROPOCO contest was higher than in recent similar events with 89 different calls appearing in participants logs. For some reason or other 39 of these did not trouble to send in entries, even though one or two would probably have achieved a high score, having worked most entrants! As is the norm for all ROPOCO events, the postcodes became more and more corrupted as the contest progressed and there were many wierd and wonderful exchanges circulating towards the end, making a substantial contribution to the loss of points for some stations. One entrant used 559 as his 'standard' report and it was surprising how many entrants fell for this and logged 599! *Accuracy in logging reports is just as important as the postcode and it should never be assumed that all entrants suscribe to the shorter 5NN for every contact.*

The overall winner was G5LP, with G40BK and G4BUO, second and third, but as they had log errors, albeit minor ones, it was left to G3NKS, in joint fourth position to produce the highest scoring no-error log and take the Verulam Silver Jubilee Trophy. He just pipped G4DJX, who was also error-free with one QSO less. Most entrants expressed satisfaction with the rules and the spirit of the event. G3NKS suggested that an earlier start time might be an advantage as it would provide better inter-G propagation and cause less interference to non-entrants.

This is something which has been discussed by the HFCC in the past. Perhaps we should look at this again and the committee would like the views of regular ROPOCO entrants. There were a few complaints that one of the leading stations ingnored requests for repeats of report/postcode sent. When this happens, *it is usually the receiving station that suffers,* but this time two of those who asked for repeats noted that they were incomplete contacts and claimed no points, so these QSOs were excluded from the senders score for a loss of 20 points. (*Less speed — greater accuracy!*)

G6LX

ROPOCO 1 1989 RESULTS

1	G5LP*	677
2	G40BK*	674
3	G4BUO*	627
4	G3NKS†	600
4	G3KHZ	600
6	G4DJX	590
7	G3GC	560
7	G3GLL	560
7	G3JJG	560
10	G4HTD	550
10	G4YYR	550
12	G3OLB	547
13	G4KGG	540
14	G4OGB	524
15	G3JJZ	520
15	G3LHJ	520
15	G4IFB	520
18	G3MA	507
19	G3OLU	504
20	G4EZB	500
21	G0CKP	484
22	G0IVZ	477
23	G3SQX	460
24	G3YAJ	440
25	G4EBK	437
26	G4KGK	434
27	G3AWR	410
28	G3IGU	404
29	G0CGB	400
30	G3JSR	380
31	GM4OSS	377
32	G3BPM	367
33	G3HKO	360
34	G4XPE	350
35	G4BLI	337
36	G3KZJ	320
37	G3CQR	317
38	G0ATR	314
39	G3LET	310
40	G3CWW	300
41	G4KLQ	287
41	G4PTE	287
43	G0IDE	250
44	G3GMM	240
45	GM3UM	220
45	G4ZME	220
47	G4AUR	210
48	G3ILO	177
49	G4PUR	160
50	G0HGA	150

Checklog: G3MCX
*: Certificate Winners
†: Verulam Silver Jubilee Trophy Winner

AFFILIATED SOCIETIES CONTEST 1989 RESULTS

AFS 1989 coincided with the after-effects of what was described by cognoscenti at the time as "the most significant solar event in recent history" (to you & me, that means a very large flare!). Certainly, conditions during the first hour or so of the contest were appalling, particularly for our Caledonian brethren, some of whom heard no 'G' stations at all during that time. It is evident from the logs that a number of stations, including some well-known contestants, became disillusioned and gave up early, but conditions did improve for those who plodded on and the leaders finished up being only ten or a dozen QSOs short of their 1988 totals. Scrutiny of the logs also reveals that a number of stations who were very active during the event did not send in entries.... Gentlemen, if you are prepared to endure the rigours of AFS for pleasure, there must be a club or group nearby crying out for your support!

As in previous years, it was nip-and-tuck for the leaders. This time, the Edgware Trophy goes to the Leicester Poly 'A' team (third last year), just 54 points ahead of Verulam 'A' (last year's fourth). Lichfield lost their second position by a single unmarked duplicate and a couple of wrong callsigns, while Three A's would probably have won it (again) had they fielded a full team. It's tough at the top! Addiscombe move up into fourth position, dropping only six points from their 1988 fifth-place score. Congratulations to G3OAY, who wins the certificate for the highest individual score, and also to G3FXB, whose very high-scoring log, although not a winner, was absolutely faultless.

Standards of log-keeping were generally very high; only ONE log out of format, and none at all on the old 25-QSO log sheets (at last!). A number of stations lost points to what were obviously errors in transcribing the logs. If you use a non-amateur (perhaps the XYL) to re-write your paperwork you should read over the copy afterwards. If *you* aren't sure whether it's a 'U' or a 'V' a 'D' or an 'O' then it's very likely that the adjudicator won't be certain either, and you lose ten points! Around two dozen unmarked duplicates were found. Unfortunately five of them appeared in one log, resulting in the first disqualification for some years. All entries are checked for unmarked duplicates before adjudication proper begins, and although it is to be expected that the odd one will slip through the net you are virtually certain of detection if you have *three* QSOs with a member of the adjudication team, and claim points for all of them!

Thanks to those entrants (the great majority) who supplied checklists - a great help to the adjudicators whatever their format if they include the serial number sent. However, the full benefit in respect of detecting duplicates is only obtained if the callsigns in each division are sorted alphabetically. Any duplicate thus shows up as two identical calls next to each other in the list - which is very obvious. It may be of help to jot the callsigns on scraps of paper or card, and then assemble the list as in a filing cabinet. Even the largest log can be sorted in this manner in half an hour or so; the time is not excessive if it catches that dupe which could cost your team a certificate, or even the trophy!

Comments ranged from "great fun" to "felt as if I had spent 4 hours being jumped on by dozens of Sumo- wrestlers" (and that from one of our better-known contesters!). Certainly the event has been a bit cramped for the last couple of years; the HFCC has decided that the frequency restrictions will be relaxed for the 1990 contest - hopefully this will reduce the pressure on the 'QRS Corral' the other major subject of complaint. Comments from north of the Border in respect of delaying the start of the event are noted. The matter of timing was the subject of prolonged discussion at a recent meeting of HFCC, when it was felt that the present timing should be retained as offering the best compromise (under normal conditions) between reasonable propagation for the

AFS Contest 1989

Posn	Points	Club	Stations contributing to score				
1	10,664	LEICESTER POLY 'A'	G3OAY	G3RIR	G3XBY	G4JGV	G3ORY
2	10,610	VERULAM 'A'	G3RTE	G4DJX	G2BAP	G4JKS	G3UJV
3	10,427	LICHFIELD	G3LNS	G3KDB	G3SJJ	G4CP	G3NKC
4	9,283	ADDISCOMBE ARC	G3UFY	G3SJX	G4ALE	G3RQZ	G3VYI
5	8,817	THREE As CONTEST GROUP	G3FXB	G4BUO	G4FAM	G3SXW	
6	8,714	LEICESTER POLY 'B'	G4EOF	G4ARI	G4CZB	G4KGG	G3SDC
7	7,744	HEREFORD ARS 'A'	G4CNY	G3FKH	G4ASR	G0DJF	G4FFD
8	7,666	STOCKPORT RS 'A'	G3NOM	G3KAF	G4GRU	G4ECI	G3RUG
9	7,548	GOVERNMENT COMMUNICATIONS ARC	G3NKS	G4PDQ	G3SSO	G2HDU	G3SNN
10	7,025	SOUTHGATE ARC 'A'	G0IDA	G3RWL	G3ZVW	G3SFG	G3KTZ
11	6,515	NORFOLK ARS	G3YLA	G4ODC	G3LDI	G3PDH	G4DYC
12	6,474	RNARS PORTSMOUTH 'A'	G3LET	G3LIK	G3JFF	G3JTG	G3CHN
13	5,978	GUILDFORD & DRS 'A'	G4BCY	G5OD	G3YXX	G3PJX	G0EFO
14	5,971	GRIMSBY ARS 'A'	G4EBK	G3RXP	G3RSD	G4HZF	G4PYD
15	5,757	CROYDON (SRCC)	G4DDY	G3BFP	G3MCX	G6LX	
16	5,654	RNARS LONDON 'A'	G3LCS	G3BBR	G4FRN	G4LNA	G4BOU
17	5,365	SOUTH MANCHESTER RC 'A'	G3SVW	G3PFZ	G4HON	G4SUB	G0HIC
18	5,364	MID-BEDS CONTEST ASSOCIATION	G4MBC	G4GIR	G4ALR		
19	5,363	LEICESTER POLY 'C'	G4ZFE	G0CLP	G5MY	G4XEN	G4GLC
20	5,335	CRAWLEY ARC	G3GRO	G3WSC	G3JKF	G3KAU	
21	5,310	EDGWARE & DRS	G4IUZ	G3ASR	G4HMD	G4UMS/P	G3PSP
22	5,261	VERULAM 'B'	G4JBD	G0EHO	G4SUP	G4VVU	G4HKA
23	5,165	CENTRAL LANCS ARC 'A'	G0FDX	G4KGK	G0CGV	G4ZYN	G0IDE
24	5,106	MARTLESHAM RS	G4PIQ	G4CXT/P	G3XDY	G4WFR	
25	5,019	SUTTON & CHEAM RS	G4HSD	G3DNJ	G3WHK	G2FHV	G0CPE
26	4,724	COLCHESTER RADIO AMATEURS	G3YEC	G4LZB	G0IBN	G3GLL	G3YAJ
27	4,178	SCUNTHORPE ARC	G3PDL	G4OGB	G3KNU	G4NFX	G4WZV
28	4,078	RNARS LIVERPOOL 'A'	G3HZL	G3JZI	G3SGQ	G4HWK	G4OKL
29	4,060	TORBAY ARS 'A'	G4ELZ	G3LHJ	G0CEL/P	G4VPM	G3HFG
30	4,054	RNARS BIRMINGHAM	G4SFO	G4IP	G4PZF	G0GRY	G4KNM
31	3,973	FARNBOROUGH & DRS	G3OLB	G0HIN	G0HNA	G4BJQ	
32	3,849	MAIDENHEAD & DARC	G3VCT	G3LVW	G3TWG	G3WYK	
33	3,842	THAMES VALLEY ARTS	G3JNB	G3BPM	G0DAS	G3LQP	
34	3,547	ECHELFORD ARS	G0HYT	G4HMC	G3EAO	G3MCK	G3KKQ
35	3,497	PLYMOUTH RC	G3VCN	G0IVZ	G3ULN	G0JNZ	G0JFX/P
36	3,294	CLIFTON ARS	G0HUZ	G3GHN	G3JJZ	G3BSN	
37	3,278	GLOUCESTER ARS	G4YYR	G0HBB	G3MA	G0ECJ	G4CIB
38	3,115	YEOVIL ARC	G3GC	G3ATK	G3CQR	G3BEC	G0HDJ
39	3,088	STOCKPORT RS 'B'	G4FAS	G4BJU	G3GMM	G0AMY	G3HQH
40	3,048	RNARS LOWESTOFT	G3OOK	G4KDL	G8NT	G0DID	
41	2,941	VALE OF EVESHAM RAC	G3DEF	G0ERA	G4RMV		
42	2,846	SOUTHGATE ARC 'B'	G0ANN	G0ASA	G0FQT	G3YRW	G4KZD
43	2,691	LEICESTER RS	G4WYN	G3TQF	G0ATR	G0FRV	G4OOS
44	2,630	RSARS "FENMAN"	G4OHX	G0HUJ	G4WYG		
45	2,621	RNARS SWANSEA	GW4HDB	GW4SPL	GW4XQK	GW4ZUO	GW4KVJ
46	2,541	CHESHAM & DARS	G0ETU	G3AYS	G3VRY	G3XZG	G4OST
47	2,490	ABERDEEN ARS	GM4SID	GM3WTA	GM3DZB		
48	2,418	HORNDEAN & DRC	G4BEQ	G3COO	G3VPO	G4OFG	G4FBS
49	2,290	RNARS STOCKTON	G3AWR	G4FCH	G4WNA	G3MXZ	G3KTT
50	2,214	SOUTHDOWN ARS	G3SJV	G3AGF	G3ZFE		
51	2,082	THREE COUNTIES ARC	G4VKC	G0BUZ	G3TUX	G0EYJ	
52	2,004	VERULAM 'C'	G4PUR	G3HJF	G3RFS	G0BLQ	G0IAL
53	1,950	SANDWELL ARC	G4PTX	G4NCY	G4ZVS		
54	1,925	HORNSEA & DARS	G4UOZ	G4SUW	G3TLI/P	G4IGY	
55	1,920	RNARS ROSYTH	GM3UM	GM3HUN	GM4JHG		
56	1,890	SOUTH MANCHESTER RC 'B'	G4MYB	G4AUR	G3FNM	G3VIW	G4BZO
57	1,801	TORBAY ARS 'B'	G3KZJ	G3MIR	G3SNU	G4OYC	
58	1,771	CHESHUNT & DARC	G0KOA	G3WFM	G4UNL	G3TIK	
59	1,688	AYLESBURY VALE RS	G3YLC	G0KMC	G0KLH		
60	1,457	HEREFORD ARS 'B'	G3WRQ	G4JSN	G4UZK		
61	1,450	WELWYN HATFIELD ARC	G0AMG	G4WKJ			
62	1,250	RNARS COPENHAGEN	OZ4CB	OZ7JR	OZ1FJB	OZ1IGT	OZ5IN
62	1,250	RNARS NOTTINGHAM	G4MQM	G4UUH			
64	1,241	NORTH KENT RS	G0CGB	G3WMR	G0FAS		
65	1,157	EXMOOR RC	G4PGW	G4JBR			
66	944	MEIRION ARS	GW3SB	GW3GKZ	GW4XXF	GW0DDQ	GW0AYQ
67	890	AXE VALE ARC	G3HAL				
68	860	RNARS PLYMOUTH	G3AQM	G3VNG			
69	840	GLENROTHES & DARC	GM3YOR				
70	730	GUILDFORD & DRS 'B'	G3ZDD				
71	690	RNARS POINT OF AYR	GW3JI				
72	687	ARIEL RADIO GROUP	G4GG	G2BCI			
72	687	RNARS MEDWAY	G3YYF				
74	634	GRIMSBY ARS 'B'	G3DOT	G4CFO			
75	530	RNARS LIVERPOOL 'B'	G4FMI				
76	524	STEVENAGE & DARS	G4DDX	G4ISO			
77	497	RNARS BRISTOL	G4CQI				
78	447	SOUTH BIRMINGHAM RS	G4EYD	G4WYS			
79	397	STOCKPORT RS 'C'	G0HAL				
80	392	RNARS PORTSMOUTH 'B'	G3BZU				
81	367	LEICESTER POLY 'D'	G4DJK				
82	247	RNARS THURSO	GM3CFS				
83	160	SOUTH MANCHESTER RC 'C'	G3HZM	G0AOU			
84	154	VERULAM 'D'	G0CNR	G4PVB	G3PMF		
85	140	RNARS LONDON 'B'	G3OZY				
86	117	CENTRAL LANCS ARC 'B'	G4TZR	G4ZYQ			
87	60	RNARS HARROGATE	G4ODS				

majority, minimising QRM to and from Europe (especially important in view of the increased band occupancy planned for 1990) and minimising domestic disturbance for the participants and their families. It may be that some other means (perhaps a separate Scottish award) may be found to redress the North-South imbalance.

