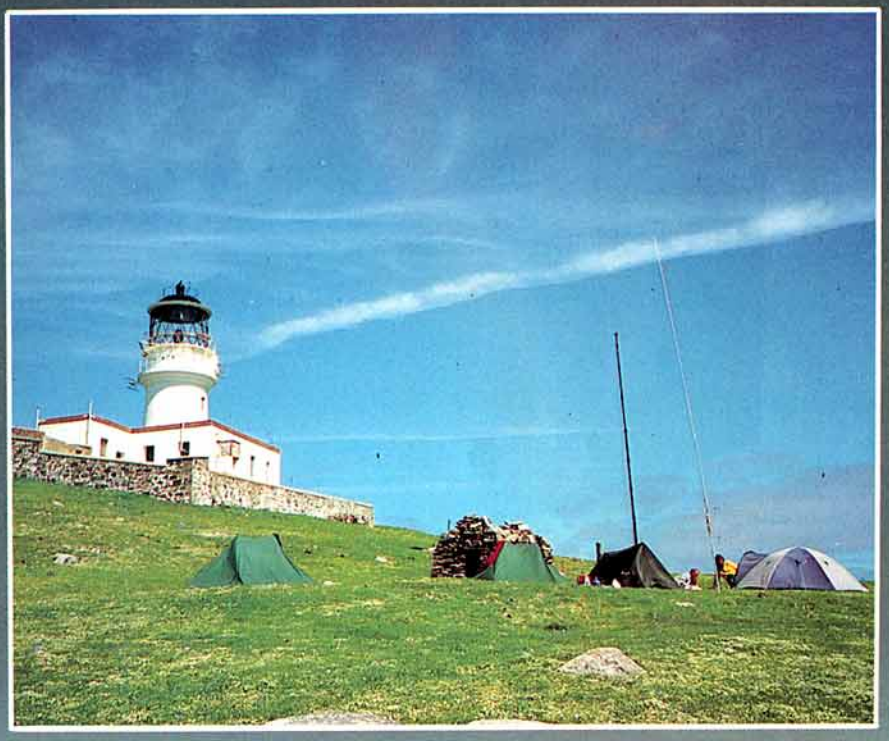
Radio Communication

November 1989

Highland Fling -
Western Isles DXpedition

Simple Spectrum Analyser – home brew project



LOWE'S LATEST:
the HF-225 Receiver

KENWOOD

TS-950S. This is DX-clusive

Rumours have abounded for some months that Kenwood were once again about to take the HF transceiver market by the throat, and with the announcement of the TS-950S those predictions have proved to be true. It is an undisputed fact that Kenwood HF transceivers have always led the way, and it seemed almost impossible for their design team to make significant advances on the success of the TS-940S, — but they have.

We don't have to tell you that the receiver performance is outstanding; a noise floor of -140 dBm will do that. Nor do we have to mention the ease of use; Kenwood has an enviable reputation in this area. What we must give a few hints about are some of the new operating aids which Kenwood have included, such as a dual receiver which allows you to listen up to 500 kHz away from your operating frequency — even during transmitting; such as the revolutionary digital signal processing option which gives improvements of up to 10 dB in carrier and unwanted sideband suppression; variable transmit bandwidth; adjustable rise time of the CW envelope; and much more.

The photograph and this brief text can only give a hint of what the TS-950S can deliver — the full story can only be told by a visit to your Kenwood approved dealer or a browse through some detailed literature, but take it from me that once again, Kenwood have shown the way forward in HF transceiver design.

John Wilson G3PCY/5N2AAC

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Radio Communication

VOLUME 65 No 11 **NOVEMBER 1989**

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Catherine Carr, G60QA, operating from the Flannan Isles — page 12.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Membership application forms available from RSGB HQ

COUNCIL BRIEF

20 May 1989 Council Meeting

■Council continued its discussion with regard to future venues for the Annual Meeting. Council had asked if any affiliated Club, Society and Group would host the Annual Meeting in December 1989 and a number of offers had been forthcoming. Council decided that the 1989 meeting would be held in Dunoon, Scotland and thanked the local Club for recommending the venue. Council also decided that the 1990 meeting would be held in Bristol and the 1991 meeting back in London.

■Council agreed new terms of reference for the T&P Committee. A change of name to the Technical and Publications Advisory Committee was also endorsed.

■Council set up a Working Group to look into ways of reducing staff overload and allocating priorities to work as a basis for reducing expenditure.

■A lengthy discussion on how best to deal with future legislation from the European Community which might affect amateur radio took place. The possibility of a liaison between all national Societies within the EC was discussed. The Society's representatives at the next meeting of the affected national Societies were briefed as to the RSGB's view and limited financial support was agreed if it became necessary.

■On a recommendation from the Morse Test Steering Group, Morse Test Examiners were reappointed by Council for a further year from 1 July 1989.

■The Tartan Trophy was discussed.

■John Bazley, G3HCT, was appointed Chairman of the Society's Licensing Advisory Committee. Alan Dearlove, G1WZZ, was appointed Chairman of the EMC Committee.

27 July 1989 Council Meeting

■Council elected the Society's EVP, Frank Hall, GM8BZX, as President of the Society for 1990.

■On a recommendation from the Exhibition and Rally Committee, Council agreed that the Society should hold its 1990 National Convention and Exhibition on 21 and 22 April 1990. The venue to be the National Exhibition Centre, Birmingham.

■It was agreed that the existing schedule for the production of the 1990 *Call Book* should be brought forward so that it would be available for sale at the 1990 National Convention.

■Council agreed to form an RSGB Events Co-ordination Group. Its function to be to co-ordinate the dates of RSGB organised main events such as the National Convention, VHF and HF Conventions and National Mobile Rally at Woburn Abbey.

■Council agreed to appoint Mr Willie McClintock, G3VPK, as Honorary Treasurer.

■It was agreed that a Working Group would be set up to discuss all aspects of GB2RS.

■Progress on Project YEAR, with special emphasis on the recent Industry Conference, was discussed in great detail. The Secretary highlighted the need for a Project Champion. It was decided to investigate the possibility of setting up a charity with a view to facilitating the funding of the project further.

■It was felt that the four popular RSGB Newsletters; the DX News Sheet, 6 Metre and Up Dxer, The Microwave Newsletter and Connect International, should be given a higher profile to stimulate further subscriptions.

■The future of the QSL Bureau was discussed. The setting up of the incoming Bureau at HQ was proceeding well.

NEWS FROM THE HF CONTESTS COMMITTEE

CONTEST REMINDERS

The adjudicator of the Clubs Call Contest, G4JKS, wishes to remind all those clubs and individual members who wish to take part that the event is on the 11 November from 2000UTC to midnight. This is an ideal starting contest for Class B operators to work on HF under the supervision of a Class A operator from either the club station, or from a Class A member's location.

Entry to this contest has been made as wide as possible and sections include, Club stations, individual operators and short wave listeners. Certificates will be awarded to the leaders in each section. Club secretaries and contest managers are reminded that they should be starting to

organise their teams for the 1990 AFS contest. January is only a few weeks away! G3MCX, the adjudicator of the Low Frequency Cumulative Contests, is looking forward to a large entry for the next series of these 7, 3.5 and 1.8MHz events which start early in January. These short multi-session events are an ideal starting point for those amateurs who have not previously entered a CW contest. Why not give it a go?

LOW FREQUENCY SSB CONTEST

As previously mentioned in HFCC News, the 7MHz Phone contest has been replaced by a Low Frequency SSB event covering both 7 and 3.5MHz. The HF Contests Committee has presented a new trophy to the Society for the UK winner of this event and the HFCC are hoping for a large UK entry. Times and dates are 1200UTC Saturday 3rd February to 0900UTC Sunday 4th February.

COMPUTER DERIVED LOGGING

The HFCC is often asked for advice on the best software to use for on-line (real-time) contest programs and other aspects of computer logging and checking. While we cannot make specific recommendations, we have prepared some general notes, based on the experience of HFCC members and a number of contest entrants. If any member would like a copy, please send a large SAE to the HFCC, Box 73, Lichfield, Staffs.

COMMITTEE MEMBERSHIP

We are pleased to welcome G4IQM who has joined the committee to replace G4RWW who recently left us because of increased business commitments.

CLASS B LICENSEES OPERATING UNDER SUPERVISION IN HF CONTESTS

There have been some queries as to why such entries are classified as multi-operator. Under the licence conditions for such operation, the supervising Class A operator has to be present at all times. While it is appreciated that in some cases, the Class B licensee gets no help from the supervising operator, there are other situations where this does not apply.

ADJUDICATION QUERIES

A number of entrants have asked for help in regard to improving their performance in contests and in particular what they can do to avoid the loss of points during the contest adjudication. While we cannot go into detail, the HFCC are always willing to discuss individual entries on a general basis. Entrants who are worried about a particular entry can always telephone or write to the nominated contest adjudicator who will try and help.

REPEATER MANAGEMENT GROUP VACANCIES

Due to re-organisation and rationalization, the Repeater Management Group of the RSGB has the following vacancies:

Zonal Repeater Managers for the following zones:
Zone A (Northern England and Isle of Man)
Zone D (SW and Central Southern England)
Zone E (Wales) — corresponding member
Zone F (Northern Ireland) — corresponding member

The job specification is as follows:

1) To liaise with Repeater groups and RLOs in the Zone as appropriate.
2) To ensure that groups proposing repeaters and site/channel changes have the necessary forms and information.
3) To argue the case for/against a repeater in the Zone prior to its acceptance in principle. (NB if a RM has a vested interest, he should pass the proposal to another committee member, though the RM may still state his views).
4) To carry out vetting, liaising with the group and, as necessary, with the appropriate specialist RMG members.
5) To maintain documentation of all vetting carried out, including that done verbally.
6) To send the complete proposal to the Proposal Manager when the proposal is complete.
7) To maintain the accuracy of the Repeater List and Close Down list for the Zone.
8) To attend the majority of Committee meetings, and if absent to produce a written report for the meeting.
9) To liaise regularly with the RMG Chairman.

Any applicants should write to the Chairman of the RMG, Geoff Dover, G4AFJ, who is QTHR.

Oxford HF Convention Address

At the Society's recent Oxford HF Convention held on 1 October 1989, the RSGB Secretary publicly thanked the DTI for their support of amateur radio and for their sponsorship of the Young Amateur of the Year Award.

"Those of us who regularly use the HF bands no doubt occasionally reflect upon the privilege which we enjoy in using prime sections of the HF spectrum for our personal enjoyment.

That privilege stems from the activities of:-

(1) the ITU in Geneva which co-ordinates worldwide spectrum management.
(2) the Government which through the DTI issues our licences, manages the spectrum within the UK and which represents all of the various radio services at ITU level.
(3) the IARU which co-ordinates amateur radio spectrum management activities internationally (bandplans, for example), and, of course,
(4) the RSGB which through its work represents UK radio amateurs, both nationally and internationally.

I have had the privilege of representing the RSGB at International Conferences in each of the three recognised radio regions in the World; the most recent being September in the USA. I realise now that UK licence conditions are in fact in many respects amongst the most liberal and progressive in the World — leading the World in a number of areas. For that we should be thankful.

I know that most amateurs have heard the phrase 'use or lose' — that saying applies to all of our amateur bands both now and in the future. We have been used to seeing a sustained growth of radio amateurs, but that growth in many countries has slowed considerably during the past few years. A lack of growth could inevitably lead to a loss of bands.

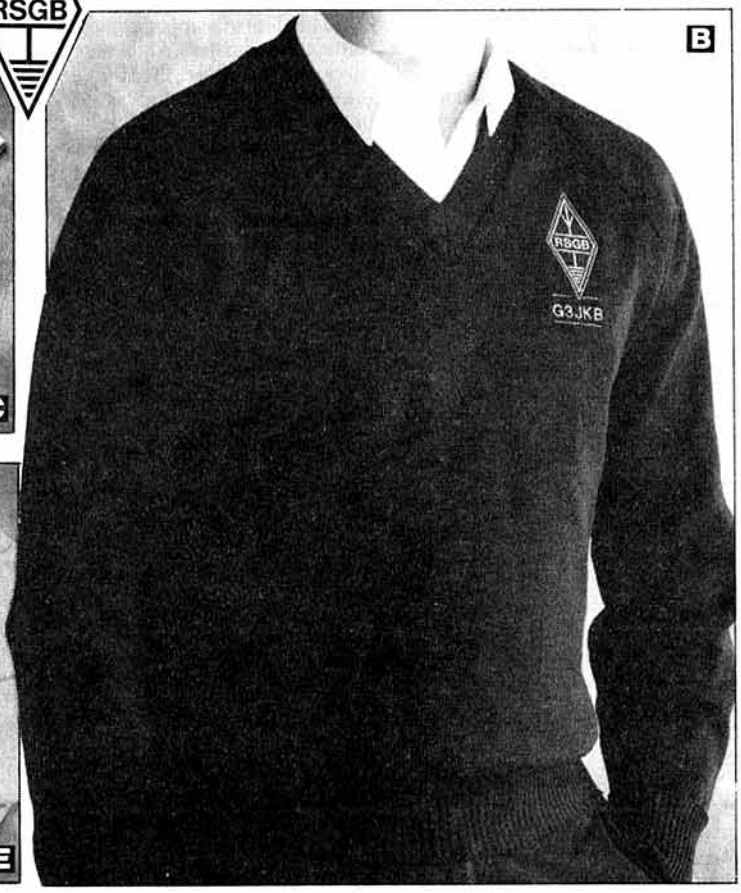
Obviously if we want to retain our most precious of assets — our amateur bands — we must continue to use them. Generating radio amateurs for the future is therefore essential. It is a process which each and every radio amateur can become involved with and is in essence precisely what the RSGB Project YEAR initiative is all about.

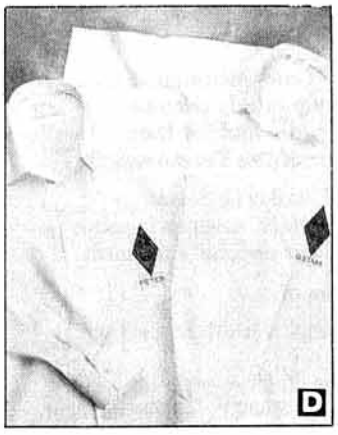
It is therefore with much gratitude that the RSGB recognises the role of the Radiocommunications Division of the DTI, in its sponsorship of the Young Amateur of the Year Award. This sponsorship recognises the DTI's commitment to the future of amateur radio and also recognises the fact that amateur radio can provide young people with an entree into science, engineering and electronics."

When asked to recognise the DTI's contribution to amateur radio, there was much applause.

David Evans, G30UF

EXCLUSIVE TO RSGB MEMBERS





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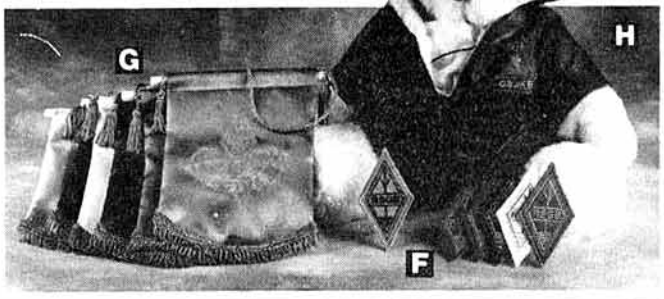
G SHACK BANNER
9" × 6" Ready to hang. RSGB logo plus your own call sign and number of membership years embroidered onto length of membership colours. (*Please state number of years when ordering*).

H HAM BEAR
18" Tall, Fully jointed collectors bear with headphones. RSGB logo and your call sign embroidered onto his jacket. Definitely NOT a toy. Made in England.



Did you work GW0HFQ/M?

As we've reported in previous editions of *RadCom*, Peter Dixon, G0HFQ, and his wife Gwenda were brutally murdered whilst on holiday in South Wales last June. Dyfed-Powys Police have asked us to say that they are still anxious to talk to anyone who had a contact with Peter whilst he was operating in Pembrokeshire as GW0HFQ/M on 7 or 14MHz SSB, 28MHz FM/SSB or 144MHz FM. The dates between which they'd like you to check your logbooks are 19-29 June 1989.

Dyfed-Powys Police believe that Peter Dixon had a contact with another mobile station in the area on 28MHz FM on the morning of Wednesday 28 June. They also think that he was in contact with an unknown man, believed to be called Tom, who was in a fishing boat off the Pembrokeshire coast at about 2pm on Sunday 25 June. This conversation took place on CB radio, channel 33. It appears that 'Tom' agreed to meet Mr Dixon at an unknown future date. Consequently, the police are very interested in speaking to 'Tom' since he may be able to furnish them with further information as to the movements of Mr and Mrs Dixon in the days immediately prior to their murders on 29 June.

If you worked GW0HFQ/M or have any information, please contact the Murder Incident Room, Haverfordwest Police Station on 0437 763355. Alternatively, contact your local police station.

This year's winner of the RSGB's Young Amateur of the Year Award, Ted Walker, G0KAQ, is pictured here with the first ever Young Amateur, Andrew Keeble, G1XYE. He received his award at a ceremony which took place at the HF Convention near Oxford in October. More details next month...

Amateur radio in schools - German style

A translation of a DARC press release by courtesy of G0CCI brought the information that more than 200 schools in West Germany have amateur radio groups and that many of them have expressed an interest in establishing contacts with school amateur radio groups in other countries. Skeds could be used to practice speaking in foreign languages and could form the basis for closer links including exchange visits. Proposed sked frequencies are 7.066 and 14.266MHz. DARC is compiling a list of school amateur radio groups which are interested in having contacts of this type. If you'd like your establishment to be included, please write to Wolfgang Lipps, DL4OAD at Sedanstr. 24, 3207 Harsum, West Germany.

Thanks for the tokens

Last April we ran an appeal on behalf of the Radio Amateur Invalid & Bedfast Club for petrol tokens with which to purchase equipment for their members. They've written to say that, thanks to your generosity and that of other motorists, they've just ordered a Kenwood 440S with automatic ATU and voice module, PSU and microphone - well done all. RAIBC adds that they can still make very good use of the following tokens; BP Lifestyle, Shell Airmiles, Texaco Stars, Esso Tiger, Maxol Magnets and also Green Shield stamps. If you have any and would like to put them to better use than exchanging them for yet another blank video tape or whatever, send them to David Caldwell, GI0HOW at 59 Connsbrook Avenue, Belfast BT4 1JW.

RAIBC will also be delighted to provide a good home for old magazines, surplus equipment and what-have-you; you can ring David on 0232 471370 and tell him about anything along those lines you'd like to get rid of.

Beacon and repeater news

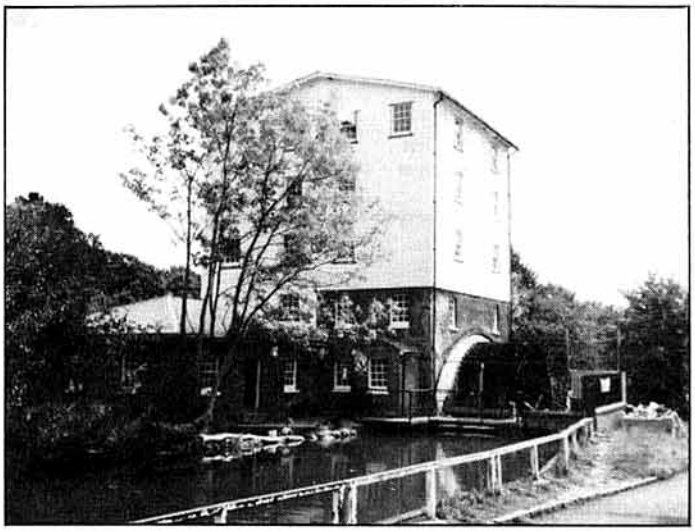
In a letter dated 14 September, the DTI said that it had approved the following:

GB3BL	430MHz	SR
GB3CV	430MHz	SR
GB3GF	430MHz	SR
GB3GU	430MHz	SR
GB3HC	430MHz	SR
GB3IG	145MHz	SR
GB3MD	430MHz	SR
GB3NU	430MHz	SR
GB3SR	145MHz	SR
GB3TH	430MHz	SR
GB7BY	430MHz	PM
GB7CD	70MHz	PR
GB7CD	144MHz	PR
GB7CS	430MHz	PR
GB7FC	70MHz	PR
GB7GP	70MHz	PR
GB7LX	70MHz	PR
GB7SP	430MHz	PR
GB7TK	70MHz	PM
GB7TK	430MHz	PM
GB7TK	1300MHz	PM
GB7AVM	430MHz	PM
GB7BBS	430MHz	PM
GB7GUR	70MHz	PM
GB7HIU	430MHz	PR
GB7KUT	430MHz	PR
GB7PLX	3.5MHz	AM
GB7PLX	21MHz	AM
GB7PLX	29Mhz	AM
GB7RDG	70MHz	PM
GB7RDG	430MHz	PM
GB7SAM	430MHz	PM
GB7SCK	28MHz	PM

SR — Speech Repeater
PM — Packet Mailbox
PR — Packet Repeater
AM — Amtor Mailbox

GB3SW, the Salisbury UHF repeater, returned to service from its new site on 7 October. GB3SW is on RB9 (433.225MHz out/ 434.825MHz in) and more information on this machine is available from G3YWT. Also, the Lakeland Fells Repeater Group's UHF repeater, GB3LF, returned to service from a new site at Lancaster on 17 September. This repeater is on channel RB14.

Finally, 430MHz operators will be glad to know that the GB3CTC beacon is now back in service. It's on 439.97MHz as before - locator is IO70OJ.



GB2CCM at Crabble Corn Mill

Paul Turvey, G1PJJ, the PRO of the South East Kent (YMCA) Amateur Radio Club recently sent in an account of a special-event station with a difference - here it is:

"On Sunday 27 August, members of the South East Kent (YMCA) Amateur Radio Club operated the special-event station GB2CCM from Crabble Corn Mill near Dover. The station was active on all HF bands and also 144MHz, with CW and packet. The site of the station was a mill which is currently undergoing restoration to full working order - a task which is being carried out by the Friends of Crabble Corn Mill for the Crabble Corn Mill Trust. The mill was built in the early 19th century and was last used in 1893.

"One of the members of the SEK ARC - Brian, G4SAU - is also one of the Friends of the mill and he was initially approached to operate a special-event station from there. As it happened, another member (G3TJQ) has associations with another Kentish mill - the Herne Mill, near Herne Bay - and this led to the idea of 'activating' as many mills as possible by amateur radio on a single day. Furthermore, it was decided to make this an annual event.

"Whilst plans for the special-event station were going ahead, G4SAU came up with the idea of generating the necessary volts and amps for the amateur radio station by water power. The water wheel at Crabble Corn Mill is not yet fully restored, but - thanks to the efforts of Doug Welby and others - a smaller wheel was constructed especially for us. This was made from two bicycle wheels spaced about two feet apart with aluminium paddles mounted in between. It was connected to a car alternator, and when water from a sluice was fed to the wheel, enough power was generated to operate an FT707. We know of no water-powered amateur radio station hitherto and hereby claim this as a 'first'! *(I've built water-cooled amplifiers in my time but I reckon they're right - Ed).*

"Actually we would like to claim another 'first' as well - the first cross-band contact made by sending CW on 14MHz (G3ROO officiating) and taking the reply from G0FAP on 144MHz packet! More conventionally, contacts were made with the Herne Mill (GB2HWM/GB6HWM) and Sandwich White Mill (GB0SWM) and it is hoped to have more mills active next year. Our thanks go to the Friends of Crabble Corn Mill for the invitation and all the help.

"Operators at GB2CCM were Brian, G4SAU; Ian, G3ROO; John, G0ADK; John, G1YXW; Brian, G8ZYZ; Des, BRS51202; and Paul, G1PJJ"

Apology

On page 9 of October's *RadCom* we ran a story about Wimbledon and District ARS raising £927 for charity, and printed a picture of the cheque being handed over. Unfortunately we neglected to credit the photographer, who was Gordon Allis, G0LRS.

His Majesty joins up!

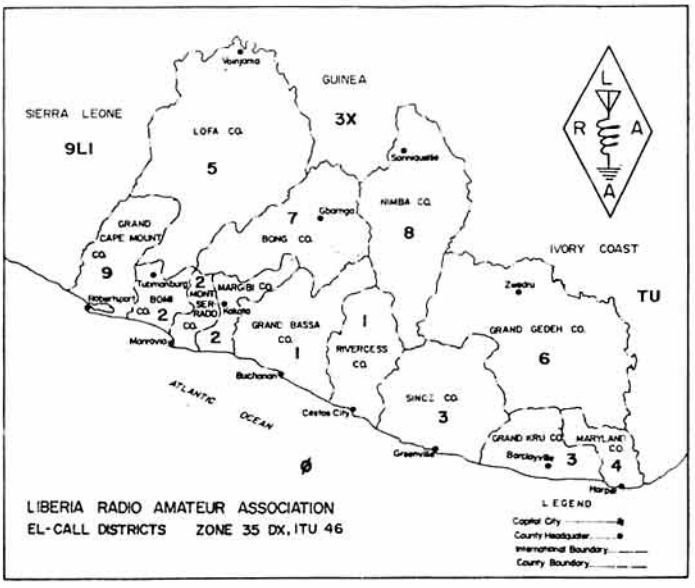
Last July, His Majesty King Hussein I of Jordan, JY1, graciously accepted an invitation to become an honorary life member of St Dunstan's Amateur Radio Society. The photo shows Bill Shea, G4AUJ, the Chairman of St DARS, presenting His Majesty with a plaque to mark the occasion, with Ted John, G3SEJ, St DARs Secretary and Robin Bellerby, G3ZYE, in the background. The inscription on the plaque reads:

HIS MAJESTY KING HUSSEIN BIN TALAL - JY1
Made an Honorary Life Member of the St Dunstan's Amateur Radio Society in recognition of his outstanding service in promoting international friendship through amateur radio, July 1989.

The ceremony took place at His Majesty's residence in London, and Ted John gave him a QSL card to confirm the eyeball contact!

More counties in Liberia

H Walcott Benjamin, EL2BA, who is the IARU Liaison Officer for the Liberian national society LARA, tells us that there have been some constituency and political sub-division changes in Liberia in recent years and that these have resulted in the establishment of three additional counties. The 'Worked All Liberia' Award has now been modified to reflect the fact that there are now 13 counties in Liberia; the terms of it now that you need to '...submit satisfactory evidence of having conducted two-way communications with at least one amateur radio station in at least nine of the thirteen counties, using at least three bands and any mode since 15 March 1962. In all, nine contacts are needed'. A variety of other interesting and attractive LARA awards are available, and we've passed the information on to John Allaway for inclusion in his column.



RAYNET news

At 0827 on Friday 22 September, there was an explosion at the Royal Marines School of Music at Deal in Kent. As was widely reported in the media, there was a large amount of damage and some 30 casualties. The emergency services responded immediately and the County Emergency Plan was implemented. South Kent Raynet was called at 1030 by the British Red Cross; shortly afterwards, a second call was received from Kent Police requesting the provision of communications for the Red Cross. British Telecom lines were congested and some form of system failure had taken place.

The Raynet call-out system was activated, and personnel were en-route to Canterbury and Deal Red Cross centres within an hour. A further half-hour saw both stations set up and fully operational. The nature of the terrain demanded a relay station part-way between Deal and Canterbury, and North East Kent Raynet supplied a talk-through unit at Whitstable to cater for any black spots.

Raynet personnel were later deployed to the scene of the incident, meaning that operations were now taking place from three locations. By 1430 the telephone system had become accessible, allowing a gradual return to normal communications between the two centres. A radio link was retained from Deal to the scene of the incident, and Raynet stood down at 1600.

Message traffic was light. A total of 13 personnel from South Kent Raynet was involved, with North East Kent on standby; offers of assistance were also received from Essex.

Still on this subject, Doncaster Raynet is looking for new members to assist at various local events. For more information, contact Pat Smith, G4ZWQ, on Doncaster 857526.

Visiting Bulgaria?

Council member Francis Rose, G2DRT, recently planned a trip to Bulgaria and wrote to the Embassy in Queen's Gate, London to ask whether he could obtain a licence; the Society backed up his application with a letter. The Embassy replied that the import of transceivers was not allowed in principle but that '...you can take along yours, so long as you declare it at the Customs on entering Bulgaria. Please affix the permit which you have got from our Federation'. Sounds as though Francis may be the first UK amateur to operate from Bulgaria - we'll see if we can persuade him to let us have some pictures and tell us how he got on.

GW3NNF receives trophy

The Harold Rose Memorial Trophy was donated last year to the Society by the UK Six Metre Group in memory of its first chairman, the late G4JLH. The trophy will be awarded each year to a person making a significant contribution to the 50MHz scene in the UK. The Society's VHF Committee has decided to award the trophy this year to Alan Mills, GW3NNF - keeper of the GB3SIX beacon, which is located at his home in Anglesey. GB3SIX has been operating for the past nine years, and was the first UK amateur transmission to be licensed to use the 50MHz band since it was taken over from broadcasting. It was a step which led eventually to the release of the 50MHz band to all UK amateurs. Alan Mills' contribution was most significant - and it was all the more appreciated since he was not a 50MHz enthusiast himself but looked after the beacon for the benefit of others.

The award of the trophy was announced at the Society's VHF Convention at Sandown Park, but since Alan was out of the country at the time, the trophy was accepted on his behalf by Brian Bower, G3COJ, and presented to Alan at his home recently.

50MHz news

Norman Fitch, G3FPK, our indefatigable VHF/UHF columnist, passed on just before we went to press that Dave Court started his short 50MHz operation from Antalya in Turkey late in September. He is TA4/G3SDL and worked ZS3, Z2 and lots of ZSs on his first appearance. Dave was billed to start on the 30th, but obviously got his act together quicker!

It's becoming depressingly obvious that the cranial capacity of a few 50MHz operators is inversely proportional to the amount of ERP they're running. For their information, the terms of the UK 50MHz allocation set an ERP limit and the general idea is that we all stick to it. We know who they are, and it seems that everyone on 50MHz also knows who they are. To be quite candid, we've worked far too hard to achieve this allocation in the last ten years or so to have it jeopardized by a few who won't play by the same rules as the rest of us.

Warning - our information is that names are going to be named if they don't knock it off.

We heard a couple of Class B licensees on 50MHz the other evening saying that the terms of the CEPT recommendation meant that they could also use the band in CEPT countries such as Malta, Portugal and Sweden. Not so, chaps. Clause 11 (1) (f) of the Licence, dealing with CEPT Recommendation T/R 61-01, states unequivocally that B licensees may "...use only those frequencies above 144MHz ..." etc.

GB75 Awards

We are pleased to announce that all of the GB75 Awards have now been dispatched. There was an overwhelming response which resulted in 450 individually handwritten certificates being sent to over 30 different countries. If you have not yet received your award please write at once with an SAE to J K Harvey, G4IVJ, who is QTHR.

Busies in Bielefeld

In May 1989 a group of police officers from Rochdale visited their twin town of Bielefeld in the Federal Republic of Germany to take part in the events celebrating 775 years of the latter city. In the course of this visit they paid a visit to a Field Day - the photo shows, L to R, Captain Richard Atterbury, DA2AQ; Polizeihauptkomissar Bernhard Wachter, DF9ED (who took the pic) and Inspector Stefan Kowal, G0BJW. DA2AQ was actually born in Bielefeld, where the ex-British military hospital is nowadays a mental hospital!

Canberra cock-up

For some mysterious reason — probably a neutrino event — we seem to have managed to avoid publishing a credit for the splendid photograph of a Canberra T17 which we used with our story about the GB2CAN/AM operation, despite trying to do so for the past four months. Profound apologies to Mr Robert A Jackson, who took the pic and who also happens to be the author of a splendid book called *Canberra — The Operational Record* published by Airlife. It's all this modern technology.

SP7JWZ visits UK

Last summer Kazik Dluglosz, SP7JWZ, visited the UK for three months to attend an English language course at the Abraham Moss Centre in Manchester. Kazik, who was at that time a Roman Catholic deacon, came with two other clergy colleagues to brush-up their command of English as part of their preparation for pastoral work amongst Polish emigre communities in English-speaking countries.

During his stay in the UK Kazik resided in Oldham. Being a keen QRP operator he visited Rochdale to meet the Reverend George Dobbs, G3RJV, of the G-QRP Club; Kazik also visited the shacks of G8HDS and G6LOK. He has now returned to Poland and is assisting as a curate in a parish in Szczecin: in a year or so he will probably be sent abroad, most probably to an English-speaking country. Some years ago his amateur radio licence was revoked since the authorities at that time considered him to be a risk to the state as a result of his training for the priesthood (!). After many representations and interviews his licence was restored, and you may come across Kazik on the HF bands; he is currently SP1JWZ since he's using the Szczecin area prefix.

Square Bashers get spliced

It comes to us all in the end, even hardened DX-chasers, as this photo shows. From L to R, G3ZMD and YXL, G6CQO, G8TFI, G8FUO, G8TFI's XYL, G4CI, G4FRE, G4CI's XYL and G7FRE. Christmas quiz question: who married whom? Both 'TFI and 'FRE are of course members of the Square Bashers DXpedition group, and in line with previous practice we expect to publish an in-depth feature on the honeymooners.

Awards news

We mentioned the Willenhall Club's innovative award based on STD codes a while back; another good one appeared on our desk the other day from the 'OWLS Radio Club'. Either we lost their covering letter or they forgot to send one, but the idea seems to be to work or hear 30 callsigns of which the suffix letters make up the words 'The Owls Radio Club, Leicestershire'. There are various rules pertaining to the way this is done, and no doubt the award manager - G6PFN, who is QTHR - will send you a copy of them if you send him an SASE. At least five of the stations you work to win the award must be in Leicestershire unless you contact the award manager himself - nice one! The award itself costs £1.25 but £1 of this goes to charity, which is a splendid touch. As we said, G6PFN will no doubt supply you with more information and he tells us he's on 144MHz SSB most Thursday evenings from 2000.

VHF/UHF Awards news

Ian Cornes, G4OUT, the Society's VHF/UHF Awards Manager, tells us that a number of notable awards were made during August and early September. First of all, Ian had great pleasure in checking and awarding a 430MHz 30 squares/6 countries award to his predecessor, Jack Hum, G5UM! John Arnold, G4NPH, also qualified for the 30/6 430MHz certificate. Other certificates for this band went to Owen Cross, G4DFI (50/13) and Paul Brockett, G1LSB (100/15). Paul also gained one of the two 430MHz 'Standard' certificates, the other going to John Arnold. Two 70MHz certificates were issued; a 'Standard' Transmitting Award went to Eddie Ashburner, G0EHV, and a 30 squares/8 countries award was accounted for by D Hilton-Jones, G4YTL.

On 144MHz, 60 squares/15 countries certificates were awarded to G4OUT and Trevor Smithers, G0KTN. An 80/18 certificate went to Clyde Hinton, G1TCH whilst Steve Redway, G4TRA and Paul Brockett both gained 100/20 certificates. Neil Carr, G6ZGO (now G0JHC) won a 40/10 award and John Hill, G7CLY, and J Gilbert, G1TOS, were both awarded 144MHz 'Standard' certificates.

To round off, Beth Jackson, G1YNR, and Peter Jackson, G3KNU, both qualified for a 50MHz DX certificate for 25 countries.

Congratulations to all recipients of RSGB VHF/UHF and Microwave awards - if you're interested in applying for one, full details of how to go about it are contained in the Member's Handbook section of the Call Book. Alternatively, Ian Cornes, G4OUT (QTHR) will be pleased to assist and receive your applications for checking.

Not the QSL manager

Alan Turford, G0AHT, has written to say that despite having received '... dozens of letters and cards' he is emphatically NOT the QSL manager for VR6TC. Sounds to us as though there's a pirate about. If the 'VR6TC' you hear or work asks you to QSL via G0AHT, don't believe a word of it — or him.

Rebuilt GB3HR back soon

The exceedingly popular UHF repeater GB3HR in south-west Hertfordshire (RB14), which has been off the air for some time for a major rebuild, should be back on by the time you read this. Group member Peter Marcham tells us that the original equipment has given very reliable service for many years and that they've carried out quite a lot of 'demon tweaks' to make it even better.

Next SAREX approved

The Shuttle Amateur Radio Experiment (SAREX) Working Group says that it now has full approval from NASA for Ron Parise, WA4SIR, to operate an amateur radio station from the STS-35 shuttle flight currently scheduled to take place in April 1990. Voice and packet radio equipment will be carried, and is currently being built and tested by the Shuttle Amateur Radio Experiment engineering group.

NASA has apparently also given the working group preliminary approval to take amateur equipment on STS-37 - the pilot on this mission will be Ken Cameron, KB5AWP. Two-way slow-scan and uplink-only fast-scan television is expected to feature highly in the plans for this mission. Tnx to the Westlink Report for this info.

More on this story as it happens - but better overhaul the elevation rotator!

New products

Our plea in the September issue for more news of new products seems to have done something - we actually received a few faxes and press releases this month! First off the pile was one from **Alpha Electronics Ltd**, who say they're '...leaders in the supply and repair of test equipment'. They now import a range of multimeters, oscilloscopes and frequency counters from the 'Gold Star' corporation and - get this - they're offering 10% discount to readers of *RadCom*. We suggest you ask them for a copy of their catalogue and have a look at the goodies on offer. Alpha Electronics is at Unit 5, Linstock Trading Estate, Wigan Road, Atherton, Manchester M29 0QA. The telephone number is 0942 873434, or send them a fax on 0942 873558.

ICS Electronics is the appointed distributor for the AEA PK-232 terminal unit, amongst other things, and they tell us that more than 35,000 are in service world-wide. ICS says that the latest upgrade package for the '232 will be available by the end of 1989 and will incorporate a personal data mailbox and other features. To ensure that all users are aware of future updates, ICS Electronics is inviting existing users to send in their name and address, the serial number of the unit and where it was purchased. The information will be incorporated in a database and used to mail information about new updates. They've also reduced the price of the unit to £289.95, and with every unit sold they throw in a free software voucher. This entitles you to claim for '...free host mode, facsimile and data software for either the IBM-PC or Commodore 64 computer on disk. Alternatively, a £5.00 discount from the price of any other PK-232 software sold by ICS may be claimed'. Contact them at Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD. Telephone 0903 731101, fax 0903 731105.

Icom UK sent in a copy of their most recent price list and some info on a new DMM, the Icom DM-300. This looks rather a nice beast - it has push-button range selection or auto-ranging and a 'data hold' facility which comes in useful when you're trying to take a reading from an inaccessible place like a tag strip buried in the bottom of a PSU. At £45.00, it's about the cheapest we've seen with this level of facilities. At the other end of the scale, an IC-781 will set you back a mere hundred times more at £4500.00! Having played with one of these for an hour or so recently, I must say it's a highly impressive piece of kit - anyone know any method of hacking into ERNIE, or fixing the football pools?

Back to reality with a new high-power 750pF variable capacitor from **Nevada**. They say that the new Model TC750 is '...particularly suitable for use in the output stages of high-power amplifiers or certain ATU circuits. The capacitor uses high-quality materials and each one is hand-assembled and tested before despatch. Priced at just £28, we feel it is excellent value for money'. The TC750 weighs 600g and its dimensions are 14.5 × 10 × 10.5mm. More info from Mike Devereux at Nevada, 189 London Road, North End, Portsmouth, Hants PO2 9AE. Telephone 0705 662145, fax 0705 690626.

We had a note from a company we haven't heard of before, which is always nice. This is **Bricomm**, who are marketing some log-keeping software designed by Walter Baur, HB9BJS. Bricomm says that the software provides facilities for adding, updating and browsing QSO records, support for nets, immediate display of information about the station you're calling or working - including country, continent, DXCC, Zone, local time, distance, beam heading, etc - a contest mode and all sorts of other nice things. The software (for IBM PC and compatibles) comes on two 5.25" in disks and requires a minimum of 384K and two drives for it to run. More info from Bricomm at 5 Mickle Meadow, Water Orton, Warwickshire B46 1SN or ring them on 021-747 5077.

Waters & Stanton tell us that they'll shortly be introducing two new HF antennas to their Sagant 'Zepp' range. One is a half-size version for 3.5MHz with a length of 20 metres and the other is for Top Band. W&S say that 'This will be quite expensive but should provide the kind of performance hitherto reserved for those with mansions and estates!'. Their Zepps certainly seem to work well - the 7MHz version was used by GB5BN from the summit of Ben Nevis recently (we'll be having a feature about this in *RadCom*) and seems to have sent their signals far and wide. More information from Waters & Stanton Electronics at 18-20 Main Road, Hockley, Essex SS5 4QS. Telephone 0702 206835, fax 0702 207488.

Cambridge Kits sent along the latest issue of 'Kit News' which contains all sorts of hints and tips on how to use some of the things they supply. Readers can get a free copy by sending a 9 × 4" stamped addressed envelope and mentioning *RadCom*; the address is Cambridge Kits, 45 Old School Lane, Milton, Cambridge CB4 4BS (telephone 0223 860150). They add that all their kits are 100% complete with case, screws and what-have-you and there's nothing else to buy. Amongst other things, they do a nice-looking antenna noise bridge and an MSF clock - oh, and a two-tone oscillator to turn your amplifier into a linear.

Now here's a nice idea for a Christmas present. Gordon Crowhurst, **G4ZPY,** makes an exceedingly posh range of paddle keys and he's recently added some new ones, as follows:

Silver-plated twin paddle key on silver-plated steel base — £96.00

Silver-plated pump key on silver-plated brass plate mounted on mahogany base — £63.00

Gold-plated twin paddle on chrome base — £110.00

Very high-speed twin paddle key in highly-polished brass — £64.00

Gordon tells us that gold and silver-plated keys are only made to order and that he'll be happy to supply further details on receipt of an SAE; his address is 41 Mill Dam Lane, Burscough, Ormskirk, Lancs L40 7TG (tel 0704 894299). He adds that a discount of 4% will be given for ordinary keys ordered in November for delivery during December if a deposit of £10 is sent.

Finally, a new product with a difference. We had a letter from the **Tor Haven Hotel** in Brixham which said 'Dear Ed. I read with great interest your little moan in the latest *RadCom (about why we weren't getting more info about new products - Ed)*. Well, Sir, I did tell you about our new 'product' in the way of Wireless at Brixham courses, but you gave us not one teeny-weeny mention. So how about it?' Hmm - it's a fair cop, officer; basically, the wonders of modern technology intervened and the file didn't make it to the typesetters, so let's have another go.

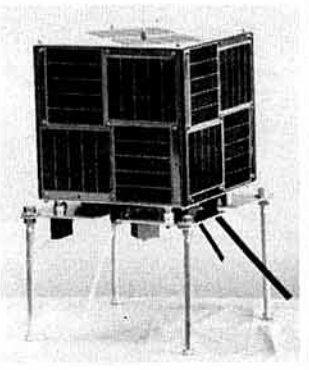
The Tor Haven Hotel is organizing a series of two and four-night breaks which include an amateur radio element; they sound extremely pleasant, although the full itinerary is a bit long to include here. Proprietors Stephen and Pat say that '...we've organized these breaks because, as a radio amateur myself, I'm sure that a lot of ladies get fed up with us playing on the radio all the time - so here's a chance for them both to have a smashing time in some of the most beautiful countryside in the United Kingdom.

In essence, the hotel provides a very well-run tour of some parts of the local area - but with something of an orientation towards radio. You get the chance to activate some rare WAB squares, visit the North Hessary Tor transmitting station and the local DVOR beacon at Berry Head (BHD on 112.7MHz for the aeronautical cognoscenti) and get the chance to use the hotel's very well-equipped shack. It all looks jolly tasty (I liked the comment in the itinerary about 'guests depart home and we collapse in a heap of washing-up') and well worth sampling. The hotel is recommended in Elizabeth Gurney's book *Staying off the Beaten Track* as well, so it must be good. Contact Stephen or Pat Nicholls at the Tor Haven Hotel on 0803 882281 or drop them a line - it's in King Street, Brixham, Devon TQ5 9TH.

'MicroSats' to be launched

An Ariane IV rocket, launched from Kourou in French Guiana, is due to carry no less than six amateur radio satellites into orbit on 10 November 1989. Four of these are known as 'MicroSats' because of their unusually small size; essentially cubic in shape, each one measures only 9" on each side.

Design and construction of the 'MicroSats' has been undertaken by the Radio Amateur Satellite Corporation in collaboration with the American Radio Relay League and the Tucson Area Packet Radio Association. More info next month.



AMSAT-NA microsat bus. The standard bus can be outfitted with mission-specific payloads such as packet transponders, CCD cameras, etc.

G6OQA in full swing on HF.

Flannan Isles DXpedition

A torrid tale of Martin Atherton, G3ZAY, and his motley crew taking to the high seas to reach the furthest outposts of the empire!

For several years Cambridge University Wireless Society members have been activating British island groups for the RSGB's Islands on the Air (IOTA) Award. Previous conquests include the Treshnish, Summer, Monach, Shiant, and Farne Is, as well as the treacherous reefs of the Plateau des Minquiers near Jersey. In most cases the operations were the first time the islands had been on the air.

ISLES APART

1989 saw only two possible new ones on the IOTA list; the Flannan Islands which lie about 20 miles west of the Outer Hebrides, and, 150 miles further on, the tiny stump of Rockall. The latter being rather too challenging logistically for a major expedition, the Flannans were chosen as the main destination. The next problem was how to get there. Transportation for previous island visits had usually been on local fishing or tourist boats willing to deviate from their normal routes for an hour or two on payment of a modest fee. Unfortunately, this clearly wasn't going to work for the Flannans which are a long way from the nearest harbour and are never visited by commercial tourist craft. We were clearly going to have to find some other way this time.

Enquiries at the tourist office in Stornoway revealed that the 40 foot, 10 berth yach "Annag" was available for charter, complete with skipper, by the day or by the week. Fully equipped with Decca navigator, radio and outboard-powered rubber dinghy, it seemed ideal. After a quick conference and unable to face the prospect of booking just a couple of days and finding ourselves confined to harbour by bad weather, we committed ourselves to a full week which we hoped would allow us to fit in a visit to St Kilda in addition to the Flannans. Martin G3ZAY, Chris G6VMA, Catherine G6OQA, Andrew G0HSD, and Mark G1XMO drove up with all the equipment via Skye and the Uig-Tarbert ferry whilst Don G3XTT jetted (well turbo-propped) in to meet up on the day before departure — Friday July 7th.

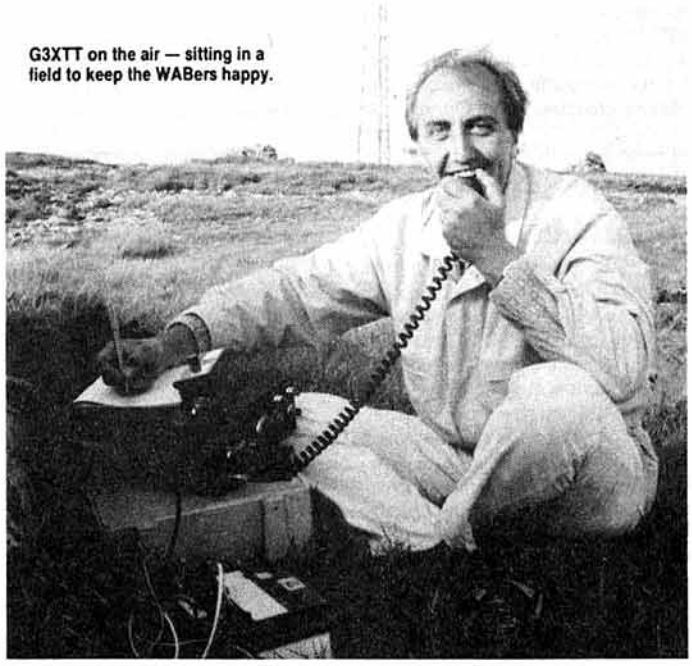
The boat was anchored at Amhuinnsuidhe (pronounced Am-In-Soo-Ee) in West Loch Tarbert, an idyllic spot graced with a magnificent Victorian castle and a sea loch where the salmon were jumping so frequently it seemed you only had to hold out a hand to catch them. The equipment and food supplies had to be ferried across in the rubber dinghy, a process which took several hours, but we were able to check in to the IOTA net using a mobile rig on the quayside and keep them up to date on our progress. The skipper, Donald Wilkie, wisely insisted on a safety lecture before departure and included individual tuition in the use of the toilets or "heads". It seemed that incorrect flushing could result in the entire boat filling with water out of the lavatory pan! We were excused sailing lessons as an experienced "Number One" had joined us in the form of Billy Mackinnon, ex-Merchant Navy, and a business studies lecturer at the local college.

SETTING OUT

Setting out at 1600 we discovered the wind was coming directly from the Flannans so rather than spend many hours tacking to and fro we started the engine and lined up on the exact compass course. Steering was quite an art as even a slight swell tended to deflect the boat and the natural tendency to over-correct resulted in a rather zig-zag wake. The islands were clearly going to be further than the straight line 30 miles the way we were going! The boat normally boasted a very fine auto-steering system capable of holding a course better than the most experienced helmsman but in common with much else on board "Annag" it was defective. Donald gradually broke the news to us that the Decca navigator system was a bit temperamental as it would not work with the engine running or if the battery volts were too low, there was a loose connection in the depth sounder, and the VHF aerial had snapped off! The aerial we could and did fix and "Annag" was quickly back in touch with the coastguard with a quarter wave whip on the rear of the boom.

We attempted maritime mobile operation with an HF whip but the lack of any metallic surface for it to work against caused severe RF feedback. A dipole would probably have worked well, but by this time, and despite Stugeron sea-sickness pills, none of us felt like going into the forward cabin to unpack the necessary boxes.

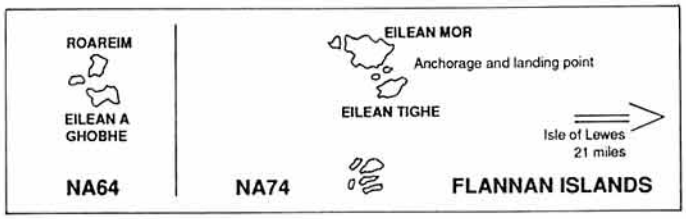
The sickness problem was solved later on when we realised that the recommended dosage, adequate for a gentle car ferry crossing, could safely be exceeded. Most of us felt fine on a triple dose though G0HSD did claim to be seeing blue Ford transit vans off the port bow after swallowing a full packet. His callsign phonetics are now "Heavy Stugeron Dose". At the risk of a lawsuit from the manufacturers I can report that the elasticated wrist-bands had no apparent effect. We were all sceptical about them from the start, not least Donald who had seen acupuncturists and homoeopathic doctors reduced to swallowing Stugerons by the dozen, so perhaps this diminished their placebo potential. Visibility was poor most of the way across and the only interest en-route was when we passed through a fleet of foreign trawlers taking advantage of the imminent Sabbath (and hence the absence of all local craft). The Flannans came into view at around 2100 and by 2230 we were anchoring in the lee of Eilean Mor, the largest of the group.



G3XTT on the air — sitting in a field to keep the WABers happy.

THE FLANNAN IS

Donald and Billy set off to reconnoitre the old landing stage,



constructed along with the light-house in 1695, and returned to pronounce the sea-level steps unusable. This only left the main loading platform some 10 feet up the cliff, reached by a steel ladder. All the equipment had to be ferried across by dinghy and then hauled up to the platform on ropes. There were some heart-stopping moments with the generators and rigs as the swell threatens to dash the dinghy against some sharp projecting bolts, but thanks to Donald's seamanship and G3XTT's brute strength everything made it safely ashore by dusk at around 2330.

Unfortunately, Eilean Mor rises almost sheer to a grassy plateau about 250ft asl so we had to carry everything up a tortuous route of broken concrete steps followed by a scramble up the old cliff railway track-bed. The railway had been constructed to lift supplies up to the light-house but was dismantled about 20 years ago when the light became automatic and helicopter access the norm. DXpedition tip: Always take at least one Territorial Army officer with you. Chris, G6VMA, and Don, G3XTT, true to their training, actually appeared to *enjoy* labouring up a crumbling path with a Honda generator or HF rig under each arm. The rest of us would probably have voted to dismantle them and take them up a piece at a time!

By about 0100 everything had been carried up but too exhausted to operate we collapsed into the tents for a rest. Adrenalin levels did not allow much sleep and we were up at 0500 erecting antennas and made the first QSO with G3TOK at 0530UTC. Daylight was of course no problem as it never really got dark; there was just a fairly deep twilight from 0000 to 0230. The equipmnt used was an FT101ZD plus KW1000 linear, with a TS120S as a second station. Power came from two Honda generators and a car battery. A 400W Honda powered the FT101ZD and a 650W Honda allowed the linear to generate about 300W output. The TS120 was quite happy running off the battery. On previous trips the Hondas performed faultlessly but on this occasion both played up. The smaller developed a blocked silencer and the larger, a sticking carburettor. At times we were wholly dependent on the car battery while G1XMO went to work on them with the limited tools we'd brought.

ANTENNAS

For antennas we had taken a Butternut HF6V vertical, a 24ft telescopic aluminium mast and dipole kit on loan from the Territorial Army, and all the makings for a 10/15m quad together with eight four foot sections of interlocking 2in steel tube. The steel sections were heavy and had been left on the yacht until we knew how the Butternut would perform. They were to stay there for the whole trip as the HF6V exceeded our expectations on all bands. With only a handful of non-resonant radials we had no trouble working into W6 and VE7 on HF and across Europe on LF.

Amhuinnsuidhe Castle, West Loch Tarbert, starting-place for the DXpedition.

The army dipole kit was a great help as it gave us a simple second antenna which could be retuned easily to whatever band we wanted. Nothing tricky about it, just a spool on each end to take up excess wire, a table of length against frequency (different from what you might expect because of the end-loading of the spools), and coloured markers every metre along the wire. To lower the operating frequency we just uncoiled more wire.

With two stations on the air it was time for the off-duty ops to explore the island. The light-house buildings were securely locked and of little interest anyway, but a little way down the hill there was a one room dry stone shack marked on the O.S. map as an ancient chapel. Local opinion was that it was more likely to have been a shelter built in the sixteenth or seventeenth century by fowling parties from Lewis or Harris. We learned that the Flannans had been a good source both of sea-birds and their eggs and had been regularly "farmed". These early visitors had apparently developed a range of superstitions associated with their landings. They would not land if the wind changed on the voyage out, they would leave their clothes on a special rock, would avoid the use of certain words, and would never kill a bird with a stone or before all members of their party were safely ashore. With no hunting taking place today the seabird numbers have increased enormously and the eastern side of Eilean Mor we found to be carpeted with Puffins. Unaware of any danger they would allow people to approach within a few feet before taking to the air.

WEATHER

The WX during our stay was reasonably good. A brisk wind blew in from the south-west during Sunday but the tents stayed in place, helped by a few large rocks, and "Annag" was well sheltered in the lee of the island. Visibility at one point increased enormously and we were able to see the outline of St Kilda on the horizon some 40 miles away. Nearer at hand we could also see the adjacent islands of the group some 4 miles west and in a different WAB square. Despite repeated requests on the 80 and 40 metre nets we decided not to attempt a landing as the sea was getting quite rough and there was no safe spot.

The majority of people seemed to know where the islands were though a few persisted in calling them the Flannels. A most interesting QSO was with a GM3 who had been one of the last light-house keepers to be permanently stationed there in the '60s. He reminded us of the mystery disappearance of three keepers in 1900 when the supply ship arrived to find a half eaten meal and nobody to be seen. It was eventually assumed they had been washed off the cliff path by a freak 100 foot wave. Perhaps they had used one of the proscribed words or left their clothes on the wrong rock!

During Monday evening we conferred with Peter, G3VIE, who works for the Met Office at Bracknell, about the best time for departure to St Kilda. His advice was to go as soon as possible as the conditions were likely to deteriorate during Tuesday with a Force 7 wind developing. Although we had been hoping for a good night's sleep and a leisurely sail across on Tuesday morning we decided to set out at once. There followed a frenzy of packing up and portering and we finally had "Annag" loaded by about 0300.

HEADING HOME

Needless to say the wind was coming at us directly from St Kilda so once again the engine was started and we chugged off to the south-west. One hour later the engine spluttered, stopped, and refused to re-start leaving us no option but to hoist sail and make the best course we could (about 40 degrees off the required track). Donald disappeared head-first into the bowels of one of the lockers in order to change what appeared to be a dirty fuel line and Billy emerged with the welcome news that a gale warning had just been issued. A little later Donald was still head-down in the locker and a muffled shouting could be heard. On investigation it seemed that he had become stuck after a few minutes and been unable to attract our attention!

Around 0900, as a result of Donald's labours (and thanks to the Jubilee clips off our camping stove) the engine was restarted and we were able to resume a proper course. Or rather, we would have been able to if we had known where we were! The batteries had run flat so the Decca navigator put us in the middle of the Sahara and we had only a rough idea of our course and speed over the previous 5 hours. Donald spent some time on a dead reckoning estimate before announcing our new course as the visibility was poor and we would need to pass reasonably close to St Kilda to sight it.

Fortunately his experience paid off and the cliffs of Hirta came into view at around 1400 not too far

from where we had been expecting them. However, just as we were looking forward to getting ashore the WX took several turns for the worse. The wind got up to Force 8-9, visibility dropped to a few hundred yards, and the sea became quite rough with waves up to about 15ft high. The island was no longer in view and the Decca still thought we were south of Timbuktu!

Inexperienced sailors would probably have given up any thought of making St Kilda and headed off for open sea but Donald was made of sterner stuff. Steering by the wave direction and making use of a small amount of mainsail he inched his way blindly into the lee of Dun, a small island guarding the entrance to Village Bay. The last few miles took about three and a half hours with "Annag" actually being blown backwards at times. It was rather depressing to glimpse one of the outlying stacs through a temporary gap in the mist and then see it in the same place through another gap half an hour later!

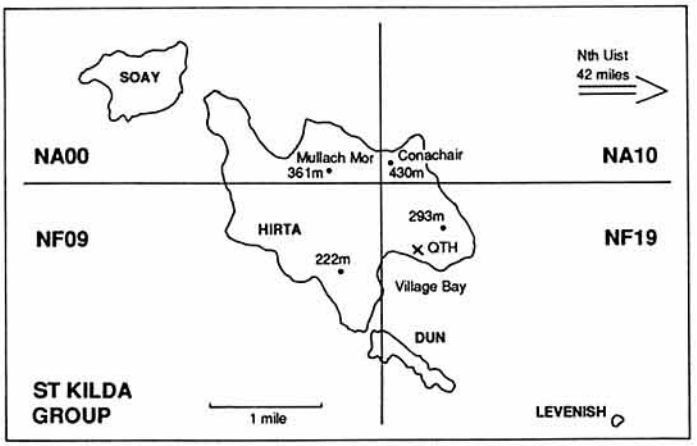
ST KILDA

Village Bay was a welcome respite from the storm though clearly it was far from being a perfect harbour. Every few minutes a squall would come racing down the hillside and shake the yacht violently. Passengers en route to the jetty would invariably get drenched with spray blown off the surface of the sea. Down below things were equally wet as one of the hatches had not been closed properly and most of the clothes and sleeping bags were soaked through.

First impressions were of a misty rainswept island rising steeply from the sea with a cluster of grey military buildings by the shoreline and a veritable smallpox of dry-stone constructions on every non-vertical surface. These were the cleits, or storage bins, built by the St Kildans when the island had a permanent population. The old village, evacuated in 1930, was visible as a line of mostly roofless dwellings in an arc around the bay.

It was a rather wet and bedraggled group that climbed onto the quayside to be welcomed by the Battery Sergeant Major of the St Kilda Royal Artillery Detachment. Our arrival was expected as we had already written to the Army and the National Trust for Scotland for landing, camping, and operating permission and we were given a warm welcome. The sergeants mess made clothes dryers available and things were soon looking up. The camp site even had hot showers.

We were pleased to find that the island boasted its own pub "The Puff Inn" but, for the first night,



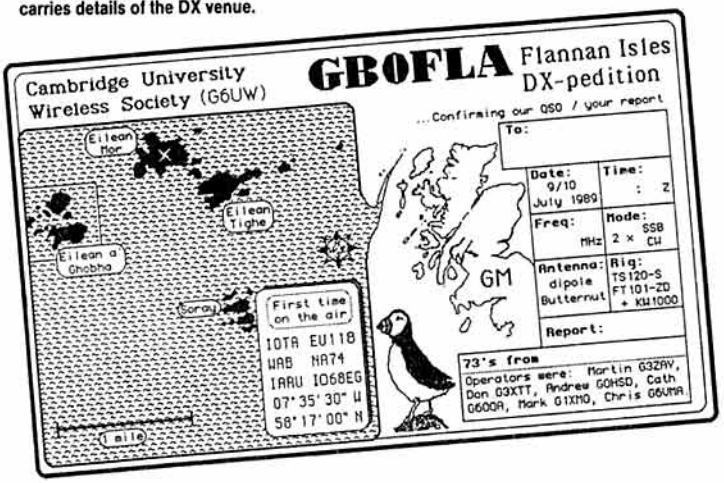
were unable to take much advantage of it because of the high levels of Stugeron in our bloodstreams. Renowned for its relaxed closing times and rowdy parties the Puff Inn was also, we were told, famous for its meat pies. Needless to say they were off the menu the night we arrived and we had to be content with crisps and peanuts.

Don, G3XTT, got a station on the air as soon as the tents were up but succumbed to exhaustion after an hour or so and like the rest of us collapsed into a sleeping bag until late Wednesday morning. Wednesday and Thursday were much brighter days and we got a clear view of the other radio installations on the island. The R.A. missile tracking equipment consists of a number of radomes on the peaks of Mullach Mor and Oiseval together with a 240 foot steel tower right on the summit. Access is by a narrow, winding, single track road suitable only for four wheel drive Land Rovers driven by specially qualified and tested drivers. Winds regularly demolish the radomes and have been known to blow the Land Rovers onto their sides!

Down below, the operating QTH was well screened by steep 1000' hillsides but the Butternut did its stuff and we had no problem working the IOTA enthusiasts in Europe and the USA. The WABers were another matter altogether as they were quick to point out that St Kilda sits on the intersection of four separate squares and wanted a QSO from each. Presumably a station on the exact cross point would have met this need with one QSO but that physical location was 800 feet up a very steep hill and we didn't fancy the idea of carrying anything up there.

NF09 could be reached by a level walk of about 400 yards from the campsite but NA00 was over the peak of Mullach Mor some 1200 feet above us and NA10 was at a similar height in territory we knew to be guarded by aggressive nesting skuas. (We had already been dive-bombed by them on an early walk around the island). We agreed to do NF09 at 1800 on the 13th and with assistance from the army in the shape of a Land Rover ride up the single track road to the summit were able to do NA00 at around 1830. Equipment for these excursions was the TS120, car battery, and trusty Butternut vertical.

The DXpedition QSL card, the reverse carries details of the DX venue.