In conclusion, thanks to the other members of the adjudication team (G3KDB, G3MCX, G4JKS, G4RWW and G6LX) for all their efforts, and to all those who gave up their day of rest to take part in AFS 1988. See you next year! *G3UFY*

Posn	Callsign	Score	Posn	Callsign	Score
1	G3OAY	2,567	80	G4RMV	1,254
2	G3RTE	2,498	81	G4CP	1,247
3	G3KDB	2,418	82	G3PFZ	1,237
4	G3NKC	2,407	83	GM3WTA	1,210
5	G4MBC	2,390	83	G3ASR	1,210
6	G3NOM	2,357	83	G0EFO	1,210
7	G4BUO	2,310	86	G3LCS	1,197
8	G3FXB	2,260	87	G3GC	1,190
9	G3NKS	2,250	87	G3DNJ	1,190
10	G3SJX	2,244	89	G2HDU	1,170
10	G0FDX	2,244	90	G3BBR	1,167
12	G3SJJ	2,228	91	G4KNM	1,160
13	G3KAF	2,214	92	G3PJX	1,157
14	G4DJX	2,200	93	G3MCX	1,150
15	G4GIR	2,190	93	G0DJF	1,150
15	G4FAM	2,190	95	G4ELZ	1,147
17	G4CNY	2,157	96	G4SFO	1,144
18	G3RIR	2,146	97	G4PTX	1,140
19	G3LNS	2,127	98	G3KTZ	1,137
20	G3LET	2,117	99	G4FFD	1,136
21	G2BAP	2,095	100	G3HZL	1,134
22	G3UFY	2,082	101	G4DYC	1,127
23	G3XBY	2,067	101	G0ERA	1,127
24	G3GRO	2,060	103	G4OOS	1,120
25	G3SXW	2,057	103	G4OGB	1,120
26	G3OLB	2,038	105	G4GRU	1,097
27	G3ORY	1,984	106	G3MCK	1,070
28	G3BFP	1,970	107	G0CLP	1,057
29	G4ODC	1,947	108	G4DDY	1,050
30	G3SDC	1,931	109	G3TWG	1,044
31	G4JKS	1,927	110	G3WSC	1,040
32	G4EOF	1,921	111	G5MY	1,037
33	G4JGV	1,900	112	G4KZD	1,034
34	G3UJV	1,890	113	G4HMD	1,020
35	G4PIQ	1,888	114	G4FRN	1,010
36	G3PDL	1,850	114	G4ECI	1,010
37	G3FKH	1,827	116	G3JFF	1,000
38	G4ALE	1,817	117	G3LHJ	994
38	G3SFG	1,817	118	G4OHX	990
40	G4ARI	1,780	119	G3RUG	988
41	G3RQZ	1,770	120	G0EYJ	978
42	G3WYK	1,747	121	G3MA	964
43	G4PDQ	1,727	122	G3GHN	960
44	G3RXP	1,700	123	G3LQP	958
45	G4CXT/P	1,664	124	G4FAS	957
46	G3SVW	1,637	124	G3WHK	957
47	G3SSO	1,631	124	G3JTG	957
48	G3JNB	1,604	127	G4XEN	950
49	G6LX	1,587	127	G0HIN	950
50	G4JBD	1,577	129	G0CGB	941
51	G4CZB	1,554	130	G3CHN	930
52	G4KGG	1,528	131	G4IP	910
53	G3OOK	1,500	131	G3PSP	910
54	G5OD	1,480	133	G3JZI	907
55	G3JKF	1,478	134	G4LZB	900
56	G3KKQ	1,477	134	G3VCN	900
57	G4ASR	1,474	136	G4SUP	897
58	G4BOU	1,470	137	G3HAL	890
58	G3LIK	1,470	138	G3BSN	884
60	G4ZFE	1,451	139	G4UMS/P	880
61	G3LDI	1,444	140	G4HON	871
62	G3YLC	1,438	141	G3AGF	870
63	G4HSD	1,437	142	G4GLC	868
64	G3ZVW	1,431	143	G4HZF	860
65	G3GLL	1,427	144	G0IVZ	850
66	G3XDY	1,414	145	GW4HDB	840
67	G3YXX	1,384	145	GM4SID	840
68	G3VYI	1,370	145	GM3YOR	840
69	G3YAJ	1,367	145	G0AMG	840
70	G4KGK	1,354	149	G4VVU	827
71	G3RWL	1,340	149	G3ULN	827
72	G3RSD	1,334	151	G3VRY	824
73	G3JJZ	1,320	152	GW4SPL	820
74	G3PDH	1,307	152	G4YYR	820
75	G0IDA	1,300	154	G4LNA	810
76	G4WYG	1,290	155	G4BJQ	795
76	G4IUZ	1,290	156	G2FHV	791
78	G4EBK	1,287	157	G4PYD	790
79	G0EHO	1,270	157	G3AWR	790

Checklogs gratefully acknowledged from G3HBZ & G3IFB.
Entry disallowed: G4EYD (Unmarked duplicates rule).

RESULTS OF THE 52nd COMMONWEALTH CONTEST, 1989

This year's Commonwealth Contest (formerly 'BERU') was dominated by poor conditions owing to the massive solar flare in mid-March. Nevertheless, we were extremely fortunate that the flare did not occur a couple of days earlier, totally disrupting the DX propagation that is the essence of BERU. Entries were up on last year (128 vs. 116), covering 26 Commonwealth call areas of the 47 worked. It is hoped that better advance publicity coupled with improved conditions will promote an even bigger entry for the 1990 event and confirm that CW DX operators are far from extinct.

John Sluymer (VE6OU/3) improved on last year's second place to win the Senior Rose Bowl this year, although two unmarked duplicates cut his lead over Nigel Hoyow (6Y5HN) by half. If Nigel's rotator had not failed just before the contest started, he may well have pipped John to first place, but he had to settle for the Junior Rose Bowl. Third was Peter Watson (ZL3GQ), a remarkable achievement considering his modest station in comparison with most of the other leading entrants. He certainly

Posn	Callsign	Score	Posn	Callsign	Score
159	G4ALR	784	239	G0AMY	454
160	G4VPM	780	240	G3RFS	450
160	G3XZG	780	241	G4WYS	447
162	G0CEL/P	772	242	GM3DZB	440
163	GM3UM	770	242	G4UZK	440
163	G3SNN	770	242	G3WFM	440
165	G3KAU	757	242	G8NT	440
166	G4SUB	750	246	G4JSN	427
167	G4BCY	747	247	G3FNM	400
168	G4KDL	734	248	G4GG	397
169	G3ZDD	730	248	G0HAL	397
169	G3TUX	730	250	G3BZU	392
169	G0HIC	730	251	G4AUR	390
172	G3YRW	724	252	G4CFO	374
172	G3LVW	724	252	G3TLI/P	374
174	G3SGQ	720	252	G0DID	374
175	G4MQM	710	255	G0JFX/P	370
176	G3CQR	704	256	G4DJK	367
176	G3ATK	704	256	G3HFG	367
178	G4HWK	700	258	G0ASA	361
179	G3SJV	697	259	G3COO	357
180	G4IGY	691	260	OZ4CB	350
181	GW3JI	690	260	G0HUJ	350
181	G4HKA	690	262	G0BUZ	344
181	G3YLA	690	263	OZ7JR	340
181	G3BPM	690	264	G3VCT	334
185	G3YYF	687	265	G4HMC	330
186	G3TIK	677	266	G3VIW	310
187	G4PZF	670	266	G0HBB	310
187	G4OFG	670	268	G3TQF	300
187	G4BJU	670	269	G2BCI	290
190	G3KNU	660	270	G4SUW	280
191	G4MYB	650	270	G3MXZ	280
192	G3ZFE	647	272	OZ1IGT	260
193	G4UNL	644	272	G3DOT	260
193	G0CPE	644	272	G0ANN	260
195	G3AQM	640	275	G0BLQ	257
196	G4FBS	637	276	OZ1FJB	250
197	G0ECJ	627	276	G0ETU	250
198	G4PUR	620	278	GM3CFS	247
199	G4OKL	617	279	G3WMR	240
200	G4WKJ	610	279	G0KLH	240
201	G4PGW	607	281	GW4KVJ	220
202	GM3HUN	590	281	G4ZVS	220
202	G4NCY	590	281	G3VNG	220
202	G3WRO	590	284	GW4ZUO	211
202	G3VPO	590	285	G0HYT	210
202	G0DAS	590	286	GW4XXF	190
207	G4WNA	580	286	G0HNA	190
207	G4UOZ	580	288	G3SNU	181
207	G3MIR	580	289	G4OST	177
210	G0FRV	577	290	G0GRY	170
210	G3KZJ	577	291	G4BEQ	164
212	G0CGV	567	292	G4WYN	157
213	GM4JHG	560	293	G4WFR	140
213	G3DEF	560	293	G4BZO	140
215	G4CIB	557	293	G3OZY	140
216	G4JBR	550	296	GW0DDQ	137
216	G0JNZ	550	297	G0IAL	130
218	G3HJF	547	297	G0HUZ	130
219	G4UUH	540	299	G0CNR	104
219	G4FCH	540	300	G3KTT	100
219	G0IBN	540	300	G3HZM	100
222	G0ATR	537	302	G4TZR	70
223	GW4XQK	530	303	G4ODS	60
530	G4FMI	530	303	G0FAS	60
225	GW3SB	520	303	G0AOU	60
226	G3GMM	517	306	G4ISO	57
227	G4ZYN	510	307	OZ5IN	50
227	G3AYS	510	307	GW0AYQ	50
229	G4NFX	498	307	G4WZV	50
230	G4CQI	497	310	GW3GKZ	47
230	G3BEC	497	310	G4ZYQ	47
232	G3YEC	490	312	G4PVB	40
232	G3HQH	490	313	G4VKC	30
232	G0IDE	490	314	G0HDJ	20
235	G4DDX	467	315	G3PMF	10
235	G0FQT	467	315	G0KQA	10
237	G4OYC	463	315	G0KMC	10
238	G3EAO	460			

puts out a potent signal and will doubtless be gunning for the top in 1990. Lee Sawkins (VE7CC) dropped back to fourth this year but was still well within sight of the top three, while Dietmar Kiesewetter (VK2APK) was nearly 300 points behind in fifth place. A perfect and well presented log from Kevin Smith (VK6LW) held off Al Slater (G3FXB) who once again won the Col. Thomas Rose Bowl as leading UK entrant, prompting another to request that Al be 'compulsorily retired' from BERU! Al's year-round DX performance helped put him 500 points clear of his nearest UK rivals, Barry Simpson (G3PEK) and Dennis Andrews (G3MXJ), with S R Coleston (VK4XA) sandwiched in between. An incomplete 80m QSO cost Dennis joint 9th place with Barry.

Of the 20 monoband entries, the clear leader was VK6AJ on 20m (51st overall) followed by G3RTE on 15m and G3PJT on 10m, while VK7RO put in a very respectable score on 40m, especially considering the poor LF conditions mentioned above. These entrants each receive certificates of merit.

Another disappointing entry in the receiving section was won by RS24775 who is awarded the Receiving Rose Bowl. Surely, many more SWL's were actively looking for the DX stations in the contest, but why did they not submit entries? The HFCC will gladly consider any positive suggestions

Commonwealth Contest 1989

Position		Callsign	Score	80m	40m	20m	15m	10m
1	*	VE6OU/3	6847	425	1480	1955	1744	1243
2	*	6Y5HN	6754	225	1494	2035	1835	1165
3	*	ZL3GQ	5727	449	1280	1720	1548	730
4	*	VE7CC	5699	50	1055	1984	1415	1195
5	*	VK2APK	5418	395	880	2065	1170	908
6	*	VK6LW	5305	50	75	2100	1335	1095
7	*	G3FXB	5295	300	1055	1552	1423	965
8	*	VK4XA	5270	250	780	1595	1330	1315
9		G3PEK	4790	445	1035	1415	1110	785
10		G3MXJ	4765	230	910	1575	1120	930
11		G4BUO	4645	280	810	1455	1175	925
12		G4OBK	4465	310	795	1455	1115	790
13		G3LET	4419	260	959	1400	1085	715
14	*	ZL1AIZ	4160	435	865	1290	1060	510
15		VK6DZF	3979	0	560	1709	1110	600
16		VE3ST	3858	130	775	1548	910	495
17	*	9J2BO	3819	99	470	870	990	1390
18		VK2AYD	3622	150	680	1402	805	585
19		VE5RA/7	3605	0	655	1305	890	755
20		G3NOM	3575	125	635	1115	945	755
21	*	VK5AGX	3534	380	645	1379	720	410
22		VE7UZ	3464	25	585	830	964	1060
23		G2QT	3419	150	565	1099	860	745
24	*	VO1AW	3265	255	350	1020	785	855
25	*	VK3MR	3169	200	839	1105	650	375
26	*	VE2KN	3120	105	290	1510	805	410
27		VK5GZ	2910	350	475	1145	730	210
28		VE3JKZ	2890	75	485	1105	650	575
29		VK3ZC	2755	125	655	1210	610	155
30		G3KMQ	2740	230	440	1030	525	515
31		ZL1HV	2700	150	630	1005	665	250
32		VK5BN	2630	250	455	800	600	525
33		VK4XW	2595	280	620	825	665	205
34		G3TBK	2585	0	405	755	990	435
35		VK2AQF	2494	125	375	1090	724	180
36		G3JJG	2385	100	325	805	650	505
37	*	ZL2TX	2375	0	325	1025	1025	0
38		G3EBH	2365	0	235	775	730	625
39	*	VE4JB	2350	0	460	810	860	220
40		G5MY	2335	50	380	1055	575	275
41		GW3HGJ	2313	100	465	970	494	284
42	*	VE6BF	2277	0	225	873	644	535
43		G3OLU	2250	25	175	875	585	590
44		GM3CIX	2235	0	230	960	620	425
45		G3EFS	2190	125	415	680	645	325
46		G4WYG	2170	75	125	890	545	535
47		VK2DID	2134	280	200	804	475	375
48		VK6RU	2112	0	285	1110	542	175
49		G3SEP	2110	125	480	525	555	425
50		G3VW	1989	0	300	789	485	415
51	*M	VK6AJ	1930	—	—	1930	—	—
52		G3MPB	1920	0	355	835	480	250
53	*	VS6UO	1915	0	300	885	365	365
54	*	VE1ZZ	1879	500	690	689	0	0
55		G3SWH	1875	75	250	770	480	300
56	*	ZD8JP	1850	125	440	565	205	515
57		G2HLU	1849	50	304	760	440	295
58		G3ESF	1800	0	280	795	355	370
59		VK2EL	1785	0	275	660	595	255
60		G3GLL	1770	125	200	685	445	315
61		VK2BQQ	1745	0	599	802	224	120
62		GW4XXF	1707	125	150	678	380	374
63	*	VK7RY	1699	125	460	635	430	49
64	*	5N0BRJ	1634	49	180	530	225	650
65		VK3KS	1629	0	0	895	559	175
66		VK3MJ	1613	0	0	759	654	200
67		G3NKS	1575	125	350	700	145	255
68		G3FKH	1569	0	0	844	425	300
69		G3VDL	1560	75	235	535	440	275
70	*	VU2PTT	1545	0	305	910	0	330
71		G3AWR	1440	0	125	580	435	300
72=		G3HJF	1420	0	50	430	430	510
72=		VK3DNC	1420	0	275	610	435	100
74		G3NKC	1389	50	174	640	250	275
75		G3KSH	1333	150	254	754	125	50
76	*M	G3RTE	1330	—	—	—	1330	—
77		G4LZB	1250	0	50	725	250	225
78	M	VK4TT	1240	—	—	1240	—	—
79		VK3DQ	1223	25	423	340	310	125
80		G3JKY	1160	0	25	655	330	150
81	*	VP2MT	1120	0	0	565	185	370
82		G3WRR	1115	0	75	375	440	225
83		VK4OD	1109	230	205	469	205	0
84		VK2AIC	1100	0	0	450	400	250
85	*M	G3PJT	1059	—	—	—	—	1059
86		G4KGK	1009	0	25	609	175	200
87		G4HZV	1000	0	0	500	300	200
88		G3CSR	980	0	0	350	380	250
89		G3BPM	969	100	99	460	235	75
90	M	VK2KM	955	—	—	955	—	—
91		G3DPX	925	0	75	375	150	325

Position		Callsign	Score	80m	40m	20m	15m	10m
92	*M	VK7RO	910	—	910	—	—	—
93		VK3BDH	902	0	0	400	302	200
94		5N0ELT	895	0	130	325	250	190
95	M	G4AZN	865	—	—	—	865	—
96		VK3XF	805	200	225	380	0	0
97	M	VK3JI	794	—	—	794	—	—
98		G6NK	739	0	0	539	200	0
99		VK5HO	733	175	260	50	200	48
100		VK6RZ	730	0	365	215	50	100
101	*M	VE3HX	715	—	—	—	—	715
102		G2BLA	710	0	100	310	175	125
103	M	G4IQM	705	—	—	—	—	705
104		VE1EP	653	48	80	425	100	0
105		G4CZB	649	74	50	175	200	150
106		VE2BLX	633	0	278	185	170	0
107		GW3SB	600	0	0	275	225	100
108=	M	VU2UR	595	—	—	—	—	595
108=	*M	Z23JO	595	0	25	140	25	405
110	*M	GM3CFS	575	—	—	575	—	—
111	M	G4UZN	570	—	—	—	—	570
112		ZL3BJ	565	0	75	490	0	0
113	*M	G4ZOB	555	—	555	—	—	—
114		VE1GI	554	66	110	140	216	22
115		VE3OMM	545	0	180	125	240	0
116		VK3FC	534	125	409	0	0	0
117	M	VK3XB	455	—	—	—	—	455
118	M	G3VLL	450	—	—	450	—	—
119	*M	VE2ZR	425	—	—	—	425	—
120		G3HAL	250	0	0	225	0	25
121	M	VE2FFE	246	—	—	246	—	—
122		G8QZ	125	0	75	0	25	25
123	M	VE2ICU	88	—	—	—	88	—
124	M	VE8ID	50	—	—	50	—	—

Award winners marked with asterisks, monoband entries marked 'M'

Listener's section

Position	Callsign	Score	80m	40m	20m	15m	10m
1	RS24775	2718	228	565	955	445	525
2	BRS1066	2540	125	370	1080	590	375
3	BCRS195	1397	200	280	487	225	205

Checklogs received with thanks from: GW3JI, G3WP, VE1ACK, G2AFV, GB5CC, VE2HN, G3XWK/P.

from SWL's or B-class licensees...

GB5CC, located at G3UFY's QTH in South London, was the only HQ station active in BERU this year, although it is hoped that a number of other HQ stations will be operating in 1990 (please note the minor change of rules requiring such stations to send 'HQ' as part of their contest exchange). Operated by G3UFY and G4IFB, GB5CC made 462 contest contacts on all bands, but was forced off the air by a transmitter fault at 07:00z. Congratulations to the DX stations who worked us overnight through heavy QRM, and apologies to those who could not raise us. One Pacific station commented that G entrants might work more DX if they were to leave longer listening breaks between CQ calls, but still the European QRM was an ever-present problem.

1ST 1.8MHz CONTEST 1989 RESULTS

Your adjudicator apologises for the delay in producing the results for this contest. Business workload and Field Day co-ordination alas forced the adjudication to take a lower priority.

The Contest exhibited two outstanding features - poor propagation and good antenna systems.

To the East, there was a distinct lack of the UA9/UA0 signals we have become accustomed to hearing, although 4X4DK was worked by G3SJJ.

No African callsign appeared in any logs and from the west, only VE1ZZ was worked by G4OBK, G3SJJ, GW4IOI and G3OLB. PY1RO was a good signal at G3LET, but no QSO was made. The maximum contact distance in any direction was around 2500 miles.

The competitive spirit and experimental nature of contesting was most apparent in the choice of antennas for this event. UK winner G4OBK used a dipole with the apex at 75ft and the ends supported at 30ft. Silver plated wire was used for the antenna and good quality coax to feed it. As Phil remarks, "It cant make much difference on 1.8MHz, but it's comforting to know that you are using as good materials as you can." A 500ft unterminated beverage was also used on receive.

At GW4IOI, a full-wave Quad Loop suspended at 120ft, with a half-wave endfed also at 120ft high, were in use. Probably too high for prevailing band conditions, Walt. Dipoles at over 70ft were also used by G3PDL, G3TBK and G3RSD, while G3SJJ, G3OLB were 'only' able to manage 60ft of antenna height.

Congratulations to G4OBK on winning the Somerset Trophy and to GM4SID who receives the Maitland Trophy. I know Sid has been after this award for some time and had great pleasure in informing him personally during a recent visit to Aberdeen.

Overseas winner was EI9FK with SP1PEA, operated by SP1CU, as runner-up.

The standard and accuracy of log-keeping was high as is usual for the 1.8MHz series of contests. Where mistakes have been found, points were deducted on the basis of loss of all claimed points for any mistake in the callsign and loss of one point for a mistake in each of RST, serial number and code received (two or more errors in any one category counting as only one mistake, ie, 599-012-LDN logged instead of 479-122-LDN would lose 2 points). *G3SJJ*

British Isles

Posn	Callsign	Valid QSOs	Bonus QSOs	Total points
1	G4OBK*	187	59	856
2	G3SJJ*	172	59	810
3	GW4IOI* (GW3NYY)	161	51	760

continued from previous column

4	G3PDL	156	54	738
5	G3LET	144	50	682
6	G3OLB	138	51	669
7	G3TBK	131	50	643
8	G3RSD	133	46	629
9	G3SQX	121	47	598
10	G4HTD	112	47	569
11	G3RXP	115	44	565
12	G3SWC	108	44	544
13	GM4SID*	106	45	543
14	G0DJF	111	42	542
15	G3ZGC/A	105	44	535
16	G4WYG	99	45	519
17	G3SWH	101	39	498
18	G2MJ	91	43	480
19	G3TXF	91	40	473
20	G3VYI	89	39	462
21	G3MCX	91	36	453
22	G3YLC	86	40	450
23	G3NKC	78	43	449
24	G4BOU	85	40	443
25	GM3UM	81	35	418
26	G2HLU	82	32	406
27	G2FSR	73	36	399
28	G4WZ	69	35	379
29	G3LIK	64	32	352
29	G0IDE	64	32	352
31	G4EBK	55	32	325
32	G3SKC	52	28	293
33	G3HKO	49	28	287
34	G3FVW	50	26	280
35	GW3JI	46	28	278
36	G3ZRZ	40	26	242
37	G3GMS	37	23	226
38	G4JSN	37	22	221

Overseas

Posn	Callsign	Valid QSOs	Bonus QSOs	Total points
1	EI9FK*	61	28	323
2	SP1PEA*	55	30	315
3	DF1LX*	55	31	314
4	EI5DI	49	27	282
5	OK1KYY	48	5	269
6	OK1FUA	49	24	264
7	OK1DRU	45	25	251
8	ON6CW	41	25	248
9	LA2UA	40	25	234
10	OL1BVR	37	23	223
11	UQ2GMB	33	23	208
12	EA6ZY	28	17	169
13	F6EPO	38	19	160
14	UP2BTA	39	16	130
15	UZ3AYT	14	12	102
16	DL1SN	15	9	90
17	UT5UJO	11	8	73

SWL Section

BRS1066	72	36	396

* certificate winner

21/28MHZ SSB CONTEST 1988 - AN APOLOGY

Apologies to G3SQX, whose entry for the above contest was wrongly listed in the single-operator, instead of the multi-operator section. All entrants placed below 16th in the single-operator section therefore move up one position. G3SQX now becomes the 15th-placed multi-operator entry - G4SND and those below that station move down one place.

CONTEST LOG SHEETS

Readers are reminded that both HF and VHG logsheets are available from Headquarters in packs of 100. Prices (which include postage and packing) are £3.29p for RSGB members and £3.87p for non-members. When ordering please remember to specify which type of log sheet is required. Send your orders to: **RSBG Sales (CWO) Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JE.**

CONTESTS CALENDAR

RSGB HF CONTESTS

2,3 Sep	SSB Field Day (Jul/Aug89)
10 Sep	DF Qualifying Event 8 (Chelmsford/Colchester) (Aug89)
24 Sep	DF National Final (Coventry)
8 Oct	21/28MHz Phone (Aug89)
9 Oct	28MHz Cumulative (Aug89)
15 Oct	21MHz CW (Jul89)
17 Oct	28MHz Cumulative
25 Oct	28MHz Cumulative
28 Oct	Mollart Memorial Triple DF Night (Mid-Thames)
2 Nov	28MHz Cumulative
10 Nov	28MHz Cumulative
11 Nov	Club Calls Contest 'CCC' — all modes & SWL (Sep89)
18,19 Nov	Second 1·8 MHz CW (Sep89)

1990

24 Feb, 1990	7MHz CW Contest (Aug89)

RSGB VHF CONTESTS

2,3 Sep	144MHz Trophy/IARU VHF (Jul89) & SWL (Jun/Jul89)
9 Sep	24GHz Cumulative (Mar89)
10 Sep	10GHz Cumulative
17 Sep	70MHz Trophy & SWL
7,8 Oct	432MHz-24GHz/IARU UHF/SHF
13 Oct	432MHz Cumulative
21 Oct	1-3/2-3GHz Cumulative
29 Oct	432MHz Cumulative
4,5 Nov	144MHz CW
6 Nov	1-3/2-3GHz Cumulative
14 Nov	432MHz Cumulative
22 Nov	1-3/2-3GHz Cumulative
30 Nov	432MHz Cumulative
3 Dec	144MHz Fixed & AFS & SWL
8 Dec	1-3/2-3GHz Cumulative
9 Dec	50MHz CW
10 Dec	70MHz CW

OTHER CONTESTS

3 Sep	Bulgarian DX Contest
9,10 Sep	European DX SSB Contest
7,8 Oct	VK/ZL Oceana DX SSB Contest
14,15 Oct	VK/ZL Oceana DX CW Contest
28,29 Oct	CQWW DX SSB Contest
11,12 Nov	Czechoslovakian Contest
25,26 Nov	CQWW DX CW Contest
1,2,3 Dec	ARRL 160M CW Contest
9,10 Dec	ARRL 10M Contest
6,8 Sep	Howdy Days (Aug89)
11 Nov	Australian Ladies' Amateur Radio Association Contest (Aug89)

1990

13 Jan, 1990	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

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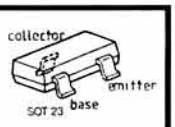

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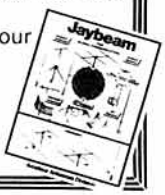

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● BBC Micro computer, issue 7, fitted Acorn 1770 and Solidisk Fourmeg boards. Sinclair QL, last production, fitted with professional sockets and EMI shielding, mint. Sinclair Spectrum with 48k RAM fitted, Interface 1, Microdrive. Offers! Tim, G4IAC not QTHR. 0272 425011.

● MAPLIN electronic organ, professionally built, 2 keyboards, pedals, rhythms. Spotless cabinet. Bench, circuit manual. SAE full spec. Offers around: £250. Palm IV 70cm tcvr, 6 xtals 1W. New nicads: £80. Westinghouse RF ampmeter 2.5A: £6. G3XKA QTHR. (Woking) 04862 73620.

● TRIO 430S tcvr c/w FM unit, boxed, service manual. Mint cond: £645. Trio 711E 2m multimode tcvr. Boxed, service manual: £635. KW107 ATU, mint: £75. Trio SP180 spkr unit with inbuilt audio filters: £20ono. MM 50W VHF linear. Mint: £50. Welz SP200 swr bridge 1.8-180MHz. Mint: £50. 2 Adonis comp. Mics, mint: £30ea. Western PM 2000 peak and RMS wattmeter 1.8-30MHz. Mint: £50. Drake bandpass filter 30MHz cut off: £10. KW ant switch, 3 outputs: £10. Western 30ft alumast, c/w Daiwa heavy duty rotator. Thrust bearing. Hy-gain 2ele beam. Hy-gain balun, winch, cables. Exc.cond: £250. Buyer to dismantle and remove (due to disability). 20ft thick walled ali tubing: £10. Also box of assorted aerial fittings: £10. Carr.extra on all items. 0202 534933 after 6pm.

● TWIN paddle key G4ZPY brass. Looks very nice. 5mths old. Never used: £40. G3UGL QTHR. 0234 750050.

● 23CM station. MMT1296/144, bandpass filter, valve linear, 1-50W, 2x 55ele tonnas, never used. Pwr splitter, LDF450 coax and Andrews connectors: £350ono. Simon. 01-761 2165 after 6pm.

● AR2002 scanning rcvr, 25-550MHz, 800-1300MHz: £300ovno. Icom ICR71E rcvr, FM board fitted: £550. Icom IC3200E dual-bander 2m/70cm, voice synthesiser: £325. Boxed as new. Jaybeam 10XY/2m: £30. Sandpiper 24cm helical: £20. Monitor 24in, ideal WX sat: £20ono. G1NVV QTHR. 0582 668648.

● TRIO R1000 rcvr. Exc.cond c/w manual and boxed: £250ovno. Bob, G0IIP QTHR. 01-576 7254 day, 01-898 7535 eve.

● TONO 5000E data comm. terminal, CW/RTTY/ASCII/AMTOR inc service manual. As new: £500. Large selection of BBC-B hardware/software. SAE list. Al, G4CVZ QTHR. 051-220 5470.

● IC751A, plus 250/500Hz filters, RC10, mic, manual, box, mint: £1100. KM4000 memory keyer: £30. PF1's RB0: £15. Diawa pwr meter, faulty: £10. Robertson. 0604 766325.

● LOUDSPEAKERS 12in, 50 real Watts bass drivers. Pressed steel chassis, beefy magnets. Roll surround, low resonance. Ideal big hi-fi cabinets or disco or guitar. Brand new: £25. IVC reel-to-reel video recorder: £40. Joe, G1VWU QTHR. 0628 32122.

● FT757GX, FC757AT, FP757HD. All 1st class order with manuals and boxes. Will not separate: £1200. G4BLB QTHR. (Deal) 0304 373538.

● SPECTRUM analyser Polarad SA84 10MHz 2GHz, manual: £400ono. G4OSJ. 0572 85451.

● EDDYSTONE pre-war coils set, boxed, slight damage, swinging link: £5. AR88 2 unused, ceramic switch assemblies, 8-wafers: £8. G2DAF TX, homebrew chassis, coils, switch wafers, incomplete: Free. Buyer arrange collection. G3NDI QTHR. (Crowthorne) 0344 774590.

● FT690R Mk2 and 10W linear: £300. 0925 65569.

● CREED manuals, parts lists. Types 54, 75, 85, 6S/6, N-type keyboard TRR2 Regen Repeater. 3000rpm governors. 125/140MHz strobe forks in wood cases. POA. G8LT QTHR. 0327 860321.

● YAESU complete HF station comprising FT757GX TX/RX, FC757AT auto ant tuner, FP757HD heavy duty PSU. All boxed with manuals. Kenwood lowpass filter. Kenwood Ham clock for world time. All VGC. Little used, going VHF only, moving into flat. The lot: £990. Also 12in Sanyo mono computer monitor: £15. 18AVT 4-band vert ant: £45. Prefer buyer inspects and collects or add carr. If buyer of complete HF station collects, some Freebies available. G3HTB QTHR. (Leeds) 0532 671789.

● LIGHTWEIGHT telegraph poles x2. Glassfibre construction, new. Each approx 30ft high and absolutely rigid. Ideal alternative to metal tower for supporting large multi-ele HF beam: £35ea. Buyer collects. G3WIF. (Bristol) 0272 293738.

● SAMSON ETM3 electronic squeeze keyer: £49.50. Philips D2935 synthesised world rcvr. Bargain: £99. SMC150PL, 50ohms dummy load: £13. SEM braidbreaker: £4.50. Howes XM1 Mk3 xtal calibrator: £10.50. QRP HB RF wattmeter: £4.75. As new. Post extra. G4GIG QTHR. 021-777 6086.

● TRIO 9130. 2m multimode immac.cond. Never used mobile. c/w free 100W linear and 10ele and 12 ele yagis: £300. Collect or plus carr. GW7AOH QTHR. 0646 686112.

● FT225RD DX-chaser is also xtalled for all FM ch: £380. 6m tvtr Microwave Modules MMT50/144: £180. Yaesu desk mic YD844A: £15. Solatron stabilised PSU 0-500V .5A plus heaters: £10. G5NU QTHR. (Reading) 0734 871200.

● YAESU FT77 100W compact HF rig. WARC bands. Orig.packing and manual: £400. Star Masterkey C-Mos memory keyer: £65. Hi-mound MK706 paddle key, heavy steel base: £20. Yaesu FT211RH 2m FM rig, 5W/45W: £230. Peter Martin G4SDK. (Birmingham) 021-453 5026 eve.

● ALTRON 36ft slimline mast c/w ground post. 18mths old: £300. Shure desk mic: £15. G4YRR QTHR. 0782 395017 or 0782 317042.

● FC707 ATU 80-10m: £100. Unused Ever-Ready nicads, D-cells: £4 pk2, AA: £3 pk4, C: £3 pk2, PP3: £3. P/P 50p. New ant? Acrylic spray protects against corrosion, dries quickly. 16oz tin: £3. P/P 50p. Mark, G4RGB QTHR. (Medway) 0634 30822 eve-w/e.

● YAESU FT709R, mobile PSU, base chrgr, spkr, mic. Headset mic. FBA5 with nicads. Half wave ant: £150. Offers considered. 28MHz 3ele minibeam. Boom 9ft longest, ele 14ft: £20. Steve, G4VRR not QTHR. (Staines) 0784 256482.