The last night was spent in the bar signing the visitors book; the ceiling! A stepladder was supplied and our callsigns were added to all the other names. We looked hard but could find no trace of the 1988 VHF expedition up there so concluded they were too drunk to climb the ladder or too wedded to operating to spend time in the bar!

The return voyage was fairly uneventful. For once the wind was behind us and were were able to sail all the way back to Amhuinnsuidhe making a short tour of the other islands in the St Kilda group on the way. Even the Decca navigator started working and was soon mastered by Catherine, G6OQA, who kept us regularly informed of progress and bearing to steer. Her course was monitored by Donald which was just as well because in the final approach up West Loch Tarbert we all forgot that although the computer was giving us the correct course to the anchorage we had forgotten to tell it there was a headland in the way.

Unloading produced a narrow escape to the great amusement of most of the onlookers. (The exceptions were Donald's next party who had come to check their departure time and begun to wonder what they were in for.). Having filled the dinghy with rucksacks, etc, we stepped in, cast off, and tried to start the engine. This is not the approved order, although we did get the first bit right, and we soon found ourselves being blown down the creek without a paddle. Yes, the dinghy was usually equipped with paddles but we'd left them on the boat! They were thrown out to us but fell short and the jerry cans we had with us didn't make an adequate substitute. Just as we were drawing lots to decide who would swim for them, the engine spluttered into life.

The rest of the trip was uneventful. We took Don back to the airport where for some reason British Airways was flying a jet in the livery of Presidential Airlines of Washington DC and then headed for home via the Stornoway-Ullapool ferry. QSO totals were 1500 from Flannans and 1000 from St Kilda. A jolly good time was had by all. Honestly.

The members of the group would like to express their appreciation for the skills (nautical and culinary) and good-natured round-the-clock assistance of "Annag's" skipper Donald Wilkie, and temporary crew-member Billy Mackinnon. Rarely can they have had such an eccentric bunch of passengers and we trust that our antics will amuse future charterers just as Donald's tales of past voyages amused us.

One small section of the G3VER/P site

HF National Field Day 1989

This is the second year your scribe has been involved with co-ordinating Field Day and the first year that I have had the pleasurable, if daunting, task of producing its report. Whilst handling the registration correspondence, receiving logs and various associated letters and telephone calls, the one impression that comes over from participants is the long established and deep-rooted enthusiasm for this major group event. It is probably relevant to quote from an excellent article by G3MA accompanying the entry from the Gloucester A.R.S entitled 'National Field Days I have known': "My association with NFD goes back to 1934, the year we won the Shield; as a very new young member my contribution was to help with aerial erection and making tea".

An estimated one thousand RSGB members were involved in running or operating the 104 stations that were on the air during the 1989 event.

Over a thousand RSGB members braved the elements for this year's HF Field Day. Chris Burbanks, G3SJJ, gives us an intriguing insight into mainstream contesting.

OVERVIEW

The excellent Sporadic E openings experienced on 28MHz last year were sadly not repeated, coupled with this there was generally poor inter-European propagation on the three higher frequency bands resulting in the lower bands carrying most of the contest traffic. Indeed, an instant histogram was produced by the six piles of logs accumulated on my desk before distribution to the adjudicators; this showed a rapid upwards trend from the LF end of the spectrum peaking at 7MHz and tailing off towards HF. A distinct lack of static helped to maintain the high scoring rates on 1·8MHz, whilst the longed-for Stateside runs were available to groups willing to spend the time during the early hours of Sunday.

The weather was much kinder to us this time with sunny conditions prevailing during the day time and only a few rain showers reported. Several groups commented on early morning frost as did one of my colleagues who forgot to bring his sleeping bag. At least his comments warmed the air for us!

THE LEADERS

Overall winners of this years event are again Restricted section entrants Marple Contest Club, G3VMW/P, who repeated last years effort by beating Open section leaders Verulam Lions, G3VER/P, by 23 points. Both groups used the bonus bands of 1·8 MHz and 28 MHz to their advantage, with Marple gaining the upper hand on the lower frequency and Verulam gaining a creditable revenge on the higher band.

Previous winners, Three As Contest Group, G0AAA/P, were runners-up in the Restricted section finishing 306 points behind the leaders. Maybe a year's absence from Field Day slightly blunted their competitive edge for the event as they were considerably down on the leaders on both bonus bands, by coincidence, 310 points on 1·8MHz.

Open section runners-up were Oxford & District ARS, G5LO/P, who moved up from 23rd in the restricted section last year, probably the most dramatic of any position changes over the last few years. Again, the group placed lower emphasis on 1·8MHz preferring to build a sound basis on 21MHz. One might wish to be a fly on the wall during the groups post-result debriefing with the operating team containing G3RBP of 160m fame and G3KLH whose group won the Open section in 1982 with a massive score of 1082 points on 21MHz.

Scottish Trophy winners were Kilmarnock and Loudoun ARC, GM0ADX/P, who achieved their position despite considerable local noise from 3000 people attending a function on the same site! The group's 3 element co-linear array for 7MHz no doubt helped them build up a good base score.

Check logs are gratefully acknowledged from YB2FEA, K8CV, VK5QG, OH3GZ, OH3MIG, SP2KQU/2 a portable station with 5 SP operators who made some 477 contacts, TA2KB/P operated by G3UIN amassing 643 QSOs and ZS1VP who sent in some superb photographs which will be displayed at the HF Convention.

BAND REPORTS

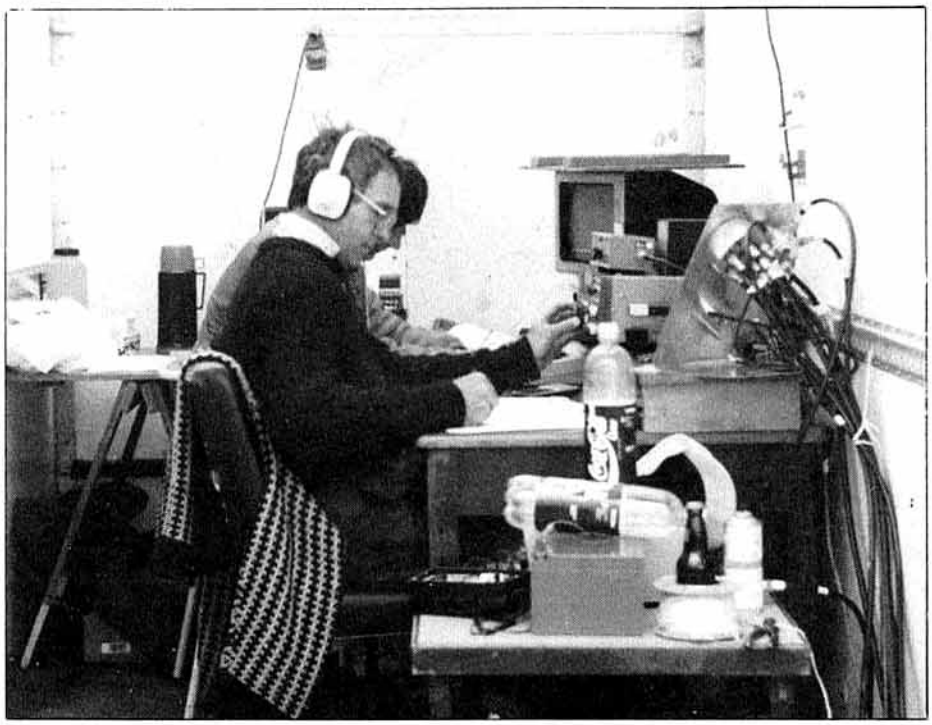
1.8MHz

Propagation was considerably better than last year, with an increase in Eu stations. Less static provided a quieter band and several groups worked VE1ZZ and VE1BVL who appeared in the middle of the small hours of Sunday. Because of the poor conditions on 28MHz, Top Band became more vital from the view of double points and most groups had scores which were up on those of last year.

It was interesting to note when the various top stations visited the band. G3WAS/P flew in at 1834 but after one contact decided to come back later. G3VER/P started seriously on the band at 1909 and left at 0245 having worked 173 stations over 3 visits. G3VMW/P came on the band much later at 2138 and left at 0205 having made the same number in one swoop. Band leaders G3SDC/P made their first appearance at 2035 and by 0335 had notched up 180 QSOs.

The standard of log-keeping was good, with only 4 unmarked dupes being found. Points were lost through transcription errors and it became obvious when original logs had been read out to the person making fair copy - S became F, M became N, and so on. Totalling logs seemed a problem for a few groups, with some underestimating their scores, whilst others showed a deal of mathematical licence. Most people enjoyed the Topband thrash with only one group falling asleep before it was worked out!

G4JKS



G3VER/P in full swing with G3JKS at the rig and G4JBD beavering away on the computerised check-logging system. Note the novel aerial switching arrangements

3.5MHz

Many groups commented that conditions were very good during the night but poor during the day, particularly on Sunday. This coupled with poor HF conditions generated more activity and higher scores than last year on this band.

There was a clear leader in the Open section with a single band entry from G5UM/P who made 321 contacts. In the Restricted section, a dual band effort paid off for G3RIR/P who led by just 9 points from last year's band winner, G0BRC/P. The latter had a higher claimed score with a single band entry, but G3RIR/P, who only spent about 15 hours on the band, made fewer errors.

Overall Open and Restricted section winners, G3VER/P and G3VMW/P made 154 and 156 contacts respectively. Although both groups spent a total of around 3 hours 10 minutes on the band, they did it in different ways between 1930 and 0800. G3VER/P made 9 visits to the band, 3 of ten minutes, 2 of twenty minutes, 2 of thirty minutes, 1 of one hour and a quick look around midday Sunday. G3VMW/P made only 4 visits, one of ten minutes, one of twenty minutes, a long one of two hours forty minutes and a quick look on Sunday afternoon.

Band activity peaked around 0300 to 0400, with plenty of Eu/P during the evening and early morning.

Most logs were good but still a few untidy ones appeared. Several groups lost points logging /A and /2 as /P, and for those not sure, 9H3IA was in Europe. Best DX for one group came from HP9ASZ/P - nice try but about 50 other logs showed the obvious origin as HB9!

G3MCX

7MHz

The disappointing conditions this year meant that the majority of traffic with Eu portables was carried on the LF bands. This band, however, was also suffering badly. Many stations spent up to twice as long on the band as they did in the 1988 event, but scores did not reflect their efforts to the same extent. There were only a handful of contacts with the USA, equally few with Asia, none at all with South America or Australasia and only a couple with Africa (ZS6). Despite the increased G activity, none of the single-band entries were able to equal last year's leading score; indeed, the leading multi-banders were right on their tails, a sure indication of poor propagation. In contrast to conditions, the standard of logs was very good with only one written in pencil this year and even that was clear and legible. No unmarked duplicates were found and the number of transcription errors was also well down.

Overall band leaders were Shirehampton ARC, G4AHG/P, using two dipoles and a vertical to make their 398 QSOs, with Clifton ARS, G3JKY/P, very close runners-up. Both were Open section entrants. The leading Restricted section station was Eccles & DARC, G3GXI/P.

Looking at how the leading multi-band stations planned their operating schedules, G6KQ/P spent a total of 489 minutes on the band spread over 8 sessions for a scoring rate of 2·08 points/minute. G3VMW/P with an equal number of visits but over 354 minutes made 2·31 pts/min. G3VER/P spent 310 minutes in 15 sessions and achieved a rate of 2·55 pts/min, whilst G0AAA/P were on for 17 sessions totalling 339 minutes at a rate of 2·93pts/min. It would appear that success lies in little and often.

G3UFY

14MHz

Conditions on this band were slightly down on recent years, with a total of 11746 QSOs producing 37653 points. Leading scores were noticeably lower and short skip was disappointing, with comparatively few inter-G contacts being made. To all those who asked "Where was the DX?" the answer was "Between 2300 and 0600 GMT" when most competitors were cleaning up on the LF bands.

The three single band entrants, G3YDD/P and G6LX/P in the Open section and G5RS/P in the Restricted section were able to work page after page of North American stations in the early hours, with a good sprinkling of VK and ZL, however there was a lack of anything really exotic.

Hereford ARS, G3YDD/P, takes the Frank Hoosen, G2YF, Memorial Trophy with Surrey RCC, G6LX/P, again the runner-up. Among others who profited from the potential of 14MHz was G0AAA/P, who paid no less than 19 scoring visits spending some four and a half in total on the band, with a contact rate of nearly 50 per hour.

Scoring still seems to confuse some groups and almost as many entrants gained points overall as lost them. A number of groups thought that the whole of Russia was in Europe, so those entrants whose claimed scores have not changed need not assume that their logs were perfect! Of the 19 computer-generated logs submitted, only 3, from G3PDL/P, G6UQ/P and G3MDG/P, did not contain obvious callsign or scoring errors. Congratulations go to these and to the few others who took the trouble to make hand corrections. The moral is obvious!

G3LET

21MHz

Most groups commented on the poor conditions prevailing but a closer examination of the logs reveals that entrants were working into Central and South America, Africa, Asia and all call areas of the United States.

Band-winners of the Open section were dual-band entry Leicester Polytechnic's A station, G3SDC/A, using a five element Yagi to capture their 763 points from 257 contacts, some considerable way behind were multi-band entrants,

G5LO/P and a single band effort from G3GHN/P. In the restricted section, West Gravesend CG, G4BUO/P, with 357 points from 106 contacts, led by a fair margin from G3VMW/P and G4FNL/P.

G3KDB

28MHz

Again, many groups commented on the dramatic difference in propagation over last years event. A combination of shrewd tactics and good aerials in the form of a TH6DXX and a 4 element quad gave G3VER/P the edge over single-band entrants, Maidenhead & DARS, G3WKS/P. The Verulam Lions made 6 visits to the band on the Saturday evening and a further 4 visits during Sunday morning. In the Restricted section, Leicester Polytechnic's B station, G3RIR/P, gained yet another band win with a secure lead over the multi-band entry from Addiscombe ARC, G4ALE/P.

Logs received on this band and 21MHz were generally good but once again the odd unmarked duplicate crept in, and in one instance, cost one of the high scorers the band award.

G3KDB

MODUS OPERANDI

A wide divergence of organisation, equipment and facilities used by the various groups is apparent, with on-site computerised logging systems beginning to appear at one end of the scene and labour-intensive paper systems prevailing at the other. Many groups used computerised logging and duping systems specifically developed by group members for the post-contest administration.

There are four potential groupings of Field Day participants: dedicated club teams, groups of contest-orientated operators, clubs taking part to show the flag and have an enjoyable weekend, and groups of operators with the same intention. All four make an impact on the event and are a vital ingredient for its success. The first two provide the impetus and innovation whilst the other two provide the high degree of activity.

The intense level of organisation, motivation and enthusiasm shown by members of the Verulam Amateur Radio club must put them at the top of the first category. Preparations begin months ahead with the appointment of a project manager to design and test antennas, choose the site-layout and colour-code masts and associated equipment for rapid installation. The current main operators, G3JKS and G4DJX, agree on operating rotas and some weeks before the event adopt the necessary sleeping patterns. Major international contests are used as dummy runs to check out antennas and operating strategies. What is most encouraging is that the club are training second operators G4JBD, G0BLQ and G0EHO to take over at a later date. In addition, the 'Heavy Gang' consisting of other club members, newcomers, parents and Project YEAR participants, appear before and after the Contest period to assist in setting up and dismantling the station - a true lesson in the self-training aspect of contesting.

Leicester Polytechnic, under the guidance of G3ORY, have evolved an interesting strategy which paid off handsomely this year. Having recognised they have a team of good operators but not necessarily of sufficient calibre for an outright win, it was decided to go for individual band awards. Their dual-band entries enable motivation to be maintained throughout the 24 hours, whilst a presence in both sections allows a greater chance of achieving the target. G3SDC/P in the Open section gained highest scores on 1·8MHz and 21MHz, and G3RIR/P in the Restricted section topped 3·5MHz and 28MHz.

AWARD WINNERS

NFD Shield	Marple Contest Club	G3VMW/P
Bristol Trophy	Verulam Lions	G3VER/P
G6ZR Memorial Trophy	Oxford and D.A.R.S.	G5LO/P
Gravesend Trophy	Three As C.G.	G0AAA/P
Scottish Trophy	Kilmarnock & Loudoun	GM0ADX/P
Frank Hoosen Memorial Trophy	Hereford A.R.S.	G3YDD/P

Two groups firmly in the category of dedicated contesters are G3VMW/P and G0AAA/P. The Marple team consisted totally of G3VMW, G3WPF, G8RFF and Janet, xyl of G3VMW and were housed in a Land Rover complete with pump-up mast. The bar-chart supplied with their entry provided a good insight into the group's operating strategy. Short band visits were maintained for the first 6-7 hours with longer spells on the LF bands from 2200 to 0700; band-hopping then resumed until the end of the contest. Operator changes followed a similar style with short spells to maintain concentration and QSO rate. A long session of 7 hours by G3WPF was followed by a further 6 hour shift by G3VMW, shorter spells where then used, no doubt to combat tiredness. The chart also indicates the highest scoring rates at around 1600, 2200 and 0500 with nulls at 2100, 0900 and 1400.

The Three As Contest group consisted of G3MXJ, G3SXW, G3TXF and G3WVG. The hallmark of this team is the extremely slick and efficient operating techniques employed. Band-hopping was used extensively and the K1EA contest logging program as a check-log produced an instant 'B4' to duplicate calls.

CONTEST ADMINISTRATION

The high cost of sending out numerous quantities of log sheets was highlighted by HQ but unfortunately a little late to inform entrants of what had been decided. A suitable arrangement was agreed resulting in fewer sheets being issued this year. The HFCC are sensitive to the financial aspects and in future, groups registering for the event will be asked to state whether stationery is required; if so one copy of each form will supplied for entrants to copy to their requirements. Hopefully this will strike an acceptable balance to all parties.

To save time when re-writing logs, it is perfectly acceptable to put in RSTs only where they are other than 599, provided a note is added to each sheet saying 'assume all reports are 599 unless otherwise stated'. In addition, it is not necessary to write a full 4 digit code for time if the hour has been given for the first contact on each log sheet and for any subsequent change of hour.

Computerised logging is becoming more popular with probably a third of the current entry having access to suitable hardware and software. As mentioned earlier, Three As CG used the K1EA program. This requires an MSDOS environment and is a suite of programs specifically designed for the ARRL, CQWW and WAE contests, but can be used in limited form for RSGB events. Dupe checking, log generation, CW memory keyer and keyboard sending are some of the useful facilities contained in the software. Having recently acquired a copy, I can vouch for the excitement and interest generated by this additional contest tool.

COMPARISON OF TOP 3 STATIONS IN EACH SECTION

OPEN SECTION

	G3VER/P	G5LO/P	G3NJA/P
OPS	G3JKS G4DJX	G3KLH G3RBP G4AZN G0AGG	G3LHJ G4EDG G4ELZ G4VPM
Help	15+	20+	25+
Cnty	HFD	OFE	DVN
TCVR	TS930S	TS940S	TS530S
ANT			
LF	Dipoles	Dipoles	Dipole
7			Loop/ Sloper
HF	TH6	Quad	Yagi
28	Quad		
QSOs	921	834	804

RESTRICTED SECTION

	G3VMW/P	G0AAA/P	G4BUO/P
OPS	G3VMW G3WPF	G3MXJ G3SXW G3WVG	G4BUO G4FAM
Help	2	1	1
Cnty	YSN	SRY	SRY
TCVR	TS930S	TS930S	TS440S
ANT	270ft	256ft	270ft
LF			
7			
HF			
28			
QSOs	919	907	835

FUTURE EVENTS

One of the most common comments received over the years is that it does seem odd to claim more points for a contact with a station a few miles away than with a station in another continent.

Certainly the event has become centralised on inter-European traffic with little incentive to work longer distances. The majority of groups would probably be against any change in the scoring system so one suggestion might be to align the dates of the European and Stateside Field Days resulting in greater inter-continental traffic and a consequent strategy overhaul. A further advantage would be the freeing of a weekend from contest traffic.

Discussions are underway but so far it seems unlikely that the idea will get off the ground. It would not be wise or popular to align with the date of the US event on the fourth weekend in June as this would be too close to the European VHF Field Day at the beginning of July. The second weekend in June, which incidentally is the date for next years event, would seem a reasonable compromise if the Stateside guys can be convinced - a mighty big stone to turn!

CONCLUSION

My thanks go to all those who have given words of encouragement to the HFCC and its efforts in organising the event. The team of volunteers this year consisted of G4JKS, G3MCX, G3UFY, G3LET and G3KDB as band adjudicators. In addition G3UFY produced the final tabulations and G3SJJ handled registrations, inspections and produced the report. Thanks also to the inspectors for their efforts; at least the weather was on your side this time.

Several stations gave details of their installation techniques and I am sorry that I have not included them. Maybe that can be rectified next year.

There is no doubt that HF NFD is the major RSGB contest event of the year. Our aim is to maintain its presence and to increase its popularity and activity as a means of learning about and enjoying the hobby. If you haven't experienced an NFD weekend, please join us next year, we can guarantee some good fun. □

Please note that full details of the HF Field Day results can be found in the contest results section of the magazine.

SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3 FKM

Rod Colvin, G0BXQ, would be very happy to act as QSL manager for a DX station - please contact him direct (QTHR).

AWARDS

WANLO - Worked All Norwegian Locators
Available to all, including SWLs. For QSOs since 1 January 1975 with 30 locators in Norway (plus stickers for higher numbers). All bands/ modes but QSOs via repeaters and digipeaters cannot be counted. HF, VHF, UHF, and mixed classes. Basic certificate costs US $6 or 10 IRCs and an application form is available from the Halden Group of NRRL, PO Box 121, 1751 Halden, Norway.

WIA Antarctic Award
This is the first new WIA award for some time. It asks for 10 QSOs with stations conducting valid operations in Antarctica. They must include stations licensed by at least six different government authorities, and must include one VK0. Any bands (including WARC) but no cross-band QSOs allowed. All modes, except via terrestial repeaters. Endorsements are available for bands and modes. QSOs must have been made since 0001 UTC on 23 February 1988 - this date marks the 75th anniversary of the first two-way communication between Antarctica and the rest of the world. Send log extracts and list of QSLs - certified by two other amateurs - plus US $5.00, to WIA Awards Manager, Geoff Gott, VK3AJU, 38A Landsdowne Rd, Saint Kilda 3183, Vic, Australia.

Portugese Discoveries Award
Between 1 and 12 December there will be our special stations on the air - CT500A, CT500B, CT500C, and CT500D. These celebrate the discoveries made by Portugese navigators five centuries ago. All four will be on all bands with SSB, CW, and RTTY and the award will be available to those who work or hear all four - the award itself is a reproduction of an ancient map. Send details of log extracts plus 8 IRCs to REP Awards Manager, Portugese Discoveries Award, PO Box 2483, 1112 Lisbon. QSLs may also be sent to the same address.

28MHz COUNTRIES TABLE

G4MUW	178(SSB)
G0CKP	171(CW)
G4DXW	166
G0IHB	159
G4ZYQ	158
GM4ELV	152(QRP)
G4XAH	134(SSB)
G0JBM	119
G4OBK	115
G4NXG/M	115
G0BXQ/M	109
G0JHC	107
G2AKK	105(CW)
GD4XTT	98
G4SJG	91
G3SDK/M	54
GM40BK	41

DX NEWS

Don Radley, G4ABI, is now active from Nairobi, Kenya, signing 5Z4FN. As 9J2GE and 9G1GE, Don was active for many years from Zambia and Ghana. Most recently he signed G4ABI/ST2 from Sudan but was forced to close due to licensing difficulties. Don is looking forward to reviving old acquaintances on the bands and will be most active on 21MHz CW. J52US closed down on 1 September and has moved to Sierra Leone. SM5DIC is in **Congo** for a year and on as 9Q5TE. He often operates near 14.315, 21.315, or 28.515MHz, and he keeps skeds on the 21MHz frequency on Saturday at 1400 and on Monday at 1600. F6EUX is due to commence a year of duty in the **Kerguelen Is** this month. He was previously J28EO and FT8XA, and this time expects to be FT5XA. *DX News Sheet* reports that J28CW should have left Djibouti and that this leaves J28TY (mainly found on RTTY), J28DL, and J28EY (who mainly use SSB), and J28PC. G4ZVJ is now on **Ascension Is** and is expected to be heard mostly on CW as ZD8VJ.

W8KKF, K8CV, WD8MQJ, NY8E, and WD8ATS were due to be J3/ at the end of October for the CQWW DX Contest, and they may still be there. 4U1WB is not in a new DXCC country but is in fact the callsign of the World Bank's amateur radio club in Washington, DC. Stations in Ontario are being allowed to use the optional XL3 prefix until 24 November to celebrate the 350th anniversary of the province.

K6KH and other S.C.DX.C members were in **Fiji** for the CQWW DX Contest as 3D2KH. OH2BGD and OH2VB were hoping to be in **Tonga** as A35VB at the same time.

1988 CQ WW DX SSB CONTEST UK SCORES
SINGLE-OPERATOR ALL-BAND

Call		Points
GW4BLE		5,235,428
G3SNN		2,891,184
G40BK		2,639,184
GW0ARK		2,137,248
G3XTT		1,773,708
G3OZF		1,636,728
GW4RHW		1,227,290
GM4VJV		848,922
GM3BCL		813,100
GI4BBV		607,624
GM4WEW		317,958
GM0DBW		156,558
G4ZXC		134,706
G4NXG/M		50,830
GM4CUX		20,280
G0AIT		15,615
G3FXB	28MHz	1,494,048
G3LNS		1,264,848
G40JH		500,820
GW5NF		192,654
GW3NYY		185,768
GM0HJV		113,288
GB75USA		94,815
G6QQ		52,059
GM4CHX		51,525
GM3CFS		26,340
G4CNY	21MHz	990,344
GW4VHO		21,861
GM0AXY		15,957

(Certificate winners in bold)
CQ Magazine also lists 'GKBB' with 160,272 points on 7MHz — obviously a callsign error unless a merchant ship's radio operator was having a little go on the quiet!

MULTI-OPERATOR (SINGLE-TRANSMITTER)

Call	Points
G3NAS	4,406,754
GB75CQ	3,553,440
G4PKP	2,412,000
GM0IZS	145,281
G3CSR	12,599

(Certificate winners in bold)
In the QRP Section GW0ESU scored 8,904 points and G3CWL/A 1,320 — both on 28MHz.

OH1RY was due on from **Vanuatu** as YJ0RJ, and 5W1/OH4ML and KH8/SM7PKK were expected from **W.Samoa** and **American Samoa** respectively. The 5W1 activity is due to finish on 7 November; following this, OH4ML hopes to visit **Tonga** as A35ML from 7 to 22 November and return to **Fiji** for the CQWW Contest before going on to the **S.Cook Is** where he hopes to be from 28 November until 4 December. From 4 to 14 November SM7PKK will join the OHs for a 24-hour-per-day a day operation from **Tokelau Is**; they plan to have two stations on the air working pile-ups and a third confined to RTTY and the WARC bands. After this, SM7PKK will go to **W.Samoa** between 16 and 27 November and may visit T30 later. *DX News Sheet* says that the expeditions will look for Europe on 14.160MHz at 0900.

PA6SUN will be a special station on the air on 11 and 12 November from the Simon Stevin's Astronomical Observatory in Hoeven. Solar activity, observed by the laboratory's heliostat, will be mentioned during QSOs and there will be a special QSL for those who work or hear the station between 0800 and 2200 on either day. Look for PA6SUN between 3.675 and 3.775MHz, and near 7.075, 14.275, 21.275, or 28.575MHz.

NCDXA BEACONS

The summer issue of the *Northern California DX Foundation Newsletter* gives the latest news on the 14.1MHz beacon chain. There are eight on the air at present - 4U1UN, KH6O, JA2IGY, 4X4TU, OH2B, CT3B, ZS6DN, and LU4AA. The Foundation spent $1,000 on a replacement for the stolen W6WX beacon but had a problem getting a part for the controller; also, the equipment sent to Colombia for the HK beacon disappeared in transit. ZS6DN was struck by lightning but has been repaired and is on the air. Authorization has been granted by the FCC to W6QHS to operate W6WX again, and temporary permission has also been given by the FCC for beacons on 21.15 and 28.2MHz. I understand from G3DME (IARU IBP Coordinator) that in fact W6WX is now transmitting on all three bands - starting on the hour for one minute on 14.1, for the second minute on 21.15MHz and for the third on 28.2MHz.

DXNS DXCC Speed Challenge

This was mentioned in September, but circumstances have changed due to the announcement of a second projected expedition to Bouvet Is. It has been decided that the competitive aspect will be abandoned and that no plaques will be awarded. The news sheet will organise another competition later for these prestigious awards. Certificates will, however, still be available to those working 100 countries and wishing to donate to Club Bouvet. Should the project not go ahead all donations will be returned (or alternatively can be donated to the RSGB HF Committee DXpedition Fund !)

THAILAND

Great news for amateur radio in Thailand has come from Tony Waltham, IARU Liasion Officer of RAST, and Bill Mantovani, G4ZVB. It seems that H.M. King Bhumibhol Adulyadej graciously accepted Thailand's first advanced-class radio amateur radio licence on 17 August and now has the callsign

HS1A. At the same time, the use of HS0A was discontinued to prevent confusion. The Director-General of the Post and Telegraph Dept. has announced that over 50,000 prospective amateurs had purchased application forms for a forthcoming novice licence examination this year! The DGT also said that associations in provinces where amateur radio is banned should apply to the PTT. Up to now, activity has been restricted to 11 provinces around Bangkok. The restriction on the number of transceivers which can be owned by an individual has been lifted. A number of students have taken an examination for the intermediate licence recently, and those who passed this (about 90) took an 8 wpm morse test in English. After passing, they will be allowed on the HF bands - the first time that Thai nationals have been legally permitted to use HF.

G4ZVB managed to get on the air during the SEANET Contest, using the new callsign HS0AIT from the Asian Institute of Technology (also the site of the HS0YDY operation by Japanese UNICEF members a little earlier). Bill asks all who worked him as HS0AIT to QSL via the RAST QSL bureau using the HS0AIT callsign, and asks for patience over the cards - all will be QSL'd.

QTH CORNER

GD4UOL	S. Muster, Flat 4, 60 Genesta Road, Westcliff-on-Sea, Essex, SS0 8DB.
GW4UOL	
HS0AIT	via RAST, PO Box 2008, Bangkok, Thailand, 10501.
L8H	via LU4HH.
PA6SUN	via VERON QSL Bureau.
VP5T	via NM2Y, 456 W.57th St, New York, NY 10019, USA.
ZD7VC	Box 5, St Helena.
5Z4FN	Donald S. Radley, PO Box 44765, Nairobi, Kenya.
9X5SP	Box 111, Kigali, Rwanda.

CONTESTS

OK DX Contest
1200 11 November to
1200 12 November.
CW and phone. 1.8 to 28MHz. Single-operator single and multi-band, multi-op multi-band, QRP (output less than 5W) and listener categories. Exchange RS/T and ITU zone (UK is 28). Stations may only be worked once per band. QSOs with OK/OL stations count four points, with stations in a different continent two points, and with stations in other countries in the same continent one point. Own country counts only as multiplier. The multiplier is the sum of ITU zones worked on each band. Separate logs for each band and entries must have the usual summary sheet and signed declaration. They must be postmarked no later that 15 December and sent to Central Radio Club, PO Box 69, 11327 Praha 1, Czechoslovakia.

Fraternizing CW Party 1989
18 and 19 November.
CW only. 18 November, 1500-1700, 7 and 14MHz, 1800-2000 3.5 and 7MHz. 19 November, 0700-0900 3.5 and 7MHz, 1000-1200 7 and 14MHz. I can supply full copies of the rules - SASE please.

TOPS Activity Contest
3.5MHz CW.
1800 2 December to
1800 3 December
3.5 - 3.585MHz. Single-operator stations must take seven hour break. Exchange RST plus serial QSO number (TOPS members give membership number as well). Copies of rules can be obtained from me - SASE please.

EXPEDITIONS

Steve, G4UOL, intends to make another foray this month - this time to GD, where he will be GD4UOL (SC38) from 18 November until 2 December. This will include operation in the CQWW DX Contest.

In the September column I gave news of a planned visit to **Bouvet Is** by the *Club Bouvet* group. At the time of writing the decision on

HF F-LAYER PROPAGATION PREDICTIONS FOR NOVEMBER 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	....9+++81..	...1999992..	...3999995..	...69889982.	431877779964	886654457998	8864221257788	++3.....24++
MALTA	....9+9983..	....999995..	...29999982.	...598899951	451876679996	997754457999	888521125788	+++2....25++
GIBRALTAR	....598873..	....799995..	....9999982.	....9988995.	231287778995	886775457899	998742224799	++++.....4++
ICELAND	.....79981..	....189993..	....499997..	....6999992.	12..88889972	785275567898	877643335788	5554....245+
** ASIA								
OSAKA	....94.....	...196.....	...3972.....	...58731...1	2..364434425	...131135764	....1...2661	.....33.
HONGKONG	...3++95....	...499972...	...2788852..	....6668741.	2...34458863	2....1135886	3674	.....34.
BANGKOK	...5++++8...	...4799991..	...1487895..	1...26679721	3....3357975	3....1.25888	1.....2676	343
SINGAPORE	...589998...	...5799992..	...2477895..	1...26689821	3....3357975	2.....25887	2675	342
NEW DELHI	...6+++91...	...568993...	...237887...	1.1.15688211	521..2357766	73....125888	61.....2677	3.....344
TEHERAN	...7++++71..	...8789992..	...75578961.	212523679832	7552..358987	874....25889	761.....3677	43.....344
COLOMBO	...6++++81..	...4589993..	...12678971.	2....4679942	62...1358987	61.....25889	4.....3677	344
BAHRAIN	...7++++72..	...7679984..	1..634789731	312412679953	8651..357998	873....25889	751.....2667	42.....345
CYPRUS	...5++++94..	...79999961.	1..988899941	432876789974	876754568998	997421246899	8851....14788	552.....45+
ADEN	...7++++951.	...766899731	31.523689963	6323.1479986	985...157999	883....25888	761.....2667	43.....344
** OCEANIA								
SUVA/S	....15885...	....379971..	....688894..	....777896..	..12644576..	...3311353..	...11...21..	.....
SUVA/L	21..55421564	22.177533764	11.387666841	..168656782.	..16632476..	...33..143..	...11....2...	.....
WELLINGTON/S	....68865...	....899871..	...1888893..	...28778951.	...4644686..	...1311353..	....1...31...	.....
WELLINGTON/L	11..1.....	22..21....11	1211531..322	.12274222521	..14632355..	...23..142..	....1...2...	.....
SYDNEY/S	...498897...	...5989981..	...5988894..	...38668971.	....6435884.	....3113572.	.....35..	.....2..
SYDNEY/L	....32....12	....542..133	..1.76421354	..1.86443662	....6324574.	....31.1461.	....1...13..	.....
PERTH	...6888761..	...6788883..	...35778971.	1...26679842	1....3358985	25874	3651	.....32.
HONOLULU	.....3..	.....5..	.1..2...371.	131.511.572.	.451622175..	.165411252..	..341...2...	.....
** AFRICA								
SEYCHELLES	...66787451.	...556887731	31.213688963	631...479986	962...157999	85.....25889	72.....2667	4.....334
MAURITIUS	...67788962.	1..556899841	42.212689985	741...379997	961...157999	83.....25889	61.....2677	3.....344
NAIROBI	...6+8898741	2..766799963	53.523489997	8623..278999	985....47999	884....15888	761.....2677	43.....344
HARARE	1..466789863	31.555589985	74.522269998	9723...48999	994....17999	883.....4889	751.....2677	42.....344
CAPETOWN	21.277789975	42.365579997	86.532248999	98241..17999	9951....4899	884.....1689	761.....377	43.....44
LAGOS	21..+++++985	53.286679997	86.573248999	983751.27999	99772...5899	8895....2799	6772.....477	444.....45
ASCENSION Is	21..8+778755	43..86557877	762183225899	984361..2899	99873....699	88861....378	7773.....57	444.....24
DAKAR	1...8++++984	32..98658996	652.96326999	8852841.4899	999661..1799	88873....488	77741....167	4442.....34
LAS PALMAS	....8++++95.	99999972	221.99889995	553198778998	998686546899	999863213799	888631..1478	++53.....5+
** S. AMERICA								
Sth SHETLAND	1...57787774	32..78877786	652.87644578	7752864222357	7875631...25	45653.....2	23321.....	.....
FALKLAND Is	....5888+873	21..78765786	552.87521378	8751863..158	899563....26	78873.....3	56751.....1	2442.....
R DE JANEIRO	48766762	11..68554685	543.86211488	776184...179	999561....58	88863.....27	76741.....4	434.....
BUENOS AIRES	58777773	11..78754575	443.87411168	766.862...48	999463....17	88863.....4	66741.....1	334.....
LIMA	.....1++++61	2865563	222.25731146	545.456...27	8893633....5	788631.....2	56741.....	244.....
BOGOTA	.....++++61	2865673	212..4731256	445..55...37	8893142....17	888631.....4	66741.....1	334.....
** N. AMERICA								
BARBADOS	.....8++++71	8855783	212..8721387	545.165..178	8893432...48	888631....17	67641.....4	444.....
JAMAICA	.....++++61	2875672	112..4741265	445.1562..47	8882443...17	888641.....4	66741.....1	334.....
BERMUDA	.....5++++61	7977882	112.18754685	445.27621378	8882543...158	888641....26	66641.....4	433.....
NEW YORK	.....19++95.	3988871	111..6776684	444.26654477	888244321157	887631....25	56541.....2	232.....
MEXICO	.....1++84.	297651	111.1.584233	344.3.572.15	78826234...3	688631.1...1	36741.....	.34.....
MONTREAL	.....19++94.	3998861	111..6787784	343.26665686	887254342357	787631.1..35	56541.....3	232.....
DENVER	.....5982.	.....7984.	111.1..88652	343.3.176444	687161253114	588541121..2	26641.....	.33.....
LOS ANGELES	.....972.	.....1973.	11.....48531	342.2..67323	587152.54..2	378541121...	15641.....	.23.....
VANCOUVER	.....461.	.....682.	11..1..18841	342.3..38753	576152146434	468531123111	14541....1...	..2.....
FAIRBANKS	.....1..	.....23..	11..1112562.	341.43347842	675164457765	467541125543	23441...2211	.....

The provisional mean sunspot number for September 1989, issued by the Sunspot Index Data Centre, Brussels, was 176.8. The maximum daily sunspot number was 296 on 9 September, and the minimum was 80 on 25 September. The predicted smoothed sunspot numbers for November, December, January and February are respectively: (classical method) 175, 171, 168 and 163; (SIDC adjusted values) 184, 180, 175 and 170.

chartering a ship and helicopter was being delayed until 15 October. It has also been revealed that another group is planning to visit the same island - leaving the USA on 19 January and travelling via London to Capetown, where it will pick up a 168' boat for Bouvet. It is hoped to arrive on 1 February. This group is large and includes W6OAT and K7JA; it is to be led by W9SU. It is said to be already fully financed, with a number of sponsors including the National Geographic Society. Yaesu is believed to be supplying eight FT1000 transceivers, and the intention of the group is to have six stations on the air for 24-hours-per-day for their 10-12 day stay. The DXpedition was fully set-up to operate this year but was delayed at the request of the National Geographic Society. The callsign 3Y0B had been issued.

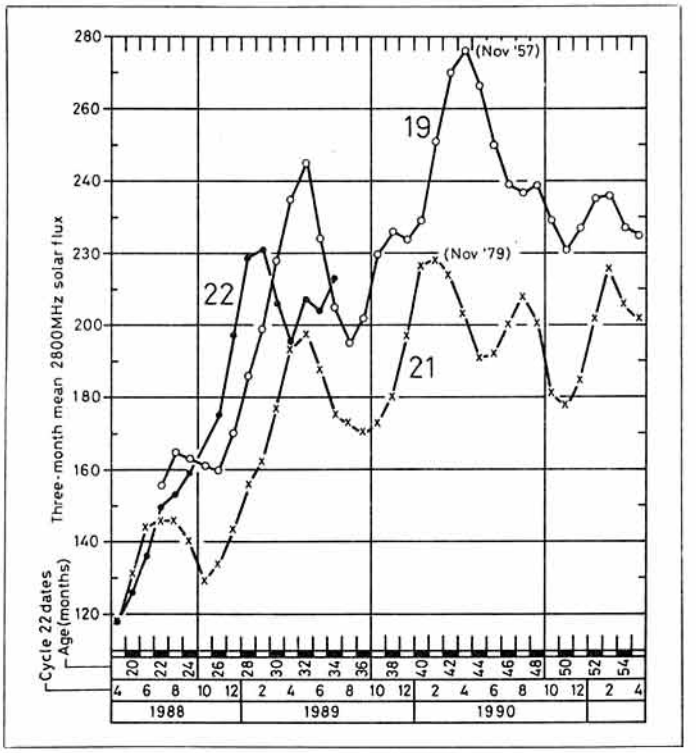
Don Radley, G4ABI, is now on the air from Kenya as 5Z4FN.

PROPAGATION

A detailed report from Smithy this month which goes as follows "The sun was markedly 'one-sided' in August and September, giving rise to large variations in the solar indices with a very strong 27-day component. The provisional daily solar flux readings topped the 300 SFU mark on 7 and 9 September, but by the end of the third week they had again fallen to 159 while the 27-day running average had levelled off at 230 SFU. With a week to go, it looked likely that the monthly flux and sunspot averages would be a little higher than the provisional values for August which were 218 and 166.8 SFU respectively. This high solar activity had its good and bad aspects. On many days the HF bands were good to excellent, with even 28MHz open to all continents. On the other hand, a major magnetic storm on 19 September severely disrupted conditions on the higher bands.

"The accompanying graph compares the relative position of the present solar cycle with those of Cycles 19 and 21 at the same monthly age, using three-month mean solar flux as a way of smoothing out the short-term variations. It can be seen that early in 1989 Cycle 22 was already higher than the peak of Cycle 21 - then in its 41st month - but it then passed through a minor trough. By month 34 (average of June-August) it was again climbing and was more than 20% above Cycle 21 at the same age and just ahead of 19. If one uses longer-term averages (smoothed monthly values - only available up to February 1989) the lead over Cycle 21 is even greater, whilst 22 is a little behind 19 on sunspot numbers but neck-and-neck using solar flux.

"The graph also suggests that the most likely time for the cycle to peak is in the first half of 1990, in months 40-44. In its July bulletin, NGDC Boulder predict the most probable peak smoothed monthly sunspot number as 193 in February 1990 (90% confidence range 154-232 and the timing spread roughly October 1989 to March 1990). It must be remembered that a smoothed number for a given month is only calculable six months later so there is a delay in knowing when the official peak was reached. For some time SIDC Brussels have been predicting a peak smoothed monthly sunspot number in the 180/190 region as early as August/September 1989. This does not, however, seem to fit the data up to July, on the basis of which the peak would need either to be considerably lower or later than their prediction - an anomaly which has been drawn to their attention. The Boulder prediction, based on the "average cycle" would seem the be the best guide for readers over the 1989/90 season."



Progress of cycle 22 compared with Cycles 19 and 21 at the same age (supplied by G8KG).

BAND REPORTS

First of all thanks to all who contributed - including G2s AKK, HKU, G3s GVV, YRM, G4s DXW, EHQ, GM4ELV, GW4KGR, G4s MUW, NXG/M, SFU, SJG, ZYQ, G0BXQ/M, and GM0KMJ. Calls in italics were stations on CW.

14MHz

0700 KH3/KN0E, KH6, ZK1DG, ZL7TZ.
1500 V85NR.
1600 FT4ZE, 8Q7AC, 9V0WW.
1900 A61AC, ZL4OP.
2000 VP8BUB (S.Ga).
2100 *FY/F3SA*, ZS1IS.
2200 *BY1QH*. KC4USV, PY0FF.
2300 BY1QH.

18MHz

1500 *JA4AO.*
1600 *D44BS, ZS8MI.*
1800 J52US, T50DX, YB0CN.
2000 *HZ1AB*, J37AJ, KV4AD, LU1ZG, VP8BXL, ZD7VJ, 8P6CC, 9M21R, 9Y4DG.

21MHz

0000 XT2PS.
0700 BV2FA, BY5RY, KL7.
0800 BZ4SAA, JT1BX, VR6ID,*ZM1BSG.*
0900 *BY4WNG.*
1000 *YI1BGD, 3D2BO, 3D2RJ (Rotuma).*
1200 *NH2/KD7P, T5CT.*
1300 *V63AO.*
1500 *AP5HQ, JT1BJ, 8J1RL.*
1600 *KC6NX, 9N1MM, 9V0VS.*
1700 *KC6YU, 9M6HF.*
1800 *HC8/KB2VO, T50DX.*
1900 *HS1BV, TR8SA.*
2100 *HL5BDS, S92LB, VQ9IF, W7, 3X1SG.*
2200 *HT3A, W6, ZS1IS (Walvis Bay).*
2300 *W6.*

24MHz

1500 *ZS8MI.*

1600 KP4DLM, 9J2WS.
1700 ZS6GG.
1800 HZ1AB.

28MHz
0600 BY1PK, *BY8AC*, XX9SW.
0800 BV2FA.
0900 A22RA, BZ4RDX, YJ8NRN.
1000 ZL.
1100 P29VU, ZD7CW, ZL1BWM, 6V1A.
1200 HL9TG, KH0AC, OD5SK, S01A, T50SG, VP2EXX, ZD8MAC.
1400 FR4FD, 3B8CF.
1500 V31BB.
1600 L8H, YB8BYS, ZS8MI.
1700 *HL5BDS, ZD8SE.*
1800 *FG/FD1OMP, F6ESG/OD5,* S79SC, ZD7VK.
1900 *FY5YE.*
2000 J6LQC, VP8RX, ZD9JR.

Thanks again to *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* (WA8TGA), *DX Report* (VK9NS), and the *Lynx DX Group Bulletin* (EA2JGO).
Closing date for January is November 21.

VHF/UHF

NORMAN FITCH G3FPK

Tropo conditions this past month have been most uninspiring. No major lifts, just the occasional apparent enhancement - more often than not due to a contest or activity period. There have been a few auroras, one of them potentially good, and meteor-scatter mode has been rewarding for its addicts.

BEACON TOPICS

Ted Collins, G4UPS (DVN), in his 6m Information for September, says that a new Finnish beacon OH1SIX (KP11QU) should now be operating on 50.025MHz running 50W in A1A mode. It is programmed to send, 'OH1SIX KP11QU' followed by 10-15 seconds of carrier. The antenna is a 2dBi gain omni-directional at 36m AGL/160m ASL.

In the European area of IARU Region 1, there are probably about 250 beacons in the bands between 50MHz and 1.3GHz; most operate in the internationally agreed sectors, but around 30 do not. (About 20 Russian beacons are listed in the 144.12 to 144.47MHz region, for example). Their powers range from a few milliwatts to the 500W ERP of LA2VHF (JP53EG) on 144.870MHz. Those running more than 50W ERP are regulated by the IARU and Brian Bower, G3COJ (BKS) is the frequency co-ordinator. Their prime purpose is to provide continuous, constant signals for propagation study purposes. Some are operated for a particular reason, e.g. SK4MPI (JP70NJ) on 144.960MHz, whose 100W ERP is beamed northwards for auroral propagation studies.

The mainstream beacons are well sited and give extensive coverage. In some countries - the UK now included - unattended transmitter operation is allowed and consequently 'private' beacons can be heard, more likely on 432MHz and above; these low-power signals are useful for receiver alignment as well as for propagation studies.

The VHF Committee has discussed how the beacon service might be improved. One enhancement would be to make them 'intelligent' by sending messages about propagation; the German beacon DK0WCY, on 10.144MHz in the 30m band, transmits such information. Obviously, this requires there to be someone who can load messages into the TX, preferably from a remote location.

Sending data from computer, via modem and telephone lines, to a distant computer is no problem; perhaps the packeteers might have some ideas? Your thoughts and suggestions on improving the beacon service would be welcome, especially if you have had any practical experience in this field.

COMPUTER QRM

When I moved to my QTH on the Surrey hills in 1969, the VHF bands were relatively free of man-made interference. But twenty years on, it's a waste of time striving for a system noise figure better than about 10dB. This is all due to the 'digital revolution' and my guess is that the overall hash level is now doubling every year.

There are several main causes of all this RFI. The first is the large number of home computers, most of which seem to generate nasty sproggies over the entire RF spectrum from DC to light. Manufacturers of PCs make almost no attempt to reduce RFI, my Amstrad PCW8512 being a typical example; attractively housed in plastic cases with unscreened connecting leads to all the peripherals, it's a real QRM machine.

The second contribution is from the combined digital hash from business computer systems in towns and cities. For example, when beaming north from G3FPK, the antennas are pointing at the tall office blocks in Croydon 5km away and to the City at some 20km. There are thousands of computers and VDUs in this line of fire, each with scores of chips, all churning out RFI. When an aurora is likely, I am frequently fooled by weak, hissing notes which are actually computer hash.

The third phenomenon is the increasing number of in-band spurious signals from cordless telephones, paging systems, burglar alarms and a host of other devices - remember the Ambassador telephone saga reported in *RadCom* in 1985, and still with us? Another problem is illegal high-power radio telephone base stations using the 70MHz band, but these are easier to deal with.

The VHF Committee, through the medium of this column, would like to hear from readers who have identified particular sources of interference. For example, a current case concerns Mike Hearsey, G8ATK (SRY), who tracked down a nearby Atari ST-series computer as the cause of terrible hash on VHF. The owner has been very co-operative, allowing Mike to supply and fit screened interconnecting cables and a few filters where possible. The dealer was reluctant to do anything off his own bat - apparently because he had no idea where to start.

To their credit, Atari were concerned enough to prepare instructions quickly for the dealer so he could modify the equipment. Mike discovered that both the chief of this American company and the person who verified the problem and wrote the application notes in this country are radio amateurs; no doubt that helped a great deal. I would like to hear about your computer problems - in particular the attitudes and co-operation of users, dealers and manufacturers. I will pass on all details to the VHF Committee after extracting any information relevant to this column.

ANNUAL VHF/UHF TABLE
January to December 1989

	50Mhz		70Mz		144Mhz		430Mhz		1.3GHz		Total
Callsign	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Points
G1SWH	68	26	64	6	90	19	51	6	—	—	330
G8LHT	61	16	34	5	92	29	50	14	7	4	312
G6HKM	61	29	—	—	78	27	40	14	23	7	279
G0IMG	66	24	39	5	51	10	27	5	—	—	227
G4XEN	24	9	23	4	76	31	39	11	—	—	217
G1DOX	30	6	47	6	59	16	27	3	13	2	209
G4PIQ	—	—	—	—	88	34	53	20	—	—	195
G8PYP	35	23	—	—	52	25	24	10	—	—	169
GM1SZF	41	11	—	—	71	16	7	6	—	—	152
GM4CXP	28	11	4	1	60	19	4	3	—	—	129
G8XTJ	40	14	—	—	54	13	—	—	—	—	121
G0EVT	24	19	—	—	39	26	6	6	—	—	120
G3FPK	—	—	—	—	76	24	—	—	—	—	100
GW4FRX	—	—	—	—	65	32	—	—	—	—	97
G4OUT	—	—	27	5	41	18	—	—	—	—	91
GJ6TMM	28	12	—	—	23	9	1	4	—	—	77
G7CLY	—	—	—	—	54	14	4	1	—	—	73
G4TGK	—	—	—	—	49	16	—	—	—	—	65
GM0JOL	—	—	—	—	44	11	—	—	—	—	55
G0HDZ	—	—	—	—	38	7	—	—	—	—	45
GM1ZVJ	4	3	—	—	23	12	—	—	—	—	42

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.

METEOR SCATTER

The next recognized meteor shower is the Leonids, useful between 14 and 20 November and peaking on the 17th; the RA is 152 degrees and the DEC +22 degrees. The radiant is above the mid-UK horizon from 2230 through midnight to 1430. Best times for the usual four directions are: NE/SW 0430, with a lesser peak around 1130; E/W 0630; NW/SE 0900 with a lesser peak around 0200; N/S two equal peaks at 0300 and 1000, all times being GMT of course. A couple of hours either side of these times should provide good reflections, but the Leonids is a variable shower with a 33-year period. 1999 is suggested as the next spectacular year, so be patient!

SOFTWARE

The software paragraphs in the September VHF/UHF brought a number of requests for the 'Proglist' and several readers now have some of the programs which are in CP/M and written for the Amstrad PCW8000 series. Recent additions include CTYAZ, which prints out the azimuths from your QTH to all British Isles counties, and a 54-page manual - in LocoScript 1 - of the entire HELP.DOC file on side 3 of the master discs; saves disc swapping during editing and programming.

In the public domain there is a very useful utility called SUPERZAP which enables you to retrieve erased files and amend HEX

listings. It is particularly useful for 'repairing' discs that will no longer load - that's when you get the unhelpful message, 'track 0 sector 1 missing address mark...' With SUPERZAP you can often amend corrupted HEX coding and restore a stubborn disc to full working order. Send me an SASE if you want the latest Proglist. I have dozens of discs containing lots of very useful non-amateur radio stuff, so mention your needs. If I can't help, I may know a man who can!

50MHz

In the August VHF/UHF, under the heading DX Window, I mentioned five proposals in the July issue of *QST* concerning a revision to the international band plan. Bill Tynan, W3XO, has kindly sent a copy of his 'The World Above 50MHz' column in the October issue. Nearly 200 operators wrote to Bill and the result of the poll was that 55% of his readers opted for the DX window of 50.100-50.125MHz as we already have. However, they voted for a calling frequency of 50.125MHz. We will discuss this during the next meeting of the VHF Committee, so watch this space.

In his August report, Ray Cracknell, G2AHU (HWR), mentions the decline in Es propagation from the middle of the month and the improvement in TEP in the run-up to the equinox. All types of F-layer propagation improved and on the 24th there was a late evening opening to ZD8, CX and LU. The first QSOs between PY and Britain occurred that evening, but no reader has owned up to a contact so far.

The Es decline resulted in ZB2VHF being received on 81% of the days; CT0WW and CT/EA amateurs 45%; 9H1SIX and 9H amateurs 32%; LA, OH and SM 13%; F, I and T77 23%; DL, HB9, OE, OZ and PA 16%; TK, SV1SIX and SV amateurs 19% and 7X 13%. The report includes contributions from SV1DH, Z23JO, ZD8MB and ZS6WB from Region 1, and from JA1VOK covering the period 23 June to 24 August.

Hal Lund, ZS6WB (KG44), has sent his ZS VHF News publication dated 27 August. In the beacon status section he reports that ZS1STB (KF05) has keyer problems. It is on 50.904MHz, running 25W to a ground plane antenna; ZS4SA (KG33) is on daily 1130-2130GMT, 50.073MHz/20W beaming north; ZS6LN/B (KG46) is QRV again, 50.055MHz/10W/GP and ZS6PW/B (KG44) is QRV daily 1100-2000, 50.027MHz beaming north.

Hal's DX News is: ZS8MI (alias ZS6PT) is QRV from Marion Island (KE83) using an IC-551D and 4-element Yagi; ZS1IS (JG77) is on from Walvis Bay, which is likely to be declared a new DXCC country; ZS3KC is another new station in JG77; J52US is QRT from Guinea-Bissau but should be on from 9L1 next January; A22BW (KG39) has been QRV from Botswana since early September using a Swan 250 and 4-element Yagi, QSL via DL3KD; 3D0AU (KG53) is operating from Swaziland with an IC-551D and 4-element Yagi, QSL to Harry Stickley, P O Box 99, Amsterdam 2375, Rep. of South Africa; 7D8DP should be on from Lesotho with an IC-505 and amplifier to a 4-element Yagi, QSL to Bob Drake, W8JBI, 3766 N Darlington Rd, Birmingham, MI 48010, USA.

G4UPS's information sheet confirms that the band has been available to personnel at the British Sovereign bases in Cyprus since 24 August. The licence conditions are the same as for the UK, on a strictly non-interference basis. ZC4s MK, AB and WP were active from the start and soon worked 9H, ZD8, TR8 and A2 but up to mid-September they had not heard any UK stations or beacons. Liberia was reactivated on 18 September by EL2FO (IJ46) in Monrovia. Alan uses an IC-551 and 5-element Yagi and his QSL route is via KN4F, 5104 Pilgrim Rd, Memphis, TN 38116, USA.

Neil Carr, G0JHC (LNH), worked W1, 2, 3 and 8 via Es on 7 August, but he was in central Florida (EL97) at the time! From home on 21 August he contacted LA, OH and SM stations via auroral Es, and worked his last UK mainland square in the aurora on the 23rd, thanks to GM1IKQ (IO76). On the 24th, A CQ call at 1915 on 50.110MHz brought a reply from LU8YYO (FF50), the start of a two-and-a-half hour opening to LU and CX, but Neil didn't mention hearing any PYs. Other QSOs were with FC1FIH (JN23) on 2 September, GU4CJG/P (ALD) on the 5th and OH9s NLO (KP26) and NMS (KP36 and square number 131) on the 6th.

Peter Scutt, G3IBI (HPH), was told by 9V1YC on 21MHz of a planned special-event station, 9V0SEA, in Singapore in the 17-19 November period. There seems little likelihood of any normal 50MHz activity from 9V since Malaysian TV uses Band 1. Peter has operated from Malta using the call 9H3KZ, mainly on 144MHz, and discussed 50MHz matters with 9H5EE and other locals. 5EE uses an FT-690R running 10W to a dipole. From home on 8 September he heard the TF6MM (IP24KG) keyer on 50.057MHz between 1429 and 1445 up to S5 but couldn't raise Thor on 50.11 or 28.885MHz. On the 17th at 1440, G3GJQ/5N0 was heard up to S7 but he couldn't break through the French barrier.

G4UPS worked GM4DGT (IO86) at 0738 on 5 September, probably via auroral Es. ZB2VHF was heard for short periods on the 2nd, 4th, 5th and 11th and 5B4CY at S3 for 13 minutes from 1103 on the 13th. On the 18th, Ted heard EL2FO up to S9 working Gs, Fs and PAs from 1533 and at 2145, ZD8VHF was copied via TEP for eight minutes. On the 20th at 0935 he made an auroral Es QSO with OH1AYQ and heard ZS3 in the late afternoon.

Paul Turner, G4IJE (ESX), complains bitterly about those stations running way over the legal limit "...who insist on working the rare DX time and time again when others are desperately trying to work it for the first time." He adds, "At least most of them don't have the nerve to put an entry in the squares table!" His only new square has been OH6RJ (KP22) on 21 August.

Dave Gregory, G8JDX (DVN), reports the band pretty dead for three weeks up to 17 September when he heard G3GJQ/5N0 at 1425. He was the first G to work EL2FO at 1533 on the 18th. Ian Harwood, G8LHT (YSS) made auroral Es QSOs with LA and OH on 21 August and on 7 September contacted GW3JXN (DFD) after a QSY from 144MHz.

Steve Damon, G8PYP (DOR), had an incomplete Es-plus-TEP contact with Z23JO at 1735 on 25 August and later an Es QSO with CT1BXT (IM89). 9 September brought GU4APA/P (ALD), and G3GJQ/5N0 was heard on the 17th. On the 18th he had an auroral QSO with PE1HXD (JO33). George Ripley, GD3AHV was EL2FO's second QSO on 18 September at 1536 for a claimed first GD/EL contact on 50MHz. In the evening he worked Gs and PAs in the aurora.

Geoff Brown, GJ4ICD, reports strong Es to Scandinavia from 1000 on 10 September and a good tropo signal from PA0OOS (JO33) at 1031. At 1440 on the 17th, G3GJQ/5N0 was S9+30db for 40 minutes with no flutter; G4UPS was only getting Roy at S5 at this time. Geoff

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	144MHz	430MHz	1.3GHz	Total
G3IMV	91	427	124	48	690
GJ4ICD	216	263	119	59	657
G4IJE	226	338	5	2	571
G4KUX	—	384	120	—	504
G6HKM	102	215	107	45	469
G4XEN	66	290	111	—	467
G4RGK	—	284	126	51	461
G1KDF	139	180	102	37	458
G6DER	43	183	114	82	422
G0CUZ	—	329	73	—	402
G6HCV	143	229	—	—	372
G4MUT	82	153	93	31	359
G4RRA	—	277	80	—	357
G4VXE	147	162	42	4	355
G8LHT	77	177	88	10	352
G4PIQ	—	261	87	—	348
G4SSO	—	251	95	—	346
GM4YXI	—	340	—	—	340
G4SWX	—	333	—	—	333
G4DHF	—	325	—	—	325
G0EVT	58	197	57	—	312
G8ATK	—	143	94	52	289
G1SWH	97	123	53	—	273
GJ6TMM	62	151	47	—	260
G3FPK	—	240	—	—	240
G0LFF	83	153	—	—	236
GM4CXP	—	198	31	—	229
GW4FRX	—	226	—	—	226
G4DOL	—	213	—	—	213
G8PYP	69	98	22	—	189
G0JHC	131	48	—	—	179
G8XTJ	38	116	—	—	154
G4XBF	—	150	—	—	150
G4TGK	—	136	—	—	136
G1DOX	39	67	12	5	123
G6UWO	—	41	44	18	103
GM0GDL	—	81	22	—	103
G1WPF	—	101	—	—	101
GM0GEI	94	—	—	—	94
G0HDZ	—	64	—	—	64
G6MEN	48	—	—	—	48
GM1ZVJ	5	40	—	—	45
G7CLY	—	38	1	—	39

No satellite, repeater or packet radio QSOs.

also heard TR8CA very weakly, and on the 19th he copied EL2FO at 1600 at S2 along with ZS3s. It seems that JE1CTA is another of these phantom QSO-makers. This chap sent QSLs for imaginary contacts with GU1DWO on 26/12/88 and with GJ4ICD on 21/12/88 and 22/1/89, all 'firsts' according to Mr Takayasu. Well, we have a few here too.

70MHz

With the Society's help, John Acton, G1DOX (AVN), has obtained planning permission for a 30ft slimline mast to enable him to put his antennas up another 12ft. In the Trophy Contest on 17 September he collected more table counties, including portables G7APD (BFD), G8EIK (NOR), GM1GEY (DGL), GM4FRE (SCD) and GM8XVJ (TYS); a new fixed station was G4PMK (YSW).

G4IJE wrote, "I've found a very enjoyable alternative to the frantic pile-ups on 50MHz. I am now active on 70MHz FM, using a Pye Westminster to a vertical dipole at 30ft." Up to 26 September he had made 38 QSOs with stations in 14 counties, usually with 15W, although full legal power is available. Best DX was G4PWD (SFD) at 171km, then G8MIW (NOT) and G4SEU (WKS). Paul concludes, "I'm amazed at the high level of activity on the band; it's quite rare for my CQ calls on 70.450MHz to go unanswered on a weekday evening. I can highly recommend 70MHz FM as a cure for the 50MHz pile-up blues!"