● 80/40M magnetic loop ant Capco, as new. Superb performance, but regret must sell: £350ono. G4INP QTHR. 0728 2811 x220 day 0728 832446 eve.

● TRIO TS830S with narrow and wide CW filters. Also DS2 12V DC cvtr. User and service manuals, boxed in perfect working order, and VGC. Workload forces reluctant QRT. Prefer buyer inspects/collects: £650ono. G0DNS QTHR. (Sheffield) 0742 888425.

● UNIDEN 100XL h/held scanner 66-88, 118-174, 406-512MHz. VGC inc nicads, chrgr, case: £95. Chris G4EJD QTHR. 0782 511080.

● CHIPS 7400 series x50: £10. Heathkit scope OS2 w/o: £10. Avo7: £15. Vintage valves, Cunningham detector 1921, base. Offers. Myers valve 1923. Offers. PR807s, ceramic bases. Igranic coils etc. Offers. Horn spkr. Vintage jazz 78s. 300 off. GW3SSJ QTHR. 087487 259.

● YAESU FT747GX Racal ATU, AOR2001 scanner, grid compass laptop computer, TI, oyster terminals. Bob. (Redditch) 0527 64885.

● FT102 HF tcvr, FM/AM boards fitted, WARC bands, mic, manual, orig.packing, near new cond: £495. MM432/144MHz tvtr, attenuator manual. VGC: £90. Eddystone 880/2 professional RX, 0.5-30MHz 30-bands, perfect, manual: £150. Trio 7010 SSB/CW: £90. Dave G4JXK. 0329 230737.

● AMSTRAD portable computer, PPC640, with modem, 3.5in disk, LCD, practically new: £395. Classic video recorders, Sony C6, Philips 2022: £49ea. Welz SP420 swr: £55. Tayamun speech processor: £50. Sharp camera PSU: £20. Olympus personal radio/micro recorder: £50. (Oxford) 0865 863333.

● IC735 HF all-band plus gen.cov TX/RX. Immac.cond as new: £825ono. HF5 vert 5-band vert: £45. AT200: £45. SP230: £50. PS30: £60. 2m colinear: £15. 8ele beam: £15. Rotator: £25. BNOS PSU 6A/13.8V: £35. 0270 257578.

● RACAL modern equip rack c/w lockable smoked plexiglass front and 2 metal lockable side panels. Has 3 cooling fans, fitted electrical ducting and 8 switched mains outlets. Accept: £135. Exc.cond. Buyer collects. G4MWR. (York) 0904 425619 after 6pm.

● TS790E for sale, 3mths old: £1275ono. 35W 2m, 30W 70cm. Selling because could not get planning

for ants. Andrew G1VUP. 0992 469522.
● YAESU FT301D 160-10m 100W PEP. VGC: £350. G3NAS QTHR. 0543 255992.
● PSU Bremi 0-30V 25A. Unused following change of plans: £120. Colour monitor Taxan 620: £120. Transformer 2300V 750mA: £25. G8CIG. 0276 600082.
● QST 1984, 1985, 1986, 1987, 1988: £5 per year. Buyer collects. G2DRT QTHR. 0494 814240.
● YAESU FRG7700 comm. rcvr with 12ch mem. unit fitted, plus matching FRT7700 ATU, YH77 phones, Datong FL2 multimode filter, ext spkr, AD370 active ant, RX4 disk and interface for Commodore 64, PSUs, leads, manuals etc: £300 the lot. Philips N7150 hi-fi stereo 7in reel-to-reel vert tape deck. 3 motors, 3 heads, 3 speeds, with tapes: £175. Geoff. (London, SE13) 01-690 9528.
● TRIO TS120V 10-80m HF tcvr: £275. Trio TL120 matching 100W linear: £100. PS30 PSU: £100. Western DX33 10-15-20, HF tribander: £125. Western 41ft wall-mounted tower c/w auto-brake winch and head unit: £200. Buyer collects. G2DWB. 061-761 5001.
● WOOD and Douglas ATV1 70cm TV TX: £50. Video camera, exc.cond: £50. Canon 6x TV-zoom lens F2, 17-102m/m with 1.5x tele cvtr C-mount. Immac.cond. Offers. Yuasa 12V 2.6AH batt, cost £18, unused: £6.50. 11ele 2m yagi: £10. 09277 63773 eve.
● YAESU FL2100Z 10-160m linear. £400. Trio oscillator sine/square generator 20-200Hz: £65. Prism modem 2000 Prestel, Micronet c/w s/ware BBC-B: £30. Exc.cond, manuals and orig.packing. Paul, G4KHX QTHR. (Northampton) 0604 858999.
● FTONE all mods fitted, THE HF gen.cov TX/RX. Pristine cond, FC102 ATU plus MD1B8 desk mic, boxed. Price around: £200. Consider splits. Peter GW4XNZ. 0646 686328 eve-w/e.
● JB 2m 4ele quad: £20. 2m GP: £10. Both from box cond. FY200 rotor working but control manual switched: £15. Used inside only. G1FXP QTHR. 01-993 4120.
● BUILDING a linear? TY4-400s: £20ea. TY2-125: £10ea. Plus post or buyer collects. G4LRT QTHR. (Northampton) 0604 740633.
● ENGRAVING machine similar to that seen at rallies making call-sign badges. With materials and letter/number fonts: £50. G4LRT QTHR. (Northampton) 0604 740633.
● FT790, box, book, extras: £260. Immac. IC02E inc extras: £165. Pye HF, 125W, 80, 40, 20, PSU. Inst. manual: £100. Video controller and Telop camera. As new. Offers. 0204 706191.
● ICOM 761. Built-in PU. Linear amp. 2KL W/PU 35W ATU 300. HF dummy load 150Z. Offers for lot. Buyer collects. QTHR. 0273 33626.
● DCP4 vert with radials. Used 6mths: £75. Cost new £147. G0IWW QTHR. (Wigan) 0942 36342.
● PK88, manual, leads: £90. Still under guarantee, Solatron CT436 double beam scope plus manual and 10:1 lead plus PW wobbulator: £60. Microwave Modules linear amp 144MHz 10W in 100W out with preamp: £70. All ono. G4LYS QTHR. 0532 703706.
● 14ele 2m yagi: £15. 48ele 70cm yagi: £15. Bencher lambic keyer: £40. Part built 2m linear amp, 4CX250/base, special transformer: £75. SX200 scanner needs telescopic aerial: £80. Ted G4MID. (Suffolk) 0359 31520.
● YAESU special 2m/marine h/held FT23R TX/RX 144-146, 156-162, with marine licence. As new, boxed, chrgr, nicad pack FNB10, rubber duck, case. Combine 2 pastimes for the price of 1: £210. GM0BVF QTHR. 05763 494.
● FT480 multimode 2m rig. No longer use SSB: £270 or will do cash adjustment on FM rig. G4UNL QTHR. 01-804 5643.
● TRIO TW4000A 2/70. No voice: £300. Mobile 1/2 and 2x5/8 plus diplexer: £25. Hansen FS7 swr 2/70: £15. All good cond. Mike. G6OBA. 01-546 6393.
● BELCOM LS102L: £175. LCL 27/81 10m: £35. Realistic DXTV: £80. Mutek 2m preamp: £20. CTE 10m preamp: £20. 10m linear 40W: £20. Ham Int. multimode 10m: £35. 6-way ant switch: £15. Creed 444, control unit and cables: £45. Creed 444, paper rolls cables: £10. Hirschman rotor, complete: £20. Trio TR9130 multimode: £330. Yaesu ext spkr: £15. ZL 12ele with coax: £15. Hi-mound marble key: £15. Trio TS930S, SP930: £1150. G0BXN. (Staffs) 05438 2289.
● SOLATRON double beam scope CT436 c/w probes and manual. Good cond and tested OK: £60. Buyer collects or carr.extra. 0292 41481.
● FT290R auto toneburst, listen CW input, 4MHz coverage, nicads, chrgr, soft case. Tokyo 25W linear. Sota 100W linear. Extn spkr. Preamp. Swr meter. 9ele Tonna. Rotator. Coax. All exc.cond. Complete 2m station: £450. G4RPS QTHR. 0664 64483.
● ICOM ICML1 10W amp for IC2E. Unused: £20. AR88D working but needs attention: £30. Class D wavemeter: £5. Green screen monitor: £10. Centronics 730/2 printer inc lead for BBC Micro: £30. Pye Cambridge: £5. Chris G1ZXY. (Beguildy) 05477 273.
● SHARP MZ80K computer. Metal case VDU T/R manuals and programs: £120ono. G4MH minibeam. AR40 rotator and cables: £50. G4GDQ QTHR. (Lincoln) 0522 683456.
● FDK 750 2m multimode, 20W with mounting bracket, little used: £275. Trio 9000 2m multimode, 10W: £200. Trio TH21E 2m h/held with 3 batts and chrgr: £150. G4YQX QTHR. (Kidlington) 08675 77144.
● EXCHANGE Canon AE1 35mm camera 70-200mm Vivitar lens, leather case for best 2m h/held offered or WHY? GW4VWY. 0443 772387.
● HEAVY duty lattice tower 60ft tiltover. Needs new winch: £100ono. G6PNX QTHR (Buxted) 082581 3638.
● TRIO TS780 VHF/UHF: £700. TH21E h/held: £100. FP707 PSU: £100. SP70 spkr: £20. Microwave linear 144/100S: £100. Microwave linear 432/50: £100. Diawa CN540 swr: £20. FX1: £20. Western rotator WE1145: £55. Jim. 0623 794568.
● MODEL EK150 electronic keyer: £50. KW Vespa xmitter plus PSU: £120. G3CWL QTHR. 0372 373549.
● TRIO R2000 comm rcvr with VC10 VHF cvtr. VGC c/w manual, accs and orig.packing £420. Also available, Hokushin HS-HF-5 HF trap vert. £10. Plus carr. G8MMN QTHR. 0282 843725.
● YAESU FT290R with auto toneburst. Listen on input mod. With carrying case and strap, screw-in helical aerial, industrial nicads, m/mount, mobile gooseneck mic and switch box: £285ono. Plus post. G4YRQ QTHR. 0704 894700.
● ICOM ICR7000 comm rcvr with voice synth EX310, remote RC12, spkr SP3, TV adaptor TVR7000. Boxed. Exc.cond: £595. SX400 scanner 25-520MHz: £150. IC3210 dual-band full duplex. Boxed: £295. G1DKL. (Medway) 0634 713520 eve-w/e.
● IC Micro 2E, chrgr, case, brand new: £180. 280pF widespaced var. caps, 3mm airgap: £5. 240/115V tapped 1kVA autoxfmr: £8. 2102 mem chips: £2/10. Various meters, enquire. G3TTC QTHR. (Warwick) 0926 490897.
● STORNO 614 basestation c/w duplexer hi-band: £200. Inverter 12V DC i/p 240V AC 50Hz o/p 100VA: £75. HP 334A distortion analyser: £200. G4AJE. (Cambs) 0354 741168.
● AR88LF rcvr, good cond. Can be seen working: £70ono. G0FML not QTHR. 0562 60887.
● PROPERTY late G3CBU. Marconi TF995A VHF/FM sig.gen: £60. Solatron SR5452 500V PSU: £30. Solatron CX1220 30MHz CRO, CX1252, CX1256 plug-ins: £50. Heathkit AV3U VVM: £5. Homebrew 900Hz active filter: £10. Homebrew 500MH VHF/UHF reflectometer: £10. H/books. WHY. G8FMH QTHR. 0256 23979.
● 6M amp for sale. BNOS LPM50-10-100, very recently serviced: £175. Peter G3ZSS. (Cobham) 0932 63552.
● YAESU FT101Z tcvr, fan, mic, manual. Good clean cond, boxed: £375. Datong FL3 auto notch audio filter. Mint cond: £75. Plustron TVR5D DXTV bands 1, 2, UHF. Good cond: £35. Buyer to inspect/collect. G4YQW QTHR. (Leeds) 0532 552615.
● YAESU FT290R all-mode tcvr. Nicads, chrgr, soft case, manual. Good cond, boxed: £195. Howes HC220 tvtr, 2-20m 10W out. Ideal 20m mobile. Boxed. Comp works well: £45. G4YQW QTHR. (Leeds) 0532 552615.
● COMPLETE kit for G3WPO FET dip oscillator Mk2 by Cirkit. Assembly almost complete: £20. Lightweight 10m quad complete in detail. Never used. Only requires assembly: £20. Must be collected. G3AO QTHR. 0663 50639.
● ALTRON CM35 35ft crank-up 3-section mast and head unit plus KR400 rotator and extension tube. Good cond: £275. Will split. GW5NF QTHR. 0495 243016.
● ICOM R70 rcvr, mint, superb: £450. G3GAD. 0275 832668.
● BLACK Jaquar Mk2, case, mains chrgr, orig.packing: £100. Opus twin double sided Sanyo 5.25in disk drives with PSU, no interface lead: £125. G6PFX QTHR. 0432 850704.
● VALVE sale. Shack clearout. 1000 valves, 400 types. All tested, some new. Reasonable prices. Battery, miniature, octal, loctal, TV, VHF, transmitting, stabilisers, rectifiers etc. 1st class SAE for list. G3MDO. 021-354 9972.
● TS430S fitted with CW/AM filters and FM unit. With dedicated Homebrew 6m tvtr 20W: £650. Daiwa CNW419 500W ATU: £125. Icom IC251E with Mutek F/E: £275. Star 600MHz counter: £100. G4INL QTHR. 0242 238243.
● FT290R helical whip, telescopic ant, nicads, chrgr, case, strap and toneburst on FM. Mutek board. All VGC. Also Betacom onepiece phone: £5. 2m 4ele Tonna: £20. Rig and accs: £275 the lot ono. Upgrade. Jim, G7AII QTHR.
● APPLE IIe computer, Kaga monitor, 80col card, dual cumana 80-track disk drives, serial parallel cards, prom blower, Yaesu FIF65 cat interface and s/ware, joystick, all orig manuals, lots s/ware: £250. Phone for details. G4ZXX. (Hatfield, Herts) 0707 269839.
● JOHNSON Viking Navigator self-contained 40W CW TX, RCA AR77E RX. FT200 good H/B PSU. All working, in current use. All manuals/documents. Advance RF sig.gen model E2 with h/book. Offers around: £200 for lot. 0489 578296.
● FAX1 ICS demodulator: £200. Tono 550: £175. Realistic 2001 scanner: £90. Halbar weather digitiser for BBC: £50. Sony WA8000 9-band stereo cassette-corder: £50. 0903 724805.
● TEN-TEC Argosy 2 fitted with 500Hz xtal filter, audio filter, and noise blanker. With mic and circuit breaker switch. VGC: £500. Also Realistic PRO32 VHF/UHF 200ch scanning rcvr. VGC: £175. G4RHR QTHR. (Suffolk) 03948 654.
● TS520SE HF TX 10-160 CW, filter, box, manual: £340. Yaesu FRG7 comm. RX, box, manual: £120. BNOS 13.5V 25A PSU: £125. All exc.cond. Prefer buyer(s) inspect/collect but will consider other arrangements. G4MWP QTHR. 0203 462035.
● BELCOM LS707 70cm multimode covers 430/440MHz. Fitted Gasfet preamp. Mint cond: £275ono. Mic.Mod. 70cm 100W amp: £180. Pye Olympic UHF FM fully converted 12ch with spare osc units. Mint cond: £85. G8KBQ. 0458 34105 between 5/6pm.
● FT102 FM/AM board fitted, narrow SSB/CW filters fitted. Brand new valves, boxed. VGC: £600ono. FV102DM digital VFO: £150. PK232 TNC: £200ono. Deecomm HF ATU: £50. G4ORT QTHR. 0274 590795.
● COMMODORE Vic 20 computer with expansion RAM pack, 4 games, chess cartridge, machine code tutor, book on Basic programming, data cassette. Offers please. Vic 20 programmers ref manual, cost £12: £6. Nuvistor 2m cvtr 28MHz IF: £10. G4BIX. (Betchworth, Surrey) 073784 2894.
● TEN-TEC Century 21 CW tcvr, built-in PSU 50W 80-40-20-10. Needs attention but h/book supplied: £50. Buyer collect. Gone QRP! G2CWY QTHR. 01-445 2508.
● FT290 multimode, carry case, strap, nicads, chrgr, rubber duck, 1/4 wave on magmount, manual, boxed. VGC, unmarked. Will pay post: £275. Paul G7DDD. 021 744 1536.
● TRIO TS700G, 2m multimode. VGC h/book, service manual, mic, DC lead: £250. 144MHz valve linear QQV0640, Electronic Developments, fan. 2 spare valves, CCT. Perfect: £100. G4JXK. (Fareham) 0329 230737.
● COMPLETE Yaesu FT102 line-up. All pristine cond. No mods. FT102 rcvr, spare tubes: £535. FV102DM ext. VFO: £140. FC102 ATU: £150. SP102 ext. spkr: £45. Or: 795 the lot. Orig.boxes, manuals etc. Ron G4YYH. 0209 717717 day 0209 718021 eve.
● MALVERN, Worcs. 4 bed, 3 recep, 2 bathroom det. house. Gas CH, parking 2 cars. Situated Western slopes Malvern Hills. 700ft ASL. Panoramic views to Wales. Easy access M5, trains to London and B'ham: £149,000. G4RRJ. 0684 575030.
● JAYBEAM MBM 48ele 70cm beam aerial. LR1/2m vert. All new, boxed. Half list price. G3RCO QTHR. (Seaton) 0297 21016.
● KENWOOD TS430S FM and CW filters fitted. Boxed with manual. Mint: £550. G4BRF QTHR. 0503 72349.
● YAESU FT101ZD, like new, 9-bands with 4 spare valves and manual. Also Daiwa auto ATU, both for: £600. Sommerkamp FT730R 70cm mobile rig. Very nice rig to use: £225. (Nottingham) 0602 277941.
● FT290 chrgr, nicads, soft case, m/mount, rubber duck: £240ono. Mic.Mod. linear amp 3W in, 30W out: £60. 5/8 fold-over gutter mount and coax: £10. G1TNK QTHR. 061-430 7250 after 6pm.
● KW2000A with PSU: £145. SEM Tranzmatch with 160m: £70. TR3200: £75. Daiwa MR300E heavy duty rotator: £200. HF5 HF vert 80-10m: £45. Robot 400 slow scan cvtr. Offers. G0FAJ QTHR. (Weymouth) 0305 789022.
● KWM 380 speech processor 140KH CW filter. Service manual: £1500. G2QT QTHR.
● FDK FM2025 2m tcvr 25/3W. 10mem, band/mem scan int. switching for 25/12.5kHz channels, manual and mic: £150ono. AES two-meter swr/pwr 3.5/150MHz: £20ono. G3DVL. (Brighton) 0273 558412.
● FT902DM good cond. House move forces sale: £550. Chris G0DLV. 028883 597.
● YAESU FT790 with chrgr, nicads and soft case: £230ono. G6BOE QTHR. (Waterlooville) 0705 240728.
● TS680S with MC43S mic. Also 6m HB9CV bought Dec 88. Ideal rig for 50MHz: £750 or sensible offer. Try before buy. G4VBH QTHR. 01-572 0465 eve.
● FREQUENCY counter. Labgear CM7044 miniatu e 50/500MHz. 2-band. With leather pouch, aerial, 240V chrgr, int. nicads. Brand new cond: £30 inc UK post. Include SAE. G8ZMM QTHR.
● FT757, mint: £550. FTV107R 6m: £90. Both, with cables/relays: £600. BNOS 6m linear, 10/100W: £150. FT730 70cm/10W: £100. FT230 2m/25W: £150. Scopex 4D/10A dual trace scope: £100. 10m FM mobile, SMC, plus 50W PA: £40. G4WZK QTHR. (Nottingham) 0602 394128.
● KW204 TX only. SSB/CW, c/w manual and mic: £100. G3CPH QTHR. (Enfield) no phone.
● TRIO 140S boxed, manual, mic. Like new: £685. G4GIO QTHR. (Northwich) 0606 45584.
● CLEAROUT! 2m beam 16ele: £20. 2m/70cm whip, magmount: £15. 2m G3CLF monitor RX, TX xtals: £15. 10GHz 5ft WG16, dish, gunn module, IF strip, flanges etc: £20. 8x10cm CRT, shield data: £10. All plus carr. Chris, G4IOK. (Witney) 0993 704867.
● FT7 Yaesu with PSU. Mint cond. Buyer inspect and collect. Taylor G6KPI, Hillside, Ebbersbourne Wake, Salisbury, SP5 5JB. 0722 780396.
● YAESU FT207R 2m FM handie. With many accs: £150. Or exch. for heavy duty PSU, 13.8V 10plus Amps. G8XCL. (Kent) 0679 20954.
● HRO RX, GC coils plus bandspread for 3.5/7. Marconi CR100/B28. Both working and in good cond. Offers to G3NNA QTHR. Buyers collect Bedford or Longridge, Lancs. 077478 4525 or 0234 870532 eve.
● BBC-B plus 128k computer with View 3 WP, DFS and ADFS: £250. Plus carr. GM0JOL QTHR. (Bettyhill) 06412 208.
● YAESU FC700 ATU: £75. MD1B8 desk mic, nearly new: £45. Datong auto RF speech processor wired for Yaesu. Never used: £55. D70 morse tutor: £30. Samson ETM3 electronic squeeze key: £20. SEM VHF Tranzmatch 2m ATU: £20. Small swr/pwr meter for 2/70 15/60W switchable: £15. All VGC. All ono, but add P/P or swap all for basic IBM clone PC. Anything considered. G0GSZ QTHR. RAIBC member so phone anytime. Peter. (Norwich) 0603 748338.
● 23CM tvtr TX OK, RX faulty, hence: £50. 70 MC/S 4ch AM xtalled 70.26: £30. Doug G1BWW. (Herts) 0462 711722.
● STANDARD C7800 70cm tcvr. Good cond c/w remote mic, pwr leads, m/bracket. Buyer collects. A faithful old friend: £150ono. G1MQP QTHR. 0474 873984.
● HUNGRY student needs cash! 2x Heathkit DX4OU HF transmitters, one working: £30. One not but full set of valves: £12. Heathkit VF1U VFO for above: £10. Marconi TF1064B VHF sig.gen: £15. All ono. Ed, G1POD QTHR. (Sussex) 0444 236848.
● TR9130 2m multimode: £350. TR9500 70cm multimode: £375. Both good cond, used basestation only, with mics, m/mounts and manuals. BO9 base mounts for above x2: £35ea. SP120 spkrs for above x2: £25ea. KR500 Kenpro elevation rotator and controller: £100. TS430S HF with FM board, CW filter 500Hz. 1.8kHz SSB filter, AMTOR mod fitted by Lowes, mic, manual. As new: £700. PS430 PSU: £140. AT250 auto aerial tuner: £250. SP430 spkr: £30. All with orig.boxes. G0LOM not QTHR. (Worcs) 056283 209.
● FC102 Matcher with 2 meters for swr and RMS/peak output. Will handle 1200W PEP. Matches single wire or coax feed. Boxed with manual. Exc.cond: £250 collected. Max, G3WMB QTHR. (Ware) 0920 463564.
● TS430S 270Hz and 1.8kHz filters. FM option: £675. SB220 2kW linear over 1kW out. All bands: £650. Commodore 1901 RGB monitor: £150. All mint. No offers. Buyers collect or arrange freight. (Oswestry) 0691 831111 eve-w/e.
● COLOUR video camera JVC GXN70E A/F 8:1 macro power zoom. 8 page title function, interval timer. 10 lux sensitivity. As new: £250. VCR Betamax portable Sony SLF1UB with remote control mains tuner-timer TTF1UB, car pwr adaptor, spare nicad etc: £175. Consider exch for BBC-B in good cond. Psion LZ64, 1mth old with guarantee: £160. Chesterfield) 0246 852469.
● THE ideal 2m mobile rig. The easiest synthesised rig to use mobile. Reluctant sale of Icom IC240 c/w mic and m/bracket: £140. Mike, G4HGV QTHR. (Swindon) 0793 725265.
● KENWOOD TS520SE HF tcvr with spare valves, mic, manual, box: £375. YM24A spkr mic: £13. Pwr amp freq FM 26-30MHz 1-4W in, 25W out: £20. All items in exc.cond. Buyer to collect or arrange carr. G0BXI QTHR. 0703 263232.