G8LHT conducted a very QRP test with G3NAQ using 300mW, with HB9CV antennas at each end. Geoff received all Ian's information in average to poor conditions - not bad from Doncaster to Newbury. By 17 September, Ian had increased his power to about 10W and best DX in the contest was G4ADV/P (CNL).

Local groups are reportedly acquiring PMR transceivers, such as Pye Westminsters or Nolton Novas, and modifying them to work on a single frequency in the band. They are multi-channel transceivers, but each channel requires two purpose-made crystals costing £10 at least - an expensive way to QSY. Thus activity is increased, but some of the groups don't welcome non-members calling in on 'their' frequency.

144MHz

Colin Morris, G0CUZ (WMD), caught an aurora on 23 August, 1615-1915, but activity was poor; he worked GM3JFG (IO77) and heard GM4ILS (IO87) but no DX. He slept through the aurora of 18/19 September - glad I wasn't the only one, Colin. He reports almost nothing of interest on tropo, apart from LX/ON7RB/P (JN29) in the contest on 3 September. MS was quite rewarding, though. On 26 August he completed with HG7B/0 (KN18BI) in 32 minutes and with the same station, this time in KN17CX, 24 hours later in 50 minutes; both were new squares. Other MS completions were with Y28OL (JO71) on 25 August and IK1LGV (JN44) on 3 September.

G1DOX added Kent to his table score on 16 September, thanks to special-event station GB4BAM at the Brenzett Aircraft Museum. Arnold Hewitt, G6PFN (LEC) is QRV on the band and monitors beacons GB3s CTC, VHF and ANG most nights. He mentions not hearing GB3NGI on 144.945MHz; it is not yet operational, although it is listed.

Andy Cook, G4PIQ (SFK), telexed his report to my Telecom Gold mailbox and said, "...the troposphere really ought to get its act together considering it's autumn..." He found things slow in the 2/3 September contest, the only noteworthy DX being DL0BQ/P (JN57), Y35O (JO62) and HB9/F1FHI/P. There was a little lift to OZ and north DL on the 6th.

Andy was alerted to the aurora on 15 September at 2130 and worked a few stations up to 2300, best DX being SM0KAK (JO89). Signals were weak and subject to fading, but from 0000 they quickly became much stronger and more stable. Even so, activity was low and he switched off at 0045. On the 18th, another telephone call alerted him to an aurora at 2030. Scandinavians and GMs were heard and LA8SJ worked, up to 2115 when he switched off. At 2305 it was in full swing and Andy worked stations in DL, OZ, SM and Y, plus SP5EFO (KO02); he heard OZ6OL working UP2, UQ2 and RB5AL (KO61).

Mark Holloway, G4YRY (DOR), lists several Fs worked in the latter part of August, including F/LX1JX (IN86) on the island of Noirmoutier on the 30th. He reckons there are plenty of Fs to be contacted, especially if you call in French. The aurora which started on 18 September was remarkable in that it went on through the night until well after dawn, finally fizzling out around 0715. From 0650, Mark contacted GM4CXM (IO74) and G3BJD (IO94) on CW and G8MDG (IO93) on SSB.

Ela Martyr, G6HKM (ESX), took part in the Trophy Contest and made 294 QSOs, fewer than last year. She finds it harder going each year, perhaps because activity is getting less? LX/ON7RB/P and F6CTT/P (IN88) were two new ones in the September contest for G8LHT. Ian has added OH to his country total now that OH5LK (KP30) has confirmed a random SSB MS single-burst contact on 12 August. G8PYP lists several Fs worked in the contest on the 2nd, plus G8NEY/P (IN79) on The Lizard; next day brought GD4IOM and the LX portable, but a QSO with GI0LIX/P wasn't completed.

Erik Gedvilas, G8XVJ (CHS), found the 18 September aurora very intense from 2215 to 0030 and he worked nine SPs, SP8AOV being the best DX; the QTE was around 85 degrees. He found more varied activity on SSB, the CW stations being mostly DLs. It was going on again at 0500 but few stations were active.

Erik remarked upon the big Doppler shift of -3kHz, so large that some operators did not hear stations calling them. The moral is to make sure you tune ±3kHz around your own frequency. I usually try to find a signal, like a distant GM, that I can hear on tropo as well as via the aurora. This gives an indication of which way and by how much the Doppler shift is. Another ruse is to zero-beat a station you can hear on tropo working the DX, then the DX station should hear you calling without his having to retune.

John Lincoln, GM0JOL (HLD), worked five countries in the aurora on 23 August and OZ1BVW (JO45) was a new square. Late-evening events occurred on 15 and 18 September and brought QSOs with DL, G, LA and PA but nothing over 1,200km. John Hilton, GM1ZVJ (LTH) worked DL3LAB (JO44) - his first German via aurora - on 23 August; he also contacted G0DKM (IO81). In the contest he worked GW4GFX/P (IO81) for his first Welsh QSO, and G3CKR/P (IO93) and G4ARI (IO92) were new squares. John contacted GM1SMI/P (OKE) on the 13th.

430MHz

G0CUZ has done extremely well on 144MHz and writes, "I will try and improve my pathetic UHF locator tally this (tropo) season." Well, 73 in the bag isn't too bad! On 20 September Colin worked EI5FK (IO51SV) on CW. In the 18/19 September aurora, G4PIQ tried 430MHz but only heard G3LQR at RST55A; Andy now realizes he missed quite a lot of interesting stuff on 144MHz.

Dave Bullock, G6UWO (NOT), operates mostly on this band and 1.3GHz and joins the Squares Table with 44 worked. He asks if EI squares count and indeed they do, just like German, Polish and French ones; it's the EI *counties* which are excluded from the Annual Table. G8LHT wrote "One or two interesting QSOs, but no DX" to sum up his month. G8PYP contacted G0CHL (SFD) for a new square on 3 September and G1WYC (IO92) on the 17th. And that's all the UHF news this time. Let's hope that the Cumulatives, which started on 13 October, will have livened things up a little.

FINALE

There is no news of microwave activity this month, so did anyone participate in the 1.3GHz Activity Contest, the rules of which appeared in the Contest News section in July? Don't forget the early deadline for the January issue, which is 11 November.

There was a large high building over the UK as this piece went to press - could the celebrated 'October lift' be about to strike? Watch this space for further details of what should be a fascinating time of year!

SWL

BOB TREACHER BRS32525

With HF conditions improving, the amount of DX information received this month has increased - for which thank you all very much. Having said that, it would be nice to receive reports from newer readers!

SPEED CHALLENGE

Following on from news of the DXNS 'Speed Challenge' in the last two issues, there has unfortunately been a change of plan in respect of the two Norwegian operators hoping to active Bouvet Island. The situation is bound to have changed by the time you read this, however, so we won't dwell on the problems. The terms of the DXNS Speed Challenge have now been somewhat modified; the competitive aspect has been abandoned and unfortunately no plaque will now be awarded for the best SWL log. DXNS will be organizing another competition later, which will be open to SWLs, but certificates will still be available to any listener hearing 100 countries - and indeed Peter Cain, BRS36554, had taken the first one as this was being written.

DX NEWS

There are lots of important news items which SWLs should be aware of this month. Firstly, the Federated States of Micronesia have changed their prefix to V6, and JA7HMZ was due to mount an expedition to put V63AD on the air for the CQWW

SSB contest. Rumours also strongly suggest that Franz Josef Land may soon have a new prefix, with 4K3 being a likely candidate. A resident operator is now *in situ*, in the form of UA0BAZ/UA1O - QSL via UA9MA. The number of amateurs in Djibouti continues to diminish and it is now quite rare; few listeners ever report hearing anyone on from there. The only active operators appear to be J28DL, EY, PC and TY. Kerguelen Is (FT8X) now has a new station for SWLs to look out for - he is expected to use the callsign FT5XA, with the QSL route being via FD6ITD. Another couple which should not be quite so rare for a while are ZD7 and 9Q5; ZD7KM should be active by now, and 9Q5TE should be operational for about one year. If you need this one, look on 14.315, 21.315 or 28.515MHz - if you find him, the QSL manager is SM0BFJ.

SWLs hearing the BZ prefix should know that these are individual - as opposed to club - stations operating from China. BZ1DX and BZ4RC have been reported this month. Rumours are clustering thick and fast around the possibility of a DXpedition to the moderately rare TI9, using the mouth-watering callsign TE90M. Another '4U1' has come on the air in the shape of 4U1WB - it's been issued to the World Bank Amateur Radio Club in Washington so it's at least as legitimate as the Bank of England (*wonder if we could get the Old Lady of Threadneedle Street a 4U1 call? - Ed*). Lastly, and to commemorate the peak of sunspot cycle 22, PA6SUN will be active on 11 and 12 November. Look for them 75kHz up from band edges.

HF NEWS

With thanks to the large number of SWLs who have provided band reports, I can offer this brief guide to the HF bands in September. Conditions picked up quite nicely, with 28MHz showing the most improvement. Strong signals had been copied from the Far East, the Pacific and the west coast of America. However, 21MHz appears to have been the best band and some good DX was about. Openings to the Pacific brought in 3D2RJ (Rotuma Is), ZK1XN, KC6NX and KC6YU; other callsigns heard include HS0E, HC8/KC2VO, TL8SC, 9L1CM, T50DX and ZD8DQ. Robert Small, BRS8841, thought his best DX of the month was on 21MHz, where he found HL5BDS on South Shetland Is.

Rather surprisingly, hardly anyone said anything about 14MHz this month. The best loggings appear to have been CE7BIY, FP5CJ, KH6KZ, KH0AC, SO1A, V31BB and V85AM. To answer a query, by the way, L1Y was a special contest callsign from Argentina. To no-one's great astonishment, there were no reports of anything interesting on either 3.5 or 7MHz but things on those bands will obviously be better by the time you read this. Robert Small was the only reporter to mention the WARC bands this time round. He monitored 18MHz and was rewarded with D44BS, J52US (soon to be active as 9L1US, incidentally), PJ2BB, 5N9ABY and 8P6CC. On 10MHz, Robert noted HK7AAG; 24MHz brought VS6VT.

Several listeners reported succesful receipt of some worthwhile QSLs this month. These included T33JS (Banaba Is), FO0CW/A, FO0EXV/M, VK0GC, ZS8MI (on 7 and 3.5MHz), 3C0A, 3D2XV (Rotuma Is) and 3W4KZ - I'd like to know the QSL route for this one for myself!

VHF NEWS

Not much has stirred in this part of the spectrum since I was last sitting at the keyboard. However, David Whitaker, BRS25429, turned on his rig at about 1730 on 26 September and discovered an aurora in progress on 50MHz; stations from EI, GI, GM and PA0 were copied. David reported some good 50MHz cards from ZS6LN and Z23JO, with the latter commenting that this was the first 50MHz SWL report he'd received - must get mine off to him! It appears that Z23JO was BRS1431 back in 1934. David also received a card from TK/HE9CXZ. I was under the impression that HE callsigns were issued to Swiss SWLs, which possibly says something about the validity of the operation - no doubt G3FPK will have something to say!

Next month, I hope to reproduce a montage of 50MHz DX cards obtained by SWLs during 1989. And also show you a selection of the European 50MHz QSL's received this year.

Do let me have your DX news, whether it's on HF, VHF or whatever, so that this part of the SWL column can be a fair reflection of what UK SWLs are hearing. See you next time.

NGC Propagation Experiments

Most radio amateurs have heard of Great Circle propagation routes, however John Branegan, GM4IHJ, has been experimenting with Non Great Circle propagation phenomena. Here are the results of this pioneering work.

It is something of a contradiction that, HF Radio users who actively exploit ionospheric propagation paths which are curved in the vertical plane, rarely consider the possibility that some HF signal paths may be far from straight in the horizontal plane. This brief paper describes a couple of Amateur Radio Experiments which suggest, that the time is coming when Non Great Circle (NGC) signal paths will be deliberately sought and exploited by Radio Amateurs.

EXPERIMENT NO.1 A TYPICAL NGC EVENT (SOLAR CYCLE PEAK 1979 to 1981)

I had a very pleasant time working 28/50MHz crossband into the United States and Canada in the winters of 1979, 1980 and 1981, but eventually the time came when the Solar flux declined below the point where it would support direct Great Circle communications paths at these frequencies. Failure of these northern paths did not mean that more southerly paths had disappeared, so I turned the beam from west to southwest and started looking for stations in the Caribbean.

To my surprise, I not only heard Caribbean stations but also the Canadian and American stations talking to them. A series of experiments then ensued whereby it was established that if both G and W/VE stations all aimed their beams at the Caribbean, good communications were possible on 28/50MHz crossband, but if either party to the contact turned his aerial beam back to the Great circle path, contact was lost. **Fig 1** shows the situation. Discussions with the participants (GM4IHJ, VE1AVX and W2UTH) which followed, revealed that both Bob, VE1AVX and Henry, W2UTH, had previous experience of NGC communication and were always prepared to try it when direct Great Circle paths were closed.

Eventually the solar flux declined to the point were 50MHz communications were no longer supported and GM4IHJ began looking at other experiments in HF propagation. Most attractive amongst these was tracking the satellite Cosmos 1686 (Beacon 19.955MHz), when it was sub-horizon from the UK, and good results were obtained from all over the world even at sunspot cycle minimum in 1986. However at this point a curious feature of some of the Cosmos 1686 tracking was revealed whereby the doppler shift of the satellite signal was often quite wrong with regard to its alignment and motion with respect to UK.

EXPERIMENT NO. 2 SATELLITE DOPPLER AND NON GREAT CIRCLE PROPAGATION

Cosmos 1686 moves round its orbit at about 7kms/sec. Resolved with respect to a ground station 400kms below it, its maximum speed of approach to, or departure away from, the ground station, is about 3.8 kms/sec. In practice this means that doppler shift can move the received signal frequency at the ground from a maximum of about 400Hz high to a minimum of about 400Hz low on the transmitted frequency of 19955kHz. **Fig 2** shows what degree of doppler shift a listener can expect to hear from Cosmos 1686, depending on its direction of motion and the angle between that direction of motion, and the great circle signal path to the observer. If Cosmos 1686 is coming straight at the listener, he should hear maximum doppler shift high. If he does not hear maximum doppler high, the signal he is getting from Cosmos 1686 is not coming to him via the great circle path. Secondly and even more audibly obvious, as Cosmos 1686 passes down past the UK the angle between direction of satellite motions and direction of signal path to UK (and hence doppler shift) should vary in a regular pattern. If it does not, NGC propagation is the likely reason.

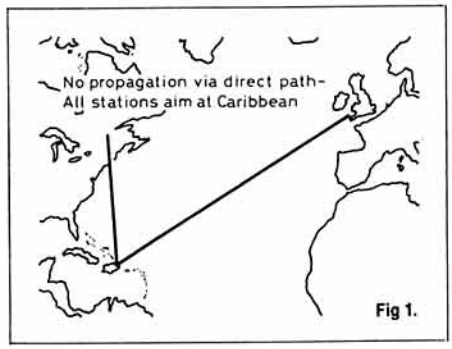


Fig 1.

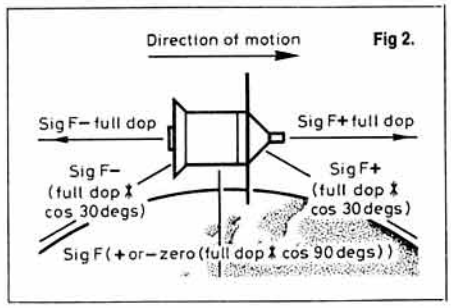


Fig 2.

Fig 1. Non great circle communications path which prompted the experiments.
Fig 2. Typical doppler shift encountered with Cosmos 1686 satellite.
Fig 3. Deviation of satellite track (solid line) from expected route.
Fig 4. Expected and actual doppler change during transit.

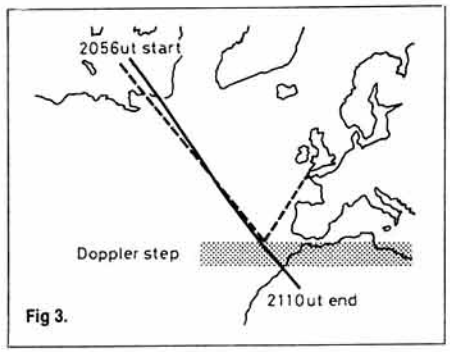


Fig 3.

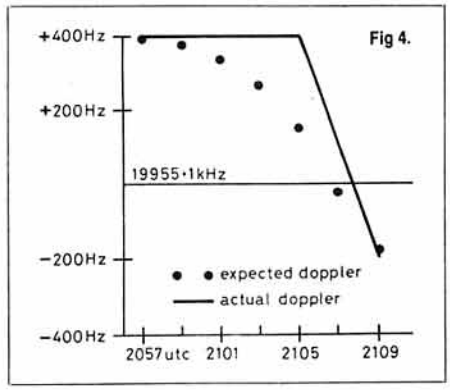


Fig 4.

The first intimation that satellite doppler shift could be used to check the signal propagation path, occurred on 14th July 1986 when I was listening to the Cosmos 1686 signal whilst the satellite was over Eastern Canada, heading almost directly towards the UK. As expected doppler shift was near maximum high, but quite unexpectedly, as the satellite track began to curve away from the UK, instead of getting the anticipated drop in signal frequency as the satellite assumed a side on view to the UK, the signal frequency stayed high. **Fig 3** shows the satellite track as a curved line on the great circle map, starting at 2056UTC over Toronto Canada and swinging down to the southwest of the UK towards North Africa where the signal was lost at 2110UTC. **Fig 4** shows the expected doppler curve as a series of small circles describing a typical doppler reverse S curve. That is the profile of doppler change to be expected if the signal had been coming to the UK from the satellite via a great circle path. The thick line on Fig 4 shows the *actual* doppler received. No change in frequency for about 8 minutes, then a confused almost auroral signal for 4 minutes, dropping quickly towards the anticipated GC doppler curve until 2110UTC when the signal was lost. Fig 3 shows the possible signal path as a series of horizontal lines with the signal always going ahead of the satellite until it reached the ionospheric discontinuity off the coast of North Africa, from whence it was perhaps propagated to the UK. If this surmise were to prove correct, Cosmos 1686 should be a useful explorer of Non Great Circle Propagation.

Several times in the following month this doppler scenario was repeated by Cosmos 1686, and in discussion with American Contest Operators, several useful points emerged. Firstly there was good evidence from Kentucky of non great circle propagation to Japan, via a propagating medium in the Central Equatorial Pacific, on frequencies down to at least 7MHz. Secondly it was suggested that if Cosmos 1686 met the NGC propagator as it descended towards Africa, what was likely to happen on reverse orbits 30 days later when it ascended up out of Africa through this same hypothetical propagator. **Fig 5** shows the track of Cosmos 1686 coming up out of Africa on 10th September 1986, and at **Fig 6** the doppler curve suggests no direct great circle signal path to the UK, but signals coming by a non great circle route

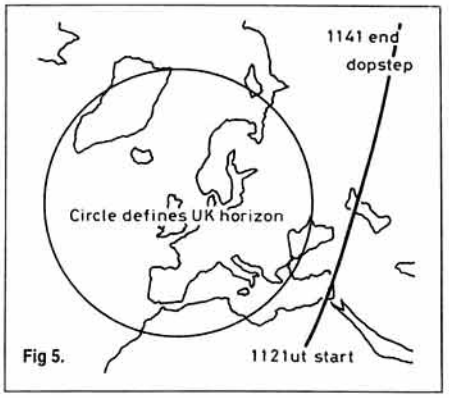


Fig 5.

Fig 5. From-Africa track of Cosmos 1686.

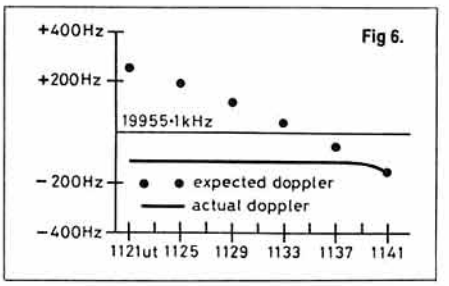


Fig 6.

Fig 6. Expected and actual doppler shift during from-Africa transit.

travelling off the back end of the satellite (abnormally low doppler), whence the signal was directed to UK from a propagator to the south of (behind) the satellite.

In the months which followed, both the Canadian/Mid Atlantic non great circle events and, the African/Asian NGC Events were repeated over a range of varying locations, in the eastern case extending well into Asia. However it must be stressed that these events were infrequent, and as yet no early warning forecast pattern has emerged.

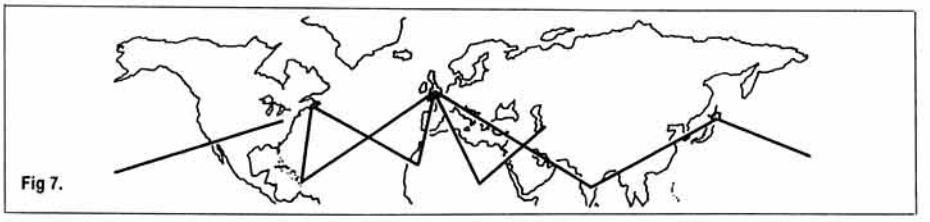


Fig 7.

Fig 7. Map of regularly appearing NGC paths.

SUMMARY

It would appear that these experiments contain strong evidence for the existence of non great circle propagation at all parts of the Sunspot Cycle. Discussion with other radio amateurs and observations of UK/Far East links on 50MHz during the early part of the 1989 Solar cycle maximum has already produced more evidence to support this proposal. **Fig 7** shows several NGC propagation paths which have appeared regularly.

The questions which I am seeking to answer and, for which I earnestly request the support of other radio amateurs, are:-

1. Is there a zone of back scatter propagation or something more substantial which extends around the World in the Tropical or near Tropical Ionosphere?

2. Is this a zone near the Magnetic Equator, or two zones one in each hemisphere disposed latitudinally above and below the Magnetic Equator?

3. Does this zone or zones, give mirror image effects in the Southern Hemisphere?

4. What are the conditions necessary to support this NGC mode of propagation. Is it specific to a particular local time of day?

5. Is this zone of NGC propagation in any way connected with the phenomenon of Equatorial High Altitude Aurora (V Ryumin Observations from the Salyut space station refer to this)? □

The active encouragement and support of, G310R, G3MFQ, G2FKZ, N4AR, and W4AUZ, during this study, have been much appreciated.

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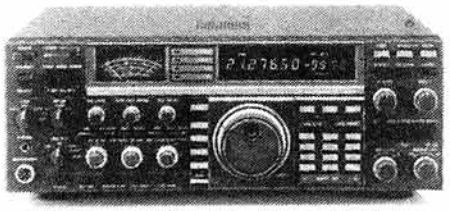

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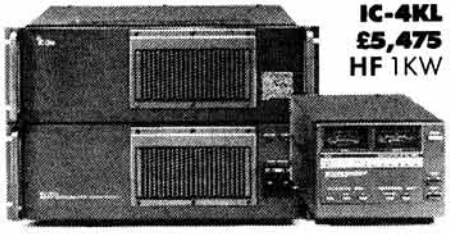

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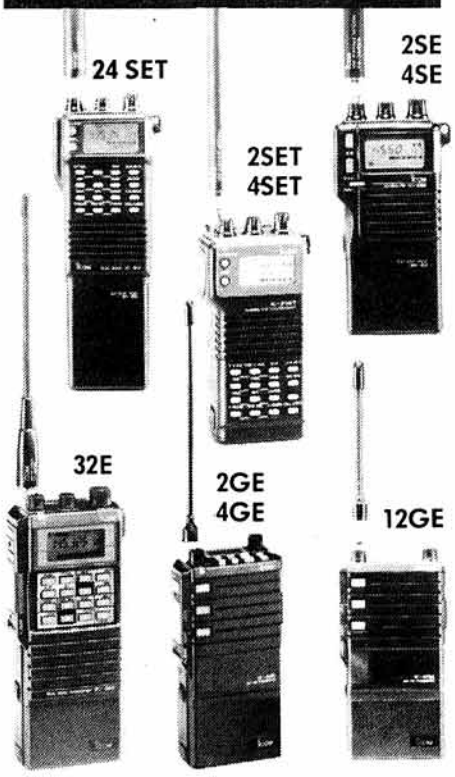

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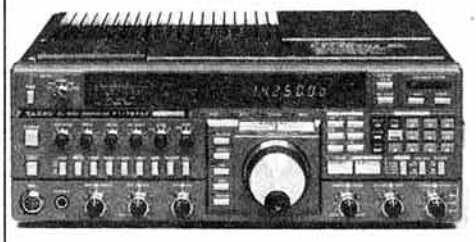

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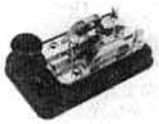

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New from Hokushin, an exciting range of high performance antennas, the WX1 has been a best seller for some time now, available are its bigger brothers the WX2 and WX4. Both are multi section 2m/70cm colinears and the mechanical construction the best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

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VHF/UHF Base	VHF/UHF Base	VHF/UHF Mobile	10m 2 ele HB9CV
144/432MHz	144/432MHz	144/432 mini	Dual driven element
6/8db gain	7.8/10.8db gain	1/4 / 5/8 wave	6dbi gain
200W max	200W max	100W max	500W PEP max
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78B	2m 7/8 wave	£15.00
78F	2m 7/8 wave folding	£21.50
88F	2m 8/8 wave	£24.10
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268E	70cm 2 section colinear	£32.80

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CHL21J	Mini dual band mobile	£14.95
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CA2X4KG	2m 2 x 5/8 70cm 4 x 5/8	£39.95
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New from Creative Designs are a range of 6M beams, the CL6DX 6 element, CL6DXX 7 element and CL6DXZ 8 element.
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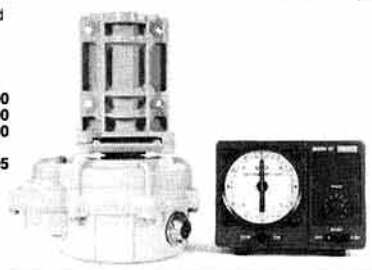
RC5A-3 .....£425.00
RC5B-3 .....£675.00
CK-46 Rotary bearing £34.95



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TECHNICAL TOPICS

PAT HAWKER G3VA

ELEMENTS FATIGUED BY FLUTTERING

An article by Dick Weber, K5IU 'Vibration induced Yagi fatigue failures' *Ham Radio,* August 1989) reminded me of one of the most traumatic events of the years I spent with the IBA. About 5pm on the evening of March 19, 1969, the news broke that one of the two IBA 1265 ft masts (the tallest masts in the UK) had suddenly collapsed. This was the TV mast at Emley Moor, Yorkshire and its collapse, fortunately without causing injuries or deaths, threatened the entire project aimed at introducing 625-line UHF colour on the ITV network by November of that year. Fortunately the engineers were able to erect a temporary mast, brought from Sweden, and this enabled the colour service to begin on time; meanwhile the present Emley Moor concrete tower was built in quick time.

Naturally, there followed a lengthy inquest on why the cylindrical steel guyed mast, erected in 1966, should have collapsed on a cold but not particularly windy evening (wind speed at the time only about 19 mph). Some pundits claimed it was due to the effect of unequal ice loading on the guys, but the inquiry discounted this hypothesis and came to the conclusion that the mast had been excited into a resonant mode of violent oscillation by 'vortex shedding' induced by the moderate wind speed. It fell to my lot later to try to put together a layman's guide to vortex shedding when the IBA fought (and won) an action against the prime contractors, arguing that the effects of such vortex-shedding induced oscillation should have been foreseen by the designers. To prevent a repetition of this collapse in the remaining two masts of this type (1265 ft at Belmont, Lincolnshire and 1015 ft at Winter Hill, near Bolton) the IBA installed suspended counterweights inside the masts — over twenty years later both are still standing.

In his *Ham Radio* article, K5IU writes: "Yagi element failures can be attributed to two basic causes. The first type of failure occurs whan an element isn't strong enough to hold up when forces are applied. These forces may be caused by a thick layer of ice, high winds, or a combintion of the two. Under the stress of these forces the element either bends or breaks off, with signs of bending in the area of the break.

"The second type of failure takes place after an element has been fluttering, or vibrating, in a relatively low wind stream. The break caused by this kind of failure is quite different. There's no sign of bending in the area of the break; it's a jagged line through the element. Boom fluttering (although not as common as element fluttering) can also lead to this type of failure.

"Because there's no sign of bending you'll know that the stress levels in the material are relatively low, yet failure occurs. What causes the element to flutter in the wind? What causes the break although the stress levels are well below those required to bend the tube? And what methods will minimise this type of failure?"

In answering these questions at some length, K5IU stresses that an antenna element will have high-Q mechanical (as well as electrical) resonances that can be excited into large displacement oscillations by quite small exciting forces. Medium speed winds, at well under 35 mph, when they strike an elongated cylindrical object create vortices or swirls of air; if these are shed from the object in a regular, orderly manner related to a natural resonance of the object, they constitute an exciting force. A commonly cited example is the pronounced low-frequency hum that comes from overhead telephone wires when the wind blows at a specific speed.

Unfortunately, when aluminium is flexed at levels below its yield-stress, while no permanent bend results, the damage accumulates and if the flexing is repeated sufficiently often there will be a fatigue failure. In effect metal fatigue is the weakened condition induced in metal parts of machines, vehicles or structures by repeated stresses or loadings, ultimately resulting in fracture under a stress much weaker than that necessary to cause fracture in a single application (*Britannica Encyclopedia* definition). Metal fatigue was noted in the 19th century but only came to public (and engineering) attention in 1954 with the failure of the pressure cabins and consequent crashes of the early Comet airliners (the first jet airliner), although this problem in aircraft had been previously forecast with surprising accuracy by Neville Shute, engineer turned novelist, in his book *No Highway.*

What then can be done to minimise fatigue failures in antenna elements? The basic approach is to try and limit the amplitude of the stresses during fluttering by damping the Q of the mechanical resonances. K5IU notes that the following ideas have been suggested:

(1) Filling the inside of tubular elements with the type of foam intended for sealing and insulating cracks and holes in buildings.

(2) Modifying the shape of the element so that orderly vortices cannot be shed. A practical technique is to wrap a wire in a helix around the element; wire diameter about 0.09 times that of the element with the turns of he helix spaced about five times the diameter (K5IU recommends this method).

(3) By attempting to move the mechanical, resonances of the element out of the range of vortex shedding. Some amateurs have fitted damping ropes inside the elements (K5IU doubts the value of this). A small weight (eg 3oz) fastened to the tip of an element can alter its resonant frequency appreciably.

Many years ago, I reported in *TT* (and subsequently in many editions of *ART*) a technique used to overcome metal fatigue fluttering of Yagi and log-periodic HF arrays at Washington State Unversity originally published in *Electronic Design* (2 August, 1966) for use in locations where there are persistent winds and the risk of elements being flexed continuously over long periods.

As shown in **Fig 2,** flat rubber sheets, or sheets fashioned by splitting a length of rubber garden hose, can be used as energy absorbers (dampers). The mechanical (as well as the electrical) impedance of any rod-like element is high at its free end(s), regardless of the number of modes along the elements. This means that placing an energy-absorbent device at the ends can reduce the amplitude of the oscillations and minimise the chance of metal-fatigue breakage (although possibly slightly increasing the bending stresses in gale-force winds).

For the 1966 approach a short section of lightweight garden hose, split lengthwise every 90° is held in place on the end of the element by a hose clamp: **Fig 2.** A more efficient and durable protection can be made from a sheet of flat rubber

SUBSTITUTE FOR A MULTI-TURN POT

Some projects call for the use of multi-turn linear potentiometers; for example to 'bandspread' electronic tuning diodes. Such pots are neither cheap nor readily available; the cost is further increased where a counter-type dial has to be fitted.

In the 'Circuit & Design Ideas' feature of *Electronics Australia* (June 1989, p79), Jim Rowe points out that a low-cost but effective substitute can be devised using a double-pole rotary switch, a conventional linear pot and a handful of fixed resistors: **Fig 1.**

He writes: "The fixed resistor divider chain and the switch poles effectively 'step' the pot along, in increments roughly equivalent to a single turn of a multi-turn pot.

"Why the small additional resistors (R/10), as well as those marked with value R?. Without these, there would be small gaps in between the end of one adjustment segment and the beginning of the next. The R/10 resistors and staggered tapping points for SW1a and SW1b ensure that the segment ranges overlap slightly, to give contiguous adjustment over the full range.

"I developed this arrangement for an application where it was used to adjust the tuning voltage applied to varicaps. Here the divider values were 180 and 18 ohms, and the pot value was 10k. Although a six-stage divider is shown in Fig 1 to suit a readily available 2-pole six-position switch, further stages may be added if desired and a suitable switch is available."

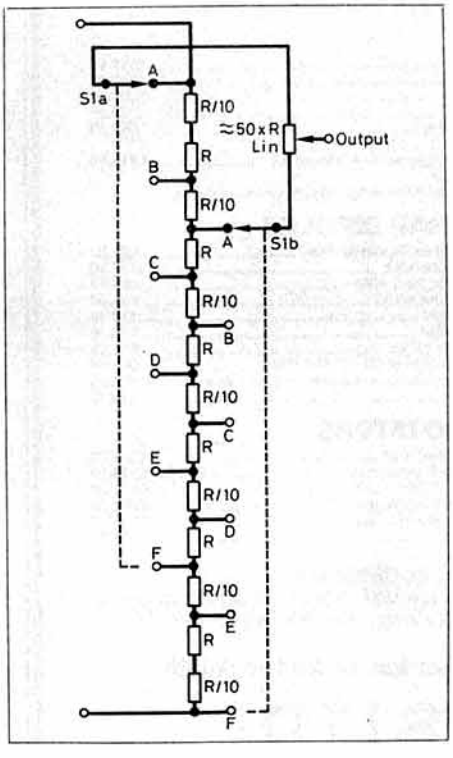


Fig 1. Lower-cost substitute arrrangement for a multi-turn potentiometer for varactor-diode tuning etc.

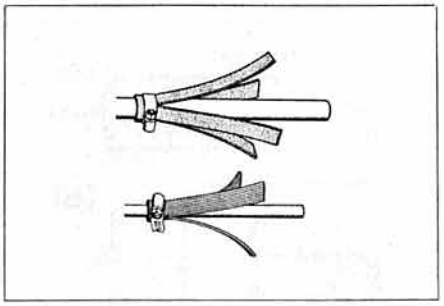


Fig 2. Energy absorbers fitted at the ends of antenna elements to reduce flutter-type oscillation due to vortex shedding.

or pliable plastic material ⅛in to ¼in thick by 5-6in long. If this is made just wide enough to wrap once round the element, the damping will be matched to the size of the element. This material is cut lengthwise to make four tabs. Ideally, such devices would be more effective if clamped at the very end of the elements, but in practice they are positioned so that the free end of the tabs are about 2in from the ends to prevent changes in the electrical length of impedance of the elements.

This system was used at a site exposed to the Pacific coastal breezes. Fitted to elements with diameters ranging from ⅜in to 1in, no breakages occurred over three years. Previously, breakages had been frequent. It occurs to me that if the energy-absorbers are made of plastics, it would be advisable to ensure that they are as UV-resistant as possible, or replaced occasionally.

For coping with the different problem of gale-force wind stresses, reference should be made to the two-part article 'Wind Loading' by David Reynolds, G3ZPF (*RadCom*, April/May 1988).

PUSH-PULL OSCILLATORS

There have been several matters arising from the notes in the June *TT* on the Kalli(ro)tron and other push-pull oscillators. Then it was mentioned that a 100W power-oscillator of this type was used in 1936 by Sir Evan Nepean, G5YN for the first amateur radio operation, as AC4YN, from Lhasa, Tibet. It was built by Lt Sidney Dagg a fellow officer in the then Royal Corps of Signals. By coincidence, I came across an obituary notice on Lt Col Sidney Dagg, who died in October 1988, in a recent *Journal of the Royal Signals Institution* and quoting from the Royal Signals book 'Through to 1970'. This notes that Sidney Dagg and G5YN provided communication and other scientific assistance to the Gould Political Mission from India to Lhasa. The object of this mission, in the days of the Raj, and with Lhasa then regarded as a Holy City, was to restore the balance of influence by outdoing the Russians in 'wireless, photography, public address equipment and fireworks'. Lt Dagg had charge of the fireworks and became a casualty when hit by one of his own maroons. However, 'valuable experience in the performance of static engines and accumulators at high altitudes and in extremes of temperature was gained. Lt Dagg designed and constructed the transmitter while Lt (later Lt Col Sir) Evan Nepean provided the receiver.' Sidney Dagg, MBE, later commanded a Brigade Signal Section with Wingate's Chindits in Burma. He became a Vice President of Lancashire Cricket Club in 1986.

Lyell Herdman, G6HD notes that a bibliography of early push-pull oscillators appeared in the book 'Phenomena in HF Systems' by August Hund (McGraw Hill, 1936). This book refers to push-pull oscillators as "a means of obtaining still higher frequencies" and credits their origination to W H Eccles and F W Jordan (*London Electrician*, Vol 83, page 299, 1919). The Eccles-Jordan R-C oscillator is the modern multivibrator. I wonder if it was ever implemented by them as a resonant-circuit sine-wave oscillator. Dr W H Eccles, it should not be forgotten, was the 1923-24 President of the RSGB, having been a member of the original Wireless Society of London since 1913. He was for many years a professor at Imperial College and was always prominent in stressing

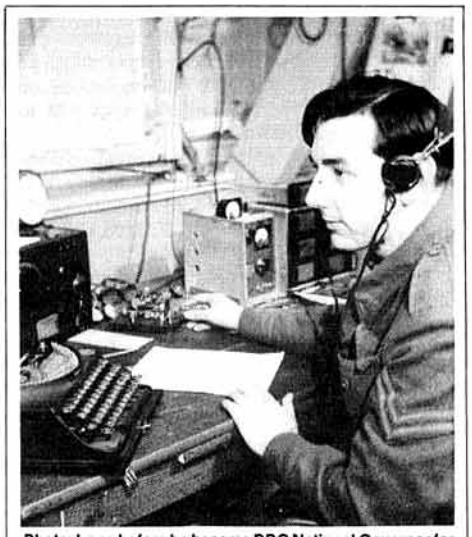


Photo: Long before he became BBC National Governor for Scotland, a youthful Watson Peat (then BRS3740, later GM3AVA) as a Special Communications radio operator in Eindhoven in 1944 shortly before gaining his Royal Signals commission and departing for India where he operated as VU2WP. Equipment includes a Whaddon Mark III (6V6 - 807) transmitter, HRO receiver and a bug-key made by G6NM. ***(See 'Amateurs of Influence' page 39)***

IC TUNING CONTROLLER FOR THE I1ARZ LOOP

The tuning system used by Roberto Craighero, I1ARZ for his 'Electrically tunable HF loop' (*RadCom*, February 1989, pp38-42) included a Bulgin receiver-type slow-motion tuning drive to provide the reduction gearing needed to achieve accurate remote-tuning of the high-Q transmitting loop. Recently, for a new portable loop, I1ARZ has devised an alternative IC electronic motor-controller with excellent results. He feels that such a controller is an improvement over mechanical gearing for such applications. He writes:

"The new method of powering the DC tuning motor is based on a high-power monolithic bridge-driver IC, type L293B made by SGS and allows the antenna to be accurately tuned without difficulty. The 16-pin DIL chip is not difficut to use and permits careful regulation of the motor speed and its direction of rotation.

"The L293B is a quad push-pull driver capable of delivering an output of 1A per channel; each channel is controlled by TTL-compatible logio input and each pair of drivers (a full bridge) has an inhibit input which turns off all four transistors of the IC.

"My circuit arrangement is shown in **Fig 3.** Only a half-bridge is used for controlling the tuning motor and the chip could control two DC motors simultaneously. Fig 3 includes the oscillator and modulator and allows independent regulation of the DC motor, the channel inputs being used to control the sense of rotation. The inputs are simply commanded by two button-switches; however it would appear possible to construct an automatic tuning system by connecting the inputs to a suitable form of standing wave bridge, akin to autumatic ATUs although I have not tested such a possibility.

"An interesting feature of this simple circuit is that it takes advantage of the threshold of the enable/inhibit input to economise on a comparator. The TBA820M audio amplifier IC generates triangular waves, the DC level of which is varied from 0 to 5V by means of RV1. Since the switching threshold of the enable/inhibit inputs of the L293B is roughly 2V, the duty cycle of the output current (and hence the motor speed) is controlled by RV1. The switching frequency is set by R1/C1 and the amplitude of the oscillator signal is set by the divider R2/R3. I recommend the use of a DC motor having a built-in reduction gear providing a shaft revolution speed not faster than 5—6 turns per minute and capable of operating at a minimum voltage of 0.75V. Then the controller as described makes it possible to obtain a shaft rotation of about 0.5rpm as set by RV1. Maximum current 1A."

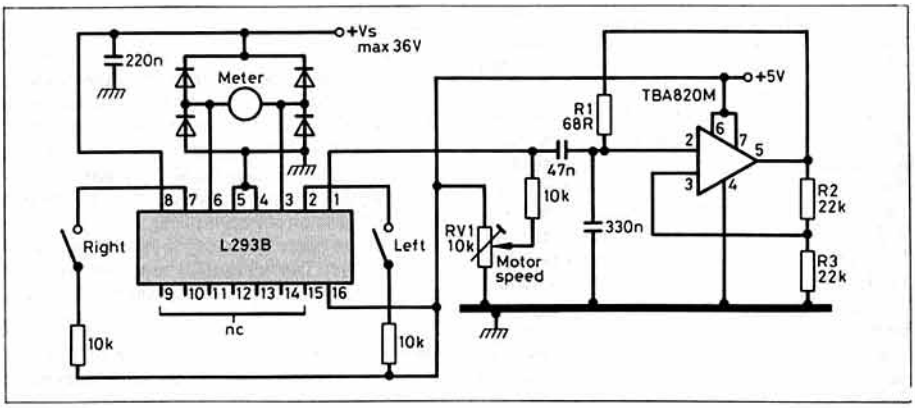


Fig 3. I1ARZ's electronic tuning controller used as an improved alternative to mechanical reduction gearing on his transmitting loop antenna.

the importance of the experimental amateur, taking an active part in urging the resumption of amateur licensing in 1919 and giving evidence on behalf of the RSGB when a Bill was introduced into Parliament in 1925 which threatened to restrict amateur radio activities severely.

The book by August Hund provides two references in French publications to the Mesny VHF push-pull oscillator mentioned, with circuit diagram, in the June *TT: Compt rend.* 177, 1106,1923 and *L'Onde elec* 3, 25-37, 99-110, 1924.

G6HD, although he cannot recall where he first heard of the Mesny oscillator, actually used one when he built a low-power VHF television transmitter to provide a laboratory signal source for the Pye Television Laboratory at Cambridge shortly before the opening in November 1936 of the BBC 405-line television service. This was to assist in the development of TV receivers at Cambridge, then believed to be beyond the range of the forthcoming Alexandra Palace transmitter on 45MHz. The transmitter comprised a Mesny oscillator (using two Mazda AC/P valves) driving a push-pull pair of audio pentodes (Mazda AC/P or Mullard Pen 4VA) in Class B, with grid modulation from a flying-spot scanner developed by his colleagues. 'Spenny' (G6NA) was one of the engineers who developed the vision channel. A similar 'transmitter' was built for the 41.5MHz sound channel.

The Mesny oscillator's anode resonant circuit was formed from a piece of copper tube with the grid 'coil' (wire) fed through it, coaxial fashion, insulated by ceramic beads. When Ally Pally fired up, it was found that in practice weak signals could be received in Cambridge, aided by a receiving TW array designed by G6HD.

DON'T KNOCK THE SYNTHESIZER

I must confess that on a number of occasions *TT* has pointed out that low-cost frequency synthesizers tend to suffer from significantly more phase noise than good free-running VFOs, resulting in reciprocal mixing and poor close-in dynamic range on receive and local noise radiation on transmit, broadening the channel. It seems only fair to give the case for the defence as put by David Reynolds, G3ZPF. He writes:

"Synthesized rigs have been getting a lot of stick over the past couple of years. Whilst I agree entirely that there are a number of shortcomings when compared with a *well-designed* valve rig, the usual comments tend to give the impression that *all* valve rigs of yesteryear *were* well-designed. In practice that was far from being the case.

"Despite the suggestion that amateur radio is losing its appeal with numbers/activity falling, here in the West Midlands at least, it is unusual not to have one in your locality. I now have G0IRN directly across the road.

"Quite by accident, I discovered that even when he is beaming his signals right at me in order to work Japan on 21MHz, I can genuinely get within 50kHz of him, using a vertical, before I even know he is there. On a quiet band, even allowing about 20dB cross-polarization loss, this says as much for the output cleanliness of his TX140 as it does for the performance of the receiver in my TS930.

"With reasonably strong incoming signals I reckon I could operate within 15kHz of his frequency without too much trouble. There is no way I could have operated my old non-synthesized valve gear on the same band as such a near-neighbour. At my former QTH, I could always tell when my (then) nearest local, about a mile or so away, was on the same band... the AGC of my valve gear used to 'pump' if I got within 500kHz of his frequency.

"When I first had my TS930, for the first few nights I found myself constantly checking 7MHz and discovered there really are gaps between the broadcast signals. Even with the subtle use of RF attenuators none of my valve rigs were ever this good. Now my complaint is that the noise of the twin fans in the TS930 sometimes drives me

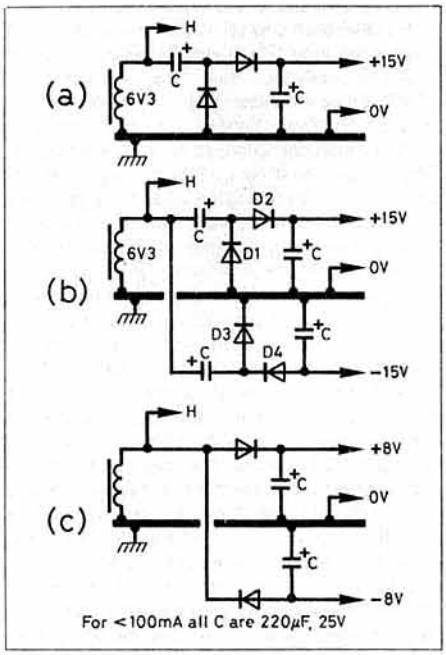


Fig 4. Using 6.3V heater lines to provide low-voltage DC to solidstate circuitry. (a) and (b) are common-terminal (cascade--type) voltage doublers.

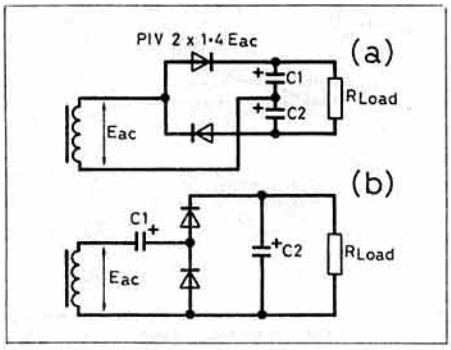


Fig 5. (a) Conventional (symmetrical) voltage doubler. (b) Common-terminal (cascade-type) voltage doubler. See text for main differences in component ratings.

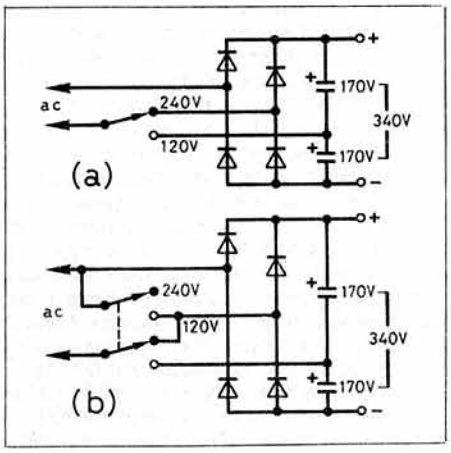


Fig 6. Use of switched bridge/voltage-doubler rectifiers to give 240/120V inputs with similar voltage output as described in Motorola AN837 of 1974. (b) improved version which parallels diodes not used on 240V in (a).

MORE ABOUT VOLTAGE DOUBLING

John Brown, G3EUR, adds to his notes on the use of voltage doubling circuits to provide economical PSU arrangements (*TT* October) by drawing attention to some ways in which experimenters adding solid-state sections to existing valve rigs can make use of the 6.3V heater line. As shown in **Fig 4** it is quite simple to obtain an output of 12V DC (which could then be used with a three-terminal IC regulator to provide say 5V), plus or minus according to diode polarity, or even both simultaneously, ie +12V/0/-12V. These arrangements thus save having to add another mains transformer and most equipment heater windings can readily spare an extra 100mA or so. In the arrangements shown in Fig 4, (a) and (b) use cascade-type (common-terminal) voltage doublers; (c) is not a voltage doubler but note that all three of these circuits have 50Hz ripple on the DC output and may need further filtering, which would be provided by an IC regulator.

It is perhaps worth adding some further basic information to that provided in the October *TT* underlining the difference between the conventional (symmetrical) and the common-terminal (cascade) voltage doubler: **Fig 5** (a) and (b) respectively.

In (a) the diodes must be able to withstand twice the peak applied voltage in the reverse direction (ie 2 × 1.4Eac). The capacitors need a working voltage at least the peak applied voltage (1.4Eac). The ripple frequency is twice that of the applied AC (ie 100Hz on 50Hz supplies).

In (b) the ripple frequency is that of the applied AC (ie 50Hz). The rating of C1 must be equal to the peak applied voltage (1.4Eac) and rated to carry the RMS load current. The rating of C2 should be twice the peak applied voltage (2 × 1.4Eac).

Output regulation of both (a) and (b) is poor, but that of (a) is better than that of (b).

G3EUR was interested to see the dual-voltage (bridge/voltage doubler) circuit devised by G3YNN to up the voltage output of his PSU. (*TT*, August, p34). He comments: "Like many of these circuits, their origins date back a long way but are then rediscovered. **Fig 6** from a Motorola Application Note AN-737 of 1974 shows what was then a novel variation of the circuit. The same principles used by G3YNN work equally well for getting the *same* DC output from either 120 or 240V AC (or 12/24V AC) with Fig 6 (b) showing the improvement of switching the diodes (unused in G3YNN's arrangement) so that they are paralleled on the lower input voltage to share the higher currents. It should be noted that a voltage doubler has poorer regulation than a bridge, and the use of large capacitors means high peak forward currents in the diodes. But full marks to G3YNN for his use of logic in arriving at a solution to his problem; this is what Amateur Radio is all about, and part of the fun."

crackers. It's not that they are particularly loud, but then neither is a mosquito and they can be thoroughly annoying!

"So don't be too hard on solidstate synthesizers. Carefully designed they can be very good although this is perhaps true of all rigs. PS, I have no connection with Trio/Kenwood in spite of using only their equipment."

DX ANTENNAS FOR 3.5MHz

Earlier this year, Martin MacGregor, G4EZG gave a talk to a local club on the options and considerations surrounding the design of DX antennas for the lower HF bands (eg 3.5MHz) for sites of different sizes and terrains (sloping, low-lying, high-plateau etc). In this he was at pains to emphasise the concept of antenna directivity and radiation versus height and ground effects.

He has sent along some of his notes and relevant diagrams; unfortunately it is not possible to include in *TT* more than a very brief digest of some of his material but even so this should help clear the minds of those who wonder why their antennas work well on the higher HF bands and for medium-distance contacts on all bands, but leave much to be desired when striving to work DX on 3.5MHz or 1.8HMz.

He notes that it is well understood that, at least theoretically, horizontal dipoles at heights of 0.25λ or less have little or no horizontal directivity (ie are virtually omni-directional) and very little radiation at the lower vertical angles (say 10-30°) desirable for DX working under normal propagation conditions: **Fig 7.** At 3.5MHz, 0.25λ is roughly 66ft so that the basic horizontal dipole is of limited value to the majority of amateurs who cannot aspire to antenna supports higher than about 60ft. As previously noted in *TT* the effective height of an antenna is usually several feet more than its actual height above ground; this is particularly true at the lower frequencies where the ground behaves rather as a lossy conductor, changing to a dielectric at higher frequencies. Additionally, a 'real' (imperfect) earth has the effect of filling in the nulls between the theoretical vertical and horizontal radiation lobes.

As confirmed by experiments by DJ2NN some years ago an optimum cost-effective height for 14-28MHz arrays is about 18.5m and 60ft has become a median height for amateur HF towers. This height can be shown to be suitable for DX operation on all bands down to and including 7MHz although theoretically unsuitable for 3.5MHz DX *(unless used to support an inverted-vee dipole with its vertically-polarized component — G3VA).* Empirically this is not the case: dipoles and their variants at 60ft do show DX capabilities under those propagation conditions that favour high-angle openings. Even so, comparatively small height increases above 60ft can dramatically improve their DX performance.

Directivity (effective gain) of an antenna has an important if secondary effect on the vertical radiation pattern of an antenna, and this has a particularly important, if secondary, effect at low antenna heights in reducing the strength of unwanted incoming high-angle signals. In general, a Yagi or other array concentrates the vertical radiation lobe to much the same extent as its horizontal (HRP) directivity.

While a 3.5MHz array at 60ft, or possibly a little less, can give acceptable results it cannot challenge the superiority of an efficiently installed and well-sited vertically-polarized array in an area of reasonably good ground conductivity. *(Hence the popularity of inverted-vees, slopers and top-loaded tower antennas — G3VA).*

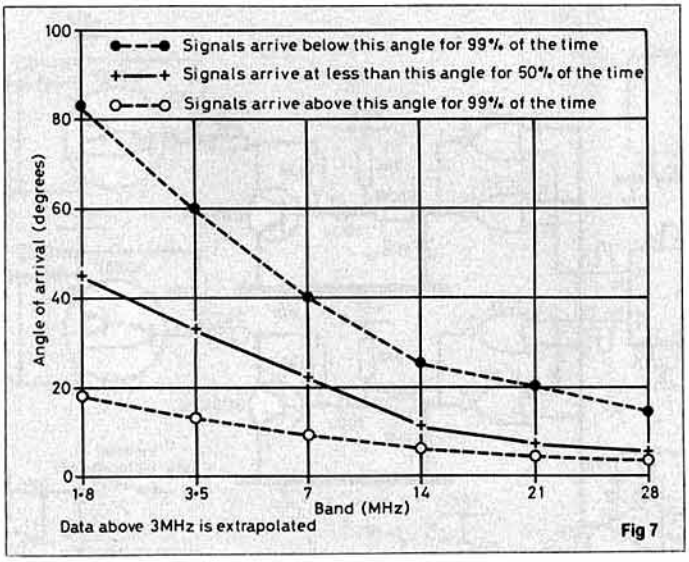


Fig 7

Fig 7. Verticle arrival angles of sky-wave signals, 3.5-30MHz.

Fig 8. 3.5MHz delta-loop antenna system preferred by G4EZG (a) Apex fed for high-angle radiation. (b) Bottom-corner fed for low-angle (DX) radiation. With a system of pulleys, G4EZG was able to move the feed point between these positions.

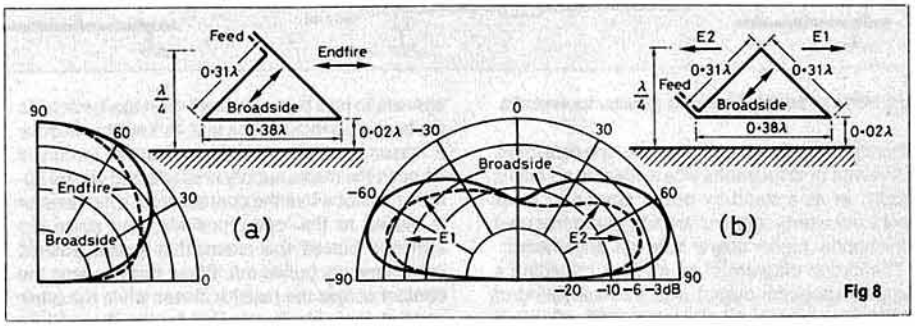


Fig 8

G4EZG adds: "Large 3.5MHz arrays apart, in my experience the best DX antenna of moderate dimensions for use with a 60ft tower, is the apex-up, bottom-corner-fed Delta loop: **Fig 8** (b). The best *local* antenna is the same but apex-up, apex-fed: **Fig 8** (a). My antenna was constructed from 2.5mm², PVC, stranded wire, fed with an 0.5λ(electrical length) of RG62A/U (93-ohm) coaxial cable. this gave a good match to the loop feed-impedance of roughly 100 ohms, and most rigs will happily load this arrangement. It obviates the need for a 0.25λ (72-ohm) matching section to a 52-ohm cable. The absence of a matching section and the use of large-diameter wire resulted in a very broad-band system.

"By placing pulleys at each of the three corners I could physically move the feed point around one side of the loop to change the vertical radiation angle to suit conditions for DX and local operation. The difference such adjustments made had to be heard to be believed! It would have been interesting to motorize this operation to see what could be achieved with remote fine-tuning of the feed-point position."

For those who cannot aspire to a 60ft antenna-support, the system could be scaled down for 7 or 10MHz and 30ft height.

AMATEURS OF INFLUENCE

In the September *TT*, in commenting on Jim Rowe's 'neck sticking out' and rather depressing review of current trends in our hobby — 'Whatever happened to Amateur Radio?' I stressed that if those in positions of media or political influence were ever to become convinced that experimental amateur radio is dead or dying, then the future outlook would be bleak indeed. The ideal situation is where the persons of influence are themselves in their spare time (if any) enthusiastic radio amateurs.

One who has for the past five years ideally fulfilled this situation has been Scottish farmer, Watson Peat, CBE, GM3AVA who has just retired as National Governor for Scotland of the BBC. It must have been unique for a member of the BBC Board of Governors to be an active radio amateur, Chairman of the Ariel Radio Group (the BBC's amateur radio club), making his interest in the hobby clear to the Board and to the staff, and including it in his *Who's Who* entry.

His knowledge of, interest in and concern with the engineering side of broadcasting — something not often found within the inner councils — has won him much respect and at the dinner held to mark his retirement I found genuine regret among senior BBC engineers that Watson (known to his wartime colleagues in Special Communications as 'Bill') has completed his five year term as National Governor. For us, as compensation, he is likely to be active for part of each year from a good site in Barbados.

250V DC/AC INVERTER

Several references have been made in *TT* to the series of general-purpose DC/AC inverters designed to provide 240V pseudo AC sine-wave output as published in recent years in *Electronics Australia.* Circuit details and waveforms of a low-power 15-watt 12-to-240V unit originally intended for powering portable CD players appeared in *TT*, December 1987, p915. For amateur applications, including their use instead of petrol-electric

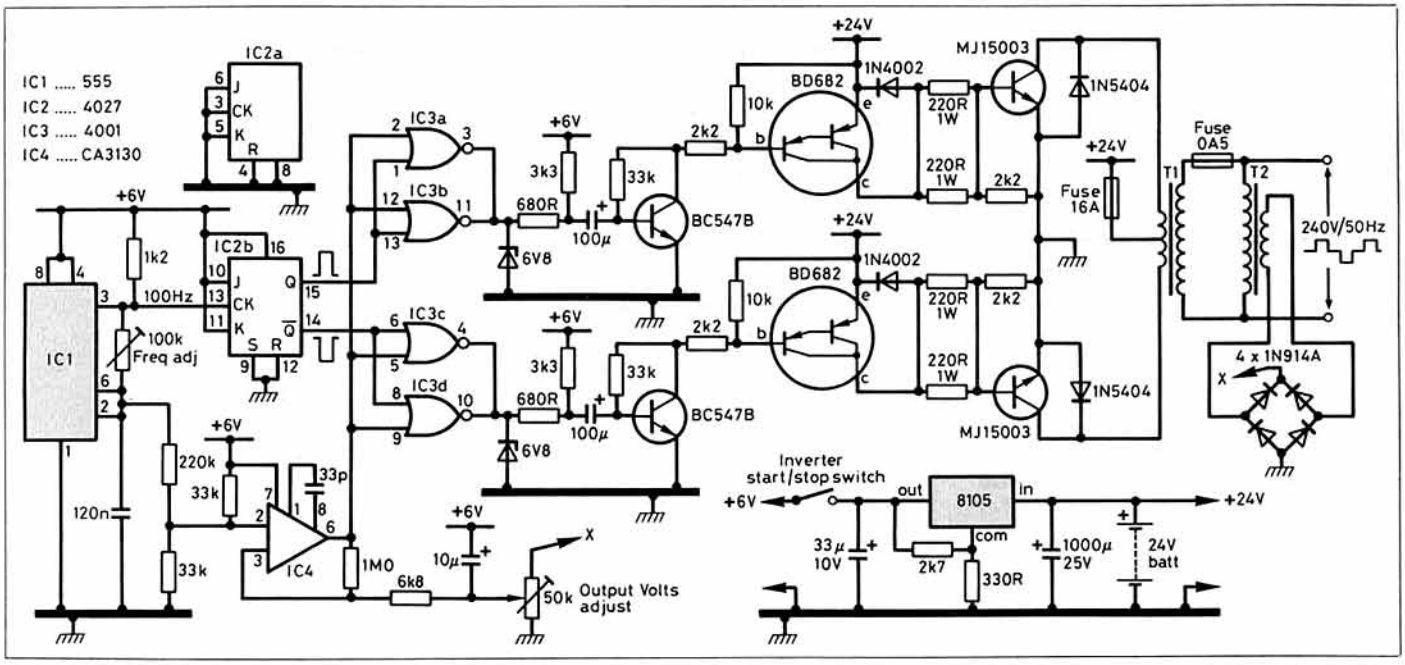


Fig 9. 250VA 24/240 DC/AC inverter (*Electronics Australia*).

generators for powering 240V mains-type equipment in the field or at locations where there is no mains supply, or as a stand-by power source in areas where the mains supplies are subject to frequent interruption, higher power inverters are needed.

The circuit diagram of an inverter providing a stepped waveform output with a power rating of 250VA appeared in *EA* (October 1988, p91) in a note from B Mortensen of Lae, Papua New Guinea where apparently there are frequent electricity blackouts.

His circuit, **Fig 9,** uses ideas from earlier *EA* inverters and functions as follows:

"The oscillator (555) and 4027 flipflop provide the 50Hz complementary square-wave which is fed via the 4001 to the BC547B devices through 100µF electrolytic capacitors. These serve to keep the 6V DC and 24V DC parts of the unit separate.

"The BC547B devices drive the BD682 Darlingtons which in turn drive the MJ15003 output transistors. Voltage regulation is achieved by the CA3130 comparing a proportion of the output voltage with the 6V regulated supply and inhibiting part of the drive circuit's waveform by turning low the output from the 4001 when required (ie a form of pulse width modulation).

"Transformer T1 is an 18-0-18/240V toroid transformer (300VA). T2 is a PCB-mount 240/2V transformer.