WANTED

● SHURE 444 desk mic. Must be in working order. G0HAE QTHR. (Southampton) 0703 455777 anytime.
● HELP! Service manuals req'd for Sony HVC2000P video camera, Ferguson 3V25 (JVC TU22EK) video tuner-timer. Sharp IT35CZ CCTV camera, Plessey CSI PCT2200 cordless phone. Also required, RadCom 6/82, RIG Newsletter No.6. Loan or purchase. Dave Wright. (Hull) 0482 443942.
● 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.
● PAL crosshatch pattern generator, preferably with colour outputs but not vital. WHY? G1EEH QTHR. 0308 68598.
● RCVR indicator R65/APN9. I do require the technical manual for this unit which was made by RCA. Will pay £25 for a copy. M. Gee, 17 Foxley Close, Mountford Est, Ferncliff Rd, Hackney, London, E8 2JN. 01-254 9083 or 01-790 2846.
● KW2000 wanted, preferably late model -/B/C/D/E. Also Cannonball TX. GM4CAZ. 031-664 3891.
● 8-TRACK tape player recorder, 8-track home stereo player. Les G1HFJ. (Bristol) 0272 640629.
● SONY ICF7600DS rcvr in good cond. Cash paid or will swap for Realistic DX400 all-mode RX plus cash. Grahaam, G4VOE QTHR. 061-740 4126.
● PAOLO Soprani button key accordion B/C tuning for spares. Cond not important. Frank, GI3ZTL QTHR. 0648 43070 after 6pm.
● ANY info on Burns Electronics xtal calibrator type CC10. CRT type D14-131GH. Valve data books. G4MNB QTHR (Swindon) 0793 826325 after 7pm.

MEMBERS ADS

● 2 RSGB 75th Anniversary lapel badges, white with blue diamond logo. Will refund cost and post. Doug, G3XPD QTHR. 0785 43686.
● CELESTION elliptical spkr 7x3.5in or Celestion comms. spkr. Mark, G4RGB QTHR. (Medway, Kent) 0634 30822 eve-w/e.
● KW77 RX. Electroniques transistorised Ham bands coil pack. Philpotts cabinet, front panel, chassis for G2DAF RX. 051-346 1270.
● REGENCY Polaris NC6000 VHF direction finder unit urgently req'd or operating or service manuals. Incomplete or faulty unit acceptable. Bob. (Redditch) 0527 64885.
● YAESU FT221 or FT225 with Mutek F/E. Also copy of Collins TCS12 TX manual. Nick G0HIK. 0229 30069.
● KENWOOD TM421ES 70cm mobile tcvr. Must be absolutely mint c/w all accs and orig packing. Also Capco 3000D ATU in similar mint cond. Paul, G4XHF QTHR. 0293 515201.
● KENWOOD PS30 20A 12V PSU and MM144/100S linear amp. Both must be mint cond. Stan, G1VUK QTHR. 01-230 3532 day 01-435 1673 eve.
● FDK multi 750XX w/shop manual or servicing info urgently req'd as rig PA defunct. Have copying facilities immediately available. Will pay full post and reasonable expenses. Jim, G4KXK QTHR. 0452 506977.
● YAESU NC15 quick chrgr DC adaptor also FNB4 nicad batt packs. G3JAU QTHR. 0202 514078.
● LABGEAR LG50 in working cond for USA Amateur. Derek QTHR. 0444 452452.
● G3DUN. Last listed mid 1950s as simply Blackheath, London. Anyone knowing name and the then or present QTH please write G3YAA QTHR or 0482 866865 transfer.
● PRE-SELECTION and protection unit, MA197B. Also a Bluespot inductor spkr unit. G6GT QTHR. (Reading) 0734 576041.
● HP8620 sweeper mainframe tuning scales. 1.7-4.3GHz, 5.9-9.0GHz, 8.0-12.4GHz and 5.9-12.4GHz. Your price paid. Steve. 0684 569863.
● HELP-P-P!! OAPs old hi-fi needs valves, PP3-250s but Px25 will do, or even Px4s. Also ME41, or any equivalents of above valves such as CV1168, CV1104, VR40, NR47 etc. Letters only please. Bracken Lodge, Rad Lane, Peaslake, nr. Dorking, Surrey.
● TRIO AT230 ATU, Datong FL3 auto notch filter, Trio HS5 phones. Peter G3WBI. 52 Reedley Rd, Reedley, Burnley, BB10 2NE. 0282 601237.
● OPERATING inst booklet for Tektronix Type 310A scope, or set not working for spares. Will pay for loan or photocopy. (Caerphilly) 0222 862374 long ring.
● FREQUENCY counter at reasonable price and in good cond. Details please. Frank, G4END QTHR. 0782 614309.
● SCRAP Telequipment S32A scope. Burnt out mains T/X or duff tube acceptable, but must have physically complete case, and be cheap. Taylor, G3YJM QTHR. (Blackburn) 0254 60455 day 0254 55939 eve.
● 1154/55. Help needed in getting restored equip operational. G0HTR seeking both rotory cvtrs used to power the 1154/55 combination when airborne. Present searches are proving fruitless so info on probable source of supply much appreciated. Larry, G0HTR QTHR. 0827 898024.
● DOES anyone have any info for the B2 TX/RX circuit or data. All expenses paid. G3MBW QTHR. (Leeds) 0943 74794.
● DRAKE L7 linear amp, Drake MN2700 matching network, Drake PS7 PSU. Immediate top cash price for mint units! 0602 609345 anytime.
● CIRCUITS, h/book, any info on Sphinx TX. Any expenses refunded. G4ANL QTHR. 0642 670850.
● HF beam WHY? (Nottingham) 0602 277941.
● FT757. Chris G0DLV. 028883 597.
● OPERATING manual for Yaesu YO-100 monitor scope, or any info. Sale, loan, or photocopy. I work shifts so letter or postcard preferred. Chris, G0JEK QTHR. 02357 2205.
● INFO wanted on radio paging systems for 2m operation. G8XCL. (Kent) 0679 20954.
● NAG 144XL linear amp, model 2200 or 2150. I would be interested in a faulty unit as long as mains transformer OK. G4LRT QTHR. (Northampton) 0604 740633.
● COLLECTOR will pay you for old or modern Antartica QSL cards. Bases supply ships and islands, such as S.Georgia, S.Orkney etc but no Falklands. All cards welcomed regardless of nationality. What have you for me? John, G3BDQ QTHR.
● REQUIRED operating manual for Epson TX80B printer. G2ABC QTHR. (Truro) 0872 78393.
● DRAKE MN2700 ant matcher. Must be in mint or VGC and unmodified. Max G3WMB. (Ware,Herts) 0920 463564 eve-w/e.
● TS930S c/w YK88C, YG455C filters, service manual, hbk; faulty PSU, not working, for spares or repair, hence £495. Dentron GLA1000 B HF linear, gwo, £295. GW4RYK, 068 686 255.
● KENPRO KR-500 elevation rotator, never used, £100. Chartwell LS3-5a loudspeakers, pair, £150. John, 0743 884822.
● ICOM IC-R7000 scanning receiver with remote control and speech modules fitted. D-130N 25-1300MH Discone Antenna. Offers. G4ZTX QTHR.

HELPLINES HELPLINES HELPLINES HELPLINES H

BOOTS AUTOFOCUS SLIDE PROJECTOR

They keep on pouring in, these 'Helpline' letters: as fast as we whack them into the word processor, another batch arrives on the desk! Straight down to business, then, with Mr L Hickingbotham, G3HZG. He writes, "I have a Boots Autofocus slide projector which I use for giving my slide show Amateur Radio Around The World. The projector has a 5-pin DIN socket for connecting it to a tape recorder, which can then be used to synchronise the sound effects with the slides. Unfortunately, although the instruction book says this can be done, it doesn't give any information on what the connections are on the socket! I have written to Boots, but they say they can't help since the projector is no longer in production." Oh dear - anyone out there got any ideas? Mr Hickingbotham's address is *95 Oakenshaw Road, Redditch, Worcs B98 7PR.*

RN1498 RECEIVER

The next letter says "To Helplines. I have recently acquired an ex-WD item of equipment called an R1948 Receiver - it is also known as an AN/APR-4. The set covers approximately 75-320MHz, using AM only. I would appreciate any information about it." Any offers to Jason Ingram, G7BSK, *31 Carr Lane, East Stockwith, Gainsborough, Lincs DN21 3DP.*

HEATHKIT TEST GEAR

Before I forget, Headquarters could do with a bit of help. We've been given some Heathkit equipment - to wit, a Solid-State VOM, Model IM-25; an AC Voltmeter, Model IM-5238; an AC VTVM, Model IM-38; and a Sine Square Audio Generator, Model IG-18. Just the job for the GB3RS shack, but we'd greatly appreciate copies of the handbooks. We could easily make copies of them, of course, and return the originals. Any offers? If so, please get in touch with Tim Charles at HQ - he'd be delighted to hear from you.