"I have had the inverter along with its mains-failure start-up (relay) circuit and voltage-sensing battery-charger in service for several months without any problems occurring. The transfomer and the MJ15003 devices were the only costly items, but the unit still proved to be a cheap and reliable 250-watt inverter."

FEEDBACK, FOLLOW-UPS & POT-POURRI

Geoff Perkins, G3VIJ, and John Brown, G3EUR, have drawn attention to a small but potentially misleading error that crept into the circuit diagram of ZS6BVO's soft-start system (Fig 6, *TT*, September, p41). As shown the 'push to soft start' switch appears to be a two-pole push-to-make switch. As explained correctly in the text, this switch must be a 'biased double-pole make-and-break' switch, ie on push the mains supply is connected via the 50-ohm resistor while the contact across the resistor is moved to the 'open' position, and since the switch is 'biased' this means that it stays pushed until manually pulled out. When this happens the contact across the resistor closes while the other contact (now short-circuited by the three RLY1 relay contacts) *opens*. G3EUR has some other reservations. My apologies to readers and to ZS6BVO whose original diagram made this clearer than Fig 6.

Gordon McDonald, VK2ZAB has re-entered the debate on Aircraft-Enhanced propagation with a trenchant article 'Signals reflected via aircraft' (*Amateur Radio*, May 1989 pp 10-11). This makes a strong attack on the artificial temperature inversion theory concluding: "VK1BG's theory has some parts which sound good but as every radioman worthy of the name knows you can't have two signal paths without interference and as there is no evidence of this the theory breaks down, ie it's wrong". VK2ZAB still puts his money on bistatic-radar-type scattering from the surface of the aircraft although he admits "there is still a lot to learn about contacts via aircraft reflections. For example, how can we estimate an aircraft's effective (bistatic) reflecting area which seems to be greater than we first thought." Then he puts an Australian four-X boot-in: "Amateur radio lore already has its fair share of myths, furphys, half-truths and plain nonsense without adding more." But surely scattering from a moving surface would show interference patterns (deep fading) as much as from both surface and inversion scattering? I still feel the debate could be settled by checking the Doppler shifts.

Mark Meyer, WA0NSY (*QST*, August 1989, p38) points out that ferrite cores from TV flyback transformers can serve well as core material for filament chokes (1.8 to 30MHz). He found that a rectangular core (inside dimensions about 1¾ by 1½ in) could handle 10V at 10A (for two 813 valves) without saturating. He made his choke as follows: "After removing the transfomer windings, I wound several layers of electrical tape on the core to protect the choke winding from the core's sharp edges. Next, I wound 34 bifilar turns of No 12 enamelled wire — as many as would fit — on the core (I obtained the wire from an electric-motor repair shop)." The choke's AC (60Hz) voltage drop measured as 0.2V at 10A and WA0NSY rewound his power transformer to deliver 10.2V under load.

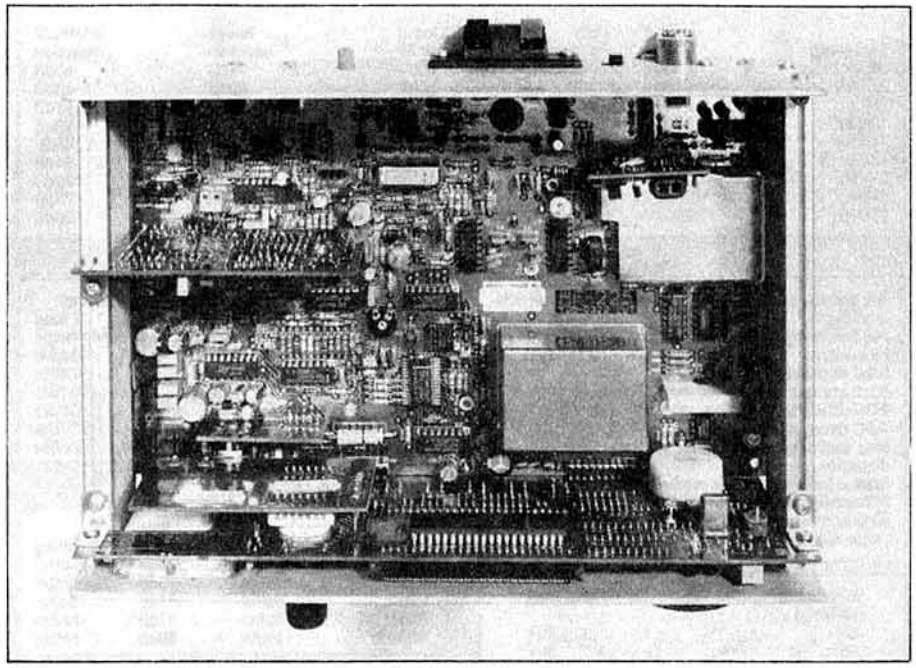
By chance I came across in Vol 8 of the massive report of the CCIR Plenary Assembly of 1986 in Report 906 ('Frequency usage in the amateur service') a succinct review of why morse telegraphy (A1A) remains popular: "1.1.1. Morse telegraphy owes its popularity to the relative simplicity of equipment; its effectiveness under conditions of low power, weak signals or high noise; its inherent capability to bridge the language barrier between operators who do not speak the same language; and its narrow-bandwidth characteristics, which permit a very high density of stations in a heavily occupied band."

CLAPP OSCILLATOR

John Roscoe, G4QK, apropos my September note on the sad story of the Gouriet (Clapp) oscillator, writes: "I seem to recall seeing a circuit for a Gouriet oscillator in Sanderman's *Radio Engineering*. It used an AC/SP3 oscillator valve (very high slope for those days) followed by another as buffer, with a diode providing AOC feedback to the first valve. Point is, I thought this was used in the BBC HF transmitters immediately *before* the war, which would date its development about 1936. Its stability was certainly comparable with the crystal oscillators of the period." The article in Proc IRE by J K Clapp was in 1950 and it seems a pity that it had to be rediscoverd more than a dozen years after its first use and years after its publication in *Radio Engineering*.

In a fine tribute to the late Jim Kirk, G6ZO (also XAZO/CE3ZO/ON5Z0/F0AJB/G6ZO/HB) in *Amateur Radio*, Norm Hull concludes: "If Heaven were to appear on the DXCC list, Jim would have one of the first calls to be issued there." The DX bands seem to lack something without his polished and always courteous operating. □

Lowe HF-225 Receiver



Peter Hart, G3SJX, investigates one of the few British amateur products — the new Lowe HF receiver.

INTRODUCTION

Compared with the number of HF transceivers on the market, the HF SWL has a much more limited selection of receivers to choose from even though communications receivers are included in the product ranges of most manufacturers. Typical examples are the Yaesu FRG8800, Kenwood R5000 and the Icom ICR71, which are true communication receivers, giving a good performance on the amateur band SSB and CW modes, as well as for broadcast use on AM. At a cost of over £600, this represents a substantial investment in the hobby for the average SWL and although lower cost receivers are available from Sony, Philips, etc. these are targeted more towards short wave broadcast band listening rather than for SSB and CW.

With this situation in mind Lowe Electronics developed the HF-125, with the HF-225 being its successor, as a lower cost communications receiver designed to suit amateur, broadcast and general HF interests.

PRINCIPAL FEATURES

The HF-225 receiver has continuous coverage between 30kHz and 30MHz with CW, LSB, USB and AM modes being provided as standard and with synchronous AM (AMS) and narrow band FM available as optional extras.

The spin-wheel tuning knob tunes in 8Hz steps on CW, SSB and AMS modes at 1.6kHz per revolution of the knob. On AM, the step size is 50Hz at 9kHz per revolution and on FM, 125Hz at 25kHz per revolution. The step size increases to give a faster tuning rate when the tuning knob is rotated rapidly whilst larger frequency changes are accomplished by means of the UP and DOWN buttons which step the frequency in units of 1MHz. An external keypad is available as an optional extra which connects by a cable to a jack on the rear panel and allows the frequency to be entered directly to a resolution of 1kHz

Twin VFOs are incorporated together with 30 memories, these being selected by means of the rotary tuning knob or alternatively, the keypad can be used to select the first 10 frequencies. The usual store and recall facilities are provided together with a preview feature. This allows the memory contents to be checked with the receiver still tuned to the VFO frequency.

Four IF filter band-widths are provided, 2.2, 4, 7 and 10kHz and on CW, an additional 200Hz audio filter can be selected. The filter last selected in each receiver mode is stored, and then automatically re-selected the next time that mode is enabled. On initial switch-on, the filter selection defaults to 2.2kHz on CW/SSB and 7kHz on AM/AMS, whilst in FM mode, there is only one fixed filter band-width of 12kHz.

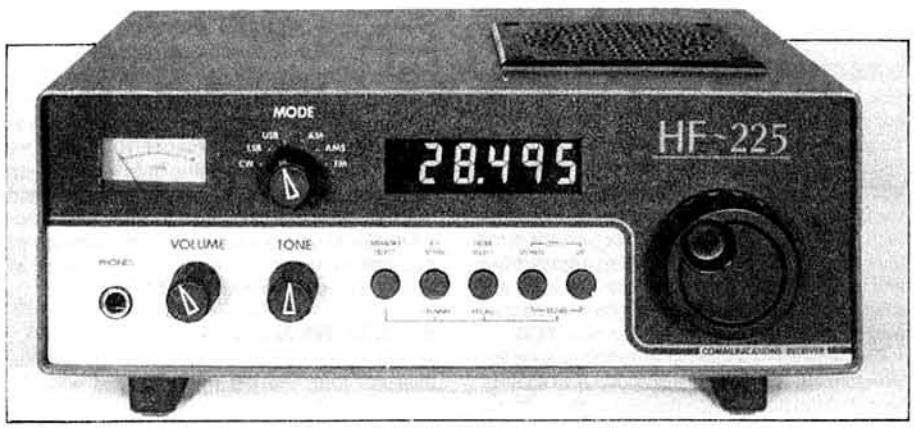
The advantage of AMS lies in its ability to overcome the effects of selective fading on long range HF broadcasting, which makes conventional AM demodulators generate severe distortion. This is a result of the amplitude of the sidebands varying with respect to each other and to that of the carrier and is especially severe if the carrier amplitude is reduced with respect to the sidebands. The synchronous AM demodulator uses a product detector together with a narrow locking-range phase locked loop to regenerate the carrier at constant amplitude so as to give a far superior performance under selective fading conditions.

Audio volume, tone and a switchable 20dB RF input attenuator are provided but there is no RF gain control. AGC and noise blanking operate continuously with a longer AGC time constant on AM compared with SSB and CW - note that this is the opposite way round to most rigs which usually have a longer time constant on SSB/CW than on AM. Frequency is indicated to a resolution of 1kHz using a large five digit backlit LCD panel which also serves to display the memory channel number and frequency when a memory is selected.

The display also has flags showing AMS lock and memory selection and indicates filter band-width and attenuator status for about three seconds when any changes are made. One immediately noticeable aspect of the display is that it uses light digits on a black background as opposed to the more usual black digit on light background arrangement. The S-meter is styled and illuminated to match the LCD display.

The rear panel carries a 50ohm SO239 socket which can be switched between a 50Ω and 'whip' position, the latter serving to switch in an optional internal pre-amp for use with the whip antenna accessory. A 600ohm antenna and ground connector is also provided, using a quick connect system akin to that seen on the rear of Hi-Fi speakers. Other rear panel facilities include a socket for the optional keypad, an FM squelch level control, an external speaker socket, 12V power input connector and a record output socket. This output, which is independent of the tone and volume controls, is at a suitable level for driving tape recorders, RTTY decoders etc. An 8cm diameter speaker is fitted into the top of the case and there is a conventional headphone jack fitted to the front panel. The receiver operates from a nominal 12V supply and is supplied with a suitable small mains PSU - internal rechargeable batteries are also available as an option.

The receiver was supplied with a 32 page



LOWE HF-225 MEASURED PERFORMANCE

RECEIVER MEASUREMENTS

Frequency	Sensitivity SSB 10dBs+n:n	Input for S9	Image rejection	45MHzIF rejection
1·8MHz	0·28uV (-118dBm)	89uV	77dB	83dB
3·5MHz	0·20uV (-121dBm)	50uV	80dB	86dB
7MHz	0·20uV (-121dBm)	50uV	80dB	91dB
10MHz	0·22uV (-120dBm)	50uV	80dB	90dB
14MHz	0·20uV (-121dBm)	50uV	82dB	85dB
18MHz	0·22uV (-120dBm)	50uV	82dB	84dB
21MHz	0·18uV (-122dBm)	40uV	84dB	79dB
24MHz	0·18uV (-122dBm)	45uV	85dB	78dB
28MHz	0·22uV (-120dBm)	56uV	84dB	76dB

AM sensitivity (28MHz): 1·4uV for 10dBs+n:n at 30% mod depth
FM sensitivity (28MHz): 0.3uV for 12dB SINAD 3kHz pk deviation
AGC threshold: about 0.5uV
80dB above threshold for +4dB audio output
AGC attack time: 5-15ms see text
AGC decay time: 1.5-2.5s
Max audio before clipping: 1.4W into 8ohm at 2% distortion
Inband intermodulation products: -33 to -40dB
Distortion on AM at 70% mod depth: 1% Distortion on AMS at 70% mod depth: 1.6% Distortion on FM at 3kHz pk deviation: 3.3%

Intermodulation (50kHz tone spacing)		
Frequency	3rd order intercept	2 tone dynamic range
1·8MHz	+10dBm	93dBm
3·5MHz	+6dBm	92dBm
7MHz	+6dBm	92dBm
14MHz	+7dBm	93dBm
21MHz	+5dBm	92dBm
28MHz	+7dBm	92dBm

S-Reading (14MHz)	Input level
S3	2uV
S5	5uV
S7	16uV
S9	500uV
S9+10	160uV
S9+30	630uV
S9+50	9mV

Tone spacing (7MHz band)	3rd order intercept	2 tone dynamic range	Blocking
5kHz	-18dBm	75dB	-29dBm
10kHz	-5dBm	84dB	-20dBm
15kHz	0dBm	87dB	-8dBm
20kHz	+4dBm	90dB	-6dBm
>20kHz			-6dBm

Selectivity response	Bandwidth 2.2	4	7	10
-6dB	2·33kHz	5·55kHz	8·36kHz	10·3kHz
-60dB	5·30kHz	9·33kHz	12·8kHz	21·6kHz

Frequency offset	Reciprocal mixing for 3dB noise
3kHz	73dB
5kHz	78dB
10kHz	86dB
15kHz	90dB
20kHz	93dB
30kHz	98dB
50kHz	104dB
100kHz	110dB
200kHz	114dB

Frequency accuracy: within display resolution of 100Hz.
Current consumption: 200-300mA (specified but not measured)

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB.

instruction manual and the 64 page *Lowe Listener's Guide*. The instruction manual covers clearly how to operate the receiver, how to obtain the best results under various conditions, and useful advice is given on suitable antennas. A full circuit diagram is included together with a circuit description and a particularly detailed equipment and performance specification. The Lowe Listener's Guide adopts a 'chatty' style and gives useful tips on getting the best from your receiver, what can be heard on which frequencies, reporting codes, antennas and understanding specifications.

DESCRIPTION

The receiver is housed in a two part case and adopts a functional layout rather than the more 'flashy' appearance of most Japanese receivers. The radio measures 25.3(w) × 10.9(h) × 20.4(d)cm and weighs about 2kg. Internally, most of the circuitry is constructed on one easily accessible PCB. A second board, located behind the front panel contains the micro-controller, display driver and other control functions. The FM/AMS and whip antenna pre-amplifier options are separate boards which fit vertically into the main PCB.

The receiver is a double conversion superhet with a first IF of 45MHz and a second IF of 455kHz. Signals from the antenna pass through one of six band-selecting filters before the first mixer. There is no RF amplifier (other than the optional whip antenna pre-amp mentioned earlier) and both mixers are high dynamic range active double balanced types. The 45MHz IF filter has a bandwidth of 15kHz with the switchable band-width filters being fitted at the 455kHz IF stage - these are cascaded as far as possible to improve the skirt selectivity. The local oscillator drive for the first mixer is provided by a simple single-loop frequency synthesizer tuning in 1kHz steps. Smaller step sizes (down to 8Hz) are provided by shifting the frequency of the oscillator drive to the second mixer over a range of 1kHz using a D/A converter and varicap diode - a common technique in many HF transceivers. A single chip micro-controller is used with separate RAM to store frequency information and the RAM is backed-up by a lithium battery. The control system and software has been developed to allow the micro-controller to be put into an idle state as much as possible in order to minimise the pick-up of spurious noise from the control system.

MEASUREMENTS

All measurements were made with the receiver powered from the DC PSU provided with the receiver. Results are given in the accompanying table with additional comments as follows.

Sensitivity

The sensitivity figures are entirely adequate for normal antenna arrangements, although the figures are a few dB less than most Japanese transceivers. For very short antennas, the whip pre-amp may be used to improve sensitivity by 6dB or more. The switchable input attenuator measured 20dB.

S-meter calibration

The S-meter calibration was the same on all modes. Perhaps the most generally accepted standard for S-meter calibration is 5dB per S-unit with S9 at 50uV. The S-meter in the HF-225 conformed closely to this standard, over most of the tuning range of the receiver and only above S9+10dB, does the linearity degrade.

Spurious rejection

Rejection of the 45MHz IF and image frequencies was in excess of about 80dB. There were very few other spurious responses, which were at a low level.

AGC performance

The AGC attack suffered considerable overshoot and took some time to settle, particularly on AM.

Distortion

One of the described benefits of synchronous AM demodulation is lower distortion. However, the measurements showed that at 70% modulation depth, the standard AM demodulator had lower distortion than the synchronous demodulator. The distortion was critically dependent on tuning, a slight touch of the tuning control with the demodulator still locked, could yield distortion figures of up to 7%. However, the synchronous demodulator really scores on fading signals.

Selectivity

The skirt selectivity of the ceramic IF filters is adequate for a receiver in this price bracket but not up to the standard of quartz filters fitted into more expensive rigs.

Strong signal performance

Considering the price of this receiver, the strong signal performance is very good, on a par with transceivers costing twice the price. **Fig 1** shows the combined results of selectivity, reciprocal mixing and blocking.

ON AIR PERFORMANCE

The receiver was used with wire and beam antennas and gave good results on all modes. There was ample sensitivity for normal antennas on the higher bands, and during the evenings on 7MHz, results were clean provided that the RF attenuator was switched in. The whip antenna option was useful for quick band checks and away from the main station antennas. The whip pre-amplifier gave an adequate increase in gain for this antenna and would also be useful for mobile whips or LF loops.

AM performance on the broadcast bands was much better than average and the audio was clean with low distortion. Synchronous AM really did function and helped greatly on signals suffering from selective fading; although if the fades were very deep, the synchronous detector could be thrown out of lock.

The receiver functioned well at low frequencies, giving good results on VLF time transmissions and beacons - the receiver is ideal for MW DXing. Tuning with 8Hz steps gave a very smooth result although there is a noticeable click every 1kHz on SSB and CW, yet there were no audible clicks on AM. I found the tuning speed rather too slow on

SSB and I would have preferred a few user-selectable tuning step sizes such as 20, 50 and possibly 100Hz in addition to 8Hz. Keypad entry of frequency was extremely useful and I would regard this as an indispensible option.

On strong SSB signals, the first character after a pause suffered transient distortion resulting in a click which is attributable to an insufficiently fast AGC attack - later confirmed by the measurements. It is important to avoid placing the receiver close to mains powered equipment, including its own AC PSU as a burble can be introduced onto received signals by AC mains fields coupling into the receiver VCO.

CONCLUSIONS

The HF-225 is a very useful general purpose receiver, ideally suited to the SWL who is interested in all aspects of HF reception including broadcast and amateur radio. It is a true communications receiver and achieves a good all-round performance. The receiver is manufactured in the UK and the basic cost is £395. Considering the level of performance achieved and the features provided, this represents excellent value for money.

The keypad and synchronous AM/FM options each cost a further £39.50. The other accessories include a whip antenna and pre-amplifier at £19.50, carrying case £23.86, internal rechargeable battery pack £49.50 and extension speaker at £49.50. All prices include VAT. □

ACKNOWLEDGEMENTS

I would like to thank Lowe Electronics Ltd of Matlock, Derbyshire for the loan of the receiver.

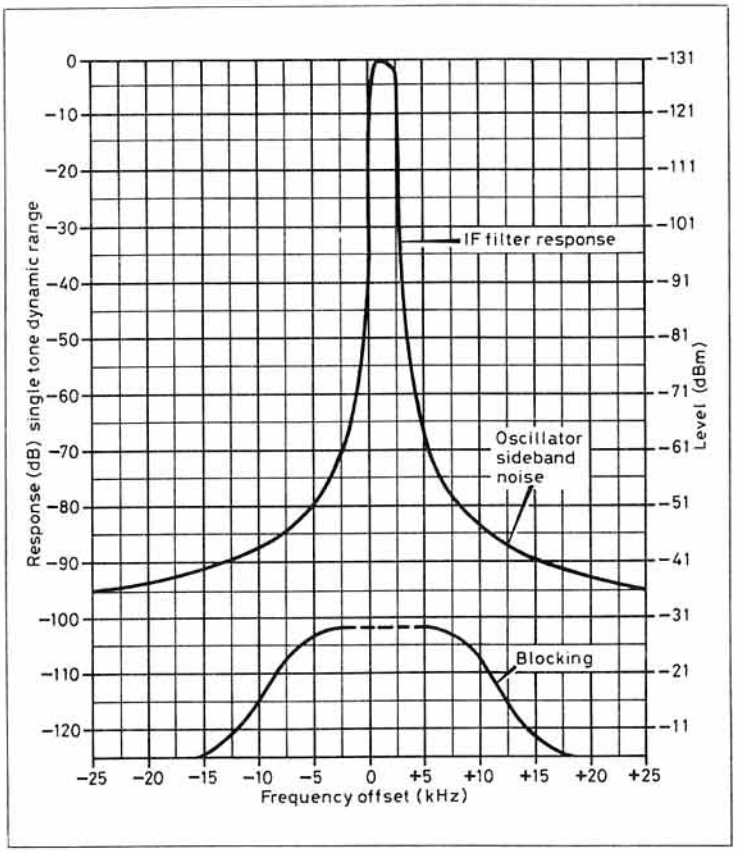


Fig 1. Effective USB selectivity curve for the HF-255.

Simple Spectrum Analyser

For most people, a spectrum analyser is way out of reach — but this design by Roger Blackwell, G4PMK, makes a home-brew unit a realistic possibility.

The Simple Spectrum Analyser (SSA) offers reasonable performance over the range 1-90MHz or so, is cheap to build, and utilises almost any oscilloscope as its display. It has selectable, calibrated, frequency sweep-width ranges, accurate logarithmlo signal strength calibration, a dynamic range of over 50dB and a built-in frequency marker generator.

ORIGINS

The original idea for the SSA came from an article by Al Helfrick, K2BLA [1], who described a basic analyser using only three chips. I have added some features contained in an earlier design of his, [2] plus some of my own, based upon a prototype which has now been in use for over a year. Following a certain amount of correspondence [3], and a good deal of information in *Technical Topics* concerning the 'BLA design ([4] and [5]) there was such an overwhelming response, over 120 enquiries, to my offer of further information and numerous requests for PCB layouts, that I decided to write up the project in more detail. The design presented here was developed with home construction in mid therefore uses pre-wound coils and PCB designs which will hopefully ensure fuss-free construction.

Suitable oscilloscopes for use with the SSA, will have a DC coupled Y amplifier offering 100mV/cm sensitivity and an external input to the X amplifier. In practice the majority of modern general purpose oscilloscopes will be suitable.

SPECTRUM ANALYSER OPERATION

Before looking at the circuit in detail, it is worth reviewing the purpose of a spectrum analyser and how it operates. Essentially, it is no more than an electronically tunable receiver, the S-meter output of which is connected to the Y input of an oscilloscope.

If a sawtooth wave-form is connected to the tuning line of the receiver VCO and also to the X input of the oscilloscope, a display of frequency against signal amplitude is obtained over the tuning range of the receiver. If the receiver also has a logarithmic response to input level, then relative signal strengths can be read off the screen. A typical display is shown in **Fig.1**.

Of course, life is just a bit more complicated than that and just as with real receivers, spurious response, selectivity and overload problems occur. The overload problems can be eliminated by specifying a maximum input level (for the SSA it is -20dBm) and by using an attenuator before the analyser input for larger input levels. The necessary selectivity is obtained by using a superheterodyne receiver design in which image problems are minimised by using an Intermediate Frequency (IF) which is higher than the maximum frequency of the analyser - in this case145MHz, which allows a readily available helical filter to be used. Unfortunately the SSA won't cover the 144-146MHz band itself.

OVERVIEW

Fig.2 shows a block diagram of the SSA. After attenuation, the input signal is fed via a low-pass filter to the first (up conversion) mixer, where the input frequency range of 0-90MHz is mixed with the varicap tuned local oscillator which operates over the range 145-235MHz, giving a first IF of 145MHz. This signal is then passed through the helical filter to a second mixer and local oscillator, where it is down-converted to the second IF of 10.7MHz.

The signal next passes through wide or narrow IF filters, a buffer amplifier and a further wide filter, before entering the logarithmic IF strip. This produces a signal-strength output which is proportional to the log of the strip input, hence the display can be calibrated in dBm. This output (usually termed the video output) is then fed to the Y channel of the oscilloscope.

The rest of the SSA is simple. The sweep generator produces a linear ramp sweep voltage, part of which (selected by the sweep width control) is added to a DC voltage from the centre frequency control. Since varicap oscillators do not have a completely linear voltage/frequency relationship, this sweep voltage is passed to the break-point generator, which puts a 'kink' in the sweep where it will attempt to linearise the frequency sweep over the 70-90MHz portion of the range. The output from the sweep oscillator also drives the X axis input of the oscilloscope.

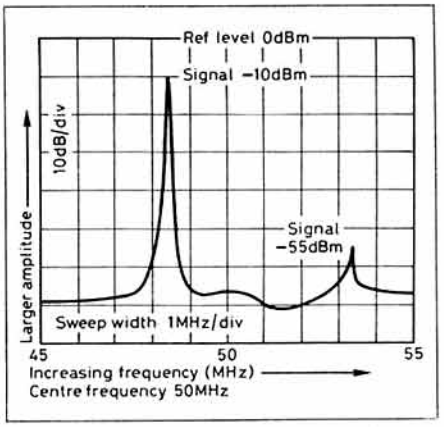


Fig.1 A typical screen display of a spectrum analyser

Not shown on the block diagram is the frequency marker generator, a simple 10MHz crystal oscillator and TTL divider which gives a low amplitude output, rich in harmonics and which is also fed to the analyser input.

CIRCUIT DETAIL

The SSA is divided into three separate boards. The first and most important is the RF unit (**Fig.3**) which is based fairly closely on the original design [1]. The input signal is routed from the front panel 50ohm BNC socket via the two front panel switched attenuators (shown in **Fig.5**), to a fixed attenuator (R1, 2.3), which is designed to limit the maximum input to the analyser to about -20dBm and provide something like a consistent 50ohm input. The signal then passes through an elliptical low-pass filter (C3, 4, 5 and L1) to the first mixer, contained in part of IC1, an MC3356. This remarkable device is one of a family of FM receiver chips such as the MC3357 and MC3359 which contain a local oscillator, mixer, limiting IF amplifier and discriminator - better known from NBFM receiver applications.

The MC3356 is intended to be used as a single-chip FSK receiver and has some special features which are exploited in the SSA. Firstly, the IF amplifier has a signal strength output which is proportional to the logarithm of the input voltage and secondly, the local oscillator and mixer will work up to at least 250MHz. The local oscillator is varicap tuned by D1 using the sweep voltage from the sweep/video board, note that two 1n capacitors (C8 and C30) are fitted at the anode end of D1 as a low impedance path is vital here to enable the highest frequency to be reached. Adding C30 to one of the prototypes increased the upper frequency limit by 5MHz!

The 145MHz IF output from IC1a goes to the first IF filter FL1, a TOKO 3-chamber helical type. The IF output from the filter is then down-

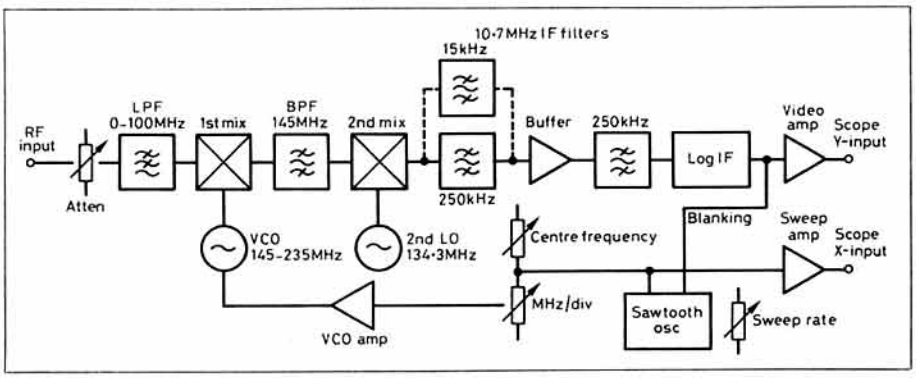


Fig.2 Block diagram of the Simple Spectrum Analyser

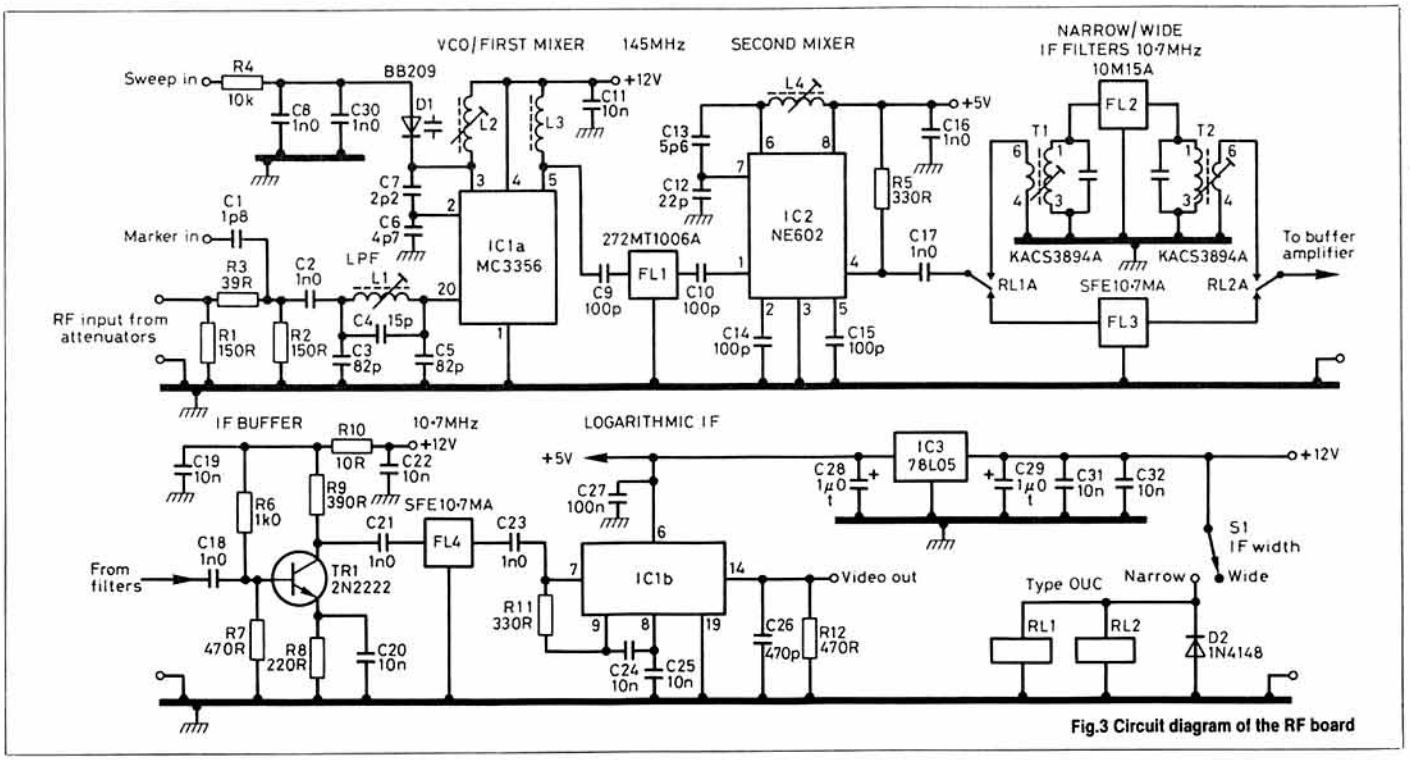


Fig.3 Circuit diagram of the RF board

converted to the second IF of 10.7MHz in IC2, a NE602 oscillator/mixer chip, the LO frequency of about 134.3MHz being set by L4, C12 and C13. Note that there are some differences between the circuit and values shown here and those in references [1] and [6]. The values shown in Fig.3 are correct and the connection of pin 6 to Vcc, together with the capacitor values, is taken from the manufacturer's data sheet.

Setting the 2nd LO below the first IF removes the 21.4MHz (2 × 2nd IF) spurious response of the original design. The NE602 requires a lower voltage supply than the MC3356 and this is obtained from a 5V regulator, IC3. Narrow (15kHz) or wide (250kHz) first IF filters (FL2 and 3) are selected by means of the miniature relays RL1 and RL2, and the front panel switch S1 (IF BANDWIDTH).

After filtering, the signal is amplified by TR1, which is run at a relatively high standing current so as to provide good dynamic range. Although the stage does not provide the correct terminations for the filters, in practice this is of little consequence. Removing C20 would improve the matching, but with the consequent loss of over 20dB of sensitivity! The signal is then passed via a second filter (FL4) to the main IF signal processing circuit, IC1b. This does one of the most difficult jobs in the analyser - it provides a DC output which is proportional to the log of the IF input voltage. Here, in one fell swoop the 10dB/division Y-axis calibration is achieved, with the (video) output being taken via a screened lead to the sweep/video board. The output from the FM discriminator is not used in this application.

SWEEP GENERATOR

The sweep generator circuit, shown in **Fig.4**, is broadly based on Helfrick's QST article [2], with a few changes for use with this particular VCO. In this circuit 741 op-amps have been used throughout as a) there is no need for anything more sophisti-

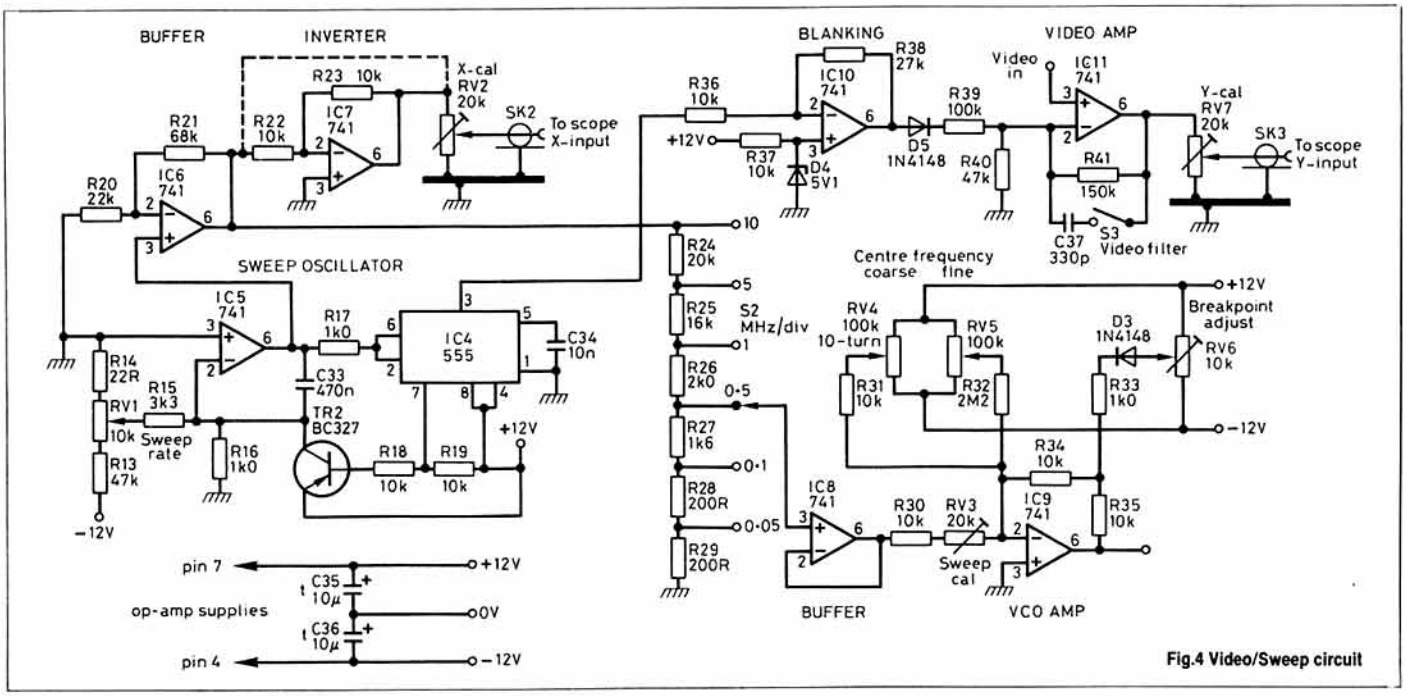


Fig.4 Video/Sweep circuit

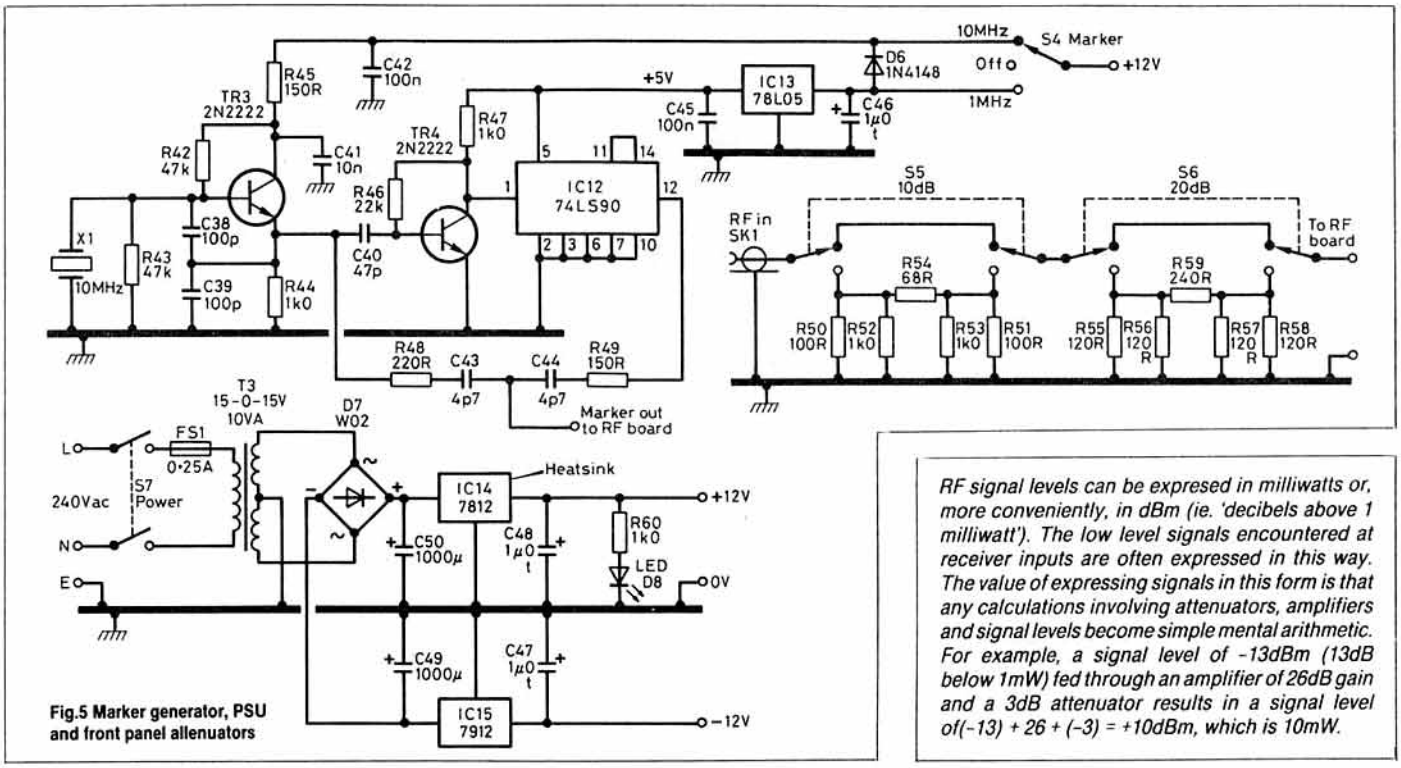


Fig.5 Marker generator, PSU and front panel allenuators

RF signal levels can be expresed in milliwatts or, more conveniently, in dBm (ie. 'decibels above 1 milliwatt'). The low level signals encountered at receiver inputs are often expressed in this way. The value of expressing signals in this form is that any calculations involving attenuators, amplifiers and signal levels become simple mental arithmetic. For example, a signal level of -13dBm (13dB below 1mW) fed through an amplifier of 26dB gain and a 3dB attenuator results in a signal level of(-13) + 26 + (-3) = +10dBm, which is 10mW.

cated and b) they are so cheap that one can be liberal with them!

The sweep ramp is generated by the 555 timer IC4, op-amp IC5 and current source TR2 with the sweep rate being controlled by a front panel potentiometer, RV1. The 555 also provides a fast blanking-pulse output for the video amplifier. The sweep output is buffered by IC6, before being fed to the sweep width from panel switch S2 (MHz/DIV) and to the X output SK2. Depending on the particular oscilloscope, the inverting unity-gain buffer IC7 may not be needed - if a positive voltage applied to the oscilloscope X input deflects the spot to the right, then IC7 can be omitted. In this instance R22 and R23 are omitted pin 6 of IC6 is connected to the top of the X CAL preset RV2, via link LK1 as shown by the dotted line.

The selected sweep voltage amplitude from the wiper of S2 is buffered by voltage follower IC8 before amplification in IC9. In this final stage three important things happen i) the sweep voltage gain is set to allow a calibrated frequency sweep, ii) an adjustable DC offset (the centre frequency) is added by means of a ten turn potentiometer RV4 (CENTRE FREQUENCY COARSE) and RV5 (CENTRE FREQUENCY FINE) and iii) an adjustable non-linearity (break-point) is deliberately introduced into the linear sweep ramp by means of RV6, D3 and R33. This improves the frequency sweep linearity above 70MHz.

VIDEO AMPLIFIER

The video amplifier (IC11) provides a small amount of gain and in conjunction with comparator IC10 provides the retrace blanking by shifting the retrace portion vertically downwards off the screen. Capacitor C37 across the feedback resistor can be switched by S3 (VIDEO FILTER) to provide a little smoothing of the 'grass' on the display if wanted and pre-set RV7 (Y CAL) allows the output of the amplifier to be set to the required 100mV per 10dB of RF input.

The third board, which contains the marker generator and power supply (Fig.5), needs little comment. The marker generator uses conventional techniques to produce a comb of 10 and/or 1MHz markers which can be added to the input signal to allow an easy method of frequency calibration. The power supply uses standard components.

CONSTRUCTION

The RF board is constructed on a double-sided glass epoxy printed circuit board, one side of which is not etched and is used as an earth plane. The component placement diagram (together with drilling details) is shown in **Fig.6**. Most (but not all) of the holes require the copper on the earth plane side to be cleared away around the hole with a counterbore or small drill. Note that the lugs of the shielding cans for FL1 and T1/T2 are used to provide earth paths for tracks underneath the board, and so need to be soldered on both sides of the PCB. The small additional holes on the track layout provide locating holes for the earth plane connections of components - small ceramic capacitors these days seem very prone to disintegrating if one of their legs is bent through a right angle! Note that the varicap diode D1 must be mounted on the underside of the board with its cathode close to the end of L2, as shown.

The video/sweep board component placement is shown in **Fig.8**. This is a single sided PCB where the optional link LK1 (shown dotted) should be fitted instead of R22, R23 and IC7 if you don't need the X output inverter stage, as described earlier. If you do need these components, then omit LK1. Note that the resistors R24-29 are mounted on the rotary switch S2.

The third board, containing the marker generator and the power supply, is also a single sided PCB. The component overlay is shown in **Fig.9**. Sufficient

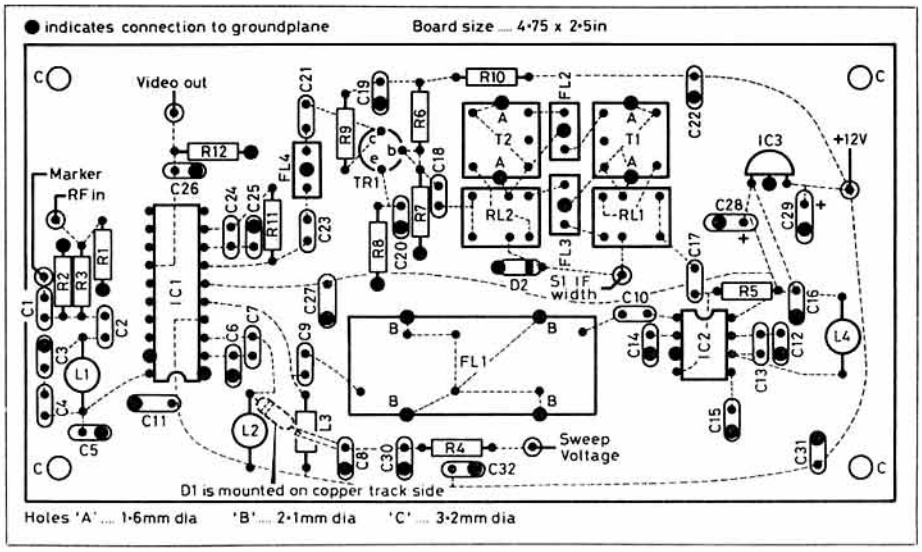


Fig.6 RF board layout (component side) Note that the B8209 D1 is mounted on the underside of the board.

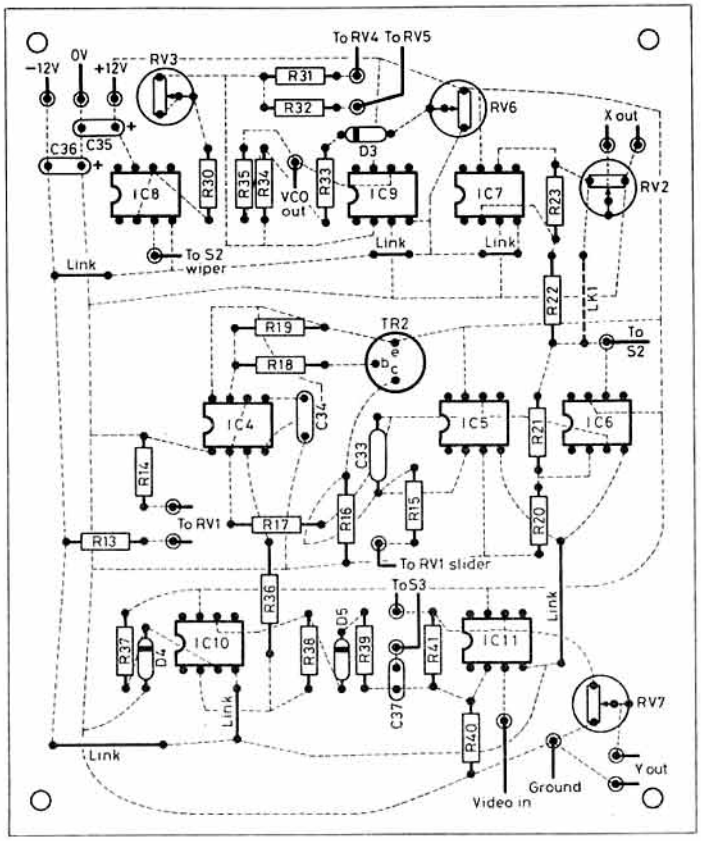


Fig.8 Video/sweep board layout (component side)

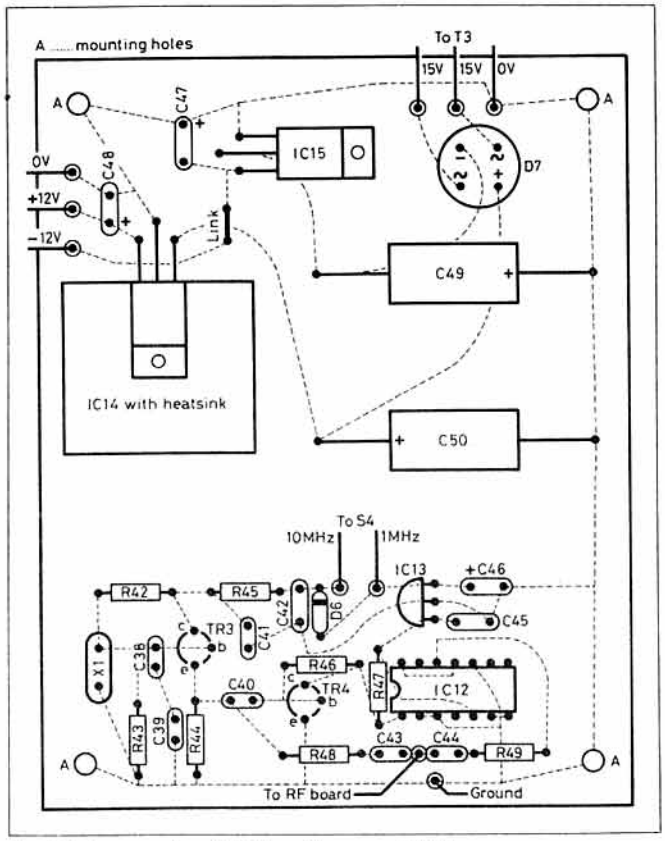


Fig. 9 Marker generator and PSU layout (component side)

space for a small heatsink for IC14 has been provided on the board.

The analyser needs to be constructed in a metal case to provide the necessary shielding from stray signals but when choosing or making a case and installing the boards, remember that the pre-sets on both the RF and sweep boards will need adjustment. This means that the boards should be mounted so that there is easy access to both boards. The input attenuators are constructed on the slide switches S5 and S6 using short leads, and could well be fitted with a grounded screening box made of double-sided PCB.

For the coarse centre-frequency control, choose a good ten-turn potentiometer and fit it with a large knob which has a cranked handle, this will save a lot of wear and tear on your fingers! The fine control needs a good quality single-turn carbon-track potentiometer. The connections to the RF board from the front panel attenuators and the marker generator should be with miniature coaxial cable such as RG174. The video and sweep connections, as well as those to S2 and the X and Y output sockets, should be made with small diameter screened (audio) cable.

Test the boards on the bench before finally assembling them in the case. One of the prototypes spent its first few weeks in this state simply because I could always find something to look at with it which seemed more interesting than the prospect of drilling holes in the front panel! Final setting up of the RF board should be done when it is fixed in the case.

ALIGNMENT

Start by testing the power supply and marker generator. The latter can be easily checked by listening to its harmonics on an HF receiver, or use an oscilloscope on the input and output of the decade divider. Next test the sweep and video board. It should be fairly easy to check the operation of this with the oscilloscope which will be used for the display. Don't set it up at this stage, merely confirm that the sawtooth waveform is available at the analyser X output, and that an attenuated version (with a DC offset dependent on the centre frequency controls) is available at the VCO sweep voltage output.

When the RF board is complete, connect power to it and ground the tuning input. Then connect the video output to the oscilloscope (which for the moment can have its conventional timebase operating) and select wide IF bandwidth. If a 145MHz source (eg. a 2m handheld with a dummy load) is brought close to the input side of the 145MHz filter, the trace should deflect upwards, showing that the second mixer, oscillator and log IF strip are working. Adjust L4 for maximum response, reducing the input signal as required.

Now complete all the interconnections, set the oscilloscope to external X operation, and connect the X output of the SSA to the external X input of the oscilloscope. Adjust RV2 (X CAL) (and perhaps also the oscilloscope X gain) so that the available sweep is just wider than the screen. Set S2 to 10MHz/DIV, connect the video ouput of the SSA to the oscilloscope Y input (set to 100mV/cm, DC coupling) and switch on the 10MHz markers. At this stage, a few blips on the screen should be seen. When the VCO is correctly aligned, one of the blips will not disappear when the markers are switched off - this is the lower limit of the coverage - in other words 0MHz.

The next stage requires patience! Set RV4 (CENTRE FREQUENCY COARSE) to about mid travel and unscrew the core of L2 so that it is about half way out of the coil - by now a few marker blips should be seen if all is well. Adjust L4 for maximum amplitude of the blips, noting that there will be two positions where this occurs - choose the position where the core is further inside the coil, as the other corresponds to the LO being on the high side of the first IF. By careful adjustment of the VCO coil L2 it should be possible to see marker blips every 10MHz up to 90MHz, whilst still keeping the 0MHz blip. If necessary adjust L4 slightly. L1 does not need adjustment - just leave the core as supplied.

Adjust RV3 (SWEEP CAL) and RV6 (SET BREAK-POINT) to give a linear display (as near as possible) over the bottom 70 or 80MHz or so, with one marker appearing at every horizontal division on the screen. You will find that careful setting of RV6 will substantially improve the frequency linearity above 70MHz. These adjustments interact somewhat, so it is worth repeating them. Check, with the aid of the 1MHz markers, the operation of the MHz/DIV (Sweep Width) switch.

FINAL ADJUSTMENT

Now is a good time to finally adjust the filters on the RF board. Using an internal marker blip, carefully adjust the 145MHz filter for maximum signal amplitude. Select the narrow IF, and adjust the cores of T1 and T2 for maximum amplitude and best shape - what is displayed is the actual IF response of the analyser. When using the narrow IF, remember to reduce the sweep rate. If a marker is put at the centre of the screen with the centre frequency controls, reducing the sweep width with S2 should not result in the marker moving - if it does, then try adjusting the oscilloscope X shift slightly and re-centering the marker.

Finally, the calibration of the log vertical scale

must be set using a 50ohm signal source, such as a signal generator connected to the SSA RF input socket. Using the oscilloscope Y shift, position the base line near the bottom of the screen. With the attenuators switched out, and the oscilloscope Y amplifier set to 100mV/cm, adjust the signal amplitude to give a peak of 4 divisions or so. Now adjust the Y cal pre-set so that when attenuation is switched in, the peak falls in amplitude by 1cm per 10dB. If you have access to an accurate signal source, you can set the oscilloscope Y shift so that the top of the screen corresponds to -20dBm (in a commercial instrument this is termed the reference level). The noise floor of the analyser is about -85dBm but note that the lowest vertical division doesn't quite correspond to the 10dB per division calibration of the rest of the screen.

PRACTICAL HINTS

Bear in mind the limitations of the analyser - remember that it has a maximum input of -20dBm (+10dBm with both attenuators in), and will start to show its own shortcomings if you overload it - the dynamic range of the analyser is over 50dB. Whilst the absolute sensitivity will vary across its range by 6dB or so, the relative calibration of 10dB per vertical division remains unchanged for any given frequency. When using the narrow IF, slow the sweep down - watching the display whilst you do will soon show you why this is necessary. Incidentally, although not shown on the circuit diagram, one addition I recommend is a good RF filter on the mains input, to keep the entry of RF to the approved route only, via the front panel input socket!

Whilst you won't find the SSA suitable for making Intermodulation Distortion measurements or looking at oscillator noise, many useful and interesting tasks await it. By connecting a few feet of wire to the input, a fascinating picture of the HF spectrum emerges - try it during the day and then have another look at night, when the 7MHz broadcast stations are in full swing. Use the 10 and 1MHz markers to find your way about the spectrum. You should find that the upper limit of the analyser is over 95MHz, and that if you live in a good signal strength area, Band II VHF radio signals are visible. Connecting a good antenna should enable a watch to be kept for 28 or 50MHz openings. If your HF rig has a mixer VFO, try looking at the output - and be prepared for a shock such as I had when I looked at mine! A photograph of a typical display using a very short antenna can be seen in **Fig.10.**

Whilst it doesn't quite have the performance of a commercial unit (or for that matter the same price tag!), when used with a modicum of care it is a very useful tool. I hope you'll find that, once you have built it, the SSA rapidly becomes indispensable for all kinds of jobs around the shack. □

ACKNOWLEDGEMENTS

First, thanks should go to Al Helfrick, K2BLA, whose inspirational design started this all. Second, to the many people who expressed interest in my original design mentioned in TT (I'm sorry I couldn't reply to you all); to G3SEK for reading the draft, and finally to G8HAJ who provided material assistance with the early development.

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[1] A Simple Spectrum Analyzer. A Helfrick, *RF Design* January 1988 35-37. Details also given in Technical Topics, *Radio Communication*, April 1988.

[2] An Inexpensive Spectrum Analyzer for the Radio Amateur. A Helfrick, K2BLA, *QST* November 1985 23-29.

[3] Technical Topics, *Radio Communication* July 1988.

[4] Technical Topics, *Radio Communication* August 1988. These notes are very definitely no longer available!

[5] Technical Topics, *Radio Communication* September 1988.

[6] Technical Topics, *Radio Communication* November 1988.

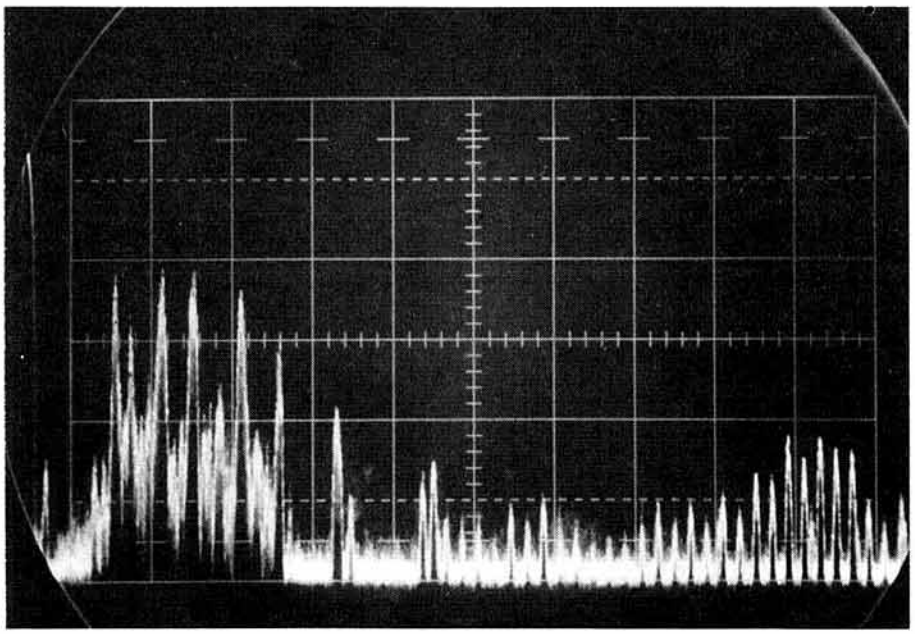

Fig.10 Typical SSA display with short antenna. Sweep width is 5MHz/DIV, the frequency range shown is 5 to 55MHz with 30MHz at the centre of the screen. HF broadcast stations dominate the left portion on the display. Just left of centre are two CB transmissions. Clock frequency harmonics from a microprocessor operating a few feet away can be seen from 30 to 55MHz.

COMPONENTS LIST

RF BOARD

RESISTORS

R1, 2	150
R3	39
R4	10k
R5, 11	330
R6	1k0
R7, 12	470
R8	220
R9	390
R10	10

CAPACITORS

C1	1p8
C2, 8, 16, 17, 18, 21, 23, 30	1n0
C3, 5	82p
C4	15p
C6	4p7
C7	2p2
C9, 10, 14, 15	100p
C11, 19, 20, 22, 24, 25, 31, 32	10n
C12	22p
C13	5p6
C26	470p
C27	100n
C28, 29	1μ 35V Tant Bead

SEMICONDUCTORS

D1	BB209
D2	1N4148
TR1	2N2222)
IC1	MC3356)
IC2	NE602
IC3	78L05

MISCELLANEOUS

FL1	272MT1006A CBT 145MHz helical filter
FL2	10M15A 2 pole 10.7 MHz crystal
FL3, 4	SFE10.7MA 10.7MHz ceramic filter
L1, 2	TOKO S18 coil 1.5t white 301SN0100
L3	4.7μH RFC TOKO FL4 348LS4R7
L4	TOKO S18 coil 4.5t yellow 301SN0400
T1, 2	TOKO KACS3894A IFT
RL1, 2	Minature relay type OUC
S1	SPDT min toggle IF BANDWIDTH

MARKER GENERATOR

RESISTORS

R42, 43	47k
R44, 47	1k0
R45, 49	150
R46	22k
R48	220

CAPACITORS

C33, 39	100p
C40	47p
C41	10n
C42, 45	100n
C43, 44	4p7
C46	1u 35V Tant bead

SEMICONDUCTORS

TR3,4	2N2222
D6	1N4148
IC12	74LS90
IC13	78L05

MISCELLANEOUS

X1	10MHz HC18U
S4	spdt centre off toggle MARKER

SWEEP AND VIDEO BOARD

RESISTORS

RV1	10k lin SWEEP RATE
RV2	20k cermet preset X CAL
RV3	20k cermet preset SWEEP CAL
RV4	100k 10-turn COARSE CENTRE FREQ
RV5	100k lin carbon FINE CENTRE FREQ
RV6	10K cermet preset BREAKPOINT ADJ
RV7	20k cermet preset Y CAL

(RV2 and RV7 can be any value in the range 10 - 100k; similarly RV4 and RV5 can be 10 - 200k)

CAPACITORS

C33	470n polyester layer
C34	10n
C35, 36	10u 25V Tant bead
C37	330p

SEMICONDUCTORS

TR2	BC327
D3, 4	1N4148
D5	5V1 zener
IC4	555
IC5-11	741

MISCELLANEOUS

S2	1 pole 6 way wafer MHz/DIV
S3	SPST or SPDT toggle VIDEO FILTER
SK2, 3	BNC panel socket

POWER SUPPLY

RESISTORS

R60	1k0

CAPACITORS

C47, 48	1u 35V Tant Bead
C49, 50	1000u 25 or 35V elect

SEMICONDUCTORS

D7	W02 bridge rectifier
D8	red panel mounting LED
IC14	7812 with small heatsink
IC15	7912

MISCELLANEOUS

T3	15-0-15V 10VA mains transformer
S7	dpst ON OFF
F1	0.25A fuse and holder

FRONT PANEL ATTENUATORS

R50, 51	100
R52, 53	1k0
R54	68
R55-58	120
R59	240
S5,6	dpdt slide switch 10dB (S5) 20dB (S6)
SK1	BNC panel mount socket

All resistors are 0.25W 5% or better, capacitors are miniature ceramic plate type unless otherwise noted.