DYMAR LYNX FM TRANSCEIVERS

Next, a cry for help from Mr Peter Whelan, G6JJB. He says, "I have recently acquired two Dymar Lynx type 830 FM transceivers for the PMR high band (146-194MHz). The transmitter was easily tweaked on to 144MHz, but I have great difficulty in tuning-up the receiver. Have any readers been able to modify the receiver of these rigs for reasonable sensitivity? I would be very grateful if they could send me details." Well, Lynx owners - drop Mr Whelan a line at *52 Buttermere Road, Liverpool L16 2NN* if you can help him out.

CONVERTING CBS

Mr S Dyke, G3ROZ, writes, "Are you interested in legitimate experiments based on cheap all-mode ex-CB sets or would you like to be? There's an informal meeting for all interested at the bar (!) of the National Amateur Radio Car Boot Sale at Old Warden on 10 September." Mr Dyke also sent in some very useful material on getting the Cybernet all-mode CB rig on 50 MHz. He writes:

"Last year it was suggested in RadCom that no commercial gear existed which was suitable for 50MHz conversion. My reply to that was that an all-mode CB rig was probably modifiable by placing the local oscillator on the low side of the signal, since CB + IF is approximately equal to 50MHz - IF.

"I have since tried this and it works! The following may be useful to fellow home-brewers who also wish to try it. A full constructional article is not possible since I made no notes during the modifications, but two articles I know about are listed below. Regrettably I only learned of these via my 'all-mode self-help group' when three-quarters of the way through my own modifications. This is what happens when we all sit in our ivory towers duplicating errors and telling no-one! Why the RSGB has been so reluctant to pass on information concerning these cheap multimode transceivers remains one of the strangest secrets in amateur radio (no secret at all, sir; until now no-one's given us any information to pass on - Ed).

"It is assumed that the reader is familiar with the Cybernet-based CB chassis and the USA CB channel-spacing scheme. Those who are not should obtain the Cybernet Export Service Manual by Lou Franklin (K6NH, QTHR), which is easily obtained in the UK over the hobby-shop counter. Nearly all multi-mode CB sets are variants of three basic designs - the Uniden up-market model, the Uniden down-market ditto and the Cybernet.

"The Cybernet variant I used was the 80-channel 'Major M588'. This uses the chassis with driver and PA stages in separate screened compartments. The later Cybernets with no screening may prove hard to keep stable at 50MHz.

"The 3kHz downshift of the VXO and BFO occurs LSB only. If the front-panel labelling and frequency readout is to remain correct on 50MHz, this must be changed. The VXO must downshift on LSB and AM/FM while the BFO downshifts on USB only.

"Credit must go to GW3SPA for suggesting the crystal least likely to produce spurious outputs from the modified 50MHz rig. It is 25.2525MHz, which gives a loop frequency of 3.19MHz corresponding to 50.01MHz RF and 10.695MHz IF. However, with the downshifts changed as above, the IF on USB is 10.692MHz, not 10.695MHz - suggesting a crystal frequency of 21.254MHz. This produces a 'birdy' on 50.56MHz, which can be removed by moving up 5kHz. So I use 21.249MHz, corresponding to a loop of 3.18MHz to give 50.01MHz (CB channels 1-80 = 50.01-50.8MHz). This requires all nine bits of the program input to be used to cover the band instead of the six bits used on 27MHz. For some reason, severe FM-ing of the SSB output after applying the nine-bit program, which was cured by decoupling the +%V rail with a 1000µF capacitor. On no account use the original Cybernet loop programming of a 2.55MHz loop to correspond with 50.01MHz RF. The mixer crystal will beat with the 10.240MHz synthesiser reference to produce a large 'birdy' on all channels!

"If similar power outputs are required on 50MHz as originally available at 27MHz, an additional TX driver stage with about 10dB gain will be needed. This can be placed before the original TX driver stage and physically just behind the screened section. I used genuine 50MHz devices - the MRF 476 and MRF 497 - for driver and PA, so I don't know how (or whether) the original transistors work at 50MHz. Other home-brewers please advise! The Rx RF amplifier gave poor noise figure when scaled for 50MHz. It would probably suffice for skip-distance QSOs but not for weak-signal working. I used a 3SK88, which is more than adequate.

"I found the original TA7310P TX mixer to be poor at 50MHz and replaced it with an SL1641/SL1611 combination. However, neither GW3SPA nor G3ROO - who both have Cybernets on 50MHz - had any problems with the original mixer, so there's some room for experimentation here. If you do use the SL1600 series you'll need to change the polarity of the ALC voltage and the term AM/FM = logic high will have to become AM/FM = logic low.

"There tends to be some interaction between the TX chain and the RX mixer at 50MHz. This is cured by grounding the AGC input to the mixer on transmit by connecting it to the PTT line via a diode. In effect, this is like switching the front-panel 'local/DX' switch to 'local' when transmitting. If the AM/FM drive level is much larger than the SSB level, there's a tendency towards instability on AM or FM. There is an A.O.T. capacitor to equalize the drive levels.

"I'm not sure that all these mods will be necessary in all cases - apart from the additional TX driver, which you'll certainly need if you want 10-15W output. Those intending to do the mods should also refer to the July 1987 Ham Radio Today and the April 1986 Short Wave Magazine for details of the original GW3SPA/G3ROO mods. You will notice that neither had trouble with FM-ing and instability, as I did, but then neither did I at the power levels they were working at. All the problems start once the power gets above 3W."

STOLEN YAESU FT290R

Great stuff - thanks, Mr Dyke, and by all means let's have more items like this. Diving back into the postbag, Mr R Robinson, G6YEJ, tells us about a Yaesu FT290R which was stolen on 24 July. The serial number is 3L330242, and the rig was security-marked inside and outside with '42BD30NA'. An MMB11 mobile mount and FL2010 linear also went walkies at the same time, unfortunately. Any information to *42 Exmouth Place, Bradford BD3 0NA.*

EX-MILITARY EQUIPMENT

Here's a letter from Australia which might be interesting to those who specialise in ex-military equipment. Mr Evan Fell, VK4EF, writes, "I have asked the RSGB to pass this letter on to a club where one of the members may be interested in helping me. I'm interested in getting technical information and circuit diagrams of the various UK radio sets used in World War 2 and some of the Army CW sets produced between the wars. If you have a member who is interested in this field and likes shopping around in technical bookstores and is prepared to help me, I can send him a sterling advance so that he is not out of pocket at any time for purchase or postage. I'm well set-up in amateur radio and should have no trouble in working the UK when conditions are right. Maybe there's something I could do for your members in return." Well, no doubt someone will take Mr Fell up on his letter - drop him a line at *97 Jubilee Tce, Bardon, Brisbane, Queensland 4065, Australia.*

MEMBERS SOUGHT

Mr Dennis Egan, secretary of the Prudential Amateur Radio Society, virtually guaranteed publication of his particular letter. He says, "We are a new society trying to get off the ground and so far we have had little or no publicity via RSGB, although Practical Wireless have been of assistance!" Argh - disgraceful. (Never heard of them - Ed). "We are looking for members world-wide; so far we have ZS, ZR and VK callsigns in our ranks." If you're a licensed amateur and on the staff of the mighty Prudential Assurance Group, write to Mr Egan at *4 Hazel Grove, Longmeadow, Dinas Powis, South Glamorgan CF6 4TE.* Incidentally, we've broadcast a similar request on behalf of the group via GB2RS, so that should help a bit.

FIND THE TIGER

Mr Lawrence Robinson, G0HTR, writes, "Are there still Tigers out there alive and kicking? I have recently renovated one of the early G8VB Tiger transmitters (the TR60B), which is now in pristine condition but its performance on the air is poor. Apart from a peculiar fault in the keying circuit, which results in a low-level output signal on key-up, the output power is low and sometimes unstable. Guidance is sought from *RadCom* readers who have had any experience with this transmitter, or indeed anyone with knowledge of the circuit diagram of the TR60B - which were only issued initially to purchasers of Tiger equipment. Of course, the main problem could be the operator! Whatever or whoever is the cause, something is not quite right with this fine example of radio engineering - hence this Helplines plea from Larry, G0HTR, on 0827 898024." It only remains for us to add that Mr Robinson's address is *82 Grassholme, Stoneydelph, Wilnecote, Tamworth, Staffs B77 4BZ.*

HOT CONNECTORS

Mr Editor Preece is breathing down my neck and telling me we're running short of space, so just time for a quick warning from G3BDX. He writes from South Africa and says, "For a long time I've been advising that the use of nickel-plated RF connectors should be avoided; in my professional experience they were potential trouble. Furthermore, always avoid right-angle connectors at VHF and UHF like the plague. In a broadcast repeater which I recently built for VHF FM service, at 500W output the right-angle 'UHF' connectors were too hot to touch after running for a couple of hours (not surprised, sir - I think I'd have used N-types myself). This applied to several different right-angle connectors used in different PAs in conjunction with ½" Heliax; the Heliax ran cool. UHF connectors must always be tightened with pliers to produce the effect of a cold weld; finger-tight is never good enough." Quite true. I must say I always give UHF connectors a big miss for anything higher in frequency than medium wave, and unless it's for power levels which the G-QRP Club would thoroughly approve of. Think of them as screened banana plugs, not as pukka RF connectors!

FOUND - STOLEN ICOM TRANSCEIVER

West Malling police (Kent) have in their custody an Icom Transceiver which they believe to be a stolen item. If you suspect that it's yours, contact Mr Wyles, in the property office, on 0732 870055, ext.160. Reference number for the enquiry is F484800. Be certain to have full details of the unit, including, of course, the serial number, when you ring.

MISSING QSLS

J.B. Roscoe, G4QK, has informed us that a batch of cards addressed to C30CCA went astray; if you are missing a response, please try once again via the QSL Bureau.

CALLBOOK HELP

Any amateur radio collections or museums wishing to be featured in the forthcoming Callbook are asked to send full details to Brett Rider at RSGB Headquarters.

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-News Bulletin' and we'll do what we can to get the message out.

CLUB NEWS

DEADLINE - Items for inclusion in the OCTOBER issue must be sent to HQ marked "Club News - DIARY" to be received by 29 August latest.
If news is received by the published deadline, it will appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

AVON

▶Bath & DARC - Sep 6, committee meeting; 13; talk "Amateur Television" by Severnside Amateur Television Group; 27, equipment sale; Oct 11, talk.
▶Bristol RSGB Group - Sep 25, TBA.
▶South Bristol ARC - Sep 6, AGM; 13, committee meeting and planning evening for Bristol Rally 1990; 20, HF activity evening.
▶Thornbury & DARC - Sep 6, junk sale; 20, project evening; Oct 4, packet update with Ray, GW1FJI.
▶Weston Super Mare RS - Sep 4, talk by John Driscoll, Cable Manager, Fibre Optic Trans-Atlantic Cable Station, Brean; 18, constructors night; Oct 2, talk "Around the World in less than 80 Days" by John Walker, G0JQN. Details 0934 514429.

BEDFORDSHIRE

▶Bedford & DARS - holiday shutdown. Sep 5/19, social nights at Allens Club.
▶Shefford & DARC - Sep 7, welcome back evening; 14, talk by visitor from RAF Chicksands; 19, visit to Bedfordshire Police HQ; 28, mobile DF hunt; Oct 5, TBA. Details 0707 372211.

BERKSHIRE

▶Maidenhead & DARC - Sep 7, talk "Aerial Tuning Units" by Peter, G3RZP; 19, talk "Switch Mode Power Supplies" by Roger, G3VCT; Oct 5, junk sale. Details Maidenhead 25952.
▶Reading ARC - Sep 14, JOTA planning meeting; 28, Autumn junk sale. Details 0734 774042.

CLWYD

▶Delyn RC - Sep 12, talk "The RAE can't be that hard" by Derek Rogers, GW3UOO; 26, ladies' night - men welcome too!; Oct 10, RAYNET - what is it? what do they do? can I help? Find out in the Daniel Owen Centre. Details 0244 819618.

DERBYSHIRE

▶Buxton RAS - Sep 5, talk "Sumsorta Exercise for Lugoiles" by G3RMV. Details G4IHO, tel: 0298 25506.
▶Derby & DARS - Sep 6, junk sale.

DEVON

▶Exeter ARS - Sep 11, talk "Contest Working" by John G3HTA; Oct 9, AGM.
▶Torbay ARS - Sep 1, 8, 15 & 29, club nights; 22, monthly meeting, Oct 6 & 13, club nights.

DORSET

▶Flight Refuelling ARS - Sep 3, talk "Direction Finding" by Bob Bromwich of FR Ltd; 10, technical topics, led by Ashley, G0CDY; 17, talk "Open Wire Feeders" by Robbie, G3MYM; Oct 1, DF hunt in the Purbeck Hills.
▶Plessey Christchurch ARC - 14, Coastguards special event station G4YRY.

ESSEX

▶Braintree & DARS - Sep 4, talk "Lorenz Beams" by Danny, G3YXJ; 18, talk "Satellite Communications" by Robin Cobbold; Oct 2, junk sale/bring & buy.
▶Chelmsford ARS - NEW SECRETARY Gwyn Williams, G4FKH, 21 Borda Close, Chelmsford, CM14JY, tel: 0245 260831.Sep 5, talk "Aerials are not Magic" by G4YTG; Oct 3, AGM.
▶Loughton & DARS - Sep 8, Aylmers Farm planning night; 22, Amateur TV Update by Barry Tickell, G6ESL; Oct 6, HF night on the air with G4ONP.

GLOUCESTERSHIRE

▶Gloucester ARC - Sep 6, AGM; 30, jumble sale at Longlevens Church Hall, 10.00 set-up; Oct 4, TBA.

GREATER LONDON

▶Acton, Brentford & Chiswick ARC - Sep 19, discussion "Transmission Lines".
▶Southgate ARC - Sep 14, talk "Astronomics" by Mr. R. Butler; 28, darts match with Cheshunt & Verulam; Oct 12, talk "Round the World Voyage" by Mark Brackenbury.
▶Wimbledon & DARS - Sep 8, talk "The Polar Trek Communications" by Michael Meerman, G0PA3BHF; 29, talk "Safety is no Accident" by Dick Biddulph, G8DPS; Oct 13, AGM. Details 01 330 2703.

GREATER MANCHESTER

▶Eccles & DARS - Sep 5, demonstration "Moving Coil Galvanometers" by G0KFP; Oct 3, talk "Achromatic Separated Lenses" by G4UOT. Details 061 773 7899.
▶South Manchester RC - NEW SECRETARY Ian Butterworth, G4BZO, tel: 061 231 5870. Sep 1, contest preparation; 8, talk "20 Things about Bicycles that you never wanted to know!" by Ian Morrison (G0DMU); 15, talk "Underwater DX" by G. Lomas, G4SYC; 22, surplus equipment sale.
▶Stockport RS - Sep 13, TBA; 27, surplus equipment sale. Details 061 439 3831.

HAMPSHIRE

▶Basingstoke ARC - Sep 4, talk "VLF & Global Navigation" by Eddie, G4SQZ; Oct 2, AGM. Details 0734 332777.
▶Fareham & DARC - Sep 13, the Valve P.A. Nite organised by Mick, G4ITF; 27, talk "How to Restore Old Equipment and Why It's Worth It" by Chris, G8JFJ.
▶Farnborough & DARS - Sep 13, talk "Propagation" by G3LTP; 27, pre-AGM discussion; Oct 11, annual construction contest. Details 0705 321411/2 (daytime).
▶Itchen Valley ARC - Sep 8, club meeting.
▶Three Counties ARC - Sep 9, skittles night; 13, construction night; 27, talk "Short Wave Listening" by Bob Treacher; Oct 11, club night for members own activities. Details 042873 7228 (H), 0483 579857 ext 3264 (W).