PRINTED CIRCUIT BOARDS, COMPONENTS AND PCB OVERLAY AVAILABILITY

PCBs

Please note that PCBs for this project are not available as yet. Arrangements are being made for these to be included in our forthcoming PCB service — see the RSGB Mail Order Price List in forthcoming issues of RadCom for details.

PCB OVERLAYS

Photocopies of the PCB track details are available from RSGB Headquarters, please send a stamped, self-addressed envelope of foolscap size and clearly mark your envelope 'Spectrum Analyser'.

COMPONENTS

Although this project contains commonly available components, readers may wish to make use of a components kit being made available by Bonex. The kit contains all the components required with the exception of PCBs, case and control knobs. The price of the kit is £48 including both VAT and postage and packing. Please send your orders direct to Bonex at:
12 Elder Way,
Langley Business Park,
Slough, Berks SL3 6EP.
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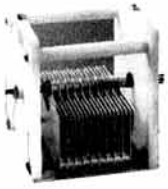
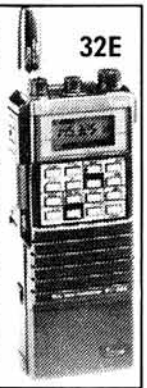
Empty ATU Case..... **£26.00**
2kw Balun Assembly..... **£28.00**



TALK ICOM

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

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



TALK SCANNERS

We probably carry the largest stocks of scanners in the U.K. Our **New Bumper Catalogue** features all the latest models. Here is a selection:-

New Jupiter 11 H/held.... **£299**
Standard AX700 Base.... **£575**

BEARCAT

200 XLT H/held..... **£229**
100 XLT H/held..... **£199**
100 XL H/held **£179**
55 XL H/held..... **£99**
590 XLT Mobile..... **£199**
760 XLT Mobile..... **£229**
145 XL Base..... **£115**
175 XL Base..... **£169**
210 XL Base..... **£169**
Black Jaguar BJ200 111..... **£199**
Sony Air 7 ..... **£229**
Sony Pro 80..... **£299**

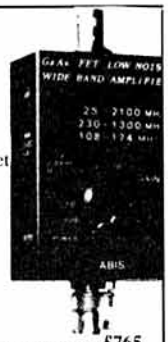
SCANNER ANTENNAS

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

ABIS SCANNER PRE-AMP

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

NOW IN STOCK
£79.95



AOR SCANNERS

AR 3000 NEW..... **£765**
AR 2002..... **£487**
AR 900..... **£235**
AR 950 NEW!..... **P.O.A.**
Sony ICF 7600 S/H..... **£99.00**
B/Cat 70 XLT S/H **£99.00**

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

TALK ACCESSORIES

REMOTE MAST HEAD SWITCHES

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

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

SADELTA XL30 Mic

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

Introductory Offer £39.95

SADELTA CM 40 Mic

As the XL 30 above, but with Vol/Tone controls

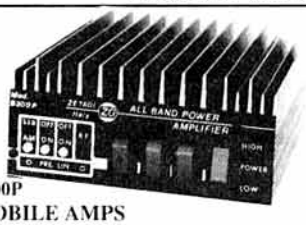
Introductory Offer £49.95

NEVADA DUMMY LOAD

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

Introductory Offer £29.95

TALK AMPLIFIERS



B300P

MOBILE AMPS

B150 180w (26- 30 Mhz)..... **£54.95**
B300P 300w (2- 30 Mhz..... **£147.52**
B550P 500w (2 - 30 Mhz)..... **£237.00**
TC35 30w (26 - 30 Mhz)..... **£24.95**
TC50 15w (50 - 52 Mhz **£29.95**
BRL35 45w (26 - 30 Mhz)..... **£29.95**
BRL40 70w (26 - 30 Mhz)..... **£34.50**
BRL31 28w (26 - 30 Mhz)..... **£19.95**

TC50DX 50Mhz amplifier

B299 300w (3 - 30 Mhz)..... **£115**
737 80w (26 - 30 Mhz)..... **£35.41**
735 35w (26 - 30 Mhz) **£18.54**
B110 110w (142 - 170 Mhz)..... **£145**

BASE AMPLIFIERS

B132 240w (3 - 30 Mhz) **£129**
BV131 250w (26 - 30 Mhz) **£115**
B507 300w (3 - 30 Mhz)..... **£278**

VISA

SEND IN NOW JUST £2 FOR OUR NEW BUMPER CATALOGUE (INCLUDES £2 VOUCHER)

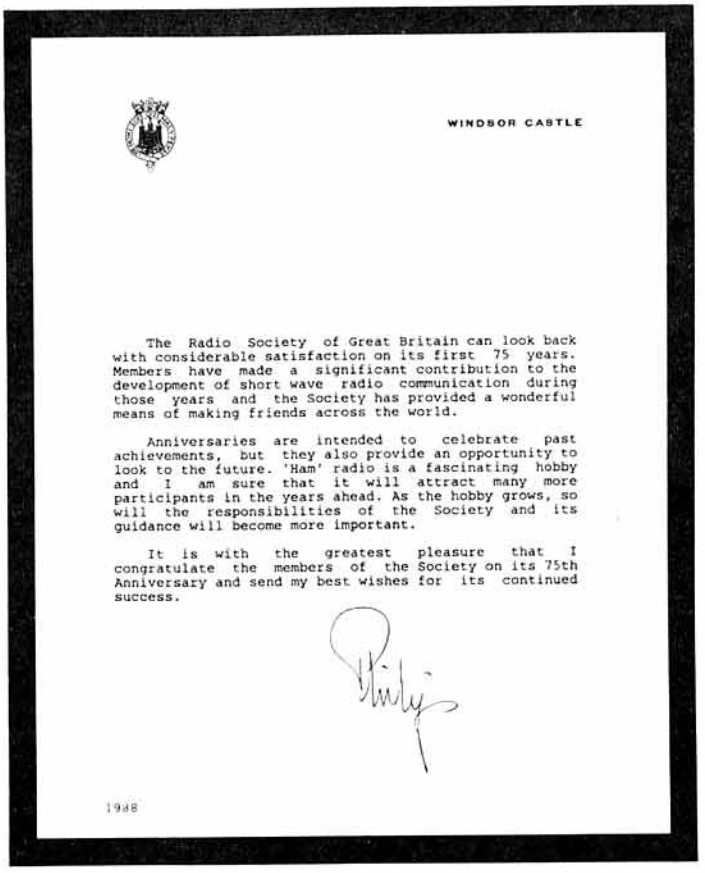
ACCESS

NEVADA COMMUNICATIONS.....WE TALK YOUR LANGUAGE

189 LONDON ROAD, NORTH END, PORTSMOUTH, PO2 9AE ORDER HOTLINE (0705) 662145

RADIO SOCIETY OF GREAT BRITAIN

The Patron's 75th Anniversary Message



WINDSOR CASTLE

The Radio Society of Great Britain can look back with considerable satisfaction on its first 75 years. Members have made a significant contribution to the development of short wave radio communication during those years and the Society has provided a wonderful means of making friends across the world.

Anniversaries are intended to celebrate past achievements, but they also provide an opportunity to look to the future. 'Ham' radio is a fascinating hobby and I am sure that it will attract many more participants in the years ahead. As the hobby grows, so will the responsibilities of the Society and its guidance will become more important.

It is with the greatest pleasure that I congratulate the members of the Society on its 75th Anniversary and send my best wishes for its continued success.

1988

HRH Prince Philip, Duke of Edinburgh, KG

REPORT AND ACCOUNTS
and
THE YEAR IN REVIEW

for the year 1 July 1988 to 30 June 1989

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)

LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE

PATRON: HRH The Prince Philip, Duke of Edinburgh, KG

COUNCIL (1 July 1988 to 30 June 1989)

President
Sir Richard Davies, KCVO, CBE, CEng, FIEE, G2XM
(President to 31.12.88)
J. N. Gannaway, MA, D.Phil., G3YGF
(President from 1.1.89)

Executive vice-President
F. D. Hall, GM8BZX (Executive Vice President from 1.1.89)

Honorary Treasurer
B. O'Brien, ACIB, G2AMV

Secretary - D. A. Evans, MSAE, CPL, G3OUF

Members
E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM
J. Allen, G3DOT
J. T. Barnes, GI3USS
G. L. Benbow, MSc, CEng, MIEE, G3HB
N. G. Brinkworth, G3UFB
E. J. Case, GW4HWR
P. E. Chadwick, G3RZP ¶
M. H. Clayton Smith G4JKS ¶
J. Greenwell, AMIEE, G3AEZ
J. Heathershaw, G4CHH*
J. D. Heys, G3BDQ *
G. R. Jessop, CEng, MIERE, G6JP
A. A. McKenzie, MBE, CENG, FIEE, FAES, G3OSS
N. F. O'Brien, FAAI, FSCA, ACIS, MIMI, G3LP ß
F. S. G. Rose, G2DRT
G. R. Smith, BSc, MISTC, MBIM, G4AJJ

* Retired 31 December 1988
ß Resigned May 1989

¶ Elected 1 January 1989

Auditors - Moores Rowland, Chartered Accountants

Solicitors - Douglas-Mann & Co.

Bankers - Barclays Bank PLC

Financial Report of Council to members of the Radio Society of Great Britain for the year ended 30 June 1989.

The financial year began in a special manner. The Society celebrated its 75th Anniversary with a series of major events during the month of July. These events were arranged to allow members and visitors from home and overseas to participate in a festival of amateur radio, culminating with the presence of our Patron, HRH The Duke of Edinburgh, at the RSGB National Convention.

The value of the publicity and goodwill created by these events cannot easily be quantified. However, there is no doubt that our members in this country will benefit from the very wide exposure of amateur radio to government officials, industry and the general public; internationally, our colleagues within IARU have indicated that the positive approach shown by the Society towards world issues during the 75th Anniversary year will be important as we run up to what could be a difficult WARC in 1992. These achievements do not come cheaply and the associated costs, shown as an exceptional item of expenditure at £29,698, should be regarded as an investment for the years to come.

As for the ordinary activities of the Society considerable efforts, which proved successful, were made to hold expenditure to 1987/88 levels, allowing for inflation. This, combined with a small but significant increase in income, resulted in a surplus of £6,752 on ordinary activities before tax of £3,000. However, if the one-off costs for the 75th Anniversary are included the annual accounts show a deficit of £22,946 before tax.

Despite being "in the red" overall there are positive signs that performance is improving. The downward trend of income from advertising and book sales has been reversed, mainly as a result of increased marketing and the provision of new book titles. Significantly, the major proportion of books are currently sold direct rather than through the trade, no doubt assisted by the ability of members to place credit card orders over the telephone. Subscription income has barely kept pace with inflation but members should note that the full effect of the July 1988 rate increase will not appear until 1989/90. This year for the first time members participated in a lottery, the proceeds of which helped to launch the Project YEAR initiative. A magnificent response from individuals and clubs brought an income (included under Other Income in the accounts) of £37,937 which, following deduction of expenses, resulted in a contribution of £22,702 towards Project YEAR costs. By this means the Society was relieved of most of the incurred costs during the year, an objective again sought, through sponsorship, for 1989/90.

More generally, although overall expenditure has increased in line with inflation, several items have exceeded this and deserve mention. One of these, the cost of sales, illustrates how the Society has invested in the purchase of new hardware and software for desktop-publishing, in order to produce future books in house and thus save money in the longer term. It also reflects the larger demand for factored books which are of course more costly to source. The cost of operating from Lambda House has increased by £5000 during the year but it is still lower than it was two years ago. Members should be aware that a valuable asset such as the HQ building must continue to be regularly maintained so charges for this are likely to increase in the years ahead. In contrast, savings have been made in administration due to a planned reduction in staff. Also, hire and maintenance charges for equipment (see note 7) are lower but are likely to increase again in 1989/90 when new computer hardware and software are installed. It is only through the use of more modern business practices that the Society can hope to improve the efficiency of its HQ operation. One example of this is the desk-top publishing system which was purchased during the year. Following a highly successful application to the book programme DTP techniques are now helping to streamline the production of RadCom.

As a result of these acquisitions tangible fixed assets are increased at year end (notes 1 and 2 refer). However, due to the overall deficit, the considerable resources of the Society have been reduced, giving a nett worth of just under £300,000. In the coming year there are no exceptional items of expenditure anticipated and liquidity should and must begin to improve. This can only occur if income increases through the continued production of saleable books and additional advertising revenue whilst membership levels are maintained, or preferably, grow. Should any one of these not be achieved then there is a risk that services to members will have to be reduced.

The next financial year will therefore present Council, staff, volunteers and members with a number of different challenges. HQ can look after books and advertising; volunteers will be encouraged to minimise expenditure both nationally and in representing the RSGB overseas. In connection with Project YEAR and the Novice Licence members will be urged to recruit vigorously amongst new and existing amateurs in order to promote Society growth. If some or all of these targets can be met there is every chance that the Society can and will be financially successful.

RADIO SOCIETY OF GREAT BRITAIN

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30 JUNE 1989

	Notes	1989 £	1989 £	1988 £	1988 £
INCOME					
Subscriptions (inc Newsletters)	(1)		649,345		*631,187*
Advertising	(1)		205,707		*197,162*
Book Sales			281,712		*270,145*
Other Income	(5)		74,127		*33,137*
TOTAL INCOME			£ 1,210,891		*£ 1,131,631*
EXPENDITURE					
Cost of Sales					
Cost of printing & distribution (Books etc)		172,064		*148,986*	
Cost of publishing & despatch staff		66,541		*49,057*	
Cost of printing & distribution (Newsletters)		28,062		*23,682*	
Morse Tests		9,760	276,427	*12,266*	*233,991*
Headquarters					
Rates,lighting,heating & cleaning		29,175		*25,693*	
Repairs & maintenance		4,969	34,144	*3,454*	*29,147*
Administration					
Cost of administration staff		276,485		*287,057*	
Telephone,postage,printing & stationery		67,481		*64,462*	
Insurance		4,070		*4,949*	
Hire & maintenance of equipment	(7)	38,257		*44,273*	
Depreciation of fixed assets	(1)	23,566		*19,986*	
Audit fees		10,100		*9,500*	
Legal and professional fees		7,557		*8,311*	
General expenses		3,886	431,402	*2,680*	*441,218*
Finance					
Bank charges		9,532		*7,796*	
Credit card charges		4,240		*3,599*	
Bad debt provision		—		*(799)*	
Exchange differences		(2,119)	11,653	*(2,101)*	*8,495*
Membership services					
Radio Communication	(8)	369,116		*342,437*	
Certificates,awards,trophies,etc		2,925		*1,228*	
QSL Bureau (exc staff costs)		8,064		*8,262*	
Beacons,repeaters,satellites & Intruder Watch		8,331		*12,827*	
IARU Region 1 contribution & levy		13,005		*14,027*	
Rallies,exhibitions and publicity	(9)	(600)		*4,911*	
Cost of committee,regional & Council meetings		47,526		*42,099*	
Cost of international meetings & conferences		2,146	450,513	—	*425,791*
TOTAL EXPENDITURE			£ 1,204,139		*£ 1,138,642*
SURPLUS/(DEFICIT) ON ORDINARY ACTIVITIES BEFORE EXCEPTIONAL COSTS			6,752		*(7,011)*
Exceptional costs of 75th Anniversary			(29,698)		—
DEFICIT ON ORDINARY ACTIVITIES BEFORE TAXATION					
(£22,946 [1988: £(7,011)] of which arises in the Society)			(22,946)		*(7,011)*
Less provision for corporation tax at 25%(1988 26.5%)		(5,000)		*(4,000)*	
Over provision for corporation tax in previous year		—		*940*	
Release of deferred taxation provision	(10)	2,000	(3,000)	—	*(3,060)*
DEFICIT FOR YEAR			£ (25,946)		*£ (10,071)*

RADIO SOCIETY OF GREAT BRITAIN

BALANCE SHEET AS AT 30 JUNE 1989

	Notes	1989 The Society £	1989 The Society and subsidiaries £	1988 The Society £	1988 The Society and subsidiaries £
FIXED ASSETS					
Tangible assets	(1)(2)	434,713	434,713	*434,419*	*434,419*
Investments	(3)	200	—	*200*	—
		434,913	434,713	*434,619*	*434,419*
CURRENT ASSETS					
Stocks, at lower of cost and net realizable value		103,609	103,609	*103,741*	*103,741*
Trade debtors		90,002	90,002	*86,260*	*86,260*
Prepayments and accrued income		99,264	99,264	*82,832*	*82,832*
Cash at bank and in hand		33,336	35,335	*110,465*	*112,464*
		326,211	328,210	*383,298*	*385,297*
CREDITORS:AMOUNTS FALLING DUE WITHIN ONE YEAR					
Trade creditors		(95,710)	(95,710)	*(104,188)*	*(104,188)*
Amounts due to subsidiary companies		(215,117)	—	*(215,117)*	—
Corporation tax		(4,000)	(4,000)	*(5,559)*	*(5,559)*
Other taxation and social security		(10,998)	(10,998)	*(10,136)*	*(10,136)*
Other creditors		(9,442)	(10,559)	*(15,032)*	*(16,149)*
Accruals and deferred income		(34,639)	(34,639)	*(69,934)*	*(69,934)*
		(369,906)	(155,906)	*(419,966)*	*(205,966)*
Subscriptions in advance		(307,222)	(307,222)	*(286,683)*	*(286,683)*
		(677,128)	(463,128)	*(706,649)*	*(492,649)*
NET CURRENT LIABILITIES		(350,917)	(134,918)	*(323,351)*	*(107,352)*
Total assets less current liabilities		83,996	299,795	*111,268*	*327,067*
CREDITORS:AMOUNTS FALLING DUE AFTER MORE THAN ONE YEAR					
Corporation tax payable 1 July 1990	(10)	(5,000)	(5,000)	*(4,000)*	*(4,000)*
		78,996	294,795	*107,268*	*323,067*
PROVISIONS FOR LIABILITIES AND CHARGES					
Deferred taxation	(1)(10)	—	—	*(2,000)*	*(2,000)*
		£ 78,996	£ 294,795	£ *105,268*	£ *321,067*
ACCUMULATED FUNDS					
Income and expenditure account					
Balance at 1 July 1988 as previously stated		120,952	336,751	*129,213*	*345,410*
Prior year adjustment	(13)	(16,010)	(16,010)	*(14,598)*	*(14,598)*
		104,942	320,741	*114,615*	*330,812*
Deficit for year		(25,946)	(25,946)	*(9,673)*	*(10,071)*
		78,996	294,795	*104,942*	*320,741*
Legacy Fund	(4)	—	—	*326*	*326*
		£ 78,996	£ 294,795	£ *105,268*	£ *321,067*

(The notes on pages v and vi form part of these accounts)

Approved by Council on 23 September 1989
and signed on its behalf by:

J. N. Gannaway G3YGF, President
W. J. McClintock G3VPK, Hon. Treasurer

NOTES ON THE ACCOUNTS

1. Accounting policies:
   (a) Subscriptions - cash received in respect of subscriptions for the year has been apportioned on a time basis from the actual dates subscriptions were receivable, after deduction of VAT.
   (b) Advertising income is the net amount receivable,after deduction of VAT, for advertisements in *Radio Communication*.
   (c) Depreciation - tangible fixed assets, except freehold land, are written off using the straight-line method over the estimated useful lives at the following rates, based on cost:
   Freehold buildings - 2 per cent per annum
   Furniture - 10 per cent per annum
   Equipment - 20-25 per cent per annum
   Computer - 20 per cent per annum
   (d) Deferred taxation is provided, using the liability method, in respect of timing differences which are not expected to continue for the foreseeable future.
   (e) Since a consolidated income and expenditure account is submitted, no such account for the Society alone has been presented

2. Tangible fixed assets

	Freehold Land and Buildings	Furniture, Equipment and Computer programmes	Total
Cost	£	£	£
At 1 July 1988	417,572	98,891	516,463
Additions	—	23,860	23,860
Disposals	—	(16,658)	(16,658)
At 30 June 1989	£ 417,572	£ 106,093	£ 523,665
Depreciation			
At 1 July 1988	38,106	43,938	82,044
Charge for the year	6,351	17,215	23,566
Disposals	—	(16,658)	(16,658)
At 30 June 1989	£ 44,457	£ 44,495	£ 88,952
Net book value			
At 30 June 1989	£ 373,115	£ 61,598	£ 434,713
At 1 July 1988	£ 379,466	£ 54,953	£ 434,419

Freehold land included above amounts to £100,000 (1988: £100,000)

3. Fixed asset investments

	1989	*1988*
Shares in group companies at cost	£ 200	£ 200

The subsidiaries are Lambda Investment Company Limited (an investment company) and RSGB (Raynet) Limited, (which has been dormant since incorporation),both Registered in England. The share capital of both companies comprises ordinary shares which are wholly owned by the Society.

4. Legacy fund

	1989 £	*1988 £*
Balance at 1 July 1988	326	*276*
Donations received	—	*50*
Transfer to RSGB Legacy Fund Trust	(326)	—
Balance at 30 June 1989	£ —	£ *326*

The Balance held on the Legacy Fund has been transferred to the Trustees of the RSGB Legacy Fund Trust.

5. Other income includes bank interest of £8,879 *(1988: £9,933)*

6. Total staff costs

	1989 £	*1988 £*
Wages and salaries	338,180	*338,948*
Social security costs	31,142	*33,607*
Pension costs	8,016	*4,000*
	£ 377,338	£ *376,555*

The average number of persons employed by the Society was 31 *(1988:33)* divided into the following categories:

	1989	*1988*
Headquarters	25	*27*
Radio Communication	4	*4*
QSL Bureau	2	*2*
	31	*33*

7. Lease rentals for equipment amounted to £15,852 (1988:£19,107) Annual commitments for lease rentals amount to £16,036 (expiring in 2 - 5 years £16,036, over 5 years nil)
8. Radio Communication expenses comprise the whole of the costs of printing, distribution and the cost of editorial staff and advertising agent.
9. Rallies, exhibitions and publicity expenses comprise:

	1989 £	1988 £
Society publicity and advertising	3,197	4,814
Deficit/(surplus) on the Society's own events and participation in other rallies and exhibitions including income from exhibition space	(3,797)	97
	£ (600)	£ 4,911

Book sales totalling £35,823 gross (1988:£16,921) made at rallies and exhibitions have been accounted for under income from book sales. The income from exhibition space is £46,528 (1988: £11,800).

10. The Society is liable to pay corporation tax on its investment and trading income. No provision for tax deferred owing to the effects of capital allowances is necessary at the balance sheet date. The potential taxation liability, not provided for in these accounts, in respect of capital gains rolled over is £37,500.

11. The Society administers certain prize and memorial funds, totalling £661 (1988: £647) which are not included in these accounts.

12. The Society operates a defined contribution pension scheme. The costs of the scheme are held separately from those of the Society in an independently administered fund. The pension cost charge represents contributions payable by the Society and amounted to £8,016 (1988: £4,000). All contributions due for the year had been paid to the fund at the year end.

13. The prior year adjustment reflects a modification of the procedures for accounting for advertising sales with a view to matching more accurately income against costs relating to the same accounting period.

CONSOLIDATED STATEMENT OF SOURCE AND APPLICATION OF FUNDS FOR THE YEAR ENDED 30 JUNE 1989

	1989 £	1988 £
SOURCE OF FUNDS		
(Deficit) for the year before taxation	(22,946)	(7,011)
Donations received (less payments made) from legacy fund	(326)	50
Adjustment for items not involving the movement of funds:	—	—
Depreciation (including losses on disposals)	23,566	19,986
Total generated by (absorbed by) operations	294	13,025
APPLICATION OF FUNDS		
Purchase of fixed assets, less proceeds of sale	(23,860)	(31,072)
Corporation tax paid	(5,559)	(5,983)
	£ (29,125)	£ (24,030)
INCREASE/(DECREASE) IN WORKING CAPITAL		
Stocks	(132)	(41,929)
Debtors, prepayments and accrued income	20,174	47,328
Creditors, accruals, deferred income and subscriptions in advance	27,962	(41,460)
	48,004	(36,061)
MOVEMENT IN NET LIQUID FUNDS		
Cash balances less bank overdraft	(77,129)	12,031
	£ (29,125)	£ (24,030)

REPORT OF THE AUDITORS TO THE MEMBERS OF THE RADIO SOCIETY OF GREAT BRITAIN

We have audited the accounts set out on pages iii to vi in accordance with auditing standards. In our opinion the accounts, which have been prepared under the historical cost convention, give a true and fair view of the state of affairs of the Society and its subsidiaries at 30 June 1989 and of their surplus of income and of their source and application of funds for the year ended on that date and has been properly prepared in accordance with the Companies Act 1985.

Clifford's Inn
Fetter Lane
London EC4A 1AS
23 September 1989

MOORES ROWLAND
Chartered Accountants

The Year in Review - Secretary's Report

A look at some of the activities of the Society - 1 July 1988 to 30 June 1989

The highlight of the busy 1988/89 RSGB year was the attendance of the Society's Patron at the 75th Anniversary Convention in July 1988. HRH The Prince Philip congratulated the Society on its 75 years of achievement, presented the very first, DTI sponsored, Young Amateur of the Year Award and formally launched the Society's Project YEAR (Youth into Electronics via Amateur Radio) initiative.

By any criterion the Society has had an active and most successful year with regard to licensing and associated matters. Items featured in this report include; the Young Amateur of the Year Award, spectrum management and the next World Administrative Radio Conference scheduled for 1992, the new UK Licence which came into effect on 1 January 1989, the upgrading of the 18/24 MHz bands, third party messages and packet radio, CEPT licensing, EC legislation and the EMC Directive, and the extension of greetings messages for JOTA.

On the financial side, the Society has had mixed fortunes. Income from subscriptions, book sales and advertising are up on the previous year, but the end of year result has been disappointing. Despite the autumn 1988 postal strike, which adversely effected the Society's business, routine activities have shown a pre-tax profit of £6,752, However the cost of the 75th Anniversary has put the annual account into deficit. While the deficit after tax is higher than anticipated, great inroads have been made to getting Project YEAR off to a good start. The future of amateur radio is naturally of paramount importance and thus the money spent on the 75th, which enabled the project to be launched, has to be seen as an investment for the future.

Financing the Society's ambitious programme of membership services and benefits remains a problem. On the one hand Council is always very keen to support all of the good works and ideas which will benefit RSGB members and the future of the hobby. On the other hand the UK economy has for some time not been highly conducive to individual spending on leisure activities. During the year Council has had to look for ways of supplementing the Society's traditional sources of income. One such method was the introduction of an RSGB credit card. A donation to Society funds was made for each member who took up the offer and a small percentage of each purchase is paid to the Society. Council believes that ideas such as these are a viable way of increasing Society income since such schemes are also of direct benefit to members.

During the year under review, both RadCom and book production have made great strides. Clearly RadCom has changed. It is brighter, better laid out and hopefully more informative and interesting to read. On the book side much effort has been put in at senior level to introduce new hi-tech book production facilities at RSGB HQ. As a result, a full desktop-publishing facility has been established and new procedures for dealing with authors and the technical assessment of manuscripts has been established. Five books have been produced on the dtp facility since it was installed at HQ.

75th Anniversary Celebrations

The presence of HRH The Prince Philip, the Society's Patron, at the 75th Anniversary celebrations in July 1988 graced the proceedings and added status to the occasion; as did the presence of guests from all over the world. That the RSGB is regarded so highly by leading Societies and radio amateurs in every continent is a testimonial to its past. However, the 75th Anniversary celebrations were unique since not only did they celebrate the past, but also looked clearly forward to the future. What better a launching pad for Project YEAR and for the presentation of the first Young Amateur of the Year Award to a young man who represents the future generations of radio amateurs.

The Patron's speech and the presentations were broadcast live on the 3.5, 7, 14 and 144 MHz bands. Though the DTI were delighted to extend the GB2RS schedule to cover this special occasion, the broadcasting of the speech on four bands simultaneously proved no small undertaking. All of the technical and operation difficulties were overcome on the day and what transpired had a very professional feel about it thanks to John Nelson, GW4FRX, acting as the link-man, and the engineering team led by Warwick Hall, G4WMH. Members and non-members all over the World who could not be at the National Exhibition Centre were able to enjoy the Patron's speech from the comfort of their homes.

In paying tribute to the Society, the Patron said that "the hobby would never have reached the standards or popularity that it has today without the RSGB" and went on to comment that "the Society can be proud of its contribution to the development of this hobby worldwide and for the part it plays in the International Amateur Radio Union".

Four other events were associated with the 75th Anniversary celebrations. Firstly, Her Majesty the Queen gave the RSGB permission to set up an amateur radio station at Windsor Castle and to erect antennas on the Edward III Tower. It was the Burnham Beeches Radio Club which organised the station GB75ER with assistance from RSGB HQ. The theme of the station was Project YEAR. The highlight of the week at Windsor was when His Royal Highness, The Prince Philip while at the RSGB 75th Anniversary in Birmingham spoke direct to G4XDU who was operating GB75ER.

Secondly, the Society held its first ever Data Symposium at Harrow School, thanks primarily to G3AAJ and G3GJW. Though the event was not over-booked, all those that attended felt that it had been a unique experience at which speakers from Europe had mixed with data buffs from other continents to discuss the very latest in Packet, Amtor and RTTY.

Thirdly, the Society hosted the very first International Satellite Seminar in association with AMSAT-UK and the UoSAT team. Terry Carrell, ZL3QL, chaired the meeting on behalf of the RSGB. The meeting was the very first of its type in the World, was positive and highlighted the need for similar meetings in the future.

Fourthly, for the first time, the Society held a series of open days at its HQ in Potters Bar. Several hundred members were shown around. They met its staff and were shown its facilities and HQ station, GB3RS.

Many Council members, staff and members were associated with various aspects of the 75th Anniversary Convention and the other activities. Of the non-Council member volunteers, special mention must be made of Norman Miller, G3MVV, the Chairman of the Society's Exhibition and Rally Committee. To all those members who contributed to the event, Council owes its sincere thanks.

A host of messages of goodwill were received from all over the world. Many of these were reproduced in the October 1988 issue of Radio Communication. Perhaps Dick Baldwin, W1RU, the President of the International Amateur Radio Union, summed it all up - "On behalf of the IARU, an organisation of 126 national Societies, representing nearly two-million radio amateurs, congratulations to the RSGB on its 75th Anniversary and its founding. Your Society has been a leader in all facets of amateur radio from the very beginning of history. A leadership that has been beneficial, not only to your own members in Great Britain, but to amateur radio worldwide. We are grateful for the important role you have played in international amateur radio and we look forward to your continued preeminence for many years to come".

Project YEAR.

Project YEAR is no more or less than a major RSGB initiative to highlight the fact that if amateur radio is to continue, there needs to be more radio amateurs. The message is getting home slowly, and surely. Amateurs are talking about the need for more amateurs over the air and at meetings. Some Clubs have grasped the initiative and are working hard to interest, recruit and train new radio amateurs.

In his speech which launched Project YEAR, His Royal Highness said that "perhaps the greatest satisfaction for the young enthusiast comes with the discovery that this hobby has provided a way into an interesting and rewarding job". He said project YEAR was "a thoroughly good idea".

Having got the Project off the ground, the Society published a full explanation of the scheme in the September 1988 issue of RadCom, together with a survey for every member to consider. In January 1989 the results of the survey were published. The Society acknowledges with great thanks the full co-operation that has been achieved with both the Scouts and Guides on all aspects of the project YEAR initiative.

One essential ingredient for any project, if it is to be successful, is financial support. Since even initial progress on project YEAR would cost money Council accepted the proposal from the 75th Advisory Group to hold a lottery. The Society had never undertaken such a project previously. It was however successful in raising funds and the winner, from Windsor, was presented with a bright new red Ford Escort on 9 March, 1989. The Society thanks again those traders that donated prizes for the lottery.

As a result of the support given to the survey and the lottery, plus the enthusiasm shown and the general support being offered by individuals and Clubs, more work was undertaken to progress each of the six main elements of the project.

1. Recruitment video.- Though some preliminary work was done in the Summer of 1988, an offer of sponsorship by one of the large independent tv companies for production work proved too good to pass by. It was felt that a considerable amount of ground work needed to be done even before work commenced on the script. A substantial survey was sent to all members known to be under 25 years of age. It asked what had first attracted them to amateur radio and what activities they were currently interested in. Having analysed all of the results, the script is currently being written.
2. Books.- A series of some 12 books, which take the non-technical beginner into amateur radio and forward to the Novice Licence, have been planned. Work has been done on technical standards, and the Novice Licence syllabus itself, since many of the books will in fact teach the Novice Licence syllabus. The first book has been written and currently illustrations are in the course of preparation.

3. DiY-Radio - Proposals for generating material for a regular publication aimed at non-technical beginners have been discussed and the plans seem viable. Methods of production and the costs of launching a new magazine at the appropriate time remain under discussion.
4. The Novice Licence - A key element of Project YEAR is the Novice Licence. Council believe that the overwhelming evidence is that such a licence is likely to attract more people into amateur radio at a time when there is little or no growth and at a time when so many other activities can be enjoyed with little or no study at all. That more people involved in the hobby is both good for it and for its future well-being is without question.
   In July 1989, the Society's Immediate Past President, Sir Richard Davies, KCVO, CBE, C.Eng. FIEE, G2XM, chaired the Society's first Industry Conference on Project YEAR. This was arranged in close co-operation with the DTI who co-sponsored the event. The Conference was opened by the then Minister, Robert Atkins, MP, Parliamentary Under-Secretary of State for Industry. At the Conference Sir Richard took the opportunity to present the Society's Novice Licence Discussion Document to the Minister (this was depicted on the front cover of the September 1989 edition of RadCom). Since then the Society has held one initial meeting with the DTI who have confirmed their support of the principles involved.
   Preceding the presentation of the Novice Licence Discussion Document to the DTI were lengthy discussions in Council and by various Society Committees, briefings to the RSGB Liaison Officers, RadCom articles and surveys, Club meetings and much feedback from the membership via telephone and correspondence. The Novice licence discussion document is available to any member at a modest price.
5. Low cost equipment - All of the research carried out by the Society indicates quite clearly that large numbers of potential beginners are put off the hobby because of the cost of beginners equipment. Gone are the days when an aspiring swl could purchase a good quality ex-WD communications receiver for a fraction of its real cost. It is a fundamental aspect of project YEAR that these problems be overcome and it is the RSGB's Technical and Publications Advisory Committee which is leading the way. Transmitters and receivers, suitable for Novices, are a fundamental part of the thinking.
6. Funding - A number of contacts were established during the year with a view to future funding for project YEAR. One such contact was with the Society's local member of Parliament, Cabinet Minister Cecil Parkinson, MP, who visited RSGB HQ during September 1988. It was from this visit that the idea of an industry conference grew. Some 12 companies and organisations have to date agreed to sponsor the project in various ways; some little, some large. However the main thrust from the Society has came from the joint RSGB/DTI project YEAR industry conference held in July 1989, which was reported in the September 1989 issue of RadCom. The proceedings of this conference are available to members.

DTI and Licensing Matters

The commitment of the Department of Trade and Industry (DTI) to the future of amateur radio has been in much evidence during the year. Undoubtedly the DTI appreciate the value of amateur radio in introducing people of all age groups to science, engineering and electronics. For the young, and as people with potential scientific and engineering skills in the future, amateur radio can be especially beneficial; it is therefore well worth encouraging.

The Young Amateur of the Year Award was sponsored by the DTI in 1988 initially for one year only. However, the award proved so successful that the Department have now agreed to sponsor the project for a further two years in 1989 and 1990. The first recipient of the award, Andrew Keeble, G1XYE, became quite a celebrity in his own right. He appeared on RadCom's front cover twice, took part in radio programmes, travelled to RSGB HQ on numerous occasions to represent young amateurs and was involved in meetings to discuss the future of the hobby. Andrew was almost showered with other prizes which included a one week course, given by the Mobile Radio Users Association, and a week in Vienna, courtesy of the RSGB sister Society in Austria, the Osterreichischer Versuchssenderverband (OVSV). Andrew's Parents, Peter and Barbara Keeble, who became know well to HQ staff during the year, remained calm and serene throughout the whole experience, as did Andrew's Headmaster, who was most co-operative in allowing Andrew to attend various RSGB functions during term time. To the DTI, MRUA, OVSV, Andrew's Parents and School and to Andrew himself, go the sincere thanks of the RSGB.

In demonstrating the real value and positive aspects of amateur radio to a young person, Andrew has been delightful and a credit to the fine traditions and values within the hobby. His successors have a tough act to follow.

In conjunction with the IARU, the organisation which unites the now 128 National Amateur Radio Society's in the World, the RSGB has continued to defend all aspects of licensing and the frequency allocations which radio amateurs are granted. To that end the Society has responded to Government requests for information; most notably, this year, on the use of the spectrum above 30 GHz. The numerous bands allocated to the Amateur Service(s) in the past were granted on the basis of their experimental value and utilisation. With the advent of keen commercial pressure on wide sections of the radio spectrum, coupled with a somewhat static number of radio amateurs, there is no doubt that the IARU and national Societies, including the RSGB, will need to give spectrum management more effort in the future. The number of radio amateurs regularly using the bands can be equated to the number of people using the railways. The RSGB does not wish to see a "Beeching effect", but it is up to every individual radio amateur, whether a member of the RSGB or not, to help and encourage tomorrow's radio amateurs. No amateurs, no bands, no amateur radio.

Preparations for the next ITU World Administrative Radio Conference, now set for 1992, have been discussed internationally and by the Society during the year. The RSGB, as one of the leading national Societies in the world (a founder member of the International Amateur Radio Union in fact) intends, yet again, to play a major role, with the IARU, during the build up to this next Conference. The Society's increasing participation in the Regional IARU Conferences and the support given to Region I especially, is evidence of such intentions. Though the ITU Conference in Seville, Spain in 1992 is as yet without an agenda, it is to be expected that several of the key amateur bands might be under some threat. Hence the need for vigilance, proper preparation and the need for unity of purpose, both nationally and internationally. What is perhaps a little frustrating is that so many members of national Societies around the world perceive them only as providers of a monthly magazine, a QSL Bureau and the other direct services. It can not be over-stressed that it is the national Societies which liaise with Governments to defend the precious frequency allocations and which constantly seek greater freedoms on behalf of their nations amateurs. This work alone justifies the support of each and every active radio amateur throughout the World.

On 1 January 1989, UK radio amateurs were granted new freedoms through the publication of a new licence document. Many hundreds of hours of work by both the DTI and RSGB personnel had been utilised in order to produce this new licence. Many changes for the better had been incorporated. What is also refreshing is that there now seems to be an annual opportunity to "fine-tune" the licence. Such a process is efficient on resources as well as enabling changes to take place as the desires and aspirations of radio amateurs and other users of the radio spectrum change with time.

Another new freedom for UK amateurs was the upgrading of the 18 and 24 MHz bands on 1 July 1989. Though the agreement for these changes had been made at 1979 WARC the changes which came into effect this year allowed complete freedom for antenna experimentation, additional modes and an alignment of the power restrictions to the other HF amateur bands.

Licensing conditions with respect to the new and popular method of communication - packet radio - were changed during the year. The main facet of the discussions centred around third party messages, log-keeping and unattended operation. The latter two aspects of licensing were specifically addressed, following lengthy discussions with the DTI, in a Gazette Notice, published on 30 September 1988. These changes were later fully incorporated into the 1 January 1989 new licence. On the question of third party messages, this matter was again discussed with the DTI over a period of many months. On 30 September 1988 the DTI issued a Press Notice, the effect of which has since been felt around the world. In essence, the DTI confirmed that messages originated by, and intended for, a licensed radio amateur, were not considered to be third party messages. The prime result of this Press Notice was to clarify the fact that the passing on of such messages between licensed amateur stations was quite legal. A number of other prominent national Societies around the world welcomed this clarification which has since been endorsed and adopted by the US Government and by other nations. In addition, a method of permitting GB7 mailboxes was discussed and implemented in conjunction with the DTI. In this area of licensing it is believed that the UK is the most progressive licensing authority in the world.

Yet another example of the UK lead in amateur radio spectrum management has been the licensing of the 50 MHz band. No report such as this would be entirely complete without it being noted that as a result of the RSGB/DTI initiative many other countries in Western Europe now permit their amateurs to use the 50 MHz band. Some exciting and unexpected propagation has been experienced and the Society is pleased to note that usage of the 50 MHz band has started to relieve the pressure on the overcrowded 144 MHz band.

As a consequence of the new licence, greater freedom within CEPT member countries is now permitted for UK radio amateurs. On 1 January 1989 agreement TR61-01 was formally put into force by the UK Government. UK radio amateurs may now operate in 22 countries without the need for the paperwork previously involved in connection with a reciprocal licence. The question of a Euro-licence, leading perhaps eventually to an International licence (akin to the International Driving Licence) has been discussed with the DTI. The Society supports and will react positively to any scheme which helps to reduce bureaucracy.

Remaining in Europe, it must be noted that some of the legislation that can be expected in future years may not be entirely beneficial to radio amateurs. Some complex questions have been raised and discussed during the year concerning the EMC Directive from the European Community. No doubt all member countries of the EC will experience some advantages and some disadvantages as national legislation is merged with

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COMMITTEE AND OFFICER REPORTS

EMC

Committee: G1WZZ, GM3WIL, GM4HYF, GM8KPH, GU3YIZ, G1OSC, G3BLE, G3GVM, G3JWI, G3OSS, G3UFB, G3VWK, G3XZB, G3ZCV, G4DXA, G4EZC, G4FWM, G4IWS, G4JKS, G4JXO, G4RLE, G5HD, G6JR, G8KLH, G8SOZ

Over the last year, the work of the EMC Committee has not been particularly visible to the general membership, but this does not mean that work has not been progressing at a rapid rate.

The Committee has been represented at the main conventions, and presented papers on EMC and on the forthcoming European Directive on EMC. Additionally, a paper was presented to the IARU Region 3 Conference on behalf of the Society.

Members have continued to give presentations on their work to various clubs around the country and it is hoped that this can be maintained in the future.

The major visible achievement was the agreement of the RadCom Editorial staff to provide a bi-monthly column on EMC, and this is now appearing. The text is mainly from Committee members but contributions are welcome from any member of the Society.

The provision of an RSGB EMC Manual has been frustrated by cost constraints and the attendant problems of production. It is hoped that this will be resolved in the first quarter of 1990.

Relationships with other RSGB committees and also with the DTI have improved over the year and various members have been given the task to liaise on a regular basis.

The EMC Coordinators Scheme was approved by RSGB Council, and much effort is being directed to have the project in place by 1 October 1989. The Scheme will hopefully provide local volunteer effort to help amateurs with breakthrough problems by giving advice.

The Committee has been active in discussion with our European Community partners in formulating a coordinated effort towards protecting the service after 1992. This had led to the formation of a European group within IARU Region 1 at Ham Radio in West Germany.

At the end of the year, the Chairman of the Committee resigned due to pressure of work in his daytime job, and our thanks are passed to him for all his work over the last two years.

Alan Dearlove G1WZZ, Chairman

EXHIBITION & RALLY

Committee: G3MVV, G3SZJ, G3TDR, G4HHB, G5HD

The Committee met twelve times throughout the year under review.

Committee work, in the main, falls into the same pattern as recent years; planning the National Rally at Woburn Abbey in August, the Trade Show at the VHF Convention in the Spring and our National Convention.

Our 75th Anniversary event gave the Committee considerable planning over a normal year. Much consideration was given to the location of a suitable venue, with the necessary accommodation to house our many overseas guests.

A rather disturbing element has crept into Exhibitions and Rallies, the practice of certain traders selling faulty equipment, the telephone calls and letters of complaint are far too consistent for it to be a coincidence. The Committee feels that the visiting radio enthusiast should not be subjected to such treatment at RSGB events. Much of the Committee's time has been spent in dealing with this matter in order to try and eliminate the small percentage of traders who undertake this practice.

Plans are being made to hold our National Convention again in 1990. It is hoped that the venue will be in Central England in order to allow as many members to attend as possible.

A note of thanks should go to the members of the 75th Anniversary Working team and all the volunteers who assisted throughout the year at various events.

Norman Miller G3MVV, Chairman

FINANCE AND STAFF

Committee: G3VPK, GM8BZX, G2AMV, G3FKM, G3LP, G3VPE, G3YGF, G4CHH, G6JP, GW8HEZ*, G3OUF (Staff)

The full Committee met six times during the year with meetings lasting between four and six hours. In addition, working groups met on five occasions to consider staff organisation, budget matters and the QSL Bureau.

Once again the main preoccupation of the Committee was the close monitoring of income and expenditure in order to influence the trading position at year end. The monthly management accounts have given good visibility for the majority of Society operations, but a number of activities need to be included to allow full financial control to be exercised. These improvements are linked with an upgrading of the hardware and software for the IBM computer which has, of late, been showing its age in terms of performance and reliability. The Committee is presently performing a cost benefit analysis of this computer upgrade.

As part of the overall policy of tight financial control a pilot scheme involving cost centres was implemented in one department with elements of success being demonstrated during the year. Consideration is being given to extending this scheme to all Society operations.

A large proportion of the cost of the popular 75th Anniversary Celebrations was an exceptional item of expenditure for 1988/9 and it was closely monitored during the events to ensure adherence to guidelines. The surplus resulting from the lottery helped to provide initial funds for the activities of Project YEAR. In the coming year

Sponsorship from Industry and Government is anticipated and the Committee has begun to consider how this can best be utilised.

New production procedures using modern desktop publishing techniques have been introduced for RadCom and books. The decision to approve capital expenditure in this area has been vindicated by the number of new books now becoming available.

The Honorary Treasurer, G2AMV, indicated that he wished to retire at the end of the 1988/89 financial year and considerable efforts have been made to find a replacement. A temporary appointment has been made whilst a permanent candidate is being sought. In January 1989, GM8BZX, joined the Committee following his election as Executive Vice President.

All committee members, especially G3VPE - who retires after many years as minutes secretary - are thanked for their support.

W J McClintock G3VPK, Chairman

HF

Committee: G3ZAY, G3FKM, G3HCT, G3KMA, G3PJT, G3RZP, G3VTT, G3XTT, G4BUO, G4FAM, GW4BKG*, G3DME*, G3GIQ, G3GVV*, G4DYO*, G4JVG*, G5XB*, G6LX*, G8GOJ*.

Tasks during 1988/89, included the organisation of the HF Convention, a review of HF content in RSGB books, preparation of papers for the 1990 IARU Conference (covering equipment standards, a QSL Manager's code of practice, and operating manners), selection of G5RP and ROTAB Trophy winners, management of the RSGB awards programmes, and bandplanning.

During 1990, the Committee will be reviewing overseas contributions to the IARU Conference, considering whether a tighter policy on contest limitation is desirable or possible, and re-visiting bandplanning issues such as packet radio and beacon allocations.

The Committee always welcomes constructive input from Society members on the above, or any other issues. Letters should be sent to the Chairman, Martin Atherton, G3ZAY, at 41 Enniskillen Road, Cambridge, CB4 1SQ.

Martin Atherton G3ZAY, Chairman

HF CONTESTS

Committee: G6LX, G3FKM, G3HCT, G3KDB, G3LET, G3MCX, G3SJJ, G3UFY, G4DRS, G4IFB, G4JKS, G4RWW, G3KKQ*, G3OZF*, G3RJV*, G3ZAY*, RS20249*, RS32525*

The work of the Committee is to organise, publicise, adjudicate and report on the Society's HF Contests. This work is broadly divided into work done by the Committee in formal session and the adjudication of contests which is dealt with by individual Committee members and small sub-committees. During the year, the Committee met eleven times in formal sessions to decide policy, review contest rules and results, make recommendations for contest awards and deal with related matters.

The Committee has close links with IARU Region 1, via G3FKM, who is the Secretary of Region 1 and also through the Committee Chairman who is the Convenor of the Region 1 HF Contest Sub-Group. During the year members of the Committee visited a number of clubs and societies to talk on contest matters and to answer members questions. The Committee also had a stand at the HF Convention and members assisted at other Society

functions. On behalf of RSGB Headquarters, the Committee provided HQ stations in the Commonwealth and the IARU HF Championship Contests. Committee members are active in other Society committees including EMC, HF, IARU, LAC and VHF Contests.

All HF events are kept under review to ensure that the scope and the rules take account of necessary updates and the comments of regular entrants to RSGB HF Contests. This has resulted in some changes to the format of several events and further alterations are planned for the winter contest season. AFS and NFD continue to attract wide support from clubs and groups, while the Commonwealth, 21MHz CW and 21/28MHz phone contests remain very popular with both UK and overseas entrants.

The shorter events have been supplemented with a new Clubs phone contest and there have been changes to the Regional Roundup event. The Town and County phone contest has been reinstated, albeit in a modified form and the 7MHz Phone Contest is being replaced with a new Low Frequency Phone event. There have also been alterations in the format for some other events to make them more attractive for the newly licenced amateur.

There have been several changes in the Committee membership during the year. Both G3OZF and BRS20249 had to give up being full members of the Committee because of increased business activities. We are pleased that they will continue to help the Committee as Corresponding members. It was a pleasure to welcome G3LET and G4DRS who joined the Committee during the year. The Chairman thanks all the full and corresponding members for their efforts and for giving up so much of their time for Committee business.

Ron Glaisher G6LX, Chairman

IARU

Committee: G3GVV, G3FKM, G3WDG, G3WSN, G3ZAY, G3ZNU, G4IQQ, G6LX, G3AAJ*, G3DME*, G5XB*

The Committee met on five occasions, carrying on some of its work by telephone and by correspondence, at considerable saving to the Society.

G3GVV represented RSGB at the Region III Conference, Seoul, presenting Papers on Contests, the RAE, EMC standards, 50MHz in Europe and VHF/UHF Propagation. He was actively involved in a working group which examined in detail and formulated proposals for future frequency allocations in the amateur and amateur satellite service. At the Committee's first meeting after this Conference, VK3KI/G3ZML (Vice President of IARU) spoke of the role of RSGB in the international area, where it provides leadership and guidance.

The Committee's main preoccupation has been the review of information from other societies, with particular reference to spectrum occupation and utilisation, and the preparation of documents for the 1990 Region I Conference. Input from G3AAJ on the satellite service, and from G5XB on the Monitoring System, has been of particular value and interest.

Now that it has been confirmed that the next World Administrative Conference (WARC) will be held early in 1992, when the frequencies in jeopardy of re-allocation are:-

HF (3-30MHz)
500MHz to 3GHz
Above 12.7GHz

it is imperative that the prime function of IARU be realised: it is the organisation by which unanimity and concerted effort for the preservation and extension of amateur bands is organised and coordinated.

R J Hughes G3GVV, Chairman

LICENSING ADVISORY

Committee: G3YGF, G3FKM, G3HCT, G3STG, G3WDG, G3WSN, G3ZNU, G4FJN, G4CCC, G4AFJ, G3OUF (staff), G3XDV (staff)

The main work of this Committee involves liaising with the DTI to maintain and improve the facilities available in the amateur licenses.

There has been a higher turnover in the Committee membership this year, but in particular we note with great regret the death of Bob Osborne, G4FJN, who made a great contribution in the effort he put into running the Observation Service (AROS). John Bazley, G3HCT also took over as Chairman from G3YGF on the latter's appointment as President.

The highlight of the year was the introduction of the revised licence on 1 January. Amateur radio has evolved dramatically since the sixties, and a revision was long overdue. As well as bringing the licence into line with current operating practices, a number of new facilities, such as maritime mobile, have been introduced. The revision has taken up a considerable amount of time in recent years, and involved dozens of meetings. It is therefore particularly gratifying to see that the implementation seems to have gone very smoothly, and that six months after its introduction there have been remarkably few problems. There are a few loose ends remaining, and these will be tidied up when the licence booklet is reprinted later this year. One contentious issue was note "aa", regarding single band equipment for 28MHz. This was finally resolved by the publication of a Gazette notice in February.

As part of Project YEAR, a draft schedule was generated for the Novice Licence proposal which was presented to the DTI at the Industry Conference on Project YEAR in July. This involved striking a delicate balance between granting a sufficient range of facilities to arouse a beginner's interest, but not so many that it would be seen as devaluing the achievement of existing licensees. The DTI have reacted very favourably to these proposals, discussions are continuing.

RSGB is continuing to distribute Notices of Variation for packet mailboxes, and progress is being made in increasing the number of bands and frequencies which are available for unattended operating/linking.

On the international side, a meeting of European Community National Societies was held in Dusseldorf in February to discuss our responses to the EC EMC directive. It was very productive, and with the approach of 1992, there will be an increasing need for close liaison between the Societies in the EC.

Julian Gannaway G3YGF, Chairman

MICROWAVE

Committee: G3PFR, G3JVL, G3PHO, G3WDG, G3YGF, G4DDK, G4ELM, G4FRE, G4KGC, G8AGN, G3JHM*, G3XDV*, G3ZNU*, G4FSG*, G4KNZ*, G3GVV¶, G3RWL¶

The Committee met seven times during the year. As in previous years, the Committee brief has covered much general day-to-day business as well as the special projects which, as a consequence of Project YEAR, were extended to cover the proposed Novice/Student Licence. Microwave Committee support for this project was seen to be particularly important and culminated in significant input into the Discussion Paper submitted to the DTI in July this year.

Once again there has been a strong bias to frequency planning resulting from continued spectrum pressure and increasing primary user occupancy of many of the bands. Some progress has been made by packet user groups in implementing the use of 1.3GHz for dedicated higher speed links between user access nodes, ie for mail forwarding.

The special projects for 1988/9 have met with varying degrees of success, as follows:-

1. Following the 1988 24GHz promotional project, wideband activity on the 24GHz band has increased quite considerably and the first of the new operating awards have been made: we would like to see this activity continuing and continuing to expand!
2. Careful frequency planning, as and when required, has occupied much time and was extended to cover the new licence conditions which came into effect in January this year.
   Detailed frequency planning to accomodate these has, nevertheless, been completed: this has to some extent been complicated by consideration of the microwave needs of the Novice/Student licence.
   It was early recognised that access to selected microwave bands could offer the Novice or Student opportunities which were not present in other amateur allocations. The outcome of this recognition was the recommendation that full access, with limited power and operating strictly within the bandplans, be given to holders of such a licence using the 1.3 and 10GHz bands.
   The UK plans were published in full as a paper in the Sandown National VHF Convention "write-up". Abridged versions have appeared in RadCom and will be submitted to IARU as the detailed, interim UK bandplans which are broadly in line with Region I plans, except where national variations are indicated. It is recommended that other Region I societies seek similar concessions.
3. Preparative work for the next WARC, tentatively in 1992, includes the above planning and will continue the search for common microwave frequencies which will accomodate the future needs, hopefully of the majority of countries in Region I.
4. Technical work to support the work of the Council Working Group on the Student Licence has continued and has resulted in the compilation of a number of microwave designs suitable for the beginner, especially when constructed under guidance. Work towards compiling a Novice/Student Guide will continue, with the emphasis on progressive construction and experiment in the 1.3 and 10GHz bands. Much work remains to be done in identifying or designing "common" equipment (ie usable on more than band, such as "tunable IF" receivers, simple test gear and power sources), there being little available either in kit form or commercially.

5. Design and building of equipment for the new satellite packages just launched or about to be launched are already supported in the 1.3GHz band by the well-known, basic G4DDK designs: it is hoped to finalise a receive converter module shortly. The 2.3GHz band will be supported in a similar manner by another G4DDK design for a reproducible 2.0 to 2.6GHz local oscillator source, to be published soon, followed by available boards.
6. Promotion of home design and construction, via the John Rouse Memorial Trophy and Premium has again resulted in poor response and, indeed, throughout this year the general level of microwave activity, both operating and constructing appear to have reached an all-time low, judging by the paucity of operators' reports. This has often led to "editorial" difficulties with both the Microwave column and the Microwave Newsletter.
7. Progress towards publication of the long awaited Microwave Handbook has been made, although again other Society publications have necessarily taken editorial priority. Volume 1 of the handbook will have been available for some months before this report is published. Volumes 2 and 3 are at an advanced stage of production and should be available within a short period after the report.
8. Work on a possible video presentation of amateur microwave activity has, as a consequence of these other activities, not progressed. However, it has taken on new significance, in that there will be a need for instructional material to support the proposed Novice/Student Licence. This will be undertaken professionally through an industrial sponsor, although it is expected that this Committee will certainly supply much of the material needed.

Apart from the purely "routine business", next year's Special Projects will continue largely unchanged, such is the volume of work associated with the recent licence changes and including the necessary support to the new licence.

I would again like to take the opportunity to thank all those who have contributed to the Committee's work during the year, some of them members of the Committee and others, outside the Committee, who have also made significant input to the work reported here.

Mike Dixon G3PFR, Chairman

MORSE TEST STEERING

Committee: G3GDO, G3AEZ, G3LP, G0KFB, G4FLQ (Staff)

The service, though well-established, has been re-organised in some areas to provide better cover, and several Examiners have been recruited to fill in dead spots. Applications remain steady and the general standards have improved. Some 90 disabled persons with diverse conditions have been examined, and once again it is pleasing to note that they have reached a high standard, of which they may be proud. There have been minimum complaints out-numbered by numerous bouquets, surprisingly some of the latter from those who failed.

Thanks are especially due to all Examiners for their continued efficient service, and to our new stalwart, Fiorina, at HQ, who has done such a good job.

Neville Ianson G3GDO, Chief Morse Examiner

REPEATER MANAGEMENT GROUP

Committee: G4AFJ, GM8LBC, G3URE, G3VZV, G3XDV, G4CCC, G4MDC, G4NJU, G6LMR, G8ASI, G8IMB, G8SSL, G3ZNU*, G3PFR*, G3WSN*, G4DAX*, G4EFO*, G4MQS*

Repeater Regional Representatives (corresponding): G0BEQ+, G0COA, G0FKE+, G1GNS, GM3AXX, G3GHS+, G3LEQ, G3TZM, GM3UKG+, G3UQH, G3YXZ+, GI4FUM, G4HSY, G4PJZ, G6AWT, GM0HNX+, G8FWY+, G8HVV, G8JNZ, G8UCY

(+ = resigned during the year)

I am pleased to be able to report that due to improved liaison with the DTI, the processing of repeater proposals and site changes has been much quicker during the past year. Some licences have been issued within a few weeks. The licensing of 430MHz repeaters is considerably improved and several repeaters that had been in the pipeline for over 2 years have been cleared. I hope that this will continue to be the case.

A report was submitted to the DTI concerning the transmission of GB2RS on repeaters and it is hoped to extend this service in the future, including the use of TV repeater transmitters.

The linking of repeaters proves to be an area of slow progress partly because of the interest in packet repeaters. RMG have produced specifications for three different types of repeater linking which seem to incorporate most of the ideas produced by groups. It proves dificult to get a firm commitment from many groups, and this leads to quite long delays before negotiations with DTI can even begin. It is hoped to present the specification for the simplest type of linking to DTI soon. One success during the year was the approval by DTI of a 10GHz "gateway" to an existing 1.3GHz repeater.

The Repeater Regional Representative system ran into serious difficulties during the year. Only 8 of 20 RRRs attended the annual meeting at the NEC. Problems arose when resignations took place. It proved very difficult to fill the vacancies and the system did not seem to be very cost effective, as in the later stages of the year less than 50% of the RRRs were functioning effectively. Long discussions took place about how to improve the situation and it became apparent that reform of the system was required to both increase efficiency and also to cut costs. It was agreed that the Regions should be redefined to coincide with the RSGB Zones and Regions system. Towards the end of the year discussions took place with Membership Liaison Committee (MLC) on how best to reform the system. It was felt that the RSGB Liaison Officer organisation could take over part of the role of the RRRs.

Routine business formed the main part of the work of the Committee, and included vetting new proposals for the DTI, responding to licensing queries from the DTI, encouraging repeater groups to provide a good service, monitoring technical standards and compliance with licensing conditions, giving technical advice to repeater groups, resolving interference problems, ensuring the accuracy of HQ records, providing a stand and organising meetings at VHF Conventions, producing Repeater Report, briefing the VHF Manager for the VHF Managers' meeting, checking with groups the accuracy of emergency closedown information, drafting technical specifications, collating service area maps, and producing a section on repeaters for the new Callbook. A number of requests for help and advice were received from overseas including Italy, Russia and Cyprus.

I would like to express my thanks to all members of the Committee for their support and the repeater groups for their forbearance. I would also like to thank the staff at HQ and in particular, Mike Dennison. Finally thanks to all those individuals in repeater groups whose work keeps the repeater network up and running.

Geoff Dover G4AFJ, Chairman

PACKET WORKING GROUP

Committee: G3XDV, GM4AUP, G0/K8KA, G3VPF, G4CLI, G4MTP, G6HIU, G8IMB, G8KHV, G8LWY, G1DIL*, G3MRX*, G3NRW*, G3PFR*, G3PLX*, G3RUH*, G3WDG*, G3WSN*, G3XTT*, G6DLJ*, G6KVK*, G8ONH*.

The major event of the year was the legalising of packet radio, and of some types of unattended operation, on 30/9/89. Together with a clarification by the DTI of the definition of third party traffic, this put packet firmly into the UK licence following more than a year's work by members of the PWG and others. Several foreign administrations, including the FCC in the USA, have subsequently drawn on these regulations when updating their own licences. Discussion continues on further enhancements to the regulations.

John Theodorson, G4MTP, took over the job of Mailbox Coordinator from G1DIL, and in his first 9 months he approved 122 applications for mailbox Notices of Variation. He also recommended the rejection of some, and discouraged others, usually in areas where mailboxes already existed.

Martin Stubbs, G8IMB, continued his work of processing applications for DTI Site and Frequency Clearance. Over 100 applications for packet repeaters and mailbox ports were sent to the DTI. This covered the 3.5, 7, 10, 14, 21, 28, 70, 144, 430, 1300, and 2300MHz bands, the majority being on 430MHz. Ninety new licences were issued by the DTI. This included the first AMTOR mailbox, and the first UK unattended operation on 7, 10, 14 and 21MHz.

An important part of each committee meeting was discussion on the direction in which the UK packet network should be developing and how RSGB policy could influence it. One output of this was the provision of a paper giving advice on equipment for the microwave bands; another was a meeting with two of the most influential packet software writers in the UK.

One of the PWG's roles is the giving of advice and information, and the promotion of discussion. This was achieved in several packet radio bulletins, and in contributions to Connect International and RadCom's Datacomms column (the Editors of which are PWG members). In addition,

PWG members organised the 1989 RSGB Data Symposium (part of DataSpace '89), and contributed many of the papers and lectures.

Close cooperation was maintained with the three spectrum committees (HF, VHF and Microwave) resulting in improved packet allocations on many bands. Technical advice was also obtained from the Microwave Committee. Papers were submitted to the HF and VHF Committees for use at their respective IARU Region 1 Working Group meetings and at the 1990 Conference.

All PWG meetings are open to observers who book beforehand, and six people availed themselves of this facility.

Other work included representing the Society at the quarterly mailbox/node SysOps meetings, and monitoring the progress of medium and high speed modem experiments.

During the year the PWG presided over the formalisation of the UK network, and its expansion from a single-band network to a multi-band one. 1989/90 is expected to another busy year in which high speed microwave trunk links come into their own, and more attention is given to the needs of the end user in terms of the quality of packet software and the uses to which the network can and should be put.

Mike Dennison G3XDV, Chairman

PLANNING ADVISORY

Committee: G8GG(P), G3LP, G3TZZ, G4GJB(P), G4OVX, G5HD, G4SHF(P)$, G3PVH(P)$, GW4ZXG(P), G4OIG(P), G8NXU(P), RS39901(P)$, G6MNF(P), G4YRS(P), G4LYX(P)$, G3GVV, G0IID, G6XM, G3HJF (staff)

NB: (P) Undertakes full case work for members

$ Currently requests no additional case work because of pressure of own professional work

Special objectives as agreed by Council at the beginning of the year:-

(a) Complete review of brochure "Planning permission - advice to members".
(b) Progress concept of local planning representatives.
(c) Continue attempts to attract more members for Panel (Case work).
(d) Investigate problems likely to arise from LPA policies re satellite aerials

Progress on above:-

(a) New edition published. Changes in legislation being monitored with view to incorporation in revisions from time to time.
(b) LPR concept found to suffer from lack of local publicity, RLOs asked to publicise through clubs but even this can only reach that limited proportion of membership who attend local meetings. A better return for effort expended seems to be concentration on (c).
(c) Several requests in RadCom, Call Book etc, have not produced any response but a larger, more prominent item in June RadCom has resulted in three offers of assistance, two of these from the South of England where pressure is greatest. Our Panel member from Scotland has been moved south of the border and although still able to supply expertise on GM Law and practice, increased distance can only further limit the range of assistance offered. Hope to arrange another "special" RadCom notice later in the year.
(d) Reduced public interest in satellite TV appears to have extended to local councils and no information about special policies has been received. The matter is therefore being put in abeyance.

Progress in other areas:-

(a) Case work:-

The main pressure appears still to arise in the south of England where Panel members are often under considerable pressure from their own professional activities. Although the number of cases dealt with by members has reduced to 41, there have been a considerable number of general queries, some being made in advance of action by the amateur rather than after trouble has developed. The first query from Northern Ireland arrive during the year and could only be dealt with in very broad terms due to absence of any member with knowledge of GI law and practice; no further information has been received about this case in spite of various requests.

The "mobile mast" case referred to last year was considered by the High Court and referred back to the Minister for further consideration. The appeal is to be reopened in August and will be the subject of a special report when the new decision is received.

The Committee learned of a case where an amateur had over a number of years submitted a series of apparently similar applications for mast and aerials. These had been refused and appeals dismissed. The latest appeal had led to costs being awarded against the amateur.

(b) Consultation on policy documents etc:-

Following the coming into operation of the revised General Development Order, DoE consulted in respect of suggested new types of application forms and the introduction of a special "Telecommunications Microwave Antennas" form. The response has doubted the need for such a form and that it could lead to pressure for amateurs to use it for any type of aerial proposal. Also for fees to be charged on a commercial user basis rather than the Householder rate currently used. No information has yet been received of DoE reaction.

Special objectives for the coming year:-

(a) Review the impact, if any, of the "mobile mast" case.
(b) Review the effects of changes in the 1988 General Development Order and their interpretation by Planning Authorities.
(c) Endeavour to reinforce availability of case work assistance in Scotland.

H Fenton G8GG, Chairman

PROPAGATION STUDIES

Committee: G3LTP, G3BYW, G3DIP, G3DME, G3HTF, G3JVL, G3NAQ, G4AQI, G4KCZ, G8GRA, DJ5DT*, G2AHU*, G2FKZ*, G3USF*, G4MXM*, RS87676*

The Committee met six times during the 1988/89 Financial Year.

Several of its members have been busy with matters of a literary nature. Two books, one on radio aurora, the other on 50MHz propagation, have been completed, two papers have been published in professional contexts - a special supplement to JIERE and in the Proceedings of an IEE Antennas and Propagation Conference - and work has begun on the preparation of some propagation studies booklets directed primarily at young newcomers to amateur radio. A member of PSC provided one of the lectures at the 1989 VHF Convention.

Written contributions were made to the work of Study Groups 5 and 6 of CCIR (the International Radio Consultative Committee) and, in a new representation, one of our members is now co-operating with CCIR in their IWP 6/14, which is concerned with active experiments in HF propagation.

We supplied, on request, specialist predictions to the Fiennes North Pole Expedition. Other prediction matters dealt with included ways of checking the usefulness of our monthly tables using amateur beacon reports and the results of professional ionospheric soundings, the difficulties of providing short-term data (such as for grey-line working) in 2-hourly tabulations which had to serve the whole of the British Isles, and the possibility of providing a computer program to enable readers to expand our monthly prediction table into a series of much more informative world maps.

A new member of the Committee was appointed for the express purpose of making the maximum research use of HF beacon reception reports. Two other new members have filled vacancies caused by retirement moves to distant places.

It had been hoped to have a solar/geophysical data station operating by now but, although the transmitter is available and a succession of problems have been overcome, the necessary paperwork seems slow to emerge from the realms of officialdom. In the meantime the solar/geophysical data section provided for the weekly GB2RS news bulletins has been expanded to take full advantage of the available time-slot.

All our routine commitments, as outlined in the current Call Book, are continuing undiminished.

R G Flavell G3LTP, Chairman

RAYNET

Committee: G3STG, GM4SRL, G3FKM, G3KWU, G3VPE, G3WDG, G3WSN, G3YAC, G8CAC, G8RWH, GI4LVC*, GM3RFA*, GW4PUX*, G4EAN¶, G4EJP*, G4ETN*, G4FSS*, G4MWO*, G4PFO*, G4UJQ*, G4YMU*, G6BBW*, G4FLQ (Staff)

Once again a most dramatic year, as well as a year of quiet and continuing progress in developing the Radio Amateur's skills in providing communications for the community in times of need.

On the national front, obviously the most dramatic event for the Nation as a whole, as well as for those RAYNET members who were directly or indirectly involved, was the tragic event at Lockerbie over the Christmas period. From December 21 to 31, RAYNET operators lead by members from Dumfries and Galloway, and from Strathclyde, provided a commu-

nications service which had even the hardened Police communications teams open-mouthed in admiration. Up to 140 operators per day worked throughout the daylight hours and beyond to provide reliable communications throughout a search area which eventually extended over at least a 25 mile length. RAYNET members from many areas of the UK worked alongside members of the Police, Mountain Rescue, Military, Helicopter Pilots, Air Accident Investigation Branch, Social Services, Salvation Army, WRVS and many other agencies. The work was gruelling and traumatic, and many members will carry memories of that operation with them for many years to come.

Detailed debriefings were subsequently given to the Home Office, and to the Department of Trade & Industry, as well as to many Chief Constables, and to RAYNET Groups throughout the UK. Many important lessons were learned from the operation, and these are being consolidated and put into effect by the RAYNET Committee. My admiration and thanks to all those involved.

As if that were not enough, during the year under review, RAYNET members were also operationally involved in other UK major disaster relief events such as the Hillsborough Stadium disaster and the M1 Air Crash. The International scene this year has also seen a great deal of activity for RAYNET, and its overseas partner IARN. Operations connected with the earthquake in Armenia gave an opportunity to practice communication links through the UK between the East and West, and also provided operational experience with the use of the AMTOR mode. Hurricane Gilbert in Jamaica provided an opportunity once again for RAYNET to demonstrate its capability in providing communications for Her Majesty's Government and the Disaster Relief Agencies and User Services to the stricken areas. In particular, a request for operators to be sent out to the Caribbean underlined a need for RAYNET to be able to raise and mobilise its own funds in order to be able to provide a flexible response to this type of need, but confirmed that it was not difficult to identify volunteers who would travel with open-ended committment to the cause.

In the field of training and routine operations, the network was busier than ever with around 300 groups and 5,000 members working on over 1,000 events, all of which had implications for public safety, and many of which were involved with raising funds for charitable causes. Once again the familiar RAYNET tabard could be seen on TV at the London Marathon, the Birmingham Superprix, the RAC Lombard Rally, and many other events.

Modifications to the Licence regulations allowed RAYNET to undertake many water and sea-borne operations, and these have presented a series of interesting challenges and opportunities for service. In addition, the expanded list of User Services led to increasing opportunities for groups to develop new skills and relationships with for example the Ambulance, Fire and Coastguard authorities.

The Committee have been much involved with a series of discussions with other volunteer organisations, and with the Home Office during the development of the Government's new strategy for response to Peacetime disaster relief. This major policy review was undertaken following emergencies such as the Bradford Stadium Fire, the Hungerford Shooting and the Kings Cross Fire, and an increasing awareness is being shown that the role of the National Volunteer Organisations is of vital importance. The RAYNET Committee look forward to the appointment of the Government adviser in this area, and to working closely with him for the common good.

In other areas, the Committee's work has continued with thorough reviews taking place of frequency allocations, network response planning and a revision of the RAYNET Manual. The need for substantial training packages and for dramatic improvement in publicity support for members continues to be an area of major concern. The use by several groups of the Public Service Announcement facility offered by the media has proved an interesting development.

The work of the Zonal Representatives in passing information in both directions, and in organising Zonal Meetings and exercises has continued to be of great assistance. Without them, the work of the Committee would be made much more difficult, and remote from members. In addition, the regular 80m Sunday morning net under the callsign G4NRC, and the large number of group weekly nets help to provide cohesion and on-air training, whilst the data-base of RAYNET specific information provided on the National RAYNET Packet Bulletin Board GB7NRC, has been well used and supported.

Once again, the Network has been admirably served by the HQ staff, especially in the areas of membership registration, supplies and administration.

Sadly, this is the last report for RadCom that I shall be writing, since I retired as the Chairman of the RAYNET Committee at the end of June. Whilst wishing Philip and his Committee all the best for the daunting tasks ahead, I know that they will receive the support of RAYNET and Society members alike.

G Griffiths G3STG, Chairman

TECHNICAL & PUBLICATIONS ADVISORY

Committee: G3RZP (Chairman from January '89), G3SJX (Chairman to January '89), G1NQW, G3MRX, G3SEK, G3YGF, GW4BWE, G4FZH, G4LQI, G4SWX, G6JR, G6XM, G8DPS, G8EZE, G8ONH

The Committee has been totally reorganised, and the distinction between "ordinary" and "corresponding" members is now hardly applicable. Meetings are held twice per year, and the majority of the work is done by correspondence. Articles are now reviewed by a team of two reviewers after allocation by the Chairman. The lead reviewer is responsible for directly contacting the author, thus reducing substantially the time taken for an author to obtain a response. This system appears, after a few misstarts to be working well, and feedback from authors is very positive.

The appointment of a particular liaison person for each book is working well, and the re-organisation at HQ has led to a large number of books becoming ready for publication in the 1989/90 financial year.

The reorganisation of the Committee has led to the requested budget for 1989/90 being half of that allocated for 1988/89.

Peter Chadwick G3RZP, Chairman

TRAINING & EDUCATION ADVISORY WORKING PARTY

Committee: GW4HWR, G3OUF, G3PFR, G4JKS

As this is actually a working party the "make up" of the group changes with the work to be done. In the period 1988-1989 the group comprised: Dr Mike Dixon, G3PFR, Mrs Hilary Claytonsmith, G4JKS, Mr David Evans, G3OUF and Mr John Case, GW4HWR (Chairman).

The work of the year was largely consolidation of the details of the Novice Licence and the final discussion document was passed to the DTI at the Industry Conference on 20 July 1989.

A training scheme has been developed and work on the Training Manual (for instructors) was commenced. At the time of writing the draft of the text, together with all of the diagrams is almost complete. It is the wish of the group to have this manual in print by 1 January 1990.

The group was also involved in the task of assessing the entries to the "Young Amateur of the Year" competition, sponsored by the DTI, and our recommendations duly passed to them for their final decision. Work is now in hand with preparations for the launch of the new novice licence, which we hope will take place early in 1990

J Case GW4HWR, Chairman

VHF

Committee: G3ZNU, G2AHU, G3COJ, G3FPK, G3FZL, G3OSS, G3UBX, G3WSN, G3ZVW, G4ASR, G4CCC, G4VXE, GM4ANB*, G3GVV*, G3PFR*, G3RKL*, G3RWL*, G3SEK*, G3STG*, G3UUT*, G3VKM*, G3VZV*, G3XDV*, G3XDY*, G4OUT*, G5UM*, G8GOJ*

During the year, G4OUT was appointed VHF Awards Manager in succession to G5UM. G4VXE became joint editor of the VHF/UHF Newsletter with G4ASR, and joined the Committee. G3FPK joined the Committee being appointed as editor of the VHF/UHF part of Radio Communication's "Spectrum Analysis" column. At the end of the year, G3ZNU stood down as Committee Chairman owing to heavy business committments, and G3UBX was appointed Chairman for the coming year.

As one of its special projects, the Committee discussed the feasibility of a VHF Frequency Register as a partial replacement of bandplanning. The Committee decided to proceed to the next step and began the selection of a Frequency Registrar.

The 12.5kHz channel spacing study initial results were published. The Committee has been requesting comment from the membership, and will be analysing the responses received before progressing further.

The VHF Convention at Sandown Park was again successful, with many of the previous year's difficulties being overcome. Part of the upper floor was used for committee and affiliated groups' stands, and for the reinstated flea market. This led to far less overcrowding in the lower hall. Less successful was the Midlands VHF Convention, and it was decided not to hold the event again as it could no longer pay its way.

The Region 1 VHF Managers' Meeting, cancelled last year, was held in Dusseldorf and provided a useful forum to raise ideas which will be

discussed more formally at the Region 1 Conference next year. The Committee has prepared papers for the Conference, and will be reviewing papers from other societies in preparation for the Conference over the coming months.

The Committee processed a number of routine matters, amongst which were changes to the rules for awards, vetting of applications for special research (high power) permits and beacon applications. The Committee was also pleased to see the 50.000MHz GB3BUX beacon become operational.

Malcolm Appleby G3ZNU, Retiring Chairman

** Corresponding members ¶ Liaison Members*

REPORTS FROM THE . . .

. . . AUDIO VISUAL LIBRARY

Although some of the Library's stock is rather elderly, and some of the more popular cassettes are showing signs of over-use, several new titles have arrived in the last few months - mostly concerning DXpeditions.

Despite recent postal increases, the hiring charge remains at two pounds per cassette for one evening.

Borrowers are asked to ensure on all occasions that items are returned within the stipulated three days. Failure to do this causes hiccups and could lead to another club being disappointed.

R G Auckland G2PA

. . . HF MANAGER

The period since my last report has seen major changes on the hf bands. One of these was the unusual event of the arrival of two new hf bands. 18 and 24MHz had been available for some time, but the restrictions imposed on their use rather took away most of the interest.

The position with regard to packet usage on 14MHz was made more difficult for those of us in Region 1 by the decision of the Region 3 Conference to expand the higher limit of the mode upwards to 14.112MHz. Those who have been used to using the segment below 14.15MHz in order to avoid powerful USA ssb signals have been offended by the interference and the packet users appear to be unaware of the trouble they cause to the many relatively low-power phone stations and the NCDXF beacon system on 14.1MHz. We still do not know exactly what the future needs of packet on hf will be and unfortunately at the present time there seems to be a lack of "give and take" at times.

The meeting of HF Managers in September 1988 confirmed that in our Region, hf packet should remain confined within the rtty allocations. It also emphasised the need to encourage more use of the "WARC" bands. It reaffirmed that 10MHz awards should be issued and that the band should be publicised by activity days, dx weekends and articles in magazines. 18 and 24MHz should also be promoted actively. Last year the 18 and 24MHz bands were only available to many countries in a severely restricted way. I was pleased to have been actively involved in obtaining their full release in the UK on 1 July 1989.

During the past year I have again had the opportunity to meet many representatives of other societies and I would like to thank them for their fine cooperation. One very noticeable point at international meetings is that the contentious topics (other than packet) rarely involve hf!

John Allaway G3FKM

. . . HF AWARDS MANAGER

During the period under review, a total of 355 certificates have been issued details of which can be seen in the table below. This is a reduction from last year but was to be expected and reflects a change in emphasis in the Society's current awards programme. Certificates for WBC, CDXC, BCRTA and BCRRA are still available and these awards will continue to be issued as long as stocks last. Full details of these can be obtained either from the second edition of the Society's Awards Handbook or from the Awards Manager.

The IARU Region 1 Award remains the most popular, and the country producing the most applications continues to be the USSR.

The production of the new edition of the Society's Awards Handbook has produced increased interest amongst British amateurs not just in the domestic awards programme but in the many Awards available from overseas.

Whilst the Awards Manager is happy to certify overseas claims, it should be pointed out that in many cases the signatures of two other amateurs will suffice.

In addition to issuing certificates, much time has been spent in liaising with overseas Awards Managers and producers of Awards manuals to ensure continued publicity for the Society's Awards programme.

Mention should be made of UK amateurs who have achieved the following:-

Worked ITU Zones: GW4RHW, G3VOF, GM3CIX, G0ANH

Commonwealth Century Club: GM3CIX, GW4RHW, G0ANH, GM3WIL

5 Band Commonwealth Century Club - Class 4: G3SJX

In conclusion, the usual plea is made for return postage with any enquiries, and for applications a check list of cards in log book format.

	G	Eu	N.Amer	S.Amer	Asia	Africa	Oceania	Total
WBC	-	26	-	-	15	-	6	47
IARU	20	71	4	3	15	-	15	128
BCRTA	1	5	-	-	3	-	2	11
DXLCA	2	53	-	-	8	-	-	63
BLRRA	-	2	-	-	1	-	-	3
CDXC	-	1	1	-	3	-	-	5
WAC	61	-	-	-	-	-	1	62
28MHz (counties)	1	-	-	-	-	-	-	1
SBITUZ	-	7	-	-	-	-	-	7
WITUZ	4	9	1	-	-	-	-	14
CCC	4	3	-	1	-	-	-	8
SBCCC	1	1	3	-	-	-	1	6
	94	178	9	4	45	-	25	355

S Emlyn-Jones GW4BKG

. . . HISTORIAN

During the year there have been a number of letter or telephone enquiries notably about old callsigns or old pre-war equipment; not all have been successfully answered. Most have lead to a satisfactory conclusion.

There is apparently a considerable interest, particularly in the USA for information on the very early valves in this country, notably the multiplicity of types, which unlike the American market, designs varied very widely in this country.

For the 75th Anniversary, several "replica" items of equipment representing the middle 1920's were produced and shown at the NEC.

Work on an historical survey of valves, initially up to 1939 has been started, this will, hopefully, detail much of the construction used by different makers, which has so far not appeared in print.

G Jessop G6JP

. . . MICROWAVE MANAGER

The main work of the Microwave Manager has continued to be international in flavour. However, on the home front the Government's request for information on bands above 30GHz has been carefully considered and a response made in conjunction with the Licensing Advisory Committee. The extended report by the Chairman of the Microwave Committee includes mention of the next World Administrative Radio Conference in 1992. Preparatory work for the conference will remain the preoccupation of all national societies around the world.

Other matters considered during the year include the international co-ordinating of microwave bandplans and, in particular, how frequencies for high-speed packet links can be accommodated and co-ordinated. Microwave activity in connection with the Novice Licence has continued to be discussed and encouraged. The publication of Volume 1 of the Microwave Manual is expected to again stimulate microwave activity.

C W. Suckling G3WDG.

. . . TROPHIES MANAGER

1989 has seen the Society acquiring 5 new trophies. Those who participate in HF AFS will no doubt be pleased to note that there is now a trophy which is to be awarded to the leading individual in this cut-and-thrust contest. Marconi Defence Systems in Portsmouth have kindly donated this trophy to be known as "The Marconi Trophy".

The friends of the late Ted Wake presented the Society with the "G5RP Trophy". This will be awarded to the person who in the opinion of the HF Committee and the Vale of White Horse ARS has made the greatest progress in the DX field in the 12-month period July to June on the HF bands. The emphasis here being placed on progress.

Harold Mee has donated a magnificent trophy to be known as "The G5MY Trophy". This will be awarded to the entrant having the highest aggregate score in the ROPOCO contests. A true test of CW copying skill.

The last of the HF trophies to be presented to the Society this year is "The HFCC Trophy", donated by the present members of the HF Contests Committee. This will be awarded to the winner of the new LF SSB contest to be held for the first time in February 1990.

One new VHF trophy has been received by the Society from the West of Scotland ARS. This is awarded to the leading GM station in the restricted section of VHF NFD. There is no residency clause attached to this award.

As Trophies Manager I now look after the 33 HF Trophies, 13 VHF Trophies and 8 Council Trophies. All of these are engraved by John Cattermole, G8NPK, to whom thanks is due.

Hilary Claytonsmith G4JKS

. . . VHF/UHF AWARDS MANAGER

This has been an encouraging first year in the position of VHF/UHF Awards Manager and I would like to express my thanks to G5UM, Jack Hum, for all his assistance in the change-over period.

During the year there has been a trend for applicants to submit initial claims for high levels and miss out the lower levels which is reflected in the number of certificates listed for the latter.

One major change in the award rules is that a change of home location is now allowed so that an applicant who moves home no longer has to start collecting anew. However, several amateurs have chosen to start collecting afresh. Certificates awarded for operation from more than one home location are endorsed as such.

The 50MHz awards seem reasonably popular in spite of some difficulties in checking that the QSL cards confirmed contact with stations operating legally. Awards details to 30 June are as follows:-

Four Metres and Down Certificates:-

(Last year's issues in parentheses)

70MHz Standard Transmitting	3	(9)
70MHz Senior Transmitting	5	(4)
144MHz Standard Transmitting	12	(9)
144MHz Senior Transmitting	9	(8)
144MHz Receiving	0	(0)
432MHz Standard Transmitting	3	(8)
432MHz Senior Transmitting	0	(7)
432MHz Receiving	0	(0)
1.3GHz Standard Transmitting	2	(3)
1.3GHz Senior Transmitting	2	(0)
2.3GHz Standard Transmitting	0	(0)
Supreme Award (qualification: three seniors or two seniors plus one 1.3GHz	3	(6)

Microwave Distance Award for Initial Contact Beyond Specified QRB:-

1.3GHz .. 600km	1	(2)
2.3GHz .. 500km	2	(2)
3.4GHz .. 400km	0	(1)
5.6GHz .. 300km	0	(1)
10GHz .. 150km	4	(9)
24GHz 25km	1	(0)
24GHz .... 75km ..... Intermediate Class	2	(5)
24GHz .. 150km ..... Advanced Class	0	(2)
Total FMD certificates issued during the year	49	(77)

RSGB Squares Awards:-

70MHz 20 squares and 4 countries	2	(6)
70MHz 25 squares and 6 countries	1	(1)
70MHz 30 squares and 8 countries	4	(2)
70MHz 35 squares and 8 countries	1	(1)
70MHz 40 squares and 8 countries	2	(0)
144MHz 40 squares and 10 countries	12	(21)
144MHz 60 squares and 15 countries	8	(13)
144MHz 80 squares and 18 countries	4	(6)
144MHz 100 squares and 20 countries	7	(11)
144MHz 125 squares and 20 countries	6	(3)
144MHz 150 squares and 20 countries	7	(1)
144MHz 175 squares and 20 countries	1	(1)
144MHz 200 squares and 30 countries	2	(0)
144MHz 250 squares and 35 countries	3	(2)
432MHz 30 squares and 6 countries	7	(5)
432MHz 40 squares and 10 countries	4	(9)
432MHz 50 squares and 13 countries	0	(4)
432MHz 60 squares and 15 countries	1	(3)
432MHz 70 squares and 15 countries	0	(2)
432MHz 80 squares and 15 countries	0	(0)
432MHz 90 squares and 15 countries	0	(4)
432MHz 100 squares and 15 countries	3	(4)
432MHz 110 squares and 15 countries	3	(1)
Total RSGB Squares Awards	79	(91)

RSGB 50MHz Countries Awards:-

10 countries 2 x way QSO	16	(5)
20 countries 2 x way QSO	5	(1)

RSGB 50MHz Squares Awards:-

25 squares	16	(4)
50 squares	5	(0)
100 squares	2	(0)

RSGB 50MHz DX Awards:-

25 countries	5	(0)
Total 50MHz Awards	49	(11)

Microwave Squares Awards:-

1.3GHz ..... 5 squares	0	(5)
1.3GHz ..... 10 squares	3	(5)
1.3GHz ..... 15 squares	2	(3)
1.3GHz ..... 20 squares	0	(2)
1.3GHz ..... 25 squares	1	(0)
1.3GHz ..... 30 squares	2	(1)
1.3GHz ..... 35 squares	2	(2)
1.3GHz ..... 40 squares	1	(2)
1.3GHz ..... 45 squares	1	(1)
1.3GHz ..... 50 squares	2	(0)
1.3GHz ..... 55 squares	0	(1)
1.3GHz ..... 60 squares	0	(2)
1.3GHz ..... 65 squares	1	(2)
1.3GHz ..... 70 squares	2	(1)
2.3GHz ..... 5 squares	1	(2)
2.3GHz ..... 10 squares	2	(0)
2.3GHz ..... 15 squares	0	(1)
2.3GHz ..... 20 squares	0	(1)
2.3GHz ..... 25 squares	0	(0)
2.3GHz ..... 30 squares	1	(1)
2.3GHz ..... 35 squares	0	(0)
2.3GHz ..... 40 squares	0	(0)
2.3GHz ..... 45 squares	0	(1)
3.4GHz ..... 5 squares	0	(1)
3.4GHz ..... 10 squares	0	(0)
3.4GHz ..... 15 squares	0	(0)
3.4GHz ..... 20 squares	0	(1)
5.6GHz ..... 5 squares	0	(1)
10GHz..... 5 squares	0	(3)
Total RSGB Microwave Squares Awards	21	(39)
OVERALL TOTAL OF AWARDS ISSUED	198	(218)

In addition to the FMD, squares and 50MHz awards issued, some 150 contest winners' certificates were sent on instructions from the VHF Contests Committee.

I thank applicants for the generally good standard of presentation of their claims, and take this opportunity to remind operators that it helps with the processing of claims if the applicant reads the rules and lists the squares/counties and sorts the QSL cards as requested.

Ian Cornes G4OUT

The Year in Review

continued from page viii

EC legislation over the next decade. Naturally the RSGB will utilise all of its available resources to make sure, as far as it can, that the benefits are felt and that any apparent disadvantages are minimised, so far as UK amateurs are concerned.

While no specific Raynet matters have needed to be addressed during the year in review, it is pleasing to note the role being played by Raynet members after emergency situations such as the Lockerbie tragedy and during natural disaster situations such as the aftermath of the hurricane which struck Jamaica in the autumn of 1988. Such efforts by Raynet members are very beneficial to radio amateurs in general.

The list of topics discussed between the Society and the DTI is a long one with almost daily contact being maintained between the Society and the Department. On the list would be the fact that during the year the DTI agreed to give the RSGB some location information for those stations who prefer their full address details to be withheld from publication. It is the intention of the Society to use such information in its Spring 1990 Call Book. Also on the list of achievements is the negotiation which led the RAF to be able to operate the first amateur aeronautical mobile station of modern times. GB2CAN/AM operated in UK airspace during May. Club callsigns and the future UK callsign series were also discussed.

Finally, negotiations took place during the year in review which would enable Scouts to pass third party greetings messages to a total of 30 countries during the 1989 October Jamboree-on-the-air. The DTI's commitment to helping young people sample and enjoy the benefits of amateur radio has never been so great. Such efforts are most welcome.

Membership

For those who might still doubt the necessity of Project YEAR, several factors all indicate a future reduction of radio amateurs in the UK; namely:-

a) A slowing down in the rate of increase in the UK amateur population.
b) Fewer people taking the RAE and Morse Test.
c) Fewer recruits to RSGB membership.
d) Fewer readers of other magazines covering amateur radio.

Though other countries show similar trends, all of these factors give cause for concern in terms of the future well-being of amateur radio.

In terms of RSGB membership, there were 3,299 new members elected during 1986/87, 2,745 in 1987/88 and 2,322 in 1988/89. Overall membership fell during the year from 36,809 to 35,868, a drop of 2.5%. There is no doubt whatsoever that if precious frequency allocations are to be maintained in the future then the numbers in worldwide amateur radio must increase, not decrease. Much has been said and written about Project YEAR; it is, however, essential that every individual radio amateur help, in some way, to create the next generation of radio amateurs.

Annual Meeting Location

Responding to positive requests from the membership, the Council decided to consider moving the venue of the Society's Annual meeting away from London to other parts of the UK. This was so that a greater number of members throughout the UK could experience and participate in the Society's Annual Meeting. This has been warmly welcomed.

In December 1988, Sir Richard Davies, G2XM, chaired, as President, the very first Annual Meeting of the Society away from the London area. The venue was in fact the University of Manchester's Institute of Science and Technology (UMIST). Another departure for the Society was to hold the Installation Ceremony of the next President for 1989, Dr. Julian Gannaway, G3YGF, after the Annual meeting.

In view of the success of the new arrangements, Council has agreed to hold the Annual Meeting for 1989 in Dunoon, Strathclyde, the 1990 meeting in Bristol, Avon and the 1991 meeting back in London.

Council and Volunteers

At the end of 1988, the Society's Immediate Past President, Mrs. Joan Heathershaw, G4CHH, stood down from Council under Article 26. In addition, Council members John Heyes, G3BDQ, Angus McKenzie, G3OSS, Francis Rose, G2DRT, George Benbow, G3HB (co-opted by Council from March 1988), Norman O'Brien, G3LP, John Greenwell, G3AEZ, John Case, GW4HWR and Frank Hall, GM8BZX (co-opted for Council for Zone G for 1988), came to the end of their terms of office. With the exception of John Heys, all stood for re-election and were in fact elected to the 1989-91 Council. Two new Council members were also elected for the same period, namely Mrs. Hilary Claytonsmith, G4JKS, and Peter Chadwick, G3RZP for RSGB Zone D. The Zone D vacancy had been created because Dr. Julian Gannaway, G3YGF, the Zone D member, was elected President for 1989.

Basil O'Brien, G2AMV, who was appointed Honorary Treasurer in January 1988, retired at the end of July 1989 from Council and thus from the post of Honorary Treasurer. There are few volunteers who have done more for the Society over several decades, first as a Regional Representative, then as a Council member, President and Honorary Treasurer. The Society owes its grateful thanks to Basil O'Brien for his untiring efforts and to his wife Eileen, G3WIO, for her unfailing support of his volunteer work.

Publications

In October 1988 Trevor Preece, G3TRP, was appointed Editor-in-Chief on a contract basis. His task was to modernise RadCom, create new and effective procedures and to add his own expertise to the already established DTP operation. Another challenge was that the News and Information Department was merged with Publications. As a result David Gough, G6EFQ, the Society's News and Information Officer was appointed News Editor under the Editor-in-Chief. This scheme worked well since responsibility for news content was with the Editor and the layout with Linda Penny who occupied a newly created post as designer on the RadCom team.

The goal of the Society's newly acquired desktop-publishing equipment was to improve accuraxy (!), profitability and speed of production. After a few months of initial trials and familiarisation with hardware and software, two books, - the Awards Book and Radio Amateur's Examination Manual - became the first examples of the RSGB's in-house publishing programme. The same technology was then applied to the latest Amateur Radio Call Book; it was an immense project, but the result was impressive with vastly improved legibility than previous editions. It proved that the book publishing department is very capable of applying DTP to all of its future publications. Other books, such as the Practical Wire Antennas, have since appeared in rapid succession, and several more are in the pipeline.

There was a call for the same processes to be applied to RadCom, but a time-sensitive, complex, monthly publication is much more difficult to convert to DTP. In addition to learning-time, while still producing a magazine, protection has to be built in for equipment failures - and even holidays and sickness of staff with unique skills. A different strategy, which would gradually lead to full DTP production, was accordingly initiated in January this year. Typesetting was transferred to a company willing to print computer-keyed copy direct to their typesetting equipment via a modem. This enabled RadCom staff and contributors to become conversant with full electronic typesetting, while retaining the traditional page make-up processes.

Within a few months RadCom progressed from one computer and no electronic input to 80% computer-keyed editorial text. Every RadCom staff member has been equipped with a PC - including a full DTP system for the designer. Copy from a 'remote' news correspondent is transmitted to HQ by modem, and a considerable number of articles are converted from contributors' disks. Currently, most text is reprocessed for transmission to the typesetters located near Southend, but full DTP is not far off; several pages of RadCom are already being compiled using the system.

Once the inevitable bugs have been eradicated from this advanced new form of publishing, it will benefit RadCom by reducing errors, contracting the time which elapses between submission of news and articles, and ultimately represent cost savings by virtue of improved efficiency and less reliance on external contractors.

Final

It goes without saying that the RSGB is its members and that the Society was formed so that the applied skills and talents of members could be fused to create results that could not be achieved by individual effort alone. Of course individual effort as part of a professional team is still very much an important aspect of the work of the Society. Over the years the RSGB has been fortunate enough to acquire many staff dedicated to the cause of amateur radio. One such member was Heather Norman who had worked for the Society for over 12 years, first as the secretary to the Secretary and later in charge of all volunteer resources. Heather left the Society's employment in the summer of 1988 with the intention of going to live in West Germany. Her hard work, expertise and experience is greatly missed and has been hard to replace.

Sadly a member of the Society's accounts department, Freda Taylor died of cancer this summer after a difficult illness. She too had been a very hard worker for the Society.

On a happier note the Society welcomed two new radio amateurs to its staff; Mike Dennison, G3XDV, who joined as Assistant to the Secretary and Jim Smith, G3HJF, who works in the Membership Services Department. Both have made excellent contributions to the work of the Society.

Finally, it should never be forgotten that the members are the Society and that they elect the Council who direct the policy of the organisation. It is also the members, over a thousand of them, who work as volunteers for the common good. The work of the RSGB is an unusual mix of staff and volunteer effort each working to the same goals. However, it is the volunteers who give up their free time to make amateur radio better for all of the members, that are thanked here for their work. Behind the reports of the Committee Chairmen and other Officers is a vast amount of work for a great organisation.

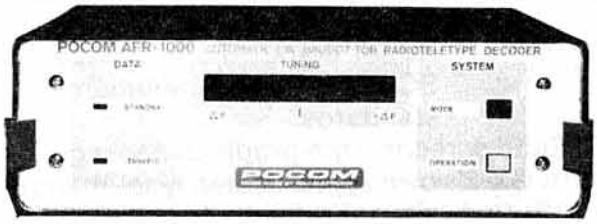
DEWSBURY ELECTRONICS

G4CLX

POCOM
SWISS MADE BY POLY-ELECTRONIC

Communication decoders

AFR-1000 Automatic CW-RTTY Decoder



The microprocessor-controlled POCOM AFR-1000 CW-RTTY Decoder automatically processes radio teletype signals in accordance with **Baudot No. 1 and No. 2, ASCII, ARQ/FEC (SITOR/SPECTOR/AMTOR) and CW (Morse telegraphy)** standards and corresponds to the latest state of the art. The AFR-1000 Automatic Decoder is remarkable for its value for money. Its moderate price makes it particularly suitable for the cost-conscious RTTY beginner. Unlike the other models in the AFR series, however, it cannot be upgraded for special codes.

FEATURES

- *Fully automatic recognition of CW, ARQ-FEC and BAUDOT No. 1 and No. 2 teletype signals with automatic decoding, independently of the shift position.*
- *Baud rate analysis in the range from approx. 30 to 250 bauds.*
- *Extremely fast phasing of ARQ-FEC signals (Typical: 1-5 seconds).*
- *Special narrow-band quadrature discriminator for all usual LF shifts of 50-1000 Hz and CW Morse telegraphy.*
- *Swiss technology and quality — 1-year guarantee.*

The **POCOM AFR-1000** is extremely easy to use and very simple to operate. The **AFR-1000** is simply connected to the loudspeaker outlet on the shortwave receiver. Operation is confined merely to choosing the mode required. No tiresome testing of the baud rate and shift position. Two LED's indicate the active operation states in each case.

The baud modulation rate measurement facility is a complete new innovation in a unit in this price range. Knowledge of the baud rate permits reference to special codes, specific radio services, etc., and makes it possible to shed light upon a radio teletype signal. The display is provided on the screen or printer linked to it to 1/1000 baud (e.g. 96.245 bauds) with quartz accuracy and within a measuring range of approx. 30 to 250 bauds.

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The SW-reception system of the future on professional level for the serious DX-er!

POCOM® PFC-100

Intelligent Frequency-Controller for ICOM R-70/JRC NRD-515

PFC-100 FEATURES:

Nonvolatile memory for 100 complete operation settings — all functions can be programmed from the keyboard — versatile timer functions (on/off); 6 outputs can be switched separately — automatic memory channel and frequency scan modes with freely definable parameters — frequency offset mode for converter usage — alphanumeric liquid crystal display — intelligent selftest functions — 6KByte user ram, 16KByte operating program — low power consumption 8 Bit CMOS CPU — easy software adaption for future modifications — developed and manufactured in Switzerland by Poly-Electronic.

The efficient monitoring of the complete SW-range calls for the use of modern receivers which should offer a large amount of operating comfort. Recently good receivers such as the popular ICOM R-70 and the JRC NRD-515 have become available on the market, but they lack the optimal microprocessor-supported operating possibilities. These requirements are fulfilled by the intelligent programmable frequency controller POCOM PFC-100 from Poly-Electronic.

The use of up-to-date circuit technology contributes to the class of this innovation which meets the highest demands of all active SW-listeners. Together with one of the two receivers (ICOM/JRC) the PFC-100 permits an unsurpassed degree of operational ease due to the consequent use of a microprocessor and comfortable software.

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IN PRACTICE

Well, the postman's been busy again; many thanks for your letters and we're glad that you seem to like our new column. Straight down to business with a problem about resistor colour codes:

Resistor Colour Codes

'I'm not quite old enough to remember resistors whose values were coded under the body-tip-spot system, but not too many years ago they all seemed to have four coloured bands to denote their value. No doubt like many other people, I became quite fluent at looking at the four bands and decoding resistor values in a few seconds. However, I notice that modern resistors seem to have five or even six bands and sometimes I can't even work out which end to start reading from - let alone how the system is supposed to work. Can you enlighten me?' M N, Bedford

We agree - it is confusing! Basically, each different colour indicates either a number or a parameter such as tolerance or temperature co-efficient. In the old four-band scheme, the first and second bands gave a two-digit number. This was operated on by a factor denoted by the third band to give a result in ohms; the fourth indicated the percentage tolerance of the value. As far as the first two bands were concerned, each stood for a figure as follows:

Black	0	Green	5
Brown	1	Blue	6
Red	2	Violet	7
Orange	3	Grey	8
Yellow	4	White	9

In the case of the third band (often called the 'multiplier' even though two of the possible colours relate to division), the coding went like this:

Silver	divide by 100
Gold	divide by 10
Black	multiply by 1
Brown	multiply by 10
Red	multiply by 100
Orange	multiply by 1,000
Yellow	multiply by 10,000
Green	multiply by 100,000
Blue	multiply by 1,000,000

So if you had a resistor whose four bands were yellow, violet, red and gold you proceeded as follows. Yellow was 4, violet was 7 and red meant 'multiply by 100'; working that out gave 4700 ohms or 4.7KΩ. The gold band indicated that there was a tolerance of ±5% on this figure, implying that the value of an individual resistor could lie anywhere between 4476 and 4935 ohms; the table of tolerances looked like this:

Red	± 2%
Gold	± 5%
Silver	±10%

The five-band coding system works on similar lines but goes a stage further. Instead of taking a two-digit number given by the first and second bands and applying a factor indicated by the third band, you derive a THREE-digit number from the first THREE bands and use the FOURTH band as the multiplier. So - taking a similar example - if a five-band resistor has yellow, violet, black, red and gold bands, proceed as follows. As in the four-band system, yellow is 4, violet is 7 and black is zero. Equally, the red band means 'multiply by 100'. So the resistor has a value of 470 × 100, which is 47,000 ohms or 47kΩ. Tolerance is given by the fifth band, and here again the gold band means a tolerance of ±5% on the figure. In the five-band system, an extra coding is introduced into the tolerance coding; if the fifth band is brown, this indicates ±1% tolerance.

The six-band system is exactly the same as the five-band but with the addition of a further colour code to indicate the resistor's temperature co-efficient in parts per million per degree Centigrade. Everything else stays the same. The table of temperature co-efficients is as follows:

Brown	100ppm/°C
Red	50ppm/°C
Yellow	25ppm/°C
Orange	15ppm/°C
Blue	10ppm/°C
Violet	5ppm/°C
White	1ppm/°C

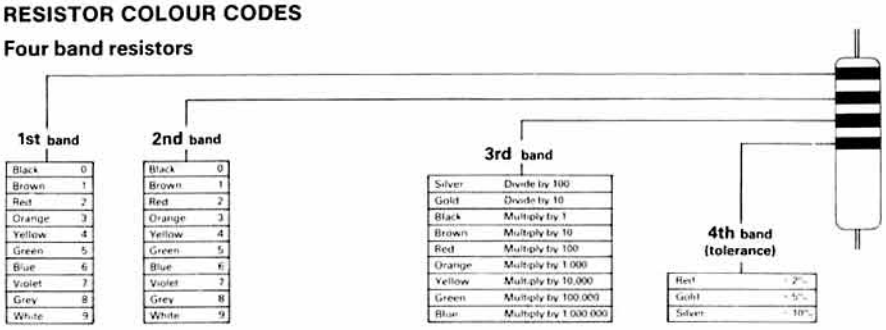
The vast majority of commercial-grade six-band resistors we've come across have a red band as the sixth, implying a tempco of 50 ppm.

There are three problems with resistor colour coding. The first is that if you've become very familiar with the four-band code over the years, it's terribly easy to misread the value of a modern five or six-band component if you don't register that it's got more than four bands when you glance at it. This is particularly true when you're breadboarding something, you've been raiding the junk-box and there are resistors of various vintages scattered around the table. The only answer is to make yourself physically count the bands on a resistor and be aware of which one is the multiplier. After a couple of weeks you'll find you can do it unconsciously and it isn't a problem, but be prepared to make some mistakes while you re-program your brain!

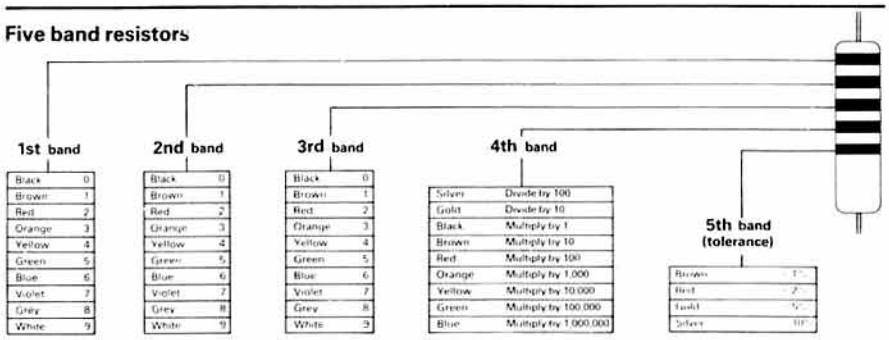
The second problem, which is confined to small five and six-band resistors, is knowing which end to start reading from. The relevant British Standard says that resistor colour coding should start at one end of the component and not finish at the other end - i.e. there should be a distinct bias in the way the bands are disposed on the body of the resistor - and that you start reading from the end which has a band on or adjacent to it. Unfortunately,

RESISTOR COLOUR CODES

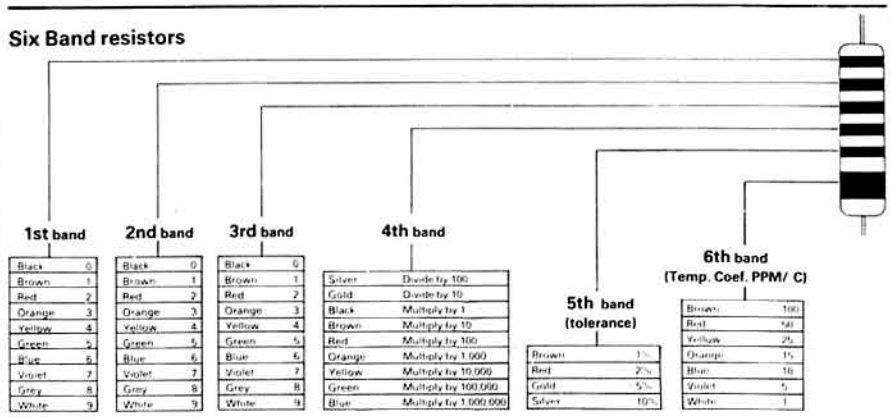
Four band resistors



Five band resistors



Six Band resistors



Reproduced by courtesy of RS Components

a modern 0.125W metal-film resistor is only about 4mm long and you tend to find that some makes of resistor have the bands disposed about the body with perfect symmetry. The Standard also specifies that the sixth band is supposed to be thicker than the other five, but very often you'd need an electron microscope to see any difference. In severe cases, even professionals resort to getting the meter out and checking that the component value is what they think it is.

This is a very good habit to get into anyway because of the third problem - colour codes are occasionally wrong. If you need a good excuse to acquire an autoranging DMM for Christmas, this is it! A few years ago I bought a pack of 10 of what were supposedly 1kΩ resistors from RS Components. They were correctly colour-coded as being 1kΩ but all of them had a value of 39kΩ. I also came across some resistors at a rally last year where were marked as 150kΩ but which were actually 1.5kΩ. Other people have reported the same problem. Equally, some manufacturers seem to adopt horribly similar shades for their reds and oranges and you need exceedingly acute colour vision to see any difference. Having said that, there's a good chance that the sixth band of a commercial six-band resistor will be red - which should give you a clue about which end to start and what a particular manufacturer's version of red looks like.

What with murky colours and downright wrong coding, I must admit that I've now got into the habit of keeping the DMM sitting on the bench on an autoranging resistance range when I'm in the middle of building something, and every resistor gets checked before it's soldered in. It may sound a little tedious, but it's much less so than spending hours trying to get something to work and then finding that what you thought was a 4.7kΩ is actually 470kΩ. As an aside, it doesn't hurt to check diodes in the same fashion - I once found some 1N4148s which were marked the wrong way round!

LDF5-50 'Heliax'

'I've just acquired a length of Andrews LDF5-50 coaxial cable (lucky you - Ed). *I was planning to use this on 144MHz, but someone I spoke to on the air scoffed at this idea and said it wasn't worth it - do you agree? I can't find any figures for its loss - have you got any? Also, where can I get N connectors for it and how do I put them on?' C B, Aberdeen*

For those who aren't dedicated UHF addicts, we should explain that the Andrew Corporation based in Illinois, USA (not 'Andrews' as most of us seem to think) makes a range of very low-loss foam dielectric cables which are marketed under the name 'Heliax'. It comes in various varieties, and the designation LDF stands for Low-Density Foam. Professional VHF and UHF users often use LDF4-50 and LDF5-50 for high-grade installations, and lengths of it often seem to find their way into amateur hands; the cellular radiotelephone industry is currently using vast quantities of 5-50 at its Tx sites, for example, and off-cuts and scrap lengths seem to be extremely common at rallies at present.

LDF5-50 has an outside diameter of about 27mm, and the combination of this and the solid corrugated outer makes it fairly unhandy stuff. However, it has exceedingly low loss - here are the figures in dB at various frequencies for a 25-metre length:

30MHz	0.16dB
100MHz	0.3dB
144MHz	0.36dB
430MHz	0.67dB
1GHz	1.1dB
1.3GHz	1.3dB
2.3GHz	1.8dB

So that answers the question about loss. As to whether or not it's worth using very low-loss cable at 144MHz, we can't really say without knowing what length of feeder is involved and something about the rest of the station - and the answers may not be quite what you might think. Oddly enough, state-of-the-art 144MHz DX barons with massive antennas who hear their own echoes off the moon every night probably won't be using LDF5-50 unless they have a very long run of feeder indeed. There are two reasons why this is so - one connected with reception and the other with transmission. In the former case, EME-type stations will inevitably be using a masthead preamp, and if you look at the figures - try G3SEK's TCALC software for an easy way to check - you'll find that the loss in the cable downstream of the preamp doesn't really matter. For transmission, the power limits in the licence relate to the power measured at the driven element of the antenna. This means that as long as you have a large enough amplifier, it doesn't matter very much what the loss is in the feeder because you can run whatever transmitter power is necessary to give you the licensed limit at the antenna.

Obviously this argument is only valid up to a point. For example, if you have 300' of UR67 between the shack and the antenna because the latter is on a tower in the next field, the loss at 144MHz will be of the order of 8dB. This would mean that an amplifier delivering just over 2.5kW of RF output would be required to produce 400W at the antenna. Using the same length of LDF5-50 would lead to a loss of about 1.4dB, implying that an amplifier power of just over 550W is needed to give 400W at the antenna.

Assuming you have a length of it, LDF5-50 or any other very low-loss cable is certainly worth using on 144MHz if a very long feeder run is required and a very low-noise masthead preamplifier is not used. For terrestrial 144MHz work, a feeder loss of 1dB or less isn't going to matter and it takes about 70 metres of LDF5-50 to lose a dB! For the average 144MHz station running less than the legal limit of power and having a fairly short feeder, there isn't much point - save the Heliax or similar for when you get going on higher bands.

As far as obtaining suitable connectors is concerned, there's no simple answer; they're certainly nowhere near as easy to obtain as the cable. Andrew Antennas at Wokingham will supply new ones, but they're not cheap - about £35 each for N male or female LDF5-50 connectors. New or used ones occasionally appear at rallies, so it's worth keeping an eye open. Assuming that suitable connectors have been acquired, it's very easy to terminate the cable; as a matter of fact, N-

LDF5-50 CO-AX CONNECTOR ATTACHMENT

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Description

These connectors are designed for self-flaring of the outer conductor and self-tapping (thread cutting) of the inner conductor of the coaxial cable. A rod (supplied) inserted through the inner connector aids in tapping the cable inner conductor. Connector L45T has screw terminals for external cable connections.

Tools and Materials Required for Assembly

Scale	Hacksaw, fine-toothed blade
Knife	Wrenches: 1-1/4 in (32 mm);
Flat file	L45F also requires 1-5/16 in (33 mm)
Wire brush	Solvent: comothene, vythene, or other non-flammable cleaning fluid

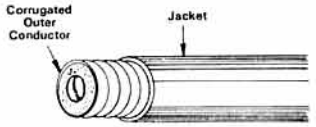
Notice

The installation, maintenance or removal of antenna systems requires qualified, experienced personnel. Andrew installation instructions have been written for such personnel. Antenna systems should be inspected once a year by qualified personnel to verify proper installation, maintenance and condition of equipment.

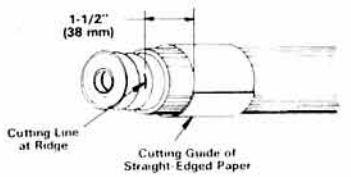
Andrew disclaims any liability or responsibility for the results of improper or unsafe installation practices.

Read Instructions Thoroughly Before Assembly

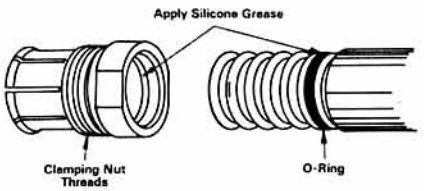
1. Prepare Cable. Straighten the end of the cable for at least 10 inches (254 mm) and remove some of the jacket with a knife to expose the outer conductor. Deburr the sharp end of the outer conductor.



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

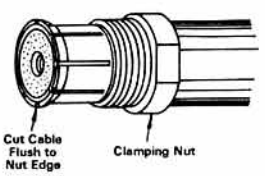


3. Clean Conductor and Add O-ring. Clean the outer conductor with solvent. Add the thick O-ring gasket to the second, fully-exposed conductor groove from the jacket. Apply a thin coating of silicone grease with your finger tip to the outer surface of the O-ring and to the gasket lead chamfer in the clamping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



4. Add Clamping Nut and Cut Cable. Push the clamping nut fully onto the cable with a twisting motion so that the spring contacts snap into the conductor groove. Check that the conductor cutting line is aligned with the edge of the clamping nut.

Tightly grip the clamping nut and carefully cut off the cable with a fine-toothed saw so that the cable end is flush with the end of the clamping nut. **Note:** After cutting, verify that the saw cut is flush with the clamping nut. If the cable protrudes, file it flush with the nut.



type LDF5-50 connectors are much easier to work with than the smaller variety used for LDF4-50 because no soldering is involved.

A final warning - all LDF-series Heliax cables are mechanically quite fragile, and their permissible bending radii are far greater than those for ordinary coaxial cables such as UR67 or RG213. If you have a length of LDF5-50, treat it with great care and never allow a length to sag under its own weight or attempt to bend it round tight corners. Always make any curves gentle and sweeping. If you have a retractable tower, be very careful to form the Heliax into very large coils on the ground as you wind the tower down. If at all possible, ask an assistant to look after the cable whilst you operate the winch. It's also very important to take great care with the termination at the top of the tower or mast. LDF5-50 is far too rigid to be allowed to loop round the rotator and a transition to something like UR67 will be needed; do ensure that the necessary plugs and sockets are thoroughly waterproofed at this point, since if the slightest amount of water gets in the Heliax it will be ruined. In my own installation, adhesive-lined heat-shrink sleeving was used over the connectors and self-amalgamating tape was wrapped over that. This was followed by several layers of insulating tape and four or five coats of UV-resistant polyurethane varnish. I did this after hearing that the local RAF base had considerable trouble with water getting into lengths of LDF4-50 used with their UHF antennas and had only cured it by liberal use of sleeving and self-amalgamating tape. They can afford to change their feeders more often than I can!

Servicing Valve Receivers

'I've just been given an AR88 which isn't working, although the power supply appears to be producing HT and heater voltages. I have some technical information on it but I'm not all that familiar with valve circuitry and I'm not sure what I should and shouldn't do. What does your erudite columnist think?' R J, Oxford

By an extraordinary coincidence, we had an item on this very subject submitted for publication a few weeks ago. It was rather good, but there was a small problem. Whoever wrote it either a) chose to remain anonymous or b) forgot to enclose a covering letter. So we couldn't do anything with it until this question appeared on our desk - at which point the obvious thing to do was to use the anonymous article as the basis of a reply. After all, why be erudite when someone else has done all the work for you? If whoever wrote the original piece recognizes his or her handiwork and owns up, we can then pay for it...

A large number of elderly valve receivers are still in use, and they frequently appear on the market. However, in recent years not much seems to have been published on servicing these sets. Needless to say, if you're planning to carry out a full service and alignment, it's helpful if the service manual is available. Resorting to hit-and-miss methods such as tweaking cores and trimmers in the hope that it will make things better is decidedly not recommended, and any 'adjustment' of this sort should only take place as a last resort. Having said that, most receivers can be put into a usable state without this information, and we'll try to give some pointers to common and not-so-common faults to which valve receivers are prone and how to trace them with a minimum of test equipment. What follows is biased towards communications receivers but most points are just as applicable to domestic valve equipments.

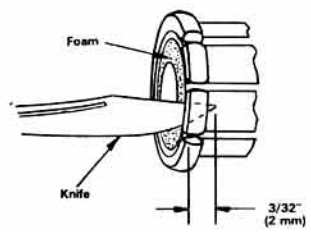
First of all, in these days when everyone is used to low-voltage transistor circuits, no apologies for stressing that the HT rail in a valve set can be around 300V DC and 700-odd volts can appear across the rectifier valve base. The old rule that a radio engineer worked with one hand in his pocket is as valid nowadays when working on valve equipment as it ever was. Also, remember that some valves - especially the audio output and the HT rectifier - can get very hot. Equally, mains voltages tend to appear at more points around the circuitry than they do with the transistor equivalent. In the case of equipments such as the Eddystone 870A which are 'universal' in the sense that they can run off AC or DC supplies, one side of the mains is connected directly to chassis. This means that the only safe way to work on them is via a mains isolating transformer. Note that a Variac or variable transformer does NOT give mains isolation.

On removing the set from its case for the first time, we'd suggest that if any form of dial cord and pulley system is used for the tuning scale, a drawing should be made of how the cord or wire is strung round the various pulleys and drums and the appropriate number of turns. In this way you can put it all back together if it comes adrift during servicing or if the string breaks at a later date. It is also advisable to make a note of the positions of all valves and their numbers for later reference, since markings can often become unreadable with time and handling. If the tuning capacitor is not enclosed, turn the tuning control so that the plates become fully meshed. This will guard against accidentally knocking and bending the vanes.

Firstly, look for any obvious signs of overheating such as blackened resistors or a smell which suggests that something has got hotter than it should. Check any fuses which have been fitted. If one of the clear glass variety has been used and is open-circuit, the way in which it's blown can give a useful clue as to why. If the glass is blackened and there are minute blobs of copper visible amidst the black, the fuse has been subjected to a massive overcurrent - suggesting a short-circuit fault. If the wire is discoloured and there's a small break visible (often with a blob at each end of the wire) a higher current than normal has caused the fuse to blow. If the wire is broken and not discoloured, the set may have been knocked or subjected to some vibration. Low-current fuses quite often fail this way.

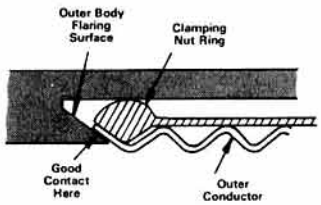
A common problem with older equipment is that the capacitors age and either decrease in value or become leaky. Apart from electrolytics - which are always suspect in old sets and which we've discussed at some length in these pages recently - the flat bakelite-cased mica types and the tubular wax-paper variety also seem to be highly unreliable - the latter often show signs of cracks in the coating. Noticeable hum in the speaker is a good indication of a faulty reservoir electrolytic, and the

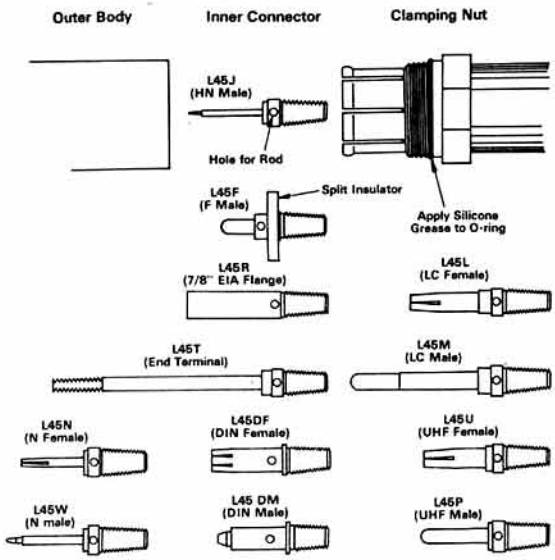
5. Separate Foam from Outer Conductor. Insert the tip of a knife to a depth of 3/32 inch (2 mm) between the foam and the outer conductor of the cable and separate them so that the outer conductor can be flared. Move the knife around the entire circumference of the outer conductor. Scrap away any foam clinging to the outer conductor. Remove any burrs from the inner edges of both conductors. Remove copper particles from the foam with a wire brush. Remove copper and foam particles from the interior of the inner conductor by holding the assembly downward and sharply tapping the clamping nut.



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

Internal Flaring Details of Connector Assembly





7. Install Inner Connector and Outer Body. Insert the rod supplied thorugh the hole in the inner connector. Twist the threaded end of the inner connector clockwise into the cable inner conductor and continue until the shoulder of the connector touches the inner conductor. Lubricate the threads with a small amount of solvent to aid tapping. Unscrew the connector slightly after every few turns if tapping becomes difficult.

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

Add the split insulator to the inner connector of L45F.

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

symptom is easily checked by temporarily connecting another in parallel. However, if the capacitor feels warm or hot, switch off AT ONCE and change it - otherwise you may be about to have a nasty explosion. A quick check on the condition of small decoupling or audio coupling capacitors having HT connected to one side can be made by disconnecting one end and connecting a voltmeter in series. If the meter shows anything in the way of a steady reading after the initial 'kick' at switch-on, the capacitor is leaky and must be replaced. Capacitors which are suspect but which only have low voltages on them will need to be removed and tested in the same way. Alternatively, use some form of capacitor tester which produces a voltage near the component's rating. A low-voltage ohmmeter test will only reveal the very worst cases.

Leaky capacitors can put excessive loads on the HT rail, reduce the voltages on screen grids, put positive bias on the control grid of the audio output valve - which will probably cause its anode to glow red-hot as a result of the excessive anode current which will flow - and cause various other tiresome symptoms. All in all, it's well worth spending some time carefully checking all capacitors in elderly equipment; in most cases you'll find at least one faulty. Don't forget the capacitor which is often connected across the output transformer to act as treble cut - also, the component which may well be connected across the mains input for interference suppression. This latter is likely to be a paper type rated at 750V DC or more - although it's used on AC - so select a replacement with great care. It needs to have an AC rating of 300V or more or a DC rating in excess of 1kV. Better still, use a 'Class X2' or 'Class Y' component specifically rated for connecting across 250V RMS mains inputs - see the 'Suppressors' section of the Electromail catalogue for some examples. Whilst you're in this general area of the set, you could also fit a modern mains socket with integral filtering - see last month's 'In Practice' for more information.

Resistors don't present so many problems, although storage under damp conditions can cause wirewound components to go open-circuit as the wire corrodes away with no visible signs. To find the value of an open-circuit wirewound resistor which has no markings, carefully scrape the coating away at the centre of the body to expose the wire. You should then be able to make a measurement of resistance from there to one or other end of the resistor. Doubling this reading will give a value for the whole component, which will be close enough for most practical purposes.

We've already mentioned the Eddystone 870A as an example of the type of receiver which has the mains connected to chassis and does not use a transformer from which to derive the heater and HT voltages. In this type of set, the HT is produced by direct rectification of the mains and the heaters are connected in series with a resistor is used to set the correct operating current. In the case of equipment having a mains transformer, the valve heaters have the same voltage rating and draw different currents. In the series chain type, each valve must have the same current rating - but they will inevitably have vastly differing voltages across them and must be appropriately rated. This does not matter if a valve is replaced with another of the same type or a direct equivalent. However, you must bear these factors in mind if you substitute a 'near equivalent'.

When one valve heater fails open-circuit in an AC/DC set, none of the valves will light up - so each heater will have to be tested for continuity to establish which one is faulty. If all the valves appear to show continuity across their heaters, check the series resistor. If the valve heaters are run in parallel from a mains transformer and the set contains metal-envelope valves, feel each one after five minutes or so to see whether it is warm. If it is not, check its heater for continuity. In the majority of cases the heater pins of an octal-based valve will be 2 and 7, but there are exceptions!