HEREFORD & WORCESTER

▶Bromsgrove & DARC - Sep 8, talk "Operation Raleigh 'Further Exploits'" by John, G4AAL. Details Bromsgrove 33173.
▶Kidderminster & DARC - NEW SECRETARY Tony Hartland, G8WOX, tel: Kidderminster 751584. Sep 12, AGM; 16, annual dinner and presentation; 26, TBA.
▶Malvern Hills ARC - Sep 12, club meeting TBA. Details 0684 573558.
▶Redditch ARS - Sep 14, talk "25 Years of Amateur Radio" by G3HZG. Details 0789 762041
▶Vale of Evesham ARC - Sep 7, talk "Radio Investigation Branch of the DTI". Details 0386 6407.

HERTFORDSHIRE

▶Cheshunt & DARC - Sep 13, talk "John Logie Baird & Television" by Derek, G0BTX; 27, talk "Radio on Postage Stamps" by Arthur Robinson, G3ZYQ; Oct 11, inter-club darts match. Details 0992 464795.
▶Verulam ARC - Sep 26, TBA.

KENT

▶West Kent - Sep 15, talk "Among my Souvenirs" by Arthur Milne, G2M1. 8pm at Adult Education Centre, Quarry St. Annexe, Camden Road, Tunbridge Wells.

LANCASHIRE

▶Fylde ARS - Sep 14, ARRL video "The New World of Amateur Radio"; 28, talk "Tramways of Lancashire" by Eric Fielding, G4IHF.
▶Wyre Amateur Radio Society - NEW SECRETARY Ian Broadbent, G0KMT, 15 Mowbray Road, Fleetwood, FY7 7JB, tel: 03917 5736.

LEICESTERSHIRE

▶Leicester RS - Sep 4, hands on test equipment evening; 11, committee meeting and HF/VHF activity night; 18, talk (TBA); 25, HF/VHF night on the air; Oct 2, quarterly progress, open meeting; 9, committee meeting, HF/VHF activity night. 7.30pm at Gilroes Estate Cottage, Groby Road, Leicester.

LINCOLNSHIRE

▶Grantham RS - 19, visit to British Horological Institute at Upton, near Newark. Details 0476 61439.

LOTHIAN

▶Lothian RS - Sep 13, President's address; 27, QRP night; Oct 11, "call my bluff". 8pm at "Orwell Lodge" Hotel, Polwarth Terrace, Edinburgh.

MERSEYSIDE

▶Liverpool & DARS - Sep 5, talk "Ham Radio pre-WW2" by George, G6VS; 12, activity - construction - club station on air; 19, surplus equipment sale; 26, pre-AGM; Oct 3, AGM. Details 051 733 6415.

NORFOLK

▶Norfolk ARC - NEW SECRETARY Mr. Steve Sewell, G4VCE, tel: 0508 78258. Sep 6, Town & Country Show final briefing; 10, club station demonstration at Town & Country Show, Royal Norfolk Showground, Costessey; 13, packet update with Roger Cooke, G3LDI and Paul Turnham, G4VLS; 20, talk "Equipment Reviews & EMC" by Angus McKenzie, G3OSS; 27, informal; Oct 4, talk "Radio Navigation Systems" by Malcolm Prestwood, G3PDH; 11, informal and committee meeting.

NORTHAMPTONSHIRE

▶Nene Valley RC - Sep 27, visit by C.M. Howes, kit manufacturers; Oct 4, talk "What makes an Archivist Tick" by Miss R. Watson.
▶Northampton RC - Sep 7, junk sale.

NOTTINGHAMSHIRE

▶ARC of Nottingham - Sep 21, foxhunt. 7.30pm Sherwood Community Centre, Mansfield Road.

OXFORDSHIRE

▶Oxford & DARS - Sep 14/28, club nights; Oct 12, club night.

SHROPSHIRE

▶Telford & DARS - Sep 6, visit to Japanese electronics factory (provisional); 13, talk "The Sun & Propagation" by G3ENY; 20, Telford repeaters (70 & 24cm) update; 27, talk & video "Tiree Expedition"; Oct 4, UHF on the air. Details Telford 770922.

SOMERSET

▶Yeovil ARC - Sep 14, talk by G8AWB; 21, talk "Product Detectors" by G3MYM; Oct 5, video night. 7.30pm at Recreation Centre, Chilton Grove, Yeovil.

SOUTH GLAMORGAN

▶British Telecom (S.Wales District) ARS - Sep 20, IBTE visit - Air Traffic Control, West Drayton. Oct 11, IBTE visit - Railway Communications Centre, Westbury, near Bristol.
▶Cardiff RSGB Group - Sep 11, talk "Transformers & Toroids for RF" by Bill Andrews, GW2DHM; Oct 9, AGM and bring & buy sale. Details 04463 3212.

SOUTH YORKSHIRE

▶Sep 11, talk "Weather Satellites" by G1ANI; 25 open meeting; Oct 9, rig check night. St. Helen's Church Hall, Lathes Lane, Newlodge.

STAFFORDSHIRE

▶Cannock Chase ARS - NEW SECRETARY D.A.Baker, G0BSM, 0543 372958.

SUFFOLK

▶Ipswich RC - Sep 13/27, Morse tuition (provisional). Details 0473 42072.
▶Felixstowe & DARS - Sep 4, quiz - return match against Leiston Radio Club at Felixstowe; 18, talk "Knots, Whippings & Lashings" by Malcolm Bell, G4CXT. Please bring a 1m length of rope; Oct 9, Orwell Park School Special Event planning. Details 0473 642595 (daytime).

SURREY

▶Coulsdon ATS - Sep 11, Monday meeting; Oct 9, talk "Advanced Driving Techniques" by John Cochrane, Institute of Advanced Motorists Group.
▶Guildford & DRS - Sep 8, surplus equipment sale; 22, social evening & barn dance. 8pm Ripley Village Hall; Oct 13, talk "My CROW Processor". Details Godalming 22107.
▶Reigate ATS - Sep 19, talk "Facts & Fallacies of Learning Morse" by Tom Mansfield, G3ESH; Oct 17, TBA.
▶Sutton & Cheam RS - Sep 15, TBA.

WARWICKSHIRE

▶Mid-Warwickshire ARS - Sep 12, visit by C.M. Howes; 26, talk "Cellular Radio" by Roger Reynolds; Oct 10, talk "These Things do Happen!" by Don, G8HRI. Details Kenilworth 513073.
▶Rugby ATS - Sep 26, presentation of various awards and cups.

WEST MIDLANDS

▶Coventry ARS - Sep 1, night on the air and Morse tuition; 8, talk "Narrow Bandwidth Television"; 15, night on the air and Morse tuition; 22, indoor Direction Finding Contest (cup qualifier); 29, night on the air and Morse tuition; Oct 6, AGM; 13, night on the air and Morse tuition. Details 0203 610408.
▶Midland ARS - 7.30pm at Unit 16, 60 Regent Place, Hockley, Birmingham. First Tuesday of month - committee; second ditto - details from G1ZCY; third ditto - monthly meeting; fourth ditto - Birmingham Raynet Group; last Monday of month - BBC computer club; every Wednesday - Morse tuition (start 7pm). Oct 17, AGM. Details from G1ZCY.

WEST SUSSEX

▶Horsham ARC - Sep 7, G3FXB contesting and USA contest stations; Oct 5, Autumn junk sale.

WEST YORKSHIRE

▶Halifax & DARS - Sep 19, AGM.
▶Keighley ARS - Sep 12, an evening with Jim, G4MH; 26, quiz v Northern Heights + supper; Oct 3, planning meeting special event.
▶Todmorden & DARS - Sep 4, visit by Lowe Electronics; 18, talk on antennas (provisional); Oct 3, junk sale.

WILTSHIRE

▶Blackmore Vale ARS - Sep 12, talk "Construction and Theory of Amateur TV Transmitters" by Steve, G1ZTO and Pat, G6VPM, of ATV; 26, G4RBV club station on air; Oct 10, junk sale. 8pm at The Old Coach House, Bell & Crown P.H.Zeals, Wilts.
▶Trowbridge & DARC talk - Sep 13, talk "Chordal Hop Propagation" by G0DAB. 8pm at T.A. Centre, Trowbridge; 27, social evening. Details GT0GRI.

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'.

30 JULY

▶Rugby ATS Amateur Radio Car Boot Sale - Lodge farm, Walcote, nr Lutterworth, Leics, about 2 miles east from junction 20 of the M1. 10am, admission 50p for non stall holders, pitches available for £5 the whole day. Talk-in on S22. Details from Kevin, G8TWH, tel 0203 441590.
▶Scarborough ARS Rally - The Spa, Scarborough. 11am, trade stands, bring and buy, refreshments and bar. Talk-in on S22. Details Ian, G4UOP, tel 0723 376847.
▶Hilderstone Radio Rally - Hilderstone College, St.Peters, Broadstairs, Kent. Details Ron, G3TAJ, tel 0304 812723.

6 AUGUST

▶RSGB NATIONAL MOBILE RALLY - Woburn Abbey, Bedfordshire. Details Norman Miller, G3MVV, tel 0277 225563 daytime.

13 AUGUST

▶Flight Refuelling Hamfest '89 - Flight Refuelling Sports Ground, Wimborne, Dorset. 10am. Radio & Electronics trade stands, craft and gift fair. Family entertainment and field displays. Free parking. Details John, G0API, tel 0202 691649 or Rob, G6DUN, tel 0202 479038.
▶Derby Radio Rally - Lower Bemrose School, St.Albans Road, Derby. Usual attractions, including monster junk sale. Details Martin, G3SZJ, tel 0332 556875.

20 AUGUST

▶Red Rose Summer Rally - Bolton Sports & Exhibition Centre. Details Dave, G1IOO, tel 0204 24104 evenings.

27 AUGUST

▶Torbay Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ, 2 Orchard Grove, Brixham, Devon TQ5 9RH.
▶Galashiels & DARS Open Day - Focus Centre, Galashiels. Details John, GM0AMB.
▶BARTG Rally - Sandown Park Racecourse, Esher, Surrey. 1030-1700. £1 adults; 50p OAP/children. Talk-in S22 and SU22 by G4ATG. Details Peter, G8VXY, tel 021-453 2676.

28 AUGUST

▶Huntingdonshire ARS JUNK 89 - The Medway Centre, Coneygeare Road, Huntingdon, Cambs. 1030-1700. Talk-in S22 and OV, (433.125, RB5). Details Chris, G1YVS, tel 0487 830212

3 SEPTEMBER

▶22nd Preston ARS Rally - University of Lancaster. Doors open 11am (10.30 for disabled visitors). University entrance on A6 trunk road, 3 miles north of M6, junction 33. Details Godfrey, G3DWQ tel 0772 53810.
▶Telford Amateur Radio Rally - Telford Exhibition Centre. Doors open 11am (10.30 for disabled visitors). Talk-in via GB4TRG on S22.

Usual facilities. Details Martyn, G3UKV, tel 0952 255416.

10 SEPTEMBER

▶Lincoln Hamfest '89 - Lincolnshire Showground, 4 miles north of Lincoln on A15. Details John, G8VGF, tel 0522 25760.
▶Vange ARS Rally - Nicholas School, Basildon. Details G4NVT, tel 0268 43025 or Mrs Thompson, tel 0268 552606.
▶6th National Amateur Car Boot Sale - The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade, Beds. Details Tony G0COQ tel 0582 508259 (24hrs). Permission to 'fly-in', tel Northill 288.

16 SEPTEMBER

▶Scottish National Convention - Fife Sports Institute. Details John, GM4ALA, tel 0592 742763.
▶Wight Wireless Rally - Wireless Museum, Arreton Manor, nr Newport, IOW. Details Douglas, G3KPO, tel 0983 67665.

17 SEPTEMBER

▶Peterborough R & ES Mobile Rally - Wirrina Sports Centre, Peterborough. Details G4PYP tel 0733 230412, evenings.

24 SEPTEMBER

▶Harlow Mobile Rally - Harlow Sports Centre. Details G4MIS tel 0279 722622 evenings or G4KVR tel 0279 22365 daytime.
▶5th North Wakefield RC Rally - Outwood Grange School, Potovens Lane, Outwood, nr Wakefield. Details Richard, G4GCX, tel 0532 622139.

1 OCTOBER

▶Blackwood Amateur Radio Rally - Oakdale Community College, Blackwood, Gwent. Doors open 10.30am. Dealers stalls, raffle, refreshments, talk-in etc. Details Brian, GW0JWF QTHR.
▶Great Lumley ARES Rally - Great Lumley Community Centre, Chester-le-Street, Co.Durham. Doors open 11am (10.30 for disabled visitors). Trade stands, book stands, bring & buy; refreshments, etc. Entrance fee 50p. Details Barry, G1JDP tel 091-388 5936.

8 OCTOBER

▶Armagh Rally - Drumsill House Hotel. Details J A Murphy, 18 Ogle Street, Armagh City, Co.Armagh, tel 0861 522153, after 5.30pm.

15 OCTOBER

▶Bishop Auckland Radio Rally - Leisure Centre, Shildon, Bishop Auckland. Bring & buy, refreshments etc. Admission 11am (10.45 for disabled visitors). Details Ernie, G4TYF, tel 0388 607500.
▶Hornsea ARC ELOEX 1989 Rally. Doors open 11am (10.30 for disabled visitors). Details Jeff, G4IGY, tel: 0964 532874.
▶Milton Keynes & DARS 3rd Amateur Radio Car Boot Sale at Cranfield Airfield, Beds. Admission 10am. Bar & refreshments. Talk in on S22. Details Mike, G0FMC, tel: 0908 566796 or Tony, G6WXM, tel. 0908 316435.

4 NOVEMBER

▶9th North Devon Radio Rally - Bradworthy Memorial Hall (near Holsworthy). Admission 10.30am. Bring & buy stand etc. Talk in on 2 metres (S22). Details G8MXI (QTHR).

4/5 NOVEMBER

▶North Wales Amateur Radio & Electronics Rally - Aberconwy Centre, Llandudno. Details Siggy, GW0DYH, tel 0492 517875 (evenings/weekends).

19 NOVEMBER

▶West Manchester RC Winter Rally - Bolton Sports & Exhibition Centre. Details Dave, G1IOO tel 0204 24104 evenings.
▶Birmingham Mini-Mobile Rally - (Venue to be advised) Details Norman, G8BHE, tel 021-422 9787.
▶Bridgend & DARC Radio Rally - Bridgend Recreation Centre, Angel Street, Bridgend, Mid-Glamorgan. Doors open 11am. Details GW4YKL, tel 0443 226198.

26 NOVEMBER

▶Verulam ARC Christmas Rally - St.Albans. Details Hilary G4JKS tel 0727 59318. Trade bookings, tel Watford 52959. (Date changed from 3 December)

10 DECEMBER

▶Leeds & DARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, nr Leeds. Details G Stubbs, tel 0532 585801.

4 MARCH 1990 (Provisional)

▶The Great Northern Rally (Trafford Rally) - G-MEX Centre, Manchester. Details Graham, G1IJK tel 061-748 9804.

11 MARCH 1990

▶Welsh Mobile Rally - Barry Leisure Centre, off Horton Road, Barry, South Glamorgan. Details GW6RCK.

1 APRIL 1990

▶Pontefract & DARS Component Fair 1990 at Carleton Community Centre, Carleton, Pontefract.
▶White Rose Rally - Leeds University. Details G4DXA, PO Box 73, Leeds LS1 5AR.

8 APRIL 1990

▶Cambridgeshire Repeater Group Rally and Junk Sale/Auction. Details G0HEM (QTHR).

13 MAY 1990

▶Southend & DARS Mobile Rally at Roachway Youth Centre, Rochford, Essex. Details from John Stone, G0DFE on 0702 202216.
▶Yeovil ARC 6th QRP Convention. Details G1MNM (QTHR).

10 JUNE 1990

▶21st Elvaston Castle Mobile Radio Rally, Elvaston Castle Country Park near Derby. Details from John, G4PZY on 0332 767994.

24 JUNE 1990

▶33rd Longleat Amateur Radio Rally, Longleat Park, Warminster, Wilts. Details Shaun O'Sullivan, G8VPG, tel: 0225 873098.

OTHER EVENTS

16 SEPTEMBER

▶Scottish National Convention-Fife Institute of Physical Recreation, 1100 to 1700. Usual traders, RSGB,catering, bring and buy, Morse Tests, Lectures, talk in on S22. Details: John Hardwick, 0506 410 677 during the day.

1 OCTOBER

▶RSGB HF Convention-Belfry Hotel, Milton Common, Oxford. Doors open 9.30am. Admission £3.50. All the usual RSGB Committee stands, presentation of trophies, Young Amateur of the Year Award, full lecture programme. Details: Martin Atherton, 0223 424714.