If you are planning to keep the equipment for some time, at least one example of each valve type should be kept as a spare. As well as being available to replace a tired valve, it makes servicing easier if a known good valve can be tried in place of a suspect one. Whilst on this topic, it's worth considering the matter of different versions of octal-based valves. They come in three variants:
1) Those with large glass envelopes, which have the suffix G after the type number (i.e. 6V6G).
2) Those with small glass envelopes, which have the suffix GT after the type number (i.e. 6SN7GT).
3) Those with metal cases, which have the suffix M after the type number (i.e. 6R8M).

Interchanging G and GT types doesn't normally cause problems providing that the G will physically fit the space originally intended for a GT. However, interchanging glass and metal types without bearing a few points in mind can cause all sorts of trouble. The reason is that the metal case is connected to pin 1 of the valve, which is not used in the glass versions. In sets originally designed to use all-glass valves, pin 1 on the valveholder is often used as a convenient HT connecting tag - so the later substitution of an M variant will leave you with a couple of hundred volts on the metal envelope! You may need to do more than disconnect the HT from pin 1, however. Most equipment designed with the metal versions of octal-based valves in mind connected pin 1 of the base to chassis so that the valve's outer screening was earthed. Leaving it floating may cause instability - so watch this point carefully if swapping valves seems to cause more difficulties than it solves. This problem, incidentally, can work the other way round - replacing a metal valve with a glass one may require the latter to be fitted with a screening can.

When considering how to replace defective octal-based rectifiers, bear in mind that it was possible some years ago to purchase substitutes consisting of solid-state diodes wired to the appropriate pins and encapsulated in a suitable envelope. These may still be available in the small ads, etc. Alternatively, it is possible to wire suitable silicon rectifiers directly across the valve base. However, both methods must be used with caution since they can cause damage to other components in the equipment. Thermionic rectifiers heat up at more or less the same rate as the other valves in the receiver, so that the HT comes up slowly and the valves are drawing current at the same time as the rectifier is producing it. However, solid-state rectifiers begin working immediately; since the valves will not draw current until they have warmed up, the HT may well rise to well in excess of its normal value. A 300V rail can easily reach 420V under these circumstances, and this may be too much for some antique reservoir capacitors not designed with surge voltages in mind. Equally, fuses may blow as a result of the unaccustomed inrush current. A similar consideration will apply if an indirectly-heated rectifier is replaced by a directly-heated one, although this is not a very likely scenario.

The quickest way to test a suspect valve is to substitute a known good one for it. If this produces no change and you have to make checks on the various voltages on the base, check at the pin itself rather than at the solder tag. It's not unknown for the valve to fail to make contact with the base connection for one reason or another, and cleaning its pins and the contacts in the base with a suitable proprietary contact cleaner is always a good idea. Actually, there's a good argument for substituting all the valves at once if the set is not working since it's not unknown for more than one valve to be faulty at once in a long-disused set; if this is the case, swapping only one valve at a time may leave you more than a little confused. However, if substitutes are not to hand you will inevitably have to get down to checking voltages on each stage. In passing, a very few dealers still have a valve tester tucked away at the back of the workshop; if you know of one who has, it might well be worth getting both the existing valves in the set and your stock of spares tested.

Here is a suggested test procedure. Firstly, establish that HT is present and has more or less the right value; the reservoir capacitor is the obvious place to look. Turn up the AF gain control to maximum and touch each tag on the control in turn with a pen-type square-wave signal injector (or, if all else fails, the blade of a screwdriver) to establish whether or not the audio stage is working - if it is, you'll hear the injector signal or a loud hum from the speaker. Be careful here; the mains on-off switch is combined with the volume control in many receivers, so be sure not to touch its tags with anything at all. If the audio stage is not working, find out why by measuring the voltages on the valve pins and deciding whether or not they are sensible. In essence, the anode ought to be at virtually the full HT voltage and the screen grid somewhere near it. The control grid ought to have a negative potential on it, probably of the order of a few tens of volts although the number of different circuit arrangements and valve types makes it impossible to be more precise. The cathode should be somewhere near earth unless the circuit arrangement is decidedly unusual. The heater pins ought to have the correct heater voltage across them. Is the speaker open-circuit, or are the contacts on the headphones jack dirty and open-circuiting the connection between the audio output transformer secondary and the speaker? Is the secondary of the audio output transformer OK?

If the audio output stage is operating properly, work backwards through the set via the detector and IF stages. Make sure that the IF gain control - if there is one - is set to maximum. An RF signal generator is best for testing, although a square-wave injector works well enough for a quick check. However, be careful not to touch anything other than the control grids of any valves; the HT or screen voltage could damage the injector. As you progress backwards through the stages towards the mixer, the signal should become stronger. A sudden fall in signal level as you test a particular stage would indicate a fault in that stage. Faults in IF stages are most likely to be low-emission valves, faulty capacitors or a screen feed resistor going high in value or open-circuit.

Having proved that the audio and IF stages are working - even if only approximately - you now only have the mixer and local oscillator and possibly an RF stage to worry about. To some extent the mixer and oscillator are interdependent insofar as, if either is not working, the result will be

no output when a signal is applied at the input to the mixer. Using a square-wave injector here can give some misleading results because if you hear any signals, it isn't clear what frequency the set may be responding on and you could just be hearing stray breakthrough into the IF stage. However, you can use the signal injector for a rudimentary check on whether the local oscillator is working. Connect an antenna to the receiver's input and connect the signal injector to the mixer grid. If you now hear some weak and distorted stations as you tune across the band, it's likely that the local oscillator is at fault. If you know what frequency the local oscillator is supposed to be working on and you have access to a serviceable receiver which will tune this frequency, another way to check the LO is to listen for it on the other Rx. If you have an oscilloscope, of course, it's merely a matter of using that to see whether the LO is working; you should find lots of RF at the anode of the LO valve, or at the appropriate grid if it's a self-oscillating mixer. The best valve communications receivers generally used separate thermionic stages for RF, mixer and local oscillator; others often combined mixer and LO in a single multi-grid valve and didn't always incorporate a signal-frequency amplifier before the mixer. Incidentally, if you're new to valve equipment, don't fall into the trap I recently heard a newly-licensed operator falling into. High-grade valve receivers often used 'cold cathode' gas stabilizer tubes to regulate the local oscillator anode voltage for less tuning drift. These usually glow a bright purplish-blue or orange inside; our man was hastily switching off his recently-purchased vintage valve receiver a minute or so after it had warmed up and the stab. tube had struck because he thought that there was something wrong with one of the valves! The glow is quite normal, and the time to worry is when it stops.

The RF stage is easily checked by connecting the antenna via a 100pF capacitor to the grid of the mixer. If stations can now be tuned in, there's obviously a problem in the RF amplifier.

Let's now consider some general faults to look out for. A common problem with elderly octal-based valves is that the envelope glass comes loose in the base. Do NOT try and remove valves thus afflicted by pulling on the glass; instead, ease them out with the blade of a screwdriver gently applied between the valve base and its holder. A very good and sound repair can then be made by means of epoxy adhesive. This problem is not confined to octal-based valves; almost every 807 we've seen in the past few years has a loose envelope.

It's highly likely that the contacts on wavechange switches and the like will have become tarnished over the years. Be careful how you clean these up; some switch cleaners are somewhat aggressive and have a very bad effect on elderly coil formers. They can also soak into the dust which inevitably accumulates around the switch wafers - together with what remains of any old grease, etc - and HT voltages can then track across the residue and burn up the switch. So do be very sparing with the switch cleaner. Incidentally, dampness can have a similar effect. If you suspect that the set has been stored in damp conditions, leave it in a dry and warm place for a week or two before doing any work on it. Then run it for a few hours with the HT off (some equipment has a switch with which to turn it off, or remove the rectifier valve or HT fuse) but not for too long since this can 'poison' some valves. Careful use of a hair dryer can also help. RF and audio gain controls are prone to becoming noisy and scratchy. The obvious answer is to replace them, but you can try injecting small amounts of switch cleaner which contains a lubricant and then rotating the control a few times until the noise disappears. The cleaner can be applied through the gaps which are usually present around the connecting tags. This technique usually works quite well with wirewound pots and the older carbon controls, but be careful that the switch cleaner isn't of the type which eats the plastic from which the bodies of some newer ones were made or loosens the carbon track. I ought to mention that in an emergency I once used ordinary light machine oil to clean the track of the AF gain control in an AR88 and it worked very well indeed, but I'm not sure whether that's something I'd try again!

With advancing years, the lubrication of the tuning system can dry out and it's worth applying a drop or two of light oil to all the metal-to-metal bearings and some light grease to ball races such as the one in the tuning capacitor. Don't overdo this - use an eye dropper, or dip the blade of a small screwdriver into the oil and apply to the point to be lubricated. A small quantity of switch cleaner on the rotor earthing fingers of the tuning capacitor is also a good move.

It is not advisable to try cleaning the dial or scale plate with anything other than a soft dry cloth, since it's extremely easy to remove the artwork or background colour and the result looks awful. A dirty scale is much less hard on the eye than a patchy and discoloured one with half the legends missing as a result of over-enthusiastic cleaning. Keep all switch cleaners well away from this part of the equipment, since they make excellent solvents for vintage enamels and paintwork - not to mention the 'Indian ink' which was used in some wavelength scales.

So far we've been assuming that the equipment was totally dead; now let's consider one which partially works. Valve ageing is a common fault and shows up in a number of ways. In fact, it can be so gradual that the deterioration in receiver performance isn't noticed until you begin to realize that you're not hearing things that the locals are, or you compare the set directly with another one of the same type. The point at which this effect becomes a problem is to some extent a matter for the individual. Unless adequate test equipment is available and you know how to use it, do NOT be tempted to start tweaking every coil in sight. Replacement of valves in IF stages shouldn't have the slightest effect on the tuned circuits, and tweaking won't usually compensate for a deteriorating valve. Re-tuning of IF stages should only be necessary if components have been replaced - or, in very old sets, when component values have altered slightly with age and the IF tuned circuits need to be brought back on frequency.

All in all, unless the IF needs to match into something like a crystal filter, it's generally safe to assume that you won't have to touch the IF transformer cores. In any case, you need access to the manufacturer's alignment information to do the job properly - not to mention the right tool for adjusting the cores. ON NO ACCOUNT attack ANY cores in ANY equipment of this type with the nearest handy-looking screwdriver from the tool kit. The last thing we want to do is to keep issuing warnings and putting you off trying things for yourself, but a ruined IF transformer with a broken core and cracked former is likely to be almost impossible to replace.

Replacement of oscillator and RF amplifier valves will probably necessitate a small amount of re-alignment, and luckily this can be done without too much in the way of test equipment. One indication that one or other of these valves needs replacing is that the equipment appears to work at low frequencies but not on higher ones. If the dial alignment is out after replacing the LO, find the appropriate oscillator coil and trimmer capacitor for each range and tune to a signal (or the signal generator) at the low end of the band you wish to adjust. Tune the oscillator coil's core so as to bring in the signal at the correct point on the dial. Repeat at the high end, but now adjust the trimmer instead of the coil. Keep doing this until the 'tracking' is correct at both ends of the band. The RF stage is peaked in a similar manner. Find a signal at the low-frequency end of the band and adjust the coil for the loudest signal; do the same at the HF end whilst tweaking the associated trimmer. Repeat until there is no improvement. You can use the S-meter reading as an indicator; if there isn't one, connect a high-impedance voltmeter to the AGC line and look for the highest reading.

Finally, if you discover that the set refuses to work at a certain point on the tuning scale and the fault appears at the same point on each range, check the tuning capacitor to see whether any vanes are shorting as it is rotated. A delicate operation will be necessary to restore clearance. It's also worth checking that the bearing screw has not worked loose; if it has, carefully tighten it until the rotor vanes are equidistant from adjacent stator plates when the capacitor is fully meshed. Tighten the locknut and check that the spacing has not altered. You will note that the outer vanes are slotted and may look 'bent' at varying angles. Do NOT be tempted to 'tidy them up' since the bending forms part of the tracking alignment of the tuning capacitor.

S-Meter Bulbs Continued...

That's about all we have space for this month except to say that Mr T Beamond, G3VLF, takes us to task over our item on replacing S-meter bulbs with LEDs a couple of months ago. He writes:

'Your advice on changing dial lamps to LEDs should be treated with some caution since on some rigs, eg the Heathkit transceivers, the dial lamps form part of the heater chain which is wired in series/parallel. Taking out a dial lamp or changing it to a different power will unbalance the heater lines and over-run some valves and under-run others with the result that the rig will not operate properly. If it is desired to lengthen the life of the bulbs, the easiest way is to drop the voltage with a series resistance. A small voltage drop (say 10%) will extend the life several times and a resistor across the combination can be used to bring the current drain back to its original value if this is required'.

Yes - we agree that a dial lamp in equipment in which it is part of the heater chain can't be changed for an LED in the way we described, and we should have said so. I'm not so sure about the old wisdom that lowering the current through a filament bulb prolongs its life, however - especially with the small variety usually used for S-meters and the like. My old IC251E seemed to get through about one S-meter bulb about every six months regardless of whether it was used in the 'dim' or 'bright' position - it's the switch-on surge that does the real damage to a filament lamp. *(Why is it that only the most inaccessible lamp goes pop? - Ed).*

See you next month. □

Standard Frequency Receiver Conversions

Dr P. Stewart, G7EAH, shows how to convert 200kHz standard frequency receivers to 198kHz operation.

Employing the modification described here reduces the cost and complication of building a completely new system for 198kHz and eliminates expensive coil construction and difficult tuning. Further, it is not necessary to change internally in any way an existing 200kHz off-air standard receiver. Many will already have constructed a 200kHz off-air receiver based, for example, on circuits given the chapter 'Frequency Measurement' in the RSGB book *'Test Equipment for Radio Amateurs'*.

FREQUENCY STANDARDS

Before describing the circuit it might be useful for those not familiar with off-air frequency standards to explain why and how they are used.

An ordinary quartz crystal oscillator operating at a frequency of 5MHz performs, without special precautions, with a stability of about 2 parts in a million over a second. If the crystal is cut in a special way and placed in an oven with a temperature sensor to maintain a constant temperature, an improvement in the stability to 5 parts in 10^{12} can be achieved over one second. A rubidium gas cell oscillator of the kind used in the Droitwich transmitter system for Radio 4 has a similar short-term stability. Whereas a high quality quartz oscillator of the kind referred to above will have a systematic drift over a day of about 5 parts in 10^{12}, the rubidium oscillator typically drifts only 2 parts in 10^{11} in a month.

Another system is the caesium beam tube — as used in the MSF 60kHz transmissions from Rugby. Caesium is described as a primary reference, while rubidium is a secondary standard. The reason for the adoption of caesium as a primary standard is that, while the short-term stability of caesium over one second is not significantly better than that of a good quartz oscillator and is in fact inferior to a rubidium system, the long-term drift of caesium is about an order of magnitude better than rubidium. The best system for long-term stability commercially available is the hydrogen maser but this is not currently used to provide stable carrier transmissions for off-air standards nor has it been adopted as a primary frequency standard. These primary and secondary standards are well beyond the means of even a small commercial laboratory costing between £10,000 and £40,000.

It is possible for the amateur to exploit the accuracy of primary and secondary standards without the expense by using what is known as an off-air standard receiver. Droitwich is just one of a number of radio stations emitting a carrier whose frequency is maintained to a very close tolerance. This transmitter does not have a quartz oscillator but a synthesizer based on a rubidium gas lamp whose frequency can be maintained to an accuracy of about 1 part in 10^{11} in any 24 hour period and constantly compared by the National Physical Laboratories with their caesium long beam primary standard. Another standard is MSF Rugby transmitting on a frequency of 60kHz, this is an even more accurate carrier based on caesium; here the carrier is maintained to an absolute accuracy of about 2 parts in 10^{12}.

Further up the bands into the HF spectrum various countries transmit accurate carriers on 2·5, 5·0 and 10·0MHz. The problem with HF transmissions is that they are much more affected by, for example, ionospheric doppler shift and refractive index changes than those in the VLF and LF bands. MSF and Droitwich are also affected but to a much lesser degree. The Droitwich transmissions (particularly at night) are affected by interference from Eastern European stations. It is particularly advantageous therefore to use a frequency for which the principal mode of a transmission at the time of measurement is the ground wave.

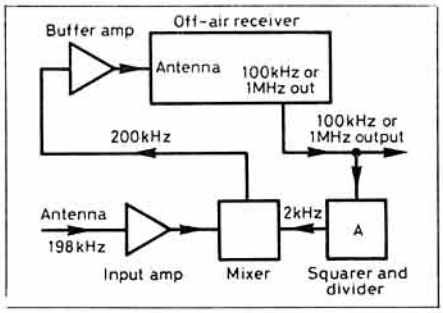


Fig 1. (above) Conversion block diagram.
Fig 2. Add-on squarer and divider circuit.

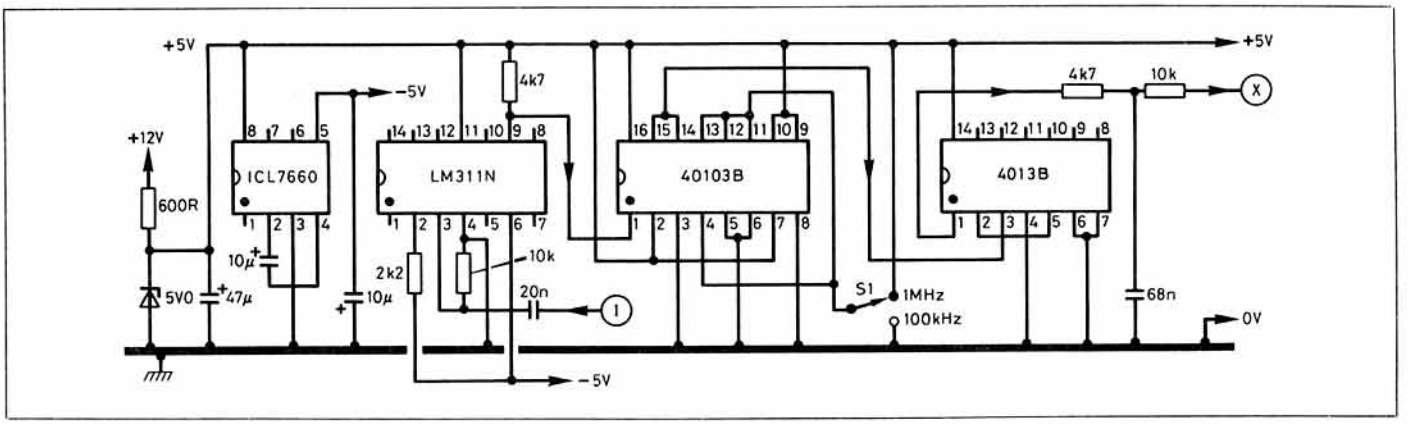
For many years the Droitwich transmitter has provided a reasonably accurate carrier for normal industrial and amateur reference. Most amateurs will be well satisfied if they are able to adjust their frequency counters to about 1 cycle at 10MHz — remember, if your counter is out by 10 cycles at 100kHz it will be out by 1kHz at 10MHz! The more enthusiastic amateur could well be looking for greater accuracy and so the question arises just how accurate is Droitwich?

The frequency as measured at your off-air receiver is the combined effect of the drift in the rubidium standard, changes in the conditions in the transmitter, the ionosphere, the electrical conductivity of the intervening terrain, local interference and the phase stability of your receiving system. The wave received can take two principal routes from the transmitter one is the ground wave the other the sky wave, with one interfering with the other because of the phase difference; the magnitude of the interference between these waves is constantly changing.

The ionosphere is one of the most significant factors determining the phase stability and hence the apparent frequency of the received signal. For example, during the day at a time of moderate ionospheric disturbance, the short-term stability — on a time scale of seconds — of Droitwich might be 1 part in 10^9 if your receiver is only 50 miles from Droitwich but this figure is a factor of 10 worse 500 miles away.

At night when the interaction between the ground and sky waves is more significant the above figures can be expected to deteriorate by another factor of 10. This means that at night within about 200 miles of the transmitter you could not expect to obtain a reference frequency from Droitwich of much better than 1Hz in 10MHz. Of course, should there be a solar storm then none of the above applies.

Experiments performed in Manchester in the Summer of 1988 reveal that the best time to use Droitwich is during a five hour period starting from about 2 hours after sunrise. Outside of these items more noise is encountered. There is, however, one caveat — namely that during a working day at Droitwich, sections of the transmitter are switched in and out for maintenance purposes. I have checked the behaviour at the Manchester location and found that when a section of the transmitter is



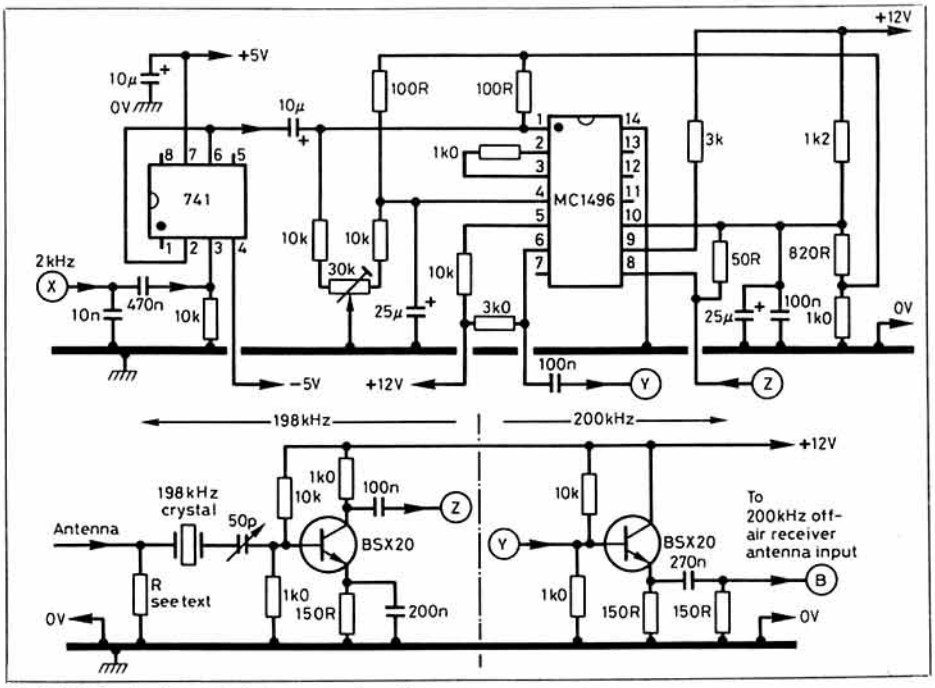


Fig 3. RF input, mixer and buffer amp schematic.

taken out of service there followed a sudden step in the phase of the received signal and, usually about an hour later a section of transmitter is put back into the main feed; there then follows a slow change in phase for about an hour amounting to a frequency error of worse than 1 part in 10^{11} (presumably as the reinserted section of the transmitter warms up). These measurements were made by comparing the Droitwich transmission with a rubidium standard while the latter was compared against MSF Rugby to ensure that the rubidium standard was not itself the source of the phase difference. The times of the observed phase changes were checked with the Droitwich engineers and seem to agree with the changes at the transmitter.

There is a further possible complication with Droitwich, ie. the phase modulation at about 25 cycles — at present used for what is called 'teleswitching' enabling the electricity generating board to switch domestic storage heaters on and off according to varying requirements and is achieved by phase modulating the carrier + and — 23 degrees each phase swing lasting about 20msec. Discussions with BBC engineers reveals however that the telemetry in this code stream gives an average a zero phase shift relative to the carrier which if frequency measurements are made over a time scale in excess of a second (as is normal) should not cause any problems, this being because most off-air standards contain a quartz crystal oscillator 'flywheel' with time constants in excess of a second implying receiver bandwidths of better than 1Hz.

All of this seems rather complicated but, provided that accuracies of order 1 part in 10^8 are required day and night there should be few problems.

MODIFICATIONS FOR 198kHz

Turning now to the circuit which is to be used to modify a 200kHz off-air receiver. **Fig. 1** shows the block diagram: simply take a nominal 100kHz or 1MHz signal output from the off-air receiver at about 0·3-5v and apply to the circuit block marked 'A'. The block firstly divides by either 50 or 500 depending on whether the signal from the receiver is 100kHz or 1MHz, respectively. The output from the divider (2kHz) is then filtered from a 5V square wave to produce a 0·3v sine wave with negligible harmonic content and then to a buffer and balanced modulator. Here the 2kHz sine wave is mixed with a signal from the aerial at 198kHz to produce at the output two frequencies one at 196kHz and the other at 200kHz; these signals then pass through an emitter follower with a low output impedance of less than 50ohms to the off-air receiver. It is the 200kHz signal to which the phase-locked-loop within the off-air receiver will lock.

Referring to **Figs. 2 & 3:** the points marked 'X' are connected together similarly with pairs 'Y' and 'Z'. The circuit is designed to operate from a 12V DC supply; the chip ICL7660 and the zener diode provide +/-5V which together with the 12V supplies the circuit with power. The 100kHz or 1MHz signal is fed into the comparator LM311N which simply squares the sine wave to a 0-5v square wave. This is then fed into a presettable counter (40103B) the voltages on whose pins are held at 0 or 5V according to whether 100kHz or 1MHz signals are being taken from the off-air receiver. This produces a short pulse every 25 or 250 periods (of the input signal) — depending on the setting of the switch SW1 (Figure 2). This then passes into a 4013B divide-by-2 circuit, the 2kHz output of which goes to a low-pass filter, the output of which is fed into a unity gain buffer amplifier 741 which has the low output impedance necessary to drive the modulator (MC1496P). The C-R chain at point 'X' serves to filter the square wave to an almost pure sine wave so that no spurious sidebands are produced by the balanced modulator. Into this modulator is also fed the 198kHz Droitwich signal which passes through a buffer amplifier and 198kHz crystal filter (bottom left of Figure 3) via point 'Z' to the carrier input of the mixer (pin 8 of MC1496 also marked 'Z').

The 198kHz signal is now converted into two side-bands one at 196 the other at the required 200kHz. These signals pass from the modulator with a high output impedance through an emitter-follower to the antenna input terminal of the off-air receiver. The 198kHz crystal filter is inserted between the antenna and the buffer amplifier and serves to prevent the 202kHz sideband of the amplitude modulated carrier mixing with the 2kHz and producing 200kHz at the receiver input. The 30kΩ trimmer potentiometer on the modulator should be adjusted to give zero output at point 'B' (Figure 3) when a 198kHz signal is inject at 'Z' with no 0·1/1MHz signal into the comparator at point 'I' (Figure 2). A 150R resistor is placed across the output to the off-air receiver because some models may require a D.C. path.

Two types of antenna may be used — either a long wire, in which case a resistor of 1k — marked R in Figure 3 — should be placed across the 198kHz input terminals to protect the circuit, or a long wave ferrite rod aerial with a 150pF trimmer capacitor in parallel for tuning.

SETTING UP PROCEDURE

On completion of the circuit, connect an antenna to the input (Figure 3 bottom left). Connect also the off-air receiver antenna input to the output of the circuit (Figure 3 bottom right). Connect the 100kHz/1MHz output from the off-air receiver to point 'I' (Figure 2) and switch SW1 (Figure 2) to the appropriate frequency. All receivers have some form of signal strength indicator — adjust the 50pF trimmer capacitor in series with the crystal (Figure 3) to give a maximum signal strength indication. Where a ferrite rod is used, position it at right angles to the direction of Droitwich and tune the 150pF trimmer for maximum signal. You will probably find that the signal strength indicator will oscillate but this should eventually stabilize on a maximum value as the crystal in the off-air standard locks onto 200kHz. Should this not happen, there are several possible causes, eg. the long wire antenna needs re-positioning or lengthening or the internal crystal of the off-air standard is outside the capture range. If the receiver is a few years old it is possible that the crystal has aged — over 20 years this could be in excess of 10 cycles. If the crystal is too far out the phase-locked-loop may not lock and the remedy is to adjust the variable capacitor associated with the crystal oscillator in the receiver to bring the 100kHz output to its nominal value. Stabilization of the output indicator will then be seen.

When this procedure has been successfully completed the 100kHz and 1MHz outputs from the off-air standard will be locked to Droitwich.

CONSTRUCTION

At the low frequencies involved in the above circuitry, VEROBOARD construction is quite sufficient so that no elaborate PCB layout is needed. The BSX20 lead connections as seen looking at the bottom of the transistor with the protruding lip on the left are emitter-base-collector taken clockwise.

TRIALS

Four different types of 200kHz off-air standard receiver were tested and found to function reliably with this conversion: — Hewlett Packard's 5090A and 5090B models, RCS Electronics 103 and Advance OS1.

SUPPLIERS

The 198kHz crystal may be obtained from Golledge Electronics, Merriott, Somerset TA16 5NS and the semiconductors and ICs from among others Maplin, Electrovalue and the Chip Shop (Semicons) Ltd., 6, Beanleach Dr, Stockport, Cheshire. □

DATACOMMS

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9600 - "Yes it does work"

Following my recent trip to the USA, during which I visited the factory of PacComm, I am now able to report that 9600 Baud packet does work. Gwyn Reedy (PacComm's President) gave me a very informative tour of their workshops in Tampa Florida. Approximately 50% of their production is directed at the amateur market with new ideas being explored at all times. I was shown the new range of TNCs including the Ultra-miniature PAD which was designed to fit inside a Toshiba portable computer. As the licenced distributors of the James Miller, G3RUH, modem in the USA, they have reproduced it onto a very small surface mounted PCB with a direct connection to their existing TNCs via the connect/disconnect header socket. Supplied built working and tested with very clear instructions of how it is installed, this seems to be a very usable system as the reports indicate good links over a much greater distance than has been previously reported.

Whilst there I saw the new software for the PC320 plug in card, this gives a very effective screen display of all the usual LEDs normally found on a TNC front panel, a very handy addition. Also on test is the latest firmware version 1.17 a release date has yet not been set but should not be too far away. 1.17 has a few alterations to the PMS forwarding controls and changes to the method of flagging mail that can be forwarded to the local mailbox.

I would like to thank Gwyn and his staff at PacComm for their hospitality and time taken to set up demonstrations on my behalf.

On the home front

The DTI has been very busy this month, many new licences have been issued, amongst them is the marvelous news that a licence has at last been issued for Amtor mailboxes for 3.5MHz and another for 28MHz, both to Peter Martinez, GB7PLX. Other news from the DTI included information that as of 1 January 1990 the RSGB will be able to issue Notices of Variation for certain frequencies on the 430MHz and 70MHz bands.

GB7ESX has announced the opening of a user port on 433.650MHz. The station operated by George Lloyd, G1NNB, is located in Witham Essex.

GB7HDS has placed a cross band node and 70cm port on the air. The station is located in Peterlee, Co. Durham.

A new packet group has been formed in the Northampton area, the group meets every six weeks and is open to all amateurs interested in packet radio. Full details from Paul G0HWC @ GB7AAA.

Dosgate

News published in *Gateway*, the ARRL packet radio newsletter, is of an application package designed to give a full gateway to a MS-DOS based computer. This system although not new (it has been in the planning stages for seven years), differs from a mailbox where a user can remotely retrieve and send mail in the form of messages, read files and in some cases download programs, by allowing the user to remotely run software packages and use the computer as if it were in his own home (with limitations).

It does not take much imagination what use you could make of a machine with a 32 bit 25Mhz 80386 CPU, an 80387 floating point co-processor, 16 Mbytes of RAM and 300 Mbytes of hard disk space. You must also understand that this power will be available to any user that can log in using the packet network, so if you only have a C-64 or a Sinclair 48k machine you will have the full power of the IBM.

This would mean that the user connected to a Dosgate system could run applications such as play a game, calculate the position of the Oscar satellites even develop and compile his own programs.

I mentioned some limitations. Because of the varying types of screens we use and the way certain applications make use of the screen, any package that uses graphics or makes use of the ANSI escape sequences should be considered non compatible with Dosgate. Also packages that bypass the operating system and make use of the machines BIOS or directly access the system hardware will not work either.

It will be interesting to see what use can be made of this system when it eventually filters over to this country.

Beginners

This is the last time you will see the heading Beginners, if you have been following the section from May you will no longer be a beginner but have as much knowledge as the next person on packet radio, therefore from January 1990 the section will be headed 'Users'.

Last month all the information needed to get a station on the air was published, this month a few of the simple problems that can occur are discussed.

Q. All I get on the screen is garbled characters.
A. Check your terminal emulation software is set to the correct parity, data bits, start and stop bits. For the correct settings refer to your TNC manual. Also check the baud rate from computer to TNC, this may differ from the baud rate that the TNC will eventually transmit on.

Q. I can see and hear packets on the frequency but nothing is echoed to my screen.
A. Having firstly checked the obvious, ie leads and connections, check that you have the MONitor of the TNC set to ON. Try to type MON followed by a carriage return, this will tell you the setting of the TNC. It will tell you if the MONitor of the TNC is either on or off. On some TNCs it will tell you the level of MONitor, 0 being off 6 being the highest level. A point to note - some rigs have an audio out connection from the Mic socket, and this may not always be enough drive for some TNCs.

Q. I issue a connect command, but my rig will not transmit.
A. Check the level of the threshold of the DCD (Data Carrier Detect). The system is such that your TNC will not allow your rig to transmit if there is another station transmitting. Most TNCs listen to noise as well as signal; if your squelch is open the noise will trigger the DCD circuit thus not allowing your TNC to activate the PTT. There is now available an upgrade for most TNCs which allows the DCD to detect only signals and ignore other noise allowing the rig to be used effectively with the squelch fully open.

Q. I issue a connect command but no other station responds.
A. There are two possible causes for this problem. The first is that you have not calibrated your TNC correctly for your rig; follow the calibration section of your TNC manual very carefully. The second, and less obvious to first time users, is the setting of a TNC command TXDelay. If your rig has relay switching you may have to increase the value of the TXDelay. This parameter delays the data from being transmitted for a set period of milliseconds after the PTT has been activated, allowing the transmitter to reach full power. If your TXDelay is too short for the rig you are using, then the first part of the packet may not be heard at the receiving station.

Q. I connect to my local mailbox only to be disconnected immediately.
A. Check that you have entered your callsign correctly using the command MYcall. If your TNC has a call that the mailbox thinks is an illegal call, eg NOCALL, it will disconnect you.

Q. I connect to my local Node but after the connect message nothing happens.
A. Unfortunately this is quite correct, most Nodes are rather unfriendly unlike a mailbox. If you follow the connect message with a carriage return the Node should prompt you with a help line.

Well that's it for this month - space has got me again. Next month being Christmas month, a change to the usual packet news and so on. Watch for the alternative glossary, a competition with a great prize, and some clean fun for the festivities.

'Your Gateway to Packet Radio' is an extensive treatment of this increasingly popular aspect of amateur operating. Written by Stan Horzepa, WA1LOU, the book incorporates a brief history of Packet evolution, explains the 'technish' which so often befuddles the newcomer and looks forward to future Packet developments. Available from RSGB HQ for £7.70 for non-members of the society, £6.55 for members. All prices include p&p.

MICROWAVES

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Committee Business

The most recent Microwave Committee meeting on 16 September discussed a number of topics including some of the RSGB awards and trophies, the preliminary preparations for next year's NEC Convention and the Sandown VHF Convention, the 1990 Microwave Cumulatives, operating awards and support for various contests.

It was noted with some regret that there had been absolutely no entries for the John Rouse Memorial Award and Premium. This was particularly disappointing, since it appeared to indicate a complete lack of interest in the design and construction of microwave equipment, either 'complete' equipment or even building 'units' or modules which could be assembled into more versatile equipment. Perhaps if I remind you that the closing date for next year's award will be September 1990, it might stir up a little activity! You might even like to make an entry by displaying some equipment on the Committee stand at either NEC or Sandown - or both.

Although not finalised, it is our intention to try to exhibit a wide range of simpler equipment for several of the bands in order to show what can be done with limited resources: G4DDK's various modules are a case in point, as outlined in my brief review of construction do's and don'ts in the August *RadCom*. This won't, of course, preclude any 'state of the art' equipment which you might want to show off!

One constructional idea which was discussed, based on MMICs or Microwave Monolithic Integrated Circuits (ModAmps, modular amplifiers and ModCons, modular converters or mixers), was the possibility of a series of 'generic' converters covering up to about 4GHz (ie 1.3GHz, 2.3GHz and 3.4GHz) which could conceivably replace the 'engineered' interdigital converters which have been so many microwave operators' introduction to microwave receivers. How much easier and simpler it would be to build a basic PCB converter (or even transverter) using these broadband devices. All that would be needed to improve their basic performance would be a fairly potent, preferably masthead, preamplifier and some front end selectivity to suppress image response. It is likely that the 'DDK oscillator sources can be extended to 3312MHz to provide an LO signal at a suitable level for an active mixer - it has, of course, already been done for 1.3GHz and 2.3GHz and there is no reason to believe that it can't be extended that bit further.

Regarding other trophies, some nominations were made for some of the Society awards which, subject to Council approval, might be presented at the AGM in Dunoon in December. The Alpha Cup, which was formerly awarded to the leading scorer in the 10GHz Cumulatives, appears to be no longer available and, again subject to Council approval, may be replaced by an annual miniature cup, renamed the G3RPE Memorial Cup, given for the same achievement. It was Dain, G3RPE, who was a moving light and active proponent of the Cumulatives as a means of raising interest in the 10GHz band.

With regard to contests and activity periods, the possibility of resurrecting the Microwave Cumulatives to run concurrently with the 10GHz Cumulatives was discussed, along with possible dates and formats for next year's events. The possibility of co-timing with some of the IARU Region 1 events was also discussed. No firm conclusions were reached, other than such co-ordination might present difficulties in talk-back (our European neighbours using 432MHz or 1.3GHz for talkback, rather than 144MHz commonly used in the UK) and presenting 'unfair advantage to east and south-coast operators' by virtue of their proximity to the continent. The debate will continue at the next meeting, scheduled for early December. If you feel inclined to have your two penn'orth, then please let any member of the Committee have your views before the meeting - I realise that I haven't given much notice here, but regular readers of the Newsletter will be aware that the dates, formats and so on have been 'up for grabs' most of this year. We really need to make decisions in December, so act quickly! Two possible new venues for Round Tables have been put forward as a result of my mention of the desire to hold such events at additional new centres in 1990; one is near Hereford and the other in the Birmingham area. These are to be discussed further with a view to supporting such events, the one difficulty, as with contests, being to fit them into a sensible part of the RSGB Events Calendar! If the two proposers, G4ASR and G0DJA, will bear with us, we'll certainly follow up their suggestions and support their organisation.

Recent Awards

The latest small but significant batch of operating awards, notified by G4OUT, the Awards Manager were as follows:

1296MHz Standard Award to G6UWO (No.80)
1296MHz Senior Award to G4BYV (No.21)
1.3GHz Distance Award to G3IMV (No.128)
1.3GHz 30 Squares to G3IMV (No.22)
1.3GHz 70 Squares Award to G4BYV (No.5)

Congratulations to all concerned. It just goes to show that there is some life out there after all!

From Here and There

Two bits of Good News on the components front! The Committee Components Service has received notification that despite the recent upheaval caused by the Plessey/GEC merger, the microwave oscillators and devices business will be transferred to MEDL, Lincoln, so that continuity of supplies of 24GHz oscillator/mixer modules is assured for the immediate future. We will, of course, explore the possibility of acquiring supplies of other devices made at Lincoln.

The second piece of news is that Mike Quee, G3ZWW, one of the directors of European Microwave Components Ltd, has offered to deal directly with members' orders on a cheque/CWO basis (no 'plastic' please) for any of the items they stock. As they are now the exclusive UK stockists of, amongst others, Mitsubishi GaAsfets and SGS Thomson RF bipolars, this is good news indeed. Enquiries/orders to 7, Freebournes Court, Newland Street, Witham, Essex CM8 2BL, Tel. 0376 515200, Fax: 0376 515278 or Telex: 995645 EBCTLX. Beside the devices mentioned, the company carry isolators, circulators, filters, couplers, hybrids, splitters, combiners, oscillators, cable assemblies and amplifier sub-systems.

Here comes the commercial! You'll find extensive information, largely non-mathematical, on most of the components mentioned above in the new *RSGB Microwave Handbook*, Volume 1, which should be available by the time you read this. If you don't know what such microwave components do, then the new Handbook is definitely for you! Volumes 2 and 3, covering further microwave topics, including individual band chapters are due sometime next year.

I've been playing 'DC' radio over the past few weeks; no, I haven't abandoned the microwave scene (although the time I get to do microwaves seems to diminish by an inverse square law!), it's simply that I've started to address the problem of simple tunable IF receivers for the beginner. I've built and tested the C M Howes Communications new DC receiver, the DXR10, covering the 10, 12 and 15m bands and find it to be a highly effective CW/SSB receiver which will quite nicely retune to cover 28 to 30MHz (actually, more than this). It would seem, on the basis of a brief period of experience, to provide quite a nice tunable IF for simple microwave use. The only snag, of course, is that it will not resolve FM; however, this is probably only a minor disadvantage when one considers that the most effective modes are the two catered for, viz. CW and SSB. A brief conversation with G4FRE revealed that he and his new XYL, (congrats Dave and Meg!) had also tested out the design as the new XYL's introduction to amateur radio construction, finding it to give very acceptable performance.

SWL

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Eric Trebilcock

First, I have some sad news to impart. It was with some regret that I learnt that Eric Trebilcock BCRS195 is now a silent key. Eric, who must have been in his eighties, had been involved with radio since the early 30's. He lived in Australia. I met him a few years ago at the QTH of G2MI and found him a charming man. He regularly entered the BERU Contest and indeed put in a log for the Society's SWL contest earlier this year. He will be sadly missed by his many friends worldwide.

Reminders

Now, a few reminders. Last month I reproduced the rules of my HF Challenge. Closing date for posting the SSB entries is 21 November. The CW leg takes place over the weekend of 25/26 November, so please take a listen, see what you can log and send the log off to me by 19 December.

International Marconi Day

I have mentioned this in a couple of recent columns, and it seems that I managed to confuse who was really responsible for the IMD Award. I am very grateful to G4WQL for writing to put the record straight. G3FWE has no connection whatever with the issue of the IMD Awards, only for the running of GB0IMD, which was active for the purpose of celebrating IMD. The event was, and still is, organised by the Cornwall Radio Amateur Club. Any Award claims both for SWL's and our licensed colleagues should go to PO Box 100, Truro, Cornwall TR1 1RX. G3FWE is, however, concerned with the Marconi Spectrum Award.

All SWL claims for the IMD Award have now been processed. It was the first time there had been an SWL category and logs from all the 'IMD' stations specially active had to be collected before the listener claims could be verified. For those who have become intrigued by continued reference to International Marconi Day, the 1990 event is to be held on 21 April. I hope to have more details available nearer the time to remind listeners that the 'IMD' stations will be there to log. If anyone would like a copy of the 1989 International Marconi Day Report, I can provide one if sent a large stamped, self addressed envelope.

G3FWE also wrote to clear up the confusion, but mainly to add some publicity to the appearance of GB2MAR to celebrate 'Marconi Families Day', This was on 16 September. If any SWL heard this special callsign, G3FWE can furnish you with a special QSL card showing the 'Mary Rose'. On another tack, he advised that there had now been an SWL claim for the 'Marconi Spectrum Award', shown in my 'Spectrum Analysis' offering in July, by Gordon BRS91705.

Newcomers

Alec Hill BRS92415 wrote to make himself known as a 'Newcomer'. He uses an Eddystone 730/4 receiver into a random length of wire and wanted details of an antenna which would giver better results on 14MHz. As Alec has only been a member of the Society since July, he had missed my late 1988/early 1989 'Antenna Slot' series which might well have given him some ideas, However, for those who are new to the hobby it might be worth repeating that where you want to listen to a particular band you need an antenna which is either a half or a whole wavelength of the wanted band. Therefore, for 14MHz a wire either 33 ft (10 m) or 66 ft (20 m) long would be the best. Again, with apologies to more established SWLs, equal lengths of wire go to the centre of the coax and the outer braid. The direction of the wire will have some influence on the part of the world which will be best received, but it will not be that critical and most parts of the globe should be audible without too much trouble. I have said it before and I will say it again, antennas are very much a personal thing and much time can be spent on making a new antenna, trying it out, and then trying something else until you find the design which is just right for you.

Alec also mentioned scanning receivers. I hope to start a series on receivers soon and scanners will be one of the types of receiver looked at.

Another to write for the first time was Philip Davies, who spent some time as an SWL being successful with the RAE. He is now G1EMD but is still an SWL at heart, having never aired his callsign. Although a 'newcomer', he began listening in the late 40's and has spent a lifetime in the electronics industry. He is in the throes of updating his listening station. His Eddystone 840a has served him faithfully for over 30 years and is now weighing up the advantages of purchasing a Lowe HF225, with Microwave Module converters for VHF.

We look forward to hearing more from both these 'Newcomers' and others. Many SWLs join the Society every month. Why not drop me a line so that I can mark your entry to the Society with a mention in your magazine?

ILA News

GW4OXB has once again provided the latest update on RS88763 — the SWL number held by the International Listeners' Association. Once again, their quarterly newsletter provided a good mix of topics of interest to the SWL. GW4OXB was actually at the ARRL Convention on behalf of the ILA at the time of compiling this. He had been invited as a guest of the Great Circle Shortwave Society (the ILA's sister society in the States) and I hope to be able to offer something on them next month.

Back to the ILA Newsletter, one of the main articles provided some insight into fax on the Commodore C64C, but to ILA members the most important item was a reminder of how to use the Society's QSL Bureau correctly, quoting RS88763. If not a member of the Society, I hope that all ILA members will follow the 'rules', as it appears that if you do not mark your outgoing cards with 'RS88763/your ILA number' you will not receive any cards in return because the SWL QSL Bureau Manager will not know which ILA member the card is for!

With over 600 members, the Association appears to be thriving. If you would like more information, please write to GW4OXB at 1 Jersey Street, Hafod, Swansea SA1 2HF.

EUCW — CW Party

Morsum Magnificat published by G4FAI for the morse enthusiast has details in its latest issue of the European CW Association's 'Fraternising CW Party' to be held over the weekend of 18 and 19 November. There is an SWL section. There are four short contests over parts of the 3.5, 7 and 14MHz band (3520-3550, 7010-7030 and 14020-14050kHz). On the first day they are between 1500 and 1700 on 7 and 14MHz, and 1800 to 2000 on 7 and 3.5MHz. The second day sees the two events on at 0700-0900 on 7 and 3.5MHz, and 1000 to 1200 on 7 and 14MHz. SWLs score three points for each complete QSO logged and there is a multiplier for the number of EUCW members heard (membership number given as part of contest exchange). Logs should be sent to DJ2XP at Illingstr. 74, D-6682 Ottweiler, Fed. Rep. of Germany. Certificates will be awarded to the leading three SWLs.

Having provided the SWL rules here, there is no reason why those SWLs who prefer listening to CW should not take a listen during the event and send in a log. The contest exchange, which mixes RST with letters and numbers, is such that it will provide an added stimulus to those who look for something other than a 599001 type contest exchange. I look forward to hearing from G4FAI in due course whether any British SWL entered the contest.

Tidbits

Joan Slater BRS90400 who is now G7EWJ provided a brief note by way of saying she was still keeping up the listening between forays on 144 and 432MHz. She has erected a G5RV which she found a big improvement on past wire antennas. She had received her first contest certificate for a second place in the 1988 21/28MHz Contest and hoped to have taken part this year. Although more appropriate to my 'other' piece, I should mention that her best DX in September was VP2EXX/VP2S.

G4DFI reports that, at the time of compiling this, he had had no entries to the CVRS CW SWL contest, but that several SSB logs had been received. He hoped to have the results into print early in the New Year.

Those listeners anxious for the results of the Society's SWL contest should discover their fate next month!

David Whitaker has informed me that the White Rose ARS have decided not to run their LF SWL Contest next year. Although the ILA, through GW4OXB, offered to organise it, the Society did not want to lose the White Rose name. They are, however, hopeful of finding a member to organise it in 1991 and if they do it will get adequate publicity about this time next year.

Finale

Once again, I have come to the end of this part of the SWL feature in the magazine. I am still most keen to hear from any Newcomers, any SWLs who specialise in listening to the more 'unusual' modes of reception — for example RTTY, SSTV, FAX etc, and remember I am still interested in pen pictures from my more 'established' readers. In case you have not noticed recently, my address is now given on page 3 of the magazine, but note that the deadline for January 1990 is particularly early. Mail should reach me no later than Monday 6 November.

Readers may be interested to know that Receiving Station Logbooks are available from RSGB HQ — prices (including postage and packing) are £3.79 for members and £4.46 for non-members.

G3GAF's 40th anniversary QSO party

Clocking up your 40th year of amateur radio is definitely something to be celebrated. In this case Colin Dollery, G3GAF, decided to throw a party — and every radio amateur in the world was invited!

Why is G3GAF creeping downstairs at 0505 GMT on 18 August - which happens to be the last Friday of his summer holiday - and sneaking into the shack to switch on the rigs? There isn't a contest on, nor even a major DXpedition; no, this is for a celebration, or what the ARRL calls a 'QSO party'.

It all began as a mad idea which was reinforced by those reprobates on the RSGB's Council! The plot was hatched a few months ago, when I realized that it was just over forty years since my first amateur licence had been granted and that I ought to do something to celebrate the fact. Council came in because they said that amateur radio was currently at a low ebb, with decreasing activity and declining number of new recruits. It was decided that G3GAF would single-handedly do something about it, and so the idea was born of operating for an entire day to try and make contacts on all the bands for which I was licensed and had equipment. At first sight it was a long list - all the HF bands between 1·8 and 28MHz including the WARC bands, together with 50, 70, 144, 430 and 1296MHz, making a total of 14 in all. I intended to have proper contacts, not ones of the '59 QRZ' variety, and they would not be prearranged. I planned to work a reasonable amount of DX on several bands and also to make some local contacts.

So, the TS940 is warming up, the sun is shining through the shack window and away we go! I tune up on 14MHz and call CQ - nothing, the band is dead. So is 21MHz. Well, there was a solar storm three days ago and conditions are still very unsettled. What to do? Shall I abort the mission and return to bed? No, let's try some CW and see if that does the trick. Sure enough, the first contact of the day happens at 0525, with I2OEB/7 on 14MHz: he gives me 579. Spirits revive and I swing the TH3 round to the south-west.

THE LONG PATH

The master plan for the day said that I should get a good start by working Australasia on long-path for the first two hours or so. At 0534 the plan sems to be working as Bill, ZL2BLF, gives me 569 on 14MHz CW from near Wellington. However, another 15 minutes of CQ calls on both 14 and 21MHz yields nothing. Is it too early, or has the solar storm wrecked the HF bands? Let's try 7MHz. At 0553 I work PY2NE, who gives me 449, but there is almost nothing else to hear on that band. Back to 14MHz, to see whether things are looking up. Bruce, VK3VF, gives me 569, peaking at the end of the contact to 589 at 0610. SSB seems worth a try now, and over the next two hours I work assorted VKs and ZLs together with UA9WA and SM0ZS, with reports ranging from 55 to 59. Tom, VK2SV, depresses me by telling me that the pilots of Australian internal flights are working to rule and flying only between 9am and 5pm - and I leave for Australia next Wednesday! However, there is a lot of interest in the 'QSO party'. Around 0800 the long path has faded but I have an interesting contact with F/DK5BW/P who is using 10W whilst on holiday in France, near Beziers. His signal is a good 56 into Essex on 14MHz - but it is time to try another band.

GOING UP THE SPECTRUM

Another element of the master plan is to move up in frequency as the day passes. 18MHz should be open by now; it certainly is to Europe and I work G0EBI, SP2BWL and HB9CRO/M. Then a good one. I have a long contact with Gerry, VK7GK, in Tasmania at 0849, with signals 56 to 57 both ways. The band is certainly open although not many people are on it.

I switch back to 21MHz and have contacts with UI8, LZ1 and UZ9, after which it's time to try 10MHz. There is little sign of any activity but CQ calls on CW produce OE3GBC, HB9DGV and IK2IGV. Fading is to be a problem all day but it is especially prevalent on this band. I return to 21MHz SSB and work Jim, 5B4YC in Limassol. And who is this putting out somewhat plaintive CQ calls and getting no takers? Good heavens, it's OH6YF/OH0! Later in the day I worked him again on 28MHz, getting through a mega-pile-up to do so, but now at mid-morning on a weekday it's nice and easy. I work 4X6DT at 1016 but after that things seem very slow; after half-an-hour without a contact I decide to try another band.

So to 3·5MHz, and a long chat with Alec, G4SIB; we talk about his use of a Psion Organiser-2 to keep a file of calls worked. This turns out to be my only 3·5MHz contact of the day, but it is a good one. A quick tune around 144MHz yields a level of activity akin to that usually found in a graveyard but Rodney, G8XRL near Felixstowe, gives me a 144MHz 'banker' in case I don't return to the band.

I return to 21MHz, to find that conditions are none too good and CQ calls on CW seem the best bet. Back comes Ray, VS6UW, in Kowloon, followed by JA6PA in Fukuoka. Then two more mobiles, HA5JI/M in Budapest and YU4FRS in Sarajevo; he is only running 5W but is a solid 559. The morning session ends with Arkadiy, UA9JM and Tony, OE6RAG; and so to lunch.

LUNCH AND AFTER

The plan said that I would have some 430MHz contacts on the TH41E hand-held over lunch whilst I barbecued the steak. Unfortunately the plan misfires, since the tiny rig won't get into any of the local repeaters! I seek consolation in another beer.

The 28MHz band is expected to be a problem since conditions are so flat, so I decide to try and pick up a ZS on the north-south path. After a quick contact with EA2BOT in Zaragoza the plan duly works and I find ZS5FG on 28MHz SSB; Rusty gives me 51 in Durban. Then another interesting mobile; Bernard, FE1LCY/M is on holiday at Millau in the Gorges du Tarn and his 5W earns him a 53 report on 28MHz SSB. But otherwise 28Mz is dead and I switch to 24MHz. What's this? IK6BAK - but it's a beacon and no other signals are audible, so I go down again to 21MHz and call CQ. I work So, HL0CAC, in Jeonju City at 1332 and he gives me 58; then, clear as a bell, 9N1MM! Les is using Father Moran's rig in Katmandu. I tell him the story of my 40th anniversary 'QSO party' and he offers congratulations; he remembers it too because when I work him again on 14MHz (with a colossal pile-up) later in the day at 2019 he reminds me of it.

Contacts with JH2US and IK4LHA follow, but I must get off 21MHz and try and work some of the more difficult bands. Tuning around, both 18 and 24MHz seem dead. My saviour is Tom, VK6ATL, near Perth; I work him on 21MHz and explain my predicament; a quick QSY to 24MHz and he gives me S2. PT7BZ pops up just as we are about to QSY to 18MHz and gives me S7, so that makes two continents on 24MHz. I can hear VK6ATL on 18MHz too but I am very weak with him; fortunately I already have an 18MHz VK in the log.

A LONG EVENING

The only really good band today is 21MHz, so I return to it. At 1456 EL7X in Monrovia comes back to a CQ call; then I have a delightful contact with Hans, OE2WJL/YU2/MM, whose boat is at the Island of Rava in the Adriatic. The water temperature at Rava is about the same as the air temperature in Essex! Several more Europeans follow, and then I have a QSO with Harry, ZS6AMP, in Pretoria. Again I drag myself away, this time to try 50MHz. Unfortunately, it is as dead as the proverbial doornail. However, I manage to work David, G1MSE, in Great Yarmouth and then proceed to lose G7GCQ/P. I leave the rig on 50.110 and listen again on 10MHz; no joy and I return to 21MHz. I work SV0GX in a pile-up and then find myself in a three-way with ZS5XA and ZS3J. Leo, ZS3J, is looking out of the window at a sandstorm in Namibia whilst Peter, ZS5XA on the other side of the continent, claims to have his visibility similarly obscured by bananas and monkeys. However, his daughter has been trying to separate him from his rig for a good hour or more to give him his supper. Every time he signs off to go QRT, someone else calls him. Judging from the sounds I hear from the kitchen, this is striking a sympathetic chord not very far from my own shack...

I call CQ on 144MHz SSB and am rewarded with white noise. By now there really ought to be some North Americans coming through on HF but I cannot hear any on 21MHz; the 14MHz band isn't much

better but on CW I work W1NF and some Europeans. Another quick foray on to 144MHz yields Mark, G0KFV, in Colchester - almost within smoke-signal distance.

Back on 28MHz I am in the middle of pulling OH6YF/OH0 out of the pile-up when the din from the headphones plugged into the 50MHz Rx finally penetrates my tired brain. Costas, SV1DH in KM27, is being called by practically everyone in the UK and the racket is tremendous! At 1814 I make it to the top of the queue and receive a 58 report for my first 50MHz contact with Greece.

SUPPER AND A BIG SURPRISE

Nothing pertaining to amateur radio is permitted over supper, so I enjoy half a bottle of excellent Australian wine and my wife's equally excellent cooking. At 1928 I am back on 21MHz and talking to VP8BZR at Mount Pleasant in the Falklands. Andy quickly QSYs to 28MHz and we exchange 55 on that band. The wolf-pack descends on him before he can return to 21MHz, so I leave him to it and try some 28MHz CQ calls. Woody, 8P6CC, comes back and we chat about a mutual acquaintance who is a pillar of the Barbadian National Trust and a talented artist, who has painted many of the splendid old plantation houses in that country. Then Joe, LU9DM, calls and wants to know my county, district council, (Maidenhead) locator and WAB square. He is a WAB enthusiast (book number 3381) and has an encyclopaedic knowledge of British geography and local government. He is clearly disappointed that I am not in Cleveland since it is one of the few WAB districts he needs. Can anyone help?

Now what? Why am I being called by a G3 on 21MHz? Golf Three Echo Bravo Hotel - good heavens above...

IT'S CLIFF!

I was first licensed as a 17-year old schoolboy in Lincoln, and the help I got from Cliff Newby, G3EBH, and other members of the Lincoln club - G4BU, G3UML and the late Frank Travis - was tremendous. They taught me how to build radio transmitters, modify ex-Service receivers for the amateur bands and how to send and receive Morse. In 1948/9 G3GAF had a modified BC342 as the main station receiver, with an R208 as backup. The transmitter final was a pair of 813s. When the new-fangled television service eventually reached Lincoln - from the Birmingham transmitter 75 miles away - TVI from the harmonics of that Class C final was an insoluble problem. The main antenna was an end-fed north-south long wire across a neighbouring farmer's field, and it put a very good signal into KH6.

So to work Cliff - still living at Nettleham, near Lincoln - on this special day was a very great pleasure; the last time we had worked had been on 3·5MHz almost twelve years previously. What a nostalgic experience, and a very good QSO at 51 to 52 over about 120 miles; goodness knows what the propagation mode was.

TIME IS RUNNING OUT

It really is time to crack 430MHz, and I spend almost 30 minutes in fruitless SSB CQ calls. I beamed north, but with hindsight I should have fired some RF towards the Netherlands. There's no alternative: it will have to be via a repeater. I try GB3NK and GB3IH and no-one replies, but a little further up the band I find G1YQH and G3PED deep in conversation via a repeater on 432·350MHz. Being gentlemen, they leave pauses between their overs and I get in, so Mike, G1YQH in Herne, Kent gives me my contact on the most difficult band so far.

A quick foray back on 14MHz produces VO1BZ - whose cat seems keen to join in the contact - and K4VTJ at Stone Mountain, Georgia.

DESPERATION

I am pretty sure I am not going to make it. Close-down has scheduled for 2300 (midnight BST), all the remaining bands are toughies and there are only 75 minutes left. Astonishingly, a quick CQ on 70MHz gives me Ray, G4EGC in Tamworth and a 54 report. No sign of another station, and no time to look for one. Now for Top Band. I fumble in the darkness outside with a torch to find the coaxial connector for the 1·8MHz dipole; it has been protected too well from the weather and precious moments are lost digging it out of its covering. Top Band is full of the usual commercial stations and great crashes of QRN and there isn't an amateur signal to be heard anywhere. CW seems the only hope and it works; I raise OK1DQ, OK1FWQ and OK2KRK in quick succession between 2216 and 2229. One band to go! At 2230 I start calling CQ on 1296MHz SSB - silence. Fifteen minutes and many calls later, still silence. Only one option left; I fire up the 144MHz amplifier, beam towards Holland and call CQ, asking for anyone who is QRV on 23cm. Silence greets the first call - and the second - and the third. Then Oliver, DL1EJA in JO31, comes up very tentatively; no, he is not QRV on 23cm but we adjourn to 144·28MHz to discuss the problem. We are joined by Hans, PE1EYV, and Peter, PA3EUI; they are not QRV on 23cm either but Hans thinks that some of his friends with 1296MHz equipment are listening to beacons on 430MHz and sets off to find them. My wife pours the last glass of lemonade for me, waves the empty carton in front of my face and makes meaningful gestures at the clock. It is midnight. At one minute past, PA0FRE appears. He is QRV on 1296MHz! I call him, but no reply. Back to 144MHz, where a conference in Dutch is in progress. I can imagine the gist of it - how can we help this crazy Englishman? Fred tells me that I am 20dB over 9 in Rotterdam on 1296MHz, so what's the problem? I discover that a coax connector on the 1296MHz transverter has been damaged in packing-up after NFD. Fortunately, I have just bought a 23cm module for the TS790E and I am soon in contact with PA0FRE on 1296, where we are joined by Herman, PB0AHX.

I close down at 2308, with the objective achieved.

EPILOGUE

Some may carp, others may smile, a few may be envious. None of the DX was extra-special, but conditions were rather flat after the solar storm. I made 88 contacts during the day, and you may not think this was a lot - you've probably worked more than that in one hour of a contest. Well, so have I, but these were not contest-type contacts. I'm also lucky enough to have reasonable equipment and antennas. But it was tremendously exciting, and there were some real high points. The enthusiasm of the VKs, particularly VK6ATL; 9N1MM coming back to a CQ call; OH0 looking almost in vain for contacts. And the friendship was tremendous. Best of all, talking to Cliff Newby about the old days in Lincoln - where it all started 40 years ago!

(Happy Anniversary Colin — I wouldn't worry about the sceptics, after all, forty years on the air is a contribution to amateur radio in itself. What a refreshing change to hear from somebody who — dare I say it ***enjoys*** *their hobby and in doing so helps others to enjoy it too! — Ed).*

CONTEST NEWS

RULES

LF CUMULATIVE CONTESTS 1990 RULES

Dates and Times: 1·8MHz Mon 8 Jan, Tue 16 Jan, Wed 24 Jan, Thu 1 Feb, Fri 9 Feb. All sessions 2000-2200GMT.
3·5MHz Sun 7 Jan, Sat 13 Jan, Sun 21 Jan, Sat 27 Jan, Sun 4 Feb. All sessions 1600-1800GMT.
7MHz Sat 6 Jan, Sun 14 Jan, Sat 20 Jan, Sun 28 Jan, Sun 3 Feb. All sessions 1000-1200GMT.
Frequencies: All contacts to be made between 1835-1865, 3520-3550 and 7015-7040kHz.
Mode: CW (A1A) only.
Eligible Entrants: All entrants must be fully paid up members of the RSGB.
Sections: Single-operator only, all stations must be operated from the same location for each session on the same frequency band. The five sessions on each frequency band constitute a separate contest, viz: there are three individual contests, one on each band.
Exchange: RST/Serial number commencing with 001 for each session. Stations may be contacted world-wide, but may be only worked once in each session for points.
Scoring: Each completed contact 3 points. The total score is calculated by adding the points of the best three sessions out of the five on the band. Unmarked duplicate contacts will be penalized at a rate of 10 times the claimed score for the contact.
Logs: Use of RSGB/IARU Region 1 Contest Log and Cover (Declaration) Sheets is preferred. If not used, the log sheet must be formatted to this standard. Only one cover sheet is required for each band.
Entries: To be sent to: HF Contests Committee, c/o G3MCX, 86 Peckham Road, London, SE15 5LQ. All logs should be postmarked no later than **Monday 26 February.**
Awards: Remember that each band is a separate contest. A Certificate of Merit will be awarded to the leading station with the highest score from the best three sessions (as selected by the entrant) on each band. and the entrant with the highest aggregate score from the three contests.
The adjudicator would welcome checklogs for the non-scored sessions and from listeners.

FIRST 1·8MHz CONTEST 1990 RULES

1. Date and time. 2100GMT Saturday 10 February to 0100GMT Sunday 11 February 1990.
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. 1820-1870KHz, CW only.
4. Exchange. RST plus serial number starting 001. British Isles stations must also give their county code as shown in the 'Operating Guide' January 1990 edition of *RadCom.*
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 penalized 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.Wayman, G4DRS, 174, St Neots Road, Sandy, Beds, SG19 1BU. Overseas entrants to PO Box 73, Lichfield, Staffs WS13 6UJ, England.
8. Date for entries. Logs must be post marked not later than 15 days after the end of the contest.
9. Awards.
(a) The Somerset 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 Second 1·8MHz Contest 1989.
(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 are encouraged to enter the receiving section.

RESULTS

NFD 1989 RESULTS TABLE - OPEN SECTION

Posn	Callsign	Affiliated Society	QSOs	1·8	3·5	7	14	21	28	Total
1	G3VER/P	VERULAM 'LIONS'	921	1220	577	791	591	248	694	4121
2	G5LO/P	OXFORD & DARS	834	776	430	747	686	423	438	3500
3	G3NJA/P	TORBAY ARS 'A'	804	948	555	613	784	107	258	3265
4	G3ZRS/P	HULL & DCG	732	1036	542	763	455	123	318	3237
5	G3SFG/P	SOUTHGATE ARC	729	982	448	596	478	242	454	3200
6	G3TBK/P	EAST NOTTS CG	675	1034	463	758	352	119	326	3052
7	G3PRC/P	PLYMOUTH RC 'A'	712	920	489	698	757	91	76	3031
8	G3PDL/P	SCUNTHORPE ARC	704	802	462	555	474	248	380	2921
9	GM0ADX/P	KILMARNOCK & LOUDOUN ARC	671	814	358	819	552	110	178	2831
10	G3ASR/P	EDGWARE & DARS	595	872	442	554	381	219	322	2790
11	G4ARN/P	NORFOLK ARC	642	658	579	669	276	91	482	2755
12	G3XRT/P	ILFORD RSGB GROUP	625	824	431	794	323	142	196	2710
13	G3CNX/P	GRIMSBY ARS	585	590	615	681	361	61	192	2500
14	G3FVW/P	SCARBOROUGH ARS	522	706	491	452	373	85	282	2389
15	G3NWR/P	WIRRAL ARS	543	550	440	617	363	58	358	2386
16	G3UES/P	ECHELFORD ARS	533	648	697	458	216	100	256	2375
	GM4DIN/P	NORTHERN LIGHTS CG	572	600	224	532	679	154	186	2375
18	G3ULT/P	READING & DARC	553	574	202	272	571	374	280	2273
19	G4CUT/P	CHELMSFORD ARS	603	208	488	1005	189	43	262	2195
20	GM4GRC/P	GLENROTHES & DARC	584	298	184	696	630	251	132	2191
21	G3SDC/P	LEICESTER POLY	437	1318				763		2081
22	G3IYT/P	HUMBERSTON ARCG	513	392	585	577	255	142	102	2053
23	G3WGC/P	WELWYN HAT-FIELD	425	790	250	524	154	43	270	2031
24	G3VGG/P	BROMSGROVE & DARC	413	530	427	363	223	82	46	1671
25	G4EKT/P	HORNSEA ARC	377	470	48	463	308	84	116	1489
26	G3YRC/P	GT YARMOUTH RC	369	144	297	568	228	105	114	1456
27	G3YDD/P	HEREFORD ARS	470				1448			1448
28	G4ADM/P	SUTTON & CHEAM RS	366	252	70	543	281	132	122	1400
29	G6LX/P	SRCC (CROYDON)	453				1363			1363
30	G4AHG/P	SHIREHAMPTON ARC	398			1316				1316
31	G3JKY/P	CLIFTON ARS	378			1245				1245
32	G4RSE/P	SEARS CG	278	380	233	64	274	41	204	1196
33	GI3XRQ/P	BANGOR & DARS	305	56	146	313	327	114	224	1180
34	G0CLU/P	MIRFIELD GROUP	262	352	220	192	232	88	48	1132
35	G5UM/P	LEICESTER RS	321		946					946
36	G3NFC/P	BURTON-UPON-TRENT & DRS	214		290	364	64	86	16	820
37	GM3USL/P	CUNNINGHAME & DARC	167	302		4	268	28	78	680
38	G3WKX/P	MAIDENHEAD & DARS	135						670	670
39	G3LRS/P	LEICESTER RS	115	176		167	115	18	20	496
40	G3GHN/P	CLIFTON	137					431		431

NFD 1989 RESULTS - RESTRICTED SECTION

Posn	Callsign	Affiliated Society	QSOs	1·8	3·5	7	14	21	28	Total
1	G3VMW/P	MARPLE CC	919	1270	554	875	660	287	498	4144
2	G0AAA/P	THREE As CG	907	960	617	993	691	197	380	3838
3	G4BUO/P	WEST GRAVESEND CG	835	1190	623	757	557	357	260	3744
4	G3RAC/P	RACAL ARS	812	1008	577	859	556	129	484	3613
5	G4FNL/P	DOWNS CG	820	1006	493	812	638	264	328	3541
6	G4ALE/P	ADDISCOMBE ARC	749	946	486	819	432	225	506	3414
7	G4MBC/P	MID-BEDS CA	691	850	705	700	364	116	452	3187
8	G6KQ/P	EAST BARNET ARCC	769	820	641	1015	458	43	90	3067
9	G5BK/P	CHELTENHAM ARA	688	766	516	794	488	66	378	3008
10	G3WSC/P	CRAWLEY ARC	646	830	541	793	368	154	206	2892
11	GW8GT/P	RED DRAGON CG	723	862	393	657	721	104	148	2885
12	G4FRS/P	FARNBOROUGH & DARS	673	602	563	797	374	253	200	2789
13	G3ZME/P	TELFORD & DARS	627	588	445	723	569	79	164	2568
14	GM4AZZ/P	MAGNUM CG	558	766	341	718	378	116	216	2535
15	G3TVS/P	TVARTS	594	744	388	460	390	253	276	2511
16	G4CRA/P	COLCHESTER RA	540	740	306	704	382	17	344	2493
17	G3TMA/P	LINCOLNSHIRE POACHERS CG	587	692	488	665	353	166	20	2384

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18	G4JKS/P	VERULAM 'GLADIATORS'	476	1014	477	444	204	52	188	2379
19	G4ECT/P	CHESHUNT & DARC	574	576	600	578	391	66	160	2371
20	G4GZQ/P	G4GZQ CG	552	592	400	921	230	43	136	2322
21	G3TRF/P	MAIDSTONE YMCA ARS CG	479	856	152	547	332	178	176	2241
22	G4AYM/P	GLOUCESTER ARS	518	732	316	554	368	137	128	2235
23	GM3NIG/P	WINDY-YETT CG	530	466	399	528	505	143	184	2225
24	G5LK/P	REIGATE ATS	512	522	382	509	450	158	164	2185
25	GD3RFH/P	WESTERN ARC	460	988	349	240	350	82	98	2107
26	G4FOX/P	MELTON MOWBRAY ARS	506	418	342	740	269	72	198	2039
27	G3GRS/P	GRAVESEND 'B'	435	708	254	367	313	100	270	2012
28	G4PGW/P	NORTH DEVON BINDER CORD CG	440	794	110	542	391	54	96	1987
29	GM3ULG/P	GLENROTHES ARC	472	602	323	390	546	35	72	1968
30	GW4CC/P	SWANSEA ARS	467	630	262	334	599	47	82	1954
31	G6UQ/P	STOCKPORT RS	471	474	404	529	427	41	66	1941
32	G0HAR/P	HESKETH ARC	425	654	413	532	213	54	62	1928
33	G4HRC/P	HAVERING & DARC	494	442	421	545	415	31	8	1862
34	G3WQK/P	SOUTHDOWN ARS	407	588	322	470	253	62	162	1857
35	G2LW/P	CRYSTAL PALACE & DRC	390	644	143	394	197	226	240	1844
36	G3LCG/P	EAST AYTON (SCARBOROUGH) GROUP	433	406	440	551	342	68	20	1827
37	G3RIR/P	LEICESTER POLY ARS	439		1042				764	1806
38	G8GG/P	BLACKPOOL & FYLDE	413	512	358	518	328	41	40	1797
39	G3CAR/P	CHILTERN ARC 'B'	380	768		750	163	22	8	1711
40	G3FJE/P	SHEFFORD & DARS	371	454	244	506	260	37	206	1707
41	G3WKS/P	WEST KENT ARS	387	294	378	646	160	54	162	1694
42	G0CEL/P	TORBAY ARS 'B'	502	150	203	862	394	54	28	1691
43	GW4LZP/P	MEIRION ARS	384	452	293	310	340	123	140	1658
44	G3ZTT/P	MIDCARS	388	326	465	262	324	77	168	1622
45	G4GCT/P	NORTH BRISTOL RC	439	192	230	585	451	53	20	1531
46	G3MDG/P	CHESHAM & DARS	348	508	129	434	256	128	46	1501
47	G0AER/P	DYNAMICS HATFIELD CLUB ARS	336	312	368	482	153		174	1489
48	G0FDX/P	CENTRAL LANCS ARC	368	252	147	389	550	30	66	1434
49	G0JNZ/P	PLYMOUTH RC 'B'	361	352	184	575	213	91	16	1431
50	G4VRS/P	AYLESBURY VALE RS	327	328	320	505	165	41	54	1413
51	GW3EOP/P	BSC PORT TALBOT	335	430	232	431	243	25	30	1391
52	G4APN/P	EASINGTON ARS	312	308	183	520	198	26	150	1385
53	GM4TOQ/P	WEST OF SCOTLAND ARS	331	308	224	352	331	12	114	1341
54	G3WAS/P	LICHFIELD ARS	202	1060		112	22	14	124	1332
55	G0ANT/P	EDEN VALLEY CG	319	180	62	475	312	121	136	1286
56	G4JS/P	DARWEN ARC	261		301	733	169		28	1231
57	G4WSM/P	WESTON-SUPER-MARE RS	326	32	296	630	222	27	12	1219
58	G4FUH/P	SCUNTHORPE ARS	340		244	555	319	37	12	1167
59	G3GXI/P	ECCLES & DARS	350			1153				1153
60	G5RS/P	GUILDFORD CG	372				1145			1145
61	G0BRC/P	BREDHURST RATS	320		1031					1031
62	G3HJF/P	VERULAM ARC 'C'	210			330	165	83	288	866
63	G4KZD/P	SOUTHGATE ARC 'B'	233	168	90	194	287	84		823
64	G0GLE/P	GOOLE R & ES	133	402	56	147	4	4	6	619

LOW POWER FIELD DAY 1989

In contrast to recent years, excellent weather made the 1989 event a decidedly pleasurable occasion. In excess of 90 QRP stations appear in the logs, one third of which were portables and 21 of these sent in entries. There was good support from QRO fixed stations with over 80 helping to contibute points to the entrants. Congratulations to Hilary Claytonsmith, G4JKS/P who beat husband Frank (G3JKS, operating G3VER/P), to win Section 'A' while Tim Raven, G4ARI/P won the QRPp Section 'B'. Most entrants lost points through log errors, but G0BUZ/P and GW3SB/P are to be congratulated on their perfect logs.

Once again, there was some confusion, particularly for contacts with fixed stations, because of the asymmetrical exchange of details (/P stations sent town and county code, fixed stations sent just 'QRP' (if appropriate). One suggestion would be for ALL stations to exchange county code and output power, but comments would be welcomed by the HFCC, via the Adjudicator, Dr G. Hinson, G4IFB, 41 Beechen Lane, Lower Kingswood, Surrey.

G4IFB

LOW POWER FIELD DAY 1989 RESULTS

SECTION 'A' (up to 10w output)

Posn	Call	Total	80m	40m	Equipment
1	G4JKS/P	1176	505	670	TS120V
2	G3VER/P	1051	438	613	TS120V
3	G4JSD/P	1020	405	615	FT77S
4	G4FRS/P	987	414	553	TS120V
5	G3SFG/P	903	428	475	TS130V
6	G4EKT/P	653	253	400	SS/105S
7	G4JBR/P	491	105	386	TS120V
8	G0KJN/P	149	-	149	Century 22

SECTION 'B' (up to 3w output)

1	G4ARI/P	1081	402	659	F850
2	G4OGB/P	848	295	553	TS430/2X1RF510
3	G0BUZ/P	800	340	460	TS130V
4	G4TLH/P	715	218	497	TS120V
5	G4FOX/P	626	226	400	Howes kit/R600
6	G0FTO/P	531	207	324	TS120V
7	G4MWC/P	480	222	258	Homebrew
8	G3BPM/P	386	124	262	Homebrew/Drake Rx
9	G4EXQ/P	383	328	55	HW8
10	GW3SB/P	365	80	285	HW8
11	G3EAO/P	339	155	184	HW8
12	G3VYI/P	314	314	-	6V6 PA/DC Rx
13	G3CQR/P	249	180	69	BFY52 PA/DC Rx

Checklogs received with thanks from G3MCK, G3OEP, G3WPK, G4CZB, G0ATR and G0JQI (perhaps they would like to enter next year?).

COUNTY ROUND-UP CONTEST 1989

With the demise of the RSGB Regions, this contest has replaced the Region Round-up and an SSB section has been added. The new section was well supported with over 200 stations active including many G0s. This compares with the number of logs submitted, which at 14, was disappointing. The HFCC is hoping for an improvement as the event becomes established.

Congratulations go to G3TBK who led the CW section and to G4OBK who, in his last contest before moving to GM, was a run-away winner on SSB. Both CW and SSB Receiving sections were hotly contested, with certificates going to BRS52868 and G1PEF respectively. The overall standard of entries was quite creditable with most points being lost due to incorrect logging of callsigns, particularly in the SSB section. Some entrants did not read the rules and calculated separate sub-totals for each band and added the two together. The adjudicator rescored these entries this time round, but he may not be so generous on future occasions!

Overall, the contest was enjoyed, but several entrants noted that conditions on 3·5MHz are deteriorating with the onset of the sunspot maximum and would like an earlier start. The HFCC is reluctant to bring a Sunday morning event much further forward in time, but will keep the matter under review.

G3LET

COUNTY ROUND-UP 1989 RESULTS

CW TRANSMITTING SECTION

Posn	Call	Points	Mult
1	G3TBK*	16524	54
2	G4OBK*	15390	54
3	G4ARI*	14508	52
4	G4KGK	13728	52
5	G3JJG	13674	53
6	G3NKS	13500	50
7	G4IFB	12948	52
8	G4IQM	10998	47
9	GM3ULG	10944	48
10	G0DJF	10575	47
11	G4OGB	10437	49
12	G3JSR	9990	45
13	G4LZB	9660	46
14	G3LIK	8910)	45
14	G4XPE	8910)	45
16	G5MY	8442	42
17	G4GLC	8235	45
18	G3MA	8041	43
19	G3CQR	7920	44
20	GW3SB	7080	40
21	G3BPM	6318	39
22	G0IDE	6156	38
23	GM3UM	5724	36
24	G4ZME	3840	32
25	G3GMS	3000	25
26	G3MCX	2940	28
27	G4AGO	2400	25
28	G0KJV	2376	24
29	G3GMM	2340	26
30	G3LET	1863	23
31	G0KJN	1530	17

CW RECEIVING SECTION

1	BRS52868	10731	49
2	BRS1066	10437	49

SSB TRANSMITTING SECTION

1	G4OBK*	33075	75
2	G4ARI*	20928	64
3	G3MA*	16170	55
4	G3LIK	14850	55
5	G3TBK	14229	51
6	G4IQM	11466	49
7	GM4GRC	9804	43
8	GM0ALs	9594	41
9	GW4EVX	9522	46
10	GW4SDO	8190	42
11	G4XPE	7611	43
12	G4KGK	4752	33
13	G3JSR	3441	31
14	G0FGS	1701	21

SSB RECEIVING SECTION

1	G1PEF*	11679	52
2	BRS5254	38772	42
3	BRS2819	87182	42

* Certificate Winners

70MHz CW CONTEST DECEMBER 1988

Posn	Callsign	Pts	Loc	QSOs	Best DX	Km.
1	EI9FK/P	265	63WC	22	G3JOC	502
2	G4RFR	234	90AS	30	GM0FRT	699
3	G4BVY/P	221	82LB	31	GM0FRT	559
4	GW4MGR/P	218	83JA	30	GM0FRT	454
5	G3UKV	168	82RR	28	GM0FRT	482
6	G3VIP	162	93XN	20	GM0FRT	411
	G3PJX/P	162	91TF	25	EI9FK/P	443
8	G3NAQ	155	91HL	25	EI9FK/P	370
9	G4ULS	106	82TI	23	EI9FK/P	265
10	GM0FRT	105	87WB	6	G4RFR	699
11	G3BPM	67	80OW	11	GW4MGR/P	233
12	G4AGO	9	91OF	3	G4RIS	128

G4OUT Checklog received.

Please note that this table supplements the contest report which appeared in October *RadCom*, page 79.

144MHz LOW POWER CONTEST

Comments were variously 'flat' 'poor' or 'good' depending on where the station was entering from. The Best DX shows what was possible.

Logging was generally good but a few points: if you work a foreign country it counts as a multiplier; if you work more than one station in that country it is still only one multiplier!

One group sat at the top of the pile for a while with over 1·5 million points! They used km not radial rings - nice try.

Congratulations to the winners and the runners up in each section, including the newly licenced operators (asterisked). They will receive certificates very soon. The 'Overseas Section' was not originally part of the contest but the results have been listed as the more activity we can get the better the competition becomes.

Many entrants used obsolete forms; whilst they have not been penalised, it would make adjudication easier if everybody used the correct stationery. If you need the latest correct forms, write to me with a large SAE, and I will send you the forms that you request. Finally a message to 'Mike' (in Devon) - please make sure you thank Jaqui and Gwen for filling in your entry for you. I'm not sure if this contravenes the rules or not, but it must be nice to have a secretary!

G4DEZ

1989 LOW POWER 144MHz CONTEST

FIXED STATION SINGLE OPERATOR

Posn	Callsign	Points	QSOs	Mult	Ant	Loc	Best km	DX prefix
1	G4PIQ	142839	269	59	14Y	01MU	576	GM4CXM
2	G3YDY	40876	129	44	9Y	01FQ	470	EI3GE
3	G6IAT	37877	133	49	17Y	91TV	407	EI3GE
4	G1HLT	36662	101	46	9Y	93KD	710	DL2LAX
5	G1OGY	35476	114	49	14Y	01GR	451	GM0CLN/P
6	G1CEI	32035	113	43	14Y	91IC	546	GM0LIR
7	G8ZRE	31455	119	45	8XY	83NE	572	FF6KPQ/P
8	G1ZBJ	30229	114	37	12ZL	80DO	451	F6IXI
9	G4DFI	25069	89	43	9Y	01BL	452	EI3GE
10	GI0LSB	20498	54	37	17Y	74BR	562	G7ABQ/P
11	G4MKW	20120	77	40	9Y	91UB	481	GM0CLN/P
12	G1WYC	19557	69	41	10Y	92XT	457	F6HPP/P
13	G1SPU	19307	77	43	14Y	82PQ	488	GM0FRT
14	G0CLP	15880	75	40	14Y	92KT	352	GU3EJL
15	G1HSK	13580	46	35	10Y	93MQ	474	F6IFR
16	G1YIY	10920	54	35	10Y	92DE	478	F6HPP/P
17	G1NMF	10650	61	30	16Y	01HN	362	G0JSB/P
18	G7AMH	5497	40	23	13ZL	90BR	400	F/HB9SAX/P
19	G7DCM*	5044	52	26	9Y	82XK	267	G4VRL/P
20	G3KZE	3894	35	22	5Y	92VD	289	F6IFR
21	G0EIY	2760	30	23	10Y	82OR		G0JSB/P
22	G3BPM	2755	25	19	8LP	80OW	433	F/HB9SAX/P
23	G5UM	2121	25	21	10Y	92MP	310	GM0CLN/P
24	G0GSL	1648	23	16	4Y	01AN	236	GW0KZP/P
25	G7AOU	36	9	4	S/JIM	91SK		

OPEN SECTION

Posn	Callsign	Points	QSOs	Mult	Ant	Loc	Best km	DX prefix
1	GW0KZP/P	215992	360	76	24Y	82JG	676	DC8EI
2	G3GQC/P	204876	330	63	17Y	93EC	1015	DL7ARM
3	GM0CLN/P	163300	212	71	14Y	84BT	679	FF7KCZ/P
4	G4JNT/P	109410	248	70	19Y	82NN	546	ON6OD
5	G1JKX/P	104196	150	57	9Y	85WL	778	DG4BBC
6	G0JSB/P	103768	195	56	8Y	70UM	630	GM0GMD
7	G4FKA/P	99855	244	63	14Y	93AC		
8	G1MTE/P	98771	164	43	18Y	94MJ	967	DL7ADM
9	G3UAX/P	97955	229	65	16Y	91GI	497	ON1KAT
10	G0GRI/P	91187	222	67	16Y	91GN	522	GM4CXM
11	G4TDL/P	90720	204	63	17Y	80ST	556	PE1DTU
12	G6BRH/P	88635	194	57	21Y	01GU	472	DG6PY/P
13	G1SAS/P	84132	179	54	14Y	02BA	666	DL2LAX
14	G1KDF/P	82095	182	65	17Y	83PO	527	FF6KCZ/P
15	G0AEI	72276	190	57	16Y	01GO	479	EI3GE
16	G6AJE/P	71166	201	58	11Y	92IR	731	DL2LAX
17	G4VRL/P	66612	142	52	19Y	70SN	472	GM0CLN/P
18	G4SSD	63189	139	51	13Y	80FJ	604	PA3EQK
19	G6ARC/P	63115	179	65	14Y	92FM	437	G0AEA
20	G4JS/P	58311	149	57	14Y	83SQ	532	FF6KCZ/P
21	GW4MGR/P	57200	171	52	16Y	83JA	557	PA/G8CUP
22	G7CKC/P	56074	180	53	17Y	91TF	654	FD1FJL/P
23	G6CTU/P	55005	178	57	17Y	91XG	487	G1JKX/P
24	G1ORC/P	53010	168	57	9Y	83XN	376	G1HHD
25	G4NVA	51330	138	58	17Y	83UF	586	F6HPP/P
26	G4BZP/P	45619	127	49	8Y	84IG	599	F6IFR
27	G4CRA/P	45469	145	41	9Y	01IT	526	DJ3MF
28	G0GKH/P	43460	129	53	17Y	81XG	561	GM0GMD
29	G6VAT/P	40280	140	53	16Y	82UK	432	ON1CET
30	G8ORG/P	34221	119	51	8Y	93AD		
31	G6HLL/P	31490	110	47	13Y	83PF	526	ON1BJX
32	G4CAR/P	28602	131	42	17Y	92BQ	587	FC1MOZ/P
33	G7DII/P*	24436	108	41	9Y	92IV	572	FC1MOZ/P
34	GW4KVI/P	19712	100	32	9Y	81LS		PA3DBJ
35	GW1SVG/P	9940	45	28	14Y	71VO	533	F/HB9AX/P
36	G8AHK	7196	53	28	10XY	91QF	353	G1MTE/P
37	G5ZG/P	4992	38	26	13Y	01CW	269	G1KDF/P

OVERSEAS SECTION

Posn	Callsign	Points	QSOs	Mult	Ant	Loc	Best km	DX prefix
1	PE1EWR	16956	51	27	10Y	11SL	603	F/HB9SAX/P
2	PA3EXS	2544	14	8	16Y	32DX	611	G1JKX/P

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SWL SECTION

Posn	BRS No.	Points	Rpts	Mult	Ant	Loc	Best km	DX prefix
1	32525	9344	37	32	9y	01AL	444	F6IHM/P
2	28198	1860	21	12	10Y	00HX	590	FC1MOZ/P
3	52543	1700	24	17	12ZL	83LT	278	G3SCP

Check logs gratefully received from G0KYS, G3ZXX, GI4KSO/P, G2FWX, GW6VZW and G6NVQ who would have come 18th if all contestants had been members of RSGB (not disqualified, entered as a checklog).

SUMMER 1·8MHz CONTEST

The UK entry was slightly up over last year. Quite a number of contestants complained about the high level of QRN which may account for the disappointing number of logs received from overseas stations compared with 1988. Comments are always welcome and again (for I am certain that it was mentioned last year), several stations suggested that the contest should finish one hour earlier. The Contest Committee will take note for the 1990 event. On this point I can do no better than quote from G3YLC: "Activity in the last hour was very low. All I could find were stations that had been worked before - so with half an hour to go, I decided to make a more satisfactory contact - with my bed!"

G3HCT

SUMMER 1·8MHZ CONTEST RESULTS

UK SECTION

Posn	Call	Score	Antenna
1	GW4IOI	567	1/2 Wave and Quad Loop at 120 ft
2	G3PDL	498	1/2 Wave at 30 ft
3	G3SYM/P	480	Inverted Vee at 95 ft
4	G3RZP	472	Vertical (Tx), Loop (Rx)
5	G4PUH	467	Dipole
6	G3ULN	446	1/4 Wave end-fed
7	G4WYG	431	Dipole
8	G3ZGC/P	426	1/4 Wave
8	G3VYI	426	1/4 Wave
10	G4OGB	421	Double-Zepp at 50 ft
10	G5MY	421	1/4 Wave
12	G3KKQ	420	1/4 Wave Inverted Vee at 40 ft
13	G0JFX	419	1/2 Dipole at 50 ft
14	GM3YEH	418	240 ft Long Wire
15	G3NKC	407	200 ft end-fed
16	G4LPK	381	1/2 Dipole
17	G3YLC	379	220 ft Centre-fed at 45 ft
18	GM4SID	378	Long Wire
19	G0JNZ	373	Semi-Vertical
20	G3MCX	365	1/2 Wave dipole
21	G3BBM	335	264 ft Centre-fed
22	G0IDE	325	1/4 Wave Loop
23	GM3UM	302	136 ft End-fed
24	G3LIK	299	W3DZZ
25	G4IRD	254	(no details supplied)
26	G3GMM	216	1/2 Wave Dipole
27	G4CZB	210	90 ft Centre-fed
28	G3ILO	183	132 ft Centre-fed
29	G3GMS	153	60 ft End-fed

OVERSEAS SECTION

1	OK1DRO	247	Inverted Vee
2	OK1KYY	240	84 Metres c/f
3	EI9FK	239	1/2 Wave Inverted Vee at 80 ft
4	OL9CUD	235	Long Wire 83m
5	OL1BVR	227	100m Delta Loop
6	OZ9BX	180	40m Wire
7	Y24OL/P	173	Long Wire
8	PA3BBP	165	34m Centre Fed
9	OK1DCS	163	Long Wire 83m
10	PA3BEJ	145	no details supplied
11	UV3AFB	110	2-element Delta Loop
12	FD1LVL	103	no details supplied
13	OL8CWI	91	Dipole
14	Y23TL/P	3	W3DZZ

Check Logs were received from G4FVK, G3SJJ, G3CXM and UZ3DWX.

AUGUST ACTIVITY CONTEST 1989 432MHZ.

We often hear the comment 'use or lose' when it comes to band occupancy. This activity contest was designed to increase activity on a band which could well be in danger. I received only one, yes ONE entry. In the comments from the only entrant, G6TTL, he notes (and as I have noted over the years) that the band was often open, with continental beacons much in evidence, but no QSOs. Please ladies and gentlemen use it, before it is too late.

It is interesting to note that during periods 2 and 3 continental activity exceeded that of the UK.

As Tony Jarvis, G6TTL, entered the contest in good faith, expecting at least some competition, I congratulate him and will arrange for the winners certificate to be sent as soon as possible. *G4DEZ*

AUGUST ACTIVITY CONTEST — 432MHz

Period	Date	Time	Points	QSOs	Mult
1	6	10/12	3344	26	19
2	19	07/09	240	6	4
3	20	06/08	39	3	1
4	30	18/20	336	6	7

ROPOCO 2 CONTEST 1989

I received an interesting variety of comments on this contest. Some competitors were over the moon, while others were scathing, to put it mildly. Conditions were noisy with the GMs having the worst of it again. Many thanks to George, GM3UM, and Norman, GM4KGK, for putting in their logs. I will be proposing that next year the time is brought forward by one hour, as most people who expressed an opinion wanted. This should go some way to helping those north of the Border.

You will notice from the tabulation that G4BWP has made his own personal protest about the contest being held on the day he was at the Woburn rally! At Woburn, I was verbally bombarded by G4DJX, G3JKS and G3UJV who all expressed their dismay at not being able to be in two places at once. This choice of date was a 'faux-pas' however the number of entries has not suffered. G3RTE commented that activity was down and that something must be done to increase it... ideas please. G3HKO wondered how many people took part but did not submit a log. I estimate that there were over 100 stations active.

Congratulations to Derek, G3KHZ, who through producing a perfect log has won the G3XTJ Memorial Trophy and Miniature. Certificates of merit go to G3LET and G4BUO. *G4JKS*

ROPOCO 2 1989 RESULTS

Posn	Callsign	Score
1	G3LET	[2]578
2	G4BUO	[2]568
3	G3KHZ	[1]550
4	G3GLL	538
5	G3PDL	536
6	G3RTE	534
7	G3KAF	528
8	G3RZP	526
9	G4ZFE	506
10	G4OGB	[3]500
11	G3JJG	488
12	G3GC	486
13	G0CKP	484
14	G3LHJ	458
14	G3PFZ	458
16	G4HTD	438
17	G3YAJ	436
18	G3JSR	434
19	G3HKO	418
20	G4BOU	378
21	G4IZB	376
22	G3BPM	368
23	G0CGV	358
23	G0IVZ	358
25	G2HLU	336
26	G4IFB	328
27	G3TUX	318
28	G3AWR	316
29	GW3SB	314
30	G0IDE	298
31	G0ATR	284
32	G3GMM	276
33	GM3UM	[3]270
34	G4KLQ	250
35	G4PTE	246
36	G4FUI	[3]240
37	G4SYC	238
38	G4ZME	216
39	G0BSF	206
40	GW4KVJ	[3]200
40	GM4KGK/P	[3]200
42	G4AGO	110
43	G4BWP	0

[1] Trophy winner
[2] Certificate winner
[3] Error-free log

Check logs received with thanks from G3MCK, GI3CKF and G4ECI.

CONTESTS CALENDAR

RSGB HF CONTESTS

2 Nov	28MHz Cumulative
10 Nov	28MHz Cumulative
11 Nov	Club Calls Contest 'CCC' [nd] all modes & SWL (Sep89)
18,19 Nov	Second 1·8 MHz CW (Sep89)
24 Feb, 1990	7MHz CW Contest (Aug89)

1990

6 Jan, 1990	7MHz LF Cumulative (Nov89)
7 Jan, 1990	3.5MHz LF Cumulative (Nov89)
8 Jan, 1990	1.8MHz LF Cumulative (Nov89)
13 Jan, 1990	3.5MHz LF Cumulative (Nov89)
14 Jan, 1990	7MHz LF Cumulative (Nov89)
16 Jan, 1990	1.8MHz LF Cumulative (Nov89)
20 Jan, 1990	7MHz LF Cumulative (Nov89)
21 Jan, 1990	3.5MHz LF Cumulative (Nov89)
24 Jan, 1990	1.8MHz LF Cumulative (Nov89)
27 Jan, 1990	3.5MHz LF Cumulative (Nov89)
28 Jan, 1990	7MHz LF Cumulative (Nov89)
1 Feb, 1990	1.8MHz LF Cumulative (Nov89)
3 Feb, 1990	7MHz LF Cumulative (Nov89)
4 Feb, 1990	3.5MHz LF Cumulative (Nov89)
9 Feb, 1990	1.8MHz LF Cumulative (Nov89)
10 Feb, 1990	1st 1.8MHz Contest (Nov89)

RSGB VHF CONTESTS

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 (Oct89)
10 Dec	70MHz CW (Oct89)

OTHER CONTESTS

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

Please note that the compilation of all RSGB Contest information is now undertaken by one representative from each contest committee and all reports and results should be directed to them for conversion to disk. This sytem has been devised so that i) there is a central source for all information, so as to avoid duplication and ii) as *RadCom* moves over to desk top publishing contest news will integrate with that process. For HF the representative is Steve Knowles, G3UFY; for VHF/UHF Bryn Llewllyn, G4DEZ and for HF-DF events Trevor Gage, G1MPJ — all of whom are QTHR in the most recent Callbook.

LOCAL AFFILIATED SOCIETIES AND CLUBS

The following list shows all local societies and clubs who are currently affiliated to the RSGB. The details of where the club meets, contact person etc were the best available at the time of going to press. If you have any corrections or additions to this list, please give them to your RSGB Regional Liaison Officer (RLO) whose details are shown at the start of every county. Each club is listed under the administrative county or Scottish region in which it regularly meets. For example the clubs which meet in Bromley whose postal county is Kent can be found in the Greater London section, likewise the Todmorden club is listed under West Yorkshire despite having a Lancashire address. Some affiliated societies, eg contest groups, do not hold formal meetings, and details as to where other clubs meet has proved impossible to obtain. These societies have therefore been listed under the county of their RSGB registered address.
Each county is assigned to an RSGB Zone and elects a Zonal Council Member. There are 7 Zones (A to G) and their Zonal Council Members are:

Zone A: (Northumberland, Tyne & Wear, Co Durham, Cleveland, North, South & West Yorkshire, North Humberside, Cheshire, Greater Manchester, Merseyside, Lancashire, Isle of Man, Cumbria)
Geoff Smith, G4AJJ, "Greenacres", Sawdon, Scarborough, North Yorkshire YO13 9DY. Tel: 0723-85845.
Zone B: (South Humberside, Derbyshire, Northampotonshire, Lincolnshire, Shropshire, Staffordshire, Leicestershire, Cambridgeshire, West Midlands, Hereford & Worcester, Warwickshire, Northamptonshire, Bedfordshire)
John Allen, G3DOT, 4 Philip Avenue, Waltham, South Humberside DN37 0QD. Tel: 0472-825899.
Zone C: (Norfolk, Suffolk, Essex, , Hertfordshire, Essex, Greater London, Surrey, Kent, East & West Sussex)
John Greenwell, G3AEZ, Eastfield, Beare Green, Dorking, Surrey RH4 5RW. Tel: 0306-77236.
Zone D: (Gloucestershire, Oxfordshire, Buckinghamshire, Avon, Wiltshire, Berkshire, Somerset, Cornwall, Devon, Dorset, Hampshire, Isle of Wight, Channel Islands)
Peter Chadwick, G3RZP, "Three Oaks", Braydon, Swindon, Wilts SN5 0AD. Home: 0666-860423. Work: 0793-518080.
Zone E: (Gwynedd, Clwyd, Dyfed, Powys, West, Mid & South Glamorgan, Gwent)
John Case, GW4HWR, 2 Abbey Close, Tyrhiw Taffs Well, Mid Glamorgan CF4 7RS. Tel:0222-810368.
Zone F: (Co Londonderry, Co Antrim, Co Tyrone, Co Fermanagh, Co Armagh, Co Down)
Terry Barnes, GI3USS, "White Gables", 95 Crawfordsburn Road, Bangor, Co Down, BT19 1BJ. Tel: 0247-473948.
Zone G: (Shetland, Orkney, Western Isles, Highland, Grampian, Tayside, Strathclyde, Cewntral, Fife, Lothian, Dumfries & Galloway, Borders)
Frank Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR. Tel: 0307-67565.

HEREFORD & WORCESTER

Council Zone: B
RLO: Chris Pettitt, G0EYO, 23 Dark Lane, Hollywood, Birmingham B47 5BS. Tel: 021-430 7267.

ARIEL RG, G3PPG. (Open only to BBC personnel). Meets at Engineer Training Centre, Wood Norton, Evesham, Worcs. Details from Mr John Gealer, G3DEF, 27 Mansion Gardens, Evesham, Worcs, WR11 6BX.

AVON VALLEY ARA, RS90309. Details from Robin Harper, G1ZUU, 25 Duttons Close, Snitterfield, Stratford-upon-Avon, Warwickshire.

BROMSGROVE & DARC, G3VGG. G6VGG. Meets 8.00pm on second Friday, at Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Trevor Harper, G0KIN, 5 Chesworth Road, Harwood Park, Worcs. B60 2HF. Tel: 0527-33173.

BROMSGROVE ARS, G4TUI. Meets 8.00pm on 2nd and 4th Tuesdays in the month, at Aston Fields WMC, Bromsgrove, Worcs. Details from Mr Jeff Porter G4OHJ, 77 Westholme Road,Bidford on Avon, Alcester, Tel: 0789-773286.

DROITWICH ARC, G4PVO. Meets 8.00pm on 2nd and 4th Mondays in the month, at Scout HQ, Droitwich, Worcs. Details from Mr D Thorpe, G4RCB, 50 Victoria Avenue, Droitwich Spa, Worcs. WR9 7DF. Tel: 0905-774235.

HEREFORD ARS, G3YDD. Meets 1st Friday 8.00pm, at Three Counties Training Services, Cattle Market, Hereford. Details from Mr Eddie Cox, G3WRQ, 35 Thompson Place, Hereford, HR4 0JP. Tel: 0432-354064.

KIDDERMINSTER & DARC, G4GXP, G6KRC. Meets 8.00pm on 2nd and 4th Tuesdays in the month, at Vice-Presidents Club, Kidderminster Harriers Football Ground, Hoo Road, Kidderminster, Worcs. Details from Mr Tony Hartland, G8WOX, 22 Granville Crescent, Offmore Farm, Kidderminster, DY10 3QS. Tel: 0562-751584.

MALVERN HILLS ARC, G4MHC. Meets 8.00pm on 2nd Tuesday in the month, at Red Lion Inn, St Anne's Road, Malvern, Worcs. Details from Mr Phillip Bellamy, G0KPS, 17 Chestnut Drive, Malvern, Worcs. Tel: 0684-573558.

REDDITCH RC, G4ACZ. Meets 8.00pm, at WRVS Centre, Ludlow Road, Redditch, Worcs. Details from Mr R J Mutton, G3EVT, Summerhayes, Mill Lane, Oversley Green, Alcester, Warwickshire, B49 6LF. Tel: 0789-762041.

SPA ARG, G0KRP. Details from Ann Regardo, G7AZZ, 27 Woodmans Close, Droitwich Spa, Worcs. WR9 9EW. Tel: 0905-773822.

TENBURY & DARS, G1TRS. Meets 8.00pm on the 1st Thursday, at The Swan Hotel, Tenbury Wells and club shack 3rd Thursday. Details from Ian Chell 3 Park Croft, Rochford, Tenbury Wells, Worcs. WR15 8SL.

VALE OF EVESHAM RAC, G0ERA, G7ERA. Meets 1st Thursday 8.00pm at MEB Club, Worcester Rd, Evesham. Details from Mr John Gealer, G3DEF, 27 Mansion Gds. Evesham, Worcs, WR11 6BX. Tel: 0386-6407.

WOODPECKER ARG, RS87194. Details from Rex Kingston, G7ANM, Florence House, Holmer Trading Estate, Hereford, HR1 1JS. Tel: 0432-263055.

WORCESTER & DARC, G3GJL, G8JC. Meets 8.00pm at The Oddfellows Hall,9 New Street, Worcester. Details from Mr D W Batchelor, G4RBD, 14 Oakleigh Heath, Hallow, Worcester, WR2 6NQ. Tel: 0905-641733.

WORCESTER LIONS ARG, G0BWD. Meets 2nd and 4th Sunday at 8.30pm at The Bull Inn, Fernhill Heath, Worcester. Details from Ann Skinner, G0BIR. Halfway Lock Cottage. Upper Gambolds Lane, Stoke Prior, Bromsgrove, Worcs. Tel: 0527-79636.

WYRE FOREST REPEATER GP, GB3KR. Details c/o 3 Beaulieu Close, Kidderminster, Worcs, DY11 5EE.

WYTHALL RC, G4WAC,G1WAC. Meets 8.00pm, every Tuesday at Wythall House, Silver Street, Wythall, Birmingham. Details from Mr C A Pettitt, G0EYO, 23 Dark Lane, Hollywood, Birmingham, B47 5BS. Tel: 021-430 7267.

HERTFORDSHIRE

Council Zone: C
RLO: Please see under Greater London North.

ARIEL RADIO GP (Brookmans Pk), G2LO. (Open only to BBC employees). Details from Mr I P Jefferson.

BISHOP'S STORTFORD ARS, G5ZG. Meets 8.00pm on 3rd Monday in the month, at Royal British Legion Club, Windhill, Bishop's Stortford, Essex, CM24 8HG. Details from Mr M Cracknell, G0CPU, 17 Windmill Fields, Harlow, essex CM17 0LQ. Tel: 0279-29970.

BRITISH AEROSPACE DYNAMICS ARC, G0AER. (Open only to employees). Meets on Wednesdays at 8.00pm. Details from Mr K G Seller, G1GJK, 1A Smallford Lane, Smallford, St Albans, Herts AL4 0SA.

CHESHUNT & DARC, G4ECT, G4MGC. Meets 8.00pm on Wednesdays, at Church Rooms, Church Lane, Wormley, Herts. Details from Roger Frisby, 2 Westfield Road, Hoddesdon, Herts, EN11 8QX

EAST BARNET ARCC, G6KQ.

HARPENDEN ARC, RS88808. Meets 8.00pm on 1st and 3rd Tuesday in the month, at the Silver Cup Public House, St. Albans Road, Harpenden. Details from Mr E P Simmons, G1BJC, 124 Station Road, Harpenden, Herts, AL5 4RH. Tel: 05827-5119.

HATFIELD POLYTECHNIC RS, G4WTB, G6BOB. (For students only) Meets2.30pm Wednesdays.

HILLINGDON ARC, G1DXY. Meets at 8.00 every Tuesday at the Hillingdon Golf Club, 18 Dorset Way, Hillingdon, Middx. Details from Mr R F Staddon, G6STI, 45 Saxony Parade, Hayes End, Middx UB3 2TQ. Tel: 01-561 2917.

SOUTH WEST HERTS UHF GROUP, GB3HR.

STEVENAGE & DARC, G3SAD. Meets 8.00pm on 1st and 3rd Tuesdays in the month, at Sitec Ltd, Ridgemond Park, Telford Ave, Stevenage, Herts. Details from Mr P Daly, G6EDA, 48 Lincoln Road, Stevenage, Herts, SG1 4PJ. Tel: 0438-724991.

VERULAM ARC, G3VER. Meets 2nd and 4th Tuesdays, 7.45 pm at RAF Association HQ, New Kent Road, St Albans, Herts. Details from George Christofi, G0JKZ, 23 Hill Road, Harrow, Middx HA1 2PN. Tel: 01-427 4800

WELWYN & HATFIELD ARC, G3WGC. Meets 8.00pm on 1st Monday in the month, Details from G4WLG, Tel: 0707-335162.

HIGHLAND

Council Zone: G
RLO: (also for Western Isles) Post vacant, please refer to Zone G Council Member.

BLACK ISLE REPEATER GP, GB3BI. Details from Mr Brian Robertson, GM0IJ, 9 Murray Place, Smithton, Inverness, IV1 2PX. Tel: 0463-791122.

CAITHNESS ARS, GM0CRA. Meets 7.30pm on 2nd Wednesday in the month, at Loch Watten Hotel, Watten, by Wick, Caithness. Details from Mrs E M C Wylie, 'Dunedin', Dunnet, Thurso, Caithness, KW14 8YD.

EASTER ROSS RC, GM4MFL. Meets every 7.30pm every Friday at Community Wing, South Lodge Primary School, Castle Street, Invergordon. Details from Mr Robert Kerr, GM4FDT, Rosskeen Bridge, Invergordon Ross-shire, IV18 0PR.

FULMAR ALPHA ARC, GM0FUL. (Open only to those who work on Fulmar). Meets irregularly, at Fulmar A platform, Details from Mr Roger Trelease, G4ROG, 15 Springfield Park, Barripper, Camborne, Cornwall, TR14 0QZ. Tel: 0209-713992.

INVERNESS ARC, GM4TPF. Meets 7.30pm on Thursdays, at Cameron Youth Club, Planefield Road, Inverness. Details from Mr Ronald McDonell, GM0CJT, Taylor Hill, Easter Kinkell, Dingwall, IV7 8HY. Tel: 0349-61783.

SUTHERLAND & DARC, GM0IYP.

HUMBERSIDE

Council Zone: North Humberside: Zone A. South Humberside: Zone B.
RLO: (also for Lincolnshire) Post vacant, please refer to Zone A and B Council Members.

GOOLE R & ES, G8HSG, G0GLE. Meets 8.00pm on several times each month, at West Park, Goole, South Humberside. Details from John Hill, G7CLY, 55 The Oval, Welton Road, Brough, North Humberside. Tel: 0482-667630.

GRIMSBY ARS, G3CNX. Meets 8.00pm on Thursdays, at Cromwell Social Club, Cromwell Road, Grimsby, South Humberside. Details from G0IOR, 36 Marklew Avenue, Grimsby, South Humberside.

HORNSEA ARS, G4EKT. Meets Wednesday evenings, at The Mill, Hornsea, North Humberside. Details from Jeff Southwell, Mill House Atwick Road, Hornsea, North Humberside, HU18 1DZ. Tel: 0964-532874.

HULL & DARS, G3AMW. Meets at Club room, Walton Street, Hull. Details from Mr R V Souter, G1RVS, 4 Risby Garth, Skidby, Cottingham, North Humberside, HU16 5UE. Tel: 0482-845326.

HUMBERSIDE REPEATER GP, GB3HS. Details from Mr M Rodmell, G3ZRS, 75 St Catherine's Drive, Leconfield, Beverley, North Humberside, HU 17 7NY. Tel: 0964-530921.

HUMBERSTON ARCG, RS88118, G3IYT. Details from 71 Humberston Avenue, Humberston, South Humberside, DN36 4SR. Tel: 0472-812914.

NORTH FERRIBY UNITED ARS, G0ECR. Meets 8.00pm Friday evenings, at Ferriby United Football Club, North Ferriby, North Humberside. Details from Mr Frank Lee, G3YCC, 8 Westland Road, Kirkella, Hull, HU10 7PJ. Tel:0482-650410.

ROYAL CORPS OF TRANSPORT ARS, G4GGD. Meets at Normandy Barracks, Leconfield, Beverley, North HUmberside. Details from Mr L Isles, Tel: 0964-550386 Ext 5210.

SCUNTHORPE & DARC, G4FUH. Meets 7.30pm on Tuesdays, at Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe, South Humberside. Details from Mrs I Y Aizlewood, G4ZGJ, 36 King Street, Winterton, Scunthorpe, South Humberside, DN15 9TP. Tel: 0724-732268.

ISLE OF MAN

Council Zone: A
RLO: Colin Mathewman, GD4FWQ, "Cronk Bane", 20 Terence Avenue, Douglas, Isle of Man. Tel: 0624-22295

ISLE OF MAN ARS, GD3FLH. Meets on Mondays at The Howstrake Hotel, Harbour Road, Onchan; Thursdays at The British Legion Club, Peel and on Fridays at the Port St Mary Yacht Club. Details from Mrs June Wrigley, GD7DPG, 20 Fairy Hill Close, Ballafesson, Port Erin, Isle of Man. Tel: 0624-834257.

ISLE OF WIGHT

Council Zone: D
RLO: Doug Byrne, G3KPO, 52 West Hill Road, Ryde, Isle of Wight PO33 1LN. Tel:0983-67665.

BEMBRIDGE SCHOOL ARC, G4RRV. (Club open only to staff and pupils). Meets at Bembridge School, Bembridge, Isle of Wight. Tel: 0983-872101.

BINSTEAD ARS, G0BAR. Meets 7.30pm on Mondays, at Brickfields Horse Country Cen, Newnham Road, Binstead, Isle of Wight. Details from Mr Derek Barnes, G4VJF, Flat 17, Rosecourt, Melville Street, Ryde, Isle of Wight, PO33. Tel: 0983-611912.

FIRST NEWPORT (IW) SCOUT GP, G4CNS. (Open to scout group members only). Meets at 1st Newport (IW) Scout Group, St John's Road Car Park, Newport, Isle of Wight. Details from Mr T M Fallick, G4FYI, 82 A Albany Road, Newport. Isle of Wight, PO30 5HZ. Tel: 0983-527949.

ISLE OF WIGHT RS, G3SKY. Meets 8.00pm on Fridays, at Unity Hall, Wooton Bridge, Isle of Wight. Details from Mr Peter Lovely, G4RGE, Dolphin Cottage, Upper Green Road, St Helens, Isle of Wight, PO33 1XE. Tel: 0983-872620.

JERSEY

Council Zone: D

RLO: S W Smith, GJ0JSY, 31 Jardin-a-Pommiers, Patier Road, St Saviour, Jersey. Home: 0534-23249, work: 0534-38996.

CHANNEL ISLAND ARCG, GJ7DGJ. No meetings held, but further details from Mr John Poole, GJ1TJP, c/o 3 Brookside Farm, La Rue du Huquet, St Martin, Jersey. Tel: 0534-63350.

JERSEY AM ELECTRONICS CLUB, GJ4HXJ. No meetings held, but the club runs the local 2m repeater and 6m beacon. Details from Mr Geoff Brown, GJ4ICD, 1 Belmont Gardens, St Helier, Jersey. Tel: 0534-77067.

JERSEY ARS, GJ3DVC. GJ8RVT. Meets 8.00pm on Fridays, at Le Hocq Tower, St Clement, Jersey. Details from Mr R Allenet, GJ3XZE, Les Sablons, Le Bourg, St Clement, Jersey. Tel: 0534-52093.

KENT

Council Zone: C

RLO: D Axford, G4LHU, 141 Nelson Road, Gillingham, Kent, ME7 4LT. Tel: 0634-575778.

BORDEN ARC, G4LBS.

BREDHURST R & TS, G0BRC. Meets 8.00pm on Thursdays, at Parkwood Community Centre, Parkwood Green, Wigmore, Gillingham, Kent. Details from Mr K E Fay, G0AMZ, 37 Sandringham Road, Rainham, Gillingham, Kent, ME8 8RP. Tel: 0634-376991.

CANTERBURY COLLEGE ARC, G4JLN.

DARENTH VALLEY RS, G0KDV. Meets 8.00pm on Wednesdays, twice monthly, at Crockenhill Village Hall, Swanley, Kent. Details from Mr Thomas, Tel: 0322-63368.

DARTFORD HEATH DF C, G4BDF. Meets at Horse & Groom Public House, Leyton Cross, Dartford Heath, Kent. Details from G8DYF, Tel: 0322-844467.

EAST KENT RS, G3LTY. Meets 7.30pm on 1st and 3rd Thursdays in the month, at Cabin Youth Centre, Kings Road, Herne Bay, Kent. Details from Mr B F Didmom, G4RIS, 45 Millstrood Road, Whitstable, Kent, CT5 1QF. Tel: 0227-262042.

EDENBRIDGE ARS, G6WFB. Meets 8.00pm on 2nd Wednesday in the month, at The Scout Hut, High Street, Edenbridge, Kent. Details from Mr J Grevatt, G8VCH, 7 Shelley Road, East Grinstead, West Sussex, RH19 1SX. Tel: 0342-24748.

GRAVESEND RS, G3GRS. Meets 8.00pm on Mondays, at The Windmill Tavern, Shrubbery Road, Gravesend, Kent. Details from Mr M Brincat, G0DYX, 2 Lingfield Road, Gravesend, Kent, DA12 5AH.

GAV/BP KENT CLUB ARS, G3PBY.

HILDERSTONE ARS, RS90702. Meets 7.00pm on Fridays, at Hilderstone AEC, Broadstairs, Kent. Details from Mr V B De Rose, G0CLO, 4 Briars Walk, Broadstairs, Kent, CT10 2XR. Tel: 0843-69812.

KENT REPEATER GROUP, GB3KS. Details from Kelvin Fay, G0AMZ, 37 Sandringham Road, Rainham, Gillingham, Kent ME8 8RP. Tel: 0634-376991.

MAIDSTONE YMCA ARS, G3TRF. Meets 8.00pm on Fridays, at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Mr P B R Martin, G0BUW, 39 A The Grove, Bearsted, Maidstone, Kent, ME14 4JB. Tel: 0622-30544.

MEDWAY ARTS, G5MW. Meets 7.30pm on Tuesdays, at 5th Medway Scout Headquarters, Roseberry Avenue, Rochester, Kent. Details from Dr I E Coates, G1MSS, 14 Scatton Fields, Sole Street, Kent, DA12 3AS. Tel: 0474-814874.

MEOPHAM PARISH RC, G1MRC. Meets 7.30pm on 2nd Sunday in the month, at The Clubhouse, Vigo Rugby Football Club, Vigo Village, Meopham, Kent. Details from Mr A P Cronk, G6TXP, 20 Downsview, Heathfield, East Sussex, TN21 8PE. Tel: 04352-2403.

RC OF THANET, G2IC. Meets 7.30pm on 2nd and 4th Tuesdays in the month, at Grosvenor Club, Grosvenor Place, Margate, Kent. Details from Mrs D M Judges, G1HWG, 39 Reculver Avenue, Birchington, Kent, CT7 9NU. Tel: 0843-42480.

RSME ARC, G3XRE.

SWALE ARC, G4SRC. Details from Mr P E Boorman, G0JBA.

TONBRIDGE SCHOOL RS, G4AJS. (Open only to staff and pupils). Meets at Tonbridge School, Tonbridge, Kent.

WEST KENT ARS, G3WKS. Meets 8.00pm on Fridays, at Adult Education Centre, Camden Annexe, Quarry Road, Tunbridge Wells, Kent. Details from Mr Roger Hood, G4BIA, 27 Marden Road, Staplehurst, Tonbridge, Kent TN12 0NE. Tel: 0580-892026.

LANCASHIRE

Council Zone: A

RLO: Posts vacant, please refer to Zone A Council Member.

BURNLEY & DARC, RS87674. Meets on Tuesdays, at Barden High School, Barden Lane, Burnley, Lancs. Details from Mr Bill Scrivener, G0BQC, 67 Lower Manor Lane, Burnley, Lancs, BB12 0EF. Tel: 0282-39765.

CENTRAL LANCS ARC, G0FDX. Meets 8.00pm on 1st and 3rd Mondays in the month, at The Priory Club, Broadfield Drive, Leyland, Lancs. Details from Mr M. Sherlock, G4ZYN. 9 Conway Road, Eccleston. Tel: 0257-452287.

DARWEN ARC, G4JS. Meets 7.30pm, 3rd Wednesday in the month, at Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details From Mr W Lishman, G2AKK, 28 Lightbown Street, Darwen, Lancs, BB3 0DY. Tel: 0254-703767.

EAST LANCS ARC, G3NTJ, G1ELC. Meets 7.30pm on 1st Tuesday in the month, at Conservative Club, Cliff St, Rishton, Blackburn, Lancs. Details from Mr Philip Drew, G1OPV, 20 Russell Street, Accrington, Lancashire, BB5 2NF. Tel: 0254-32936.

FYLDE ARS, RS53939. Meets 7.45pm on 2nd and 4th Thursdays in the month, at South Shore Lawn Tennis Club, Midgland Road, Blackpool. Details from Mr Don Underwood, G0HBQ, Otter Bank, Clifton Road, Marton, Blackpool, FY4 4QF. Tel: 0253-63523.

LANCASTER UNIVERSITY ARS, G7AAB. c/o Student's Union, Bailrigg, Lancaster, Lancs. LA1 4YW.

LEYLAND HUNDRED ARG, G4TLH. Meets 7.30pm on 2nd Monday in the month, at The Grapes, Town Road, Croston, Lancs. Details from Mr D Hodkinson, G4YSU, Ferndale, Liverpool Road, Much Hoole, Preston, PR4 4RJ. Tel: 0772-612815.

MORECAMBE BAY ARS, G4YBS, G1MBR. Meets 7.30pm on Tuesdays, at Trimpell Sports & Social Club, Outmoss Lane, Morecambe, Lancs. Details from Derek Wood, G4ZJL, 29 Oakville Road, Higher Heysham, Morecambe, Lancs, LA3 2TB. Tel: 0524-52042.

NORTH WESTERN REPEATER GP, RS42050, GB3RF & GB3PF. Meets 8.00pm, 3rd Thursday in the month, at The Globe Bowling Club, Willows Lane, Accrington, Lancs. Details from Mr Mark Sumner, G0DTI, 7 Largs Road, Shadsworth, Blackburn, Lancs, BB1 2JQ. Tel: 0254-675897.

ORMSKIRK & DARC, G4SNX. Meets 8.00pm 3rd Thursday in the month, at The Ship Inn, Wheat Lane, Burscough, Ormskirk, Lancs. Details from Mrs Bridget Wainwright, G1YWX, 243 Long Lane, Aughton, Nr. Ormskirk, Lancs. L39 5BY. Tel: 0695-421673.

PRESTON ARS, G3KUE. Meets 8.00pm on alternate Thursdays, at Lonsdale Club, Fulwood Hall Lane, Fullwood, Preston. Details from Mrs R J Watson, G4WQT, 3 Layton Road, Larches Estate, Preston PR2 1PB. Tel:0772-733975.

ROLLS-ROYCE ARC, G3RR. Meets 7.30pm Mondays, 2.30pm Tuesdays, 7.30pm Wednesdays, 8.00pm Fridays, 11.30am Sundays, at Rolls-Royce Sports & Social Club, Barnoldswick, Colne, Lancs. Membership is open to guests. Details from Mr Leslie Logan, G4ILG, 19 Fenton Avenue, Barnoldsick, Colne, Lancs, BB8 6HB. Tel: 0282-812288.

ROSSENDALE ARS, G1RRS. Meets 8.00pm on Wednesdays, at The Huntsman Hotel, Burnley Road, Loveclough, Rossendale, Lancs. Details from Mr Ray Wood, G0GSP, 27 Parkwood Drive, Rawtenstall, Rossendale, Lancs, BB4 6RP. Tel: 0706-213230.

SKELMERSDALE & DARC, G4SME. Deatils from c/o 89 Kestral Park, Ashurst, Skelmersdale, Lancs, WN8 6TA.

SOUTHPORT & DARC, (includes Ainsdale ARC) G2OA. Meets 8.00pm on 3rd Monday in the month, at St Marks Church Hall, Scarisbrick, Lancashire. Details from Dr. Vivian Slight, G6SX, Whitegate, 17 Westcliffe Road, Southport, Merseyside, PR8 2BW. Tel: 0704-67436.

THORNTON CLEVELEYS ARS, G4ATH, G6GMW. Meets 7.45pm on Mondays, at 1st Norbreck Scout HQ, Carr Road, Bispham, Blackpool, Lancs. Details from Mr J E Duddington, G4BFH, 8 The Grove, Thornton Cleveleys, Blackpool, FY5 2JD. Tel: 0253-853554.

WYRE ARS, G6WVG. Meets 1st and 3rd Wednesdays in the month, at Fleetwood Cricket & Social Club, Fleetwood Road, Broadwaters, Fleetwood. Details from Ian Broadbent, G0KMT, 15 Mowbray Road, Fleetwood, FY7 7JB. Tel: 03917-5736

LEICESTERSHIRE

Council Zone: B

RLO: Gwyn Harries, G4WYN, 1 St Michael's Close, Ashby-de-la-Zouch, Leicestershire LE6 5ES. Tel: 0530-417307.

BUCKING BRONCO CG, G0KBB. Details c/o 26 Lawn Avenue, Birstall, Leicester.

CARAVAN & CAMPING RG, G4RCC.

HINCKLEY AR & ES, G3VLG. Meets 7.30pm on 2nd Wednesday in the month, at John Cleveland College, Butts Lane, Hinckley, Leics. Details from G8STX, Tel: 0455-63778.

LEICESTERSHIRE METRE WAVE GROUP, G8LM. Details from Mr J R Jennings, Millside, Mill Road, Ullesthorpe, Lutterworth, Leics, LE17 5DE

LEICESTER REPEATER GP, GB3CF, GB3LE. Information from P O Box 180, Leicester.

LEICESTER POLYTECHNIC ARS, G3SDC. (Open only to students).

LEICESTER RS, G3LRS, G6XRS. Meets 8.00pm on Mondays, at Gilroes Cottage, Groby Road, Leicester. Details from Mr Frank Elliott, G4PDZ, 40 Treasure Close, Glenfield, Leicester, LE3 8LT. Tel: 0533-871086.

LOUGHBOROUGH & DARC, G3RAL. Meets 8.00pm on Tuesdays, at Hind Leys College, Shepshed, Loughborough, Leics. Details from Mr J J Griffiths, G0FTT, 1 The Paddock, Shepshed, Loughborough, Leics, LE12 9AY.

MELTON MOWBRAY ARS, G4FOX. Meets 7.30pm on 2nd Friday in the month, at St John Ambulance Hall, Asfordby Hill, Melton Mowbray, Leics. Details from Mr R Winters, G3NVK, 8 Epping Drive, Melton Mowbray, Leics, LE13 1UH. Tel: 0664-63369.

NORTH LUFFENHAM ARC, G6RAF. Details from OIC Radio Club, RTPS, RAF North Luffenham, Oakham, Leics.

WELLAND VALLEY ARC, G4WVR. Meets 7.30pm on Mondays, at Welland Park School, Market Harborough, Leics. Tel: 0858-880746.

WIGSTON ARS, G4WAR. Meets 7.30pm on Fridays, at Wigston