27-28 OCTOBER

▶Leicester Show-Granby Halls, Leicester. Doors open 1000(0930 for disabled visitors) until 1800 each day, admission £1. This is the biggest show ever held at Granby Halls. RSGB stand. Details Frank Elliott, G4PDZ, 0533 553293.

GB CALLS

The list below shows all special event stations licensed for operation during this month (as at press date). It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days. The callsign in parentheses is the source for further information.

1 SEPTEMBER

▶GB0CDZ (G3KXW)	COASTAL DEFENCE STATION Z
▶GB0GPF (G4KWW)	GLOUCESTERSHIRE POLICE FORCE
▶GB2GAF (G3MA)	GLOUCESTER AIR FORCE
▶GB2RXY (G3HQU)	ORIGINAL C/SIGN ISSUED 1913
▶GB4BAM (G0LAD)	BRENZETT AVIATION MUSEUM
▶GB4BBC (GM0BLX)	BOYS' BRIGADE COUNCIL
▶GB4RFC (G3FQH)	ROYAL FLYING CORPS
▶GB4RRG (G0FRL)	RED ROSE GOLD
▶GB4SDC (G0GTE)	STEVENAGE DISABLED CENTRE
▶GB6RRA (G1TAR)	RED ROSE AWARD

2 SEPTEMBER

▶GB0WFS (G0LIB)	WELLOW FLOWER SHOW
▶GB1CDN (G1JGS)	COASTAL DEFENCE 'N'
▶GB2MC (G4DCJ)	MUCKLEBURGH COLLECTION
▶GB4BTS (G4JKF)	BRITISH TELECOM STONE
▶GB5TD (GM4NNC)	TINWALD DOWNS

3 SEPTEMBER

▶GB0WPF (G4SHV)	WILTSHIRE POLICE FORCE
▶GB2FRB (GM0GBH)	FORTH ROAD BRIDGE
▶GB2TE (G0FCV)	TRANSPORT EXTRAVAGANZA
▶GB2TX (G0FCV)	TRANSPORT XTRAVAGANZA

4 SEPTEMBER

▶GB8NS (G4WWA)	NEEN SAVAGE

7 SEPTEMBER

▶GB0XXV (G3ZKI)	25TH ANNIVERSARY BRISTOL ARC
▶GB2RAF (G0KUC)	ROYAL AIR FORCE

8 SEPTEMBER

▶GB0GPF (G4KWW)	GLOUCESTERSHIRE POLICE FORCE
▶GB2SSG (G4UBD)	SILEBY SCOUTS & GUIDES
▶GB4HH (G0EAE)	HINWICK HALL
▶GB4LSG (G4KHF)	LONG SUTTON GALA
▶GB8FC (G0BDG)	RFC

9 SEPTEMBER

▶GB0RAF (G4NVD)	ROYAL AIR FORCE
▶GB2INB (G4XQA)	INCE 'B'
▶GB2WMF (G0KBT)	WINSCOMBE MICHAELMAS FAIR
▶GB4RAF (G4WZU)	ROYAL AIR FORCE
▶GB4YRD (G3PTU)	YORKSHIRE RAYNET DONCASTER
▶GB5CS (GW3TQI)	CARDIFF SHOW
▶GB8SL (G4XOM)	STOURBRIDGE LION

10 SEPTEMBER

▶GB2CDU (G0CWX)	COASTAL DEFENCE
▶GB4VMR (G4NVT)	VANGE MOBILE RALLY

11 SEPTEMBER

▶GB0SUB (G0FOD)	SUBMARINE ALLIANCE
▶GB2MAR (G3RDR)	MARCONI AMATEUR RADIO

15 SEPTEMBER

▶GB0PC (G0FBW)	PETERLEE CARNIVAL
▶GB1SBS (G8XSO)	1ST SOUTHOE & BUCKDEN SCOUTS

16 SEPTEMBER

▶GB0CSV (G3IUC)	CHIEF SCOUT'S VISIT
▶GB0HMF (G0JBM)	HOOE MICHELMAS FAIR
▶GB4FMF (G4RJO)	FRIENDS OF MOIRA FURNACE
▶GB8HMF (G0JBM)	HOOE MICHELMAS FAIR

17 SEPTEMBER

▶GB2WF (G4ZPV)	WALTON FIRS

18 SEPTEMBER

▶GB6BC (G4VUA)	BELVOIR CASTLE

21 SEPTEMBER

▶GB2PL (G4THN)	PATROL LEADER
▶GB2RCC (G4EPN)	RADIO CARAVAN CAMPING

22 SEPTEMBER

▶GB1UB (G1GUH)	UNIVERSITY OF BIRMINGHAM
▶GB2UB (G4HHJ)	UNIVERSITY OF BIRMINGHAM
▶GB4DLC (GM3MXN)	DAVID LIVINGSTONE CENTRE
▶GB8FC (G0BDG)	RFC

23 SEPTEMBER

▶GB2FD (G0EVD)	FIRE DAY
▶GB4HMS (G0ERS)	HER MAJESTIES SHIP
▶GB4RAF (G4CFS)	ROYAL AIR FORCE
▶GB9OO (G4SVX)	800 YEARS NORTHAMPTON CHARTER

25 SEPTEMBER

▶GB0CDS (G0JEZ)	COASTAL DEFENCE SOUTHWICK

26 SEPTEMBER

▶GB0CDD (G0HCZ)	COASTAL DEFENCE 'D'
▶GB6CDV (G0HCZ)	COASTAL DEFENCE VENTNOR

28 SEPTEMBER

▶GB1RLD (G1UJX)	RADIO LINK DERBY

29 SEPTEMBER

▶GB1CDN (G1JGS)	COASTAL DEFENCE 'N'

30 SEPTEMBER

▶GB4IBM (GM0ETC)	IBM GREENOCK OPEN DAY

1 OCTOBER

▶GB0CDZ (G3LXW)	COASTAL DEFENCE STATION Z
▶GB0EWC (G0AHI)	EAST WICKHAM CUBS
▶GB0RRA (G0JBR)	RED ROSE AWARD
▶GB0RRR (G0JWU)	RED ROSE RALLY
▶GB2NCC (G0ACR)	NORTHUMBERLAND COUNTY COUNCIL
▶GB4RRA (G0FRL)	RED ROSE AWARD
▶GB4RRS (G0IZR)	RED ROSE SILVER
▶GB6HEY (G6IMJ)	KNOWSLEY HEY SCHOOL
▶GB8RRG (G1IOO)	RED ROSE GOLD

CW FILTER FOR THE RC14

Alas there's an error in the PCB layout for the CW filter published back in the July issue. The problem lies with the polarity of two 22µF electrolytics - C5 and C8 - which are shown the wrong way round. Fig 3 is in error - the circuit diagram, Fig 2, is correct. In the words of the author, Steve Price, "don't shoot the draughtsman - the mistake is entirely my fault!"

PSION ORGANISER MORSE PROGRAM

We published a program which enables the Psion Organiser to be used as a morse tutor, in the June issue ofRadCom. There are no mistakes as such, although the presentation of the program in line 3 (page 40) has misled one or two people. As printed, lines 3 and 4 are one and the same line - our computer printer simply wrapped the text round the end of a long line.

Line 3, therefore, begins "SAV$ (16)... The real line 4 is "GOTO SET::"

It has been suggested, as well, that a line be moved in column 3 on page 41. One third of the way down column three, locate the line BEEP 800,100. The new order, from that line on, is:

```
BEEP 800,100
SAV$=""
GOTO SET::
ELSEIF SL%<>85
CLS
```

Several people seem to have had some strange results with the bleep; this was investigated by G6MCY, who traced the problem to the bleep statements in the procedures DA, DI and SP which set the space intervals between the morse component and the individual letters. The problem was that the frequency-determining component of the statement had been set to "0" which produced a frequency of 11.8kHz, and hence the high pitched bleeps. He says, "I can only assume that the piezo transducers in some organisers are better than others and will produce a frequency of 11kHz. The cure is to alter the beep statement as follows:

Proc.	Original line	New line
DI	BEEP L%,0	BEEP L%,-39
DA	BEEP L%,0	BEEP L%,-39
SP	BEEP L%*3,0	BEEP L%*3,-39

"Another modification I made was to include a routine to allow the frequency of the oscillator to be changed so that the output could be adjusted to suit the user. This routine consists of the following lines:

```
PRINT"ENTER OSC FREQ"
INPUT HZ%
T%=((921600/HZ%)-78)/2
```

"The variable HZ% has also to be added to the global definition line at the beginning of the program, or when you run the program you will get the "MISSING EXTERNAL" error message.

This routine can be added to the program in place of the line "T%=80" which appears in the listing at the top of column 1 on page 41."

the last ...

DATASPACE 89 'A SUCCESS'

I have just returned from the 1989 DATASPACE gathering and I am writing to say how delighted I was with the entire proceedings. I can safely say that it has been one of the most enjoyable events that I have attended. The speakers were top-class with most interesting and well prepared lectures. The idea of the packet/satellite mix is a very good idea and one that should be used in future years. It added to the already high quality of the whole event.

The venue, whilst not a four star hotel, was adequate and comfortable with very reasonable load. The University is a fine place to hold such an event and should be considered for future years.

I missed the dinner that we had at Harrow and consideration should be given to bringing this back, caterers allowing! A few more exhibitors would also be welcome, if they can be persuaded to come.

Many thanks to the organisers and for all the hard work put in by the various people. You have succeeded in doing a good job! *Mr T Sloan, GI4AHP*

FULL MARKS RAS NOTTINGHAM

On the night of 10 July, 1989, my car was broken into, and a 2m linear amplifier was stolen along with some small change and other odds and ends.

The theft was reported to the local Amateur Radio suppliers to notify them of my loss in case it should turn up there. The reaction from the various people whose livelihood revolves around amateur radio, to my request for help, was mixed, ranging from enthusiasm to total disinterest.

One of the emporia that did show interest and enthusiasm was RAS Nottingham. The same day I spoke to RAS a local CB dealer phoned them for an expert valuation of a linear amplifier they had been offered as a trade in. After hearing a description of the amplifier Mr Peter Owen of RAS told the CB dealer the equipment was stolen, arranged for him to hold the equipment, and then notified me of its whereabouts for my recovery.

Full marks to Mr Peter Owen and his team at RAS Nottingham for their dedication to amateur radio.

Mr C Philpot, G6KBC

It's nice to hear of an equipment theft which has a happy ending for a change. In the light of Mr Philpots experience, this may be the appropriate moment for us to consider post coding our gear with a UV marker as recommended by the police - three cheers for Peter Owen and his quick thinking! (Dep Ed)

ANTI ANTI-CONTEST

What to me is so sad about your readiness to print anti-contest letters in *RadCom* is that they don't have to be well-considered, accurate or relevant - any old tirade of abuse will do, such as that from G4XPP in the July issue.

I know personally of two letters supporting contests that you have not printed, but most contesters prefer to get on with their chosen element of the hobby, normally with a minimum of QRM, rather than whinge in the pages of *RadCom*.

Only the biggest events of the year - CQ WW, WPX and ARRL - could be said to take over the bands, and IARU Radiosport is the only major multimode event, itself a contradiction of the IARU's own guidelines. Even during CQ WW SSB, surely the biggest event of the year, it is perfectly possible to find clear frequencies above 14.3MHz at the height of the contest. I suspect that many of the complainants object to not being able to use 'their' frequency at the same time each week to discuss the WX with Fred down the road for hours on end (the RF Byrne cartoon is most appropriate). No-one has the right to a QRM-free sked frequency; one aspect of self-training certainly taught by contesting is the ability to use the receiver tuning dial to find a clear frequency.

In the same issue that you print G4XPP's ramblings, the letter from G3LCK points out the daily lack of activity on 24MHz. Great care has been taken throughout IARU to keep contest traffic away from 10, 18 and 24MHz, but these bands remain under-used. The recent lifting of restrictions does not appear to have generated an increase in usage, even during the alleged QRM of contest weekends.

It seems to me that contesters suffer an image problem because we don't sit down and write letters of complaint to *RadCom*, but spend time improving our stations, experimenting with antennas and refining our operating skills. G4XPP perhaps thinks that all there is to a contest is exchanging 5NN with everyone. Let him try maintaining 100 QSOs per hour on CW, let alone SSB, and I wonder how often he gives truthful reports such as R3 (readable with considerable difficulty) or T5 (musically modulated note) during his QSOs?

Why allow such ill-informed comments in *RadCom*? The 100W and dipole limit he suggests is already in place in NFD, which is supported by very many club members throughout the country. G4XPP's club (assuming he is not against clubs as well) has the opportunity to enter Field Day, and his belief that contests do not involve self-training could then be tested by seeing how well he gets on.

Mr D Lawley, G4BUO

The reason why we publish such letters is simple - whether we agree with the sentiments or not, both yourself and Mr Bolton are entitled to air your views! Having said that, it may be worth suggesting that all factions involved in the contest issue are prey to the same underlying cause ie. the limited availability of a scarce resource. Maybe it would be an idea if the two groups got together to discuss the matter instead of the perpetual 'Mexican stand-off'? Come on folks, it is a hobby! (Dep Ed)

'DEAD' QUIET?

Please may I ask "What is amateur radio coming to?". No, I am not referring to the lack of young blood or the misbehaviour on the London repeaters. I am referring to an incident which occurred in my region on 18 July 1989. A station (which I shall leave nameless since this letter is from me and may not represent his views) requested assistance on 2m for an RTA (road traffic accident - *Dep Ed*) in Dursley. All he required was that somebody with a telephone make the necessary 999 call since police and ambulance assistance was needed. The call went unanswered.

I am only 16 years old and was many miles from the scene so I was worried that I would not be believed. However, I answered the call as soon as it became apparent that nobody else was going to. Upon doing so, two mobile stations started talking over the top of me whilst I was trying to make arrangements to QSY. Even if they could not hear the other station they were sure to have heard me. They may not have even been aware there was an RTA (although I cannot be sure) but where has common amateur radio courtesy gone?

However the police arrived just as I was about to make my 999 call. The story does not end here, though. I contacted the station involved later again - he was very quick to thank me since, he explained, he had been in a similar situation on three previous occasions, and never before had anybody offered assistance on 2m! On one occasion a station had replied simply to inform the mobile that he was breaking his licence regulations by handling third-party traffic! As my friend said, there would have been a response on CB radio despite its many failings - yet on Two there was nothing EVEN THOUGH LIVES COULD HAVE DEPENDED ON IT.

Mr S D Kennedy, G0LRI

I have had a similar experience in the past - it just goes to show that age is not a qualification for good manners. (Dep Ed).

NET OR SNARE

For many years I used to think a 'net' as used in amateur radio was so called because it consisted of a joining together of stations. In recent years I have come to the conclusion that now 'net' often means being 'trapped' for far too long.

I feel that controllers often do not control - surely if each station was allowed, say three minutes to have their say, the others would remember what had been said; and so comment more quickly etc! In the 'long run' (HI!) the whole time taken would not be any longer, and everyone would have 'fair shares'. I wonder how many agree with me?

Miss C Hall, G8LY

QUICK WORD

Have just heard what must be the shortest QSO ever. An overseas station was working a string of other stations and went something like this:

"QRZ"

(other station) "This is XYZAA you're 5&9"

(calling station) "you're 5 & 9. QRZ"

I wonder what on earth is gained from such a contact or am I missing out on something. It was not a contest QSO.

Mr R Smith, G4LZY

CONTESTING

While I agree entirely with G4XPP's comments on the futile pastime of contesting, I realise that from experience that is only my present opinion and my tastes might change and one day I might derive some sort of pleasure from contesting, however odd that might seem to me at the moment.

While the Hornets nest that G4XPP may have stirred subsides may I say that having held an Italian licence I only wished that I were allowed to run 1-2kW of RF at HF! Most British amateurs don't know how good we have it here. Italian stations are only allowed 300W (PEP) on any band for a General Licence (Class A) and 10W (input) VHF and UP, for a Limited Licence (Class B).

There is NO mobile operation allowed on HF in any form, except CB (*sic*) and only 10 watts when mobile on VHF and up for ANY class of licence. While these facts don't reduce the interference levels we have all experienced, don't think that Italian stations have some sort of fantastic power advantage, they don't. Blame propagation, 3/4 ELE beams pointing stateside, even bad operating practice, but least of all don't forget your own front end. *Mr D Bragoli, G0ANC*

With your comment on wanting kilowatts, I wouldn't be surprised if you have just stirred up your own personal hornets nest!

... word

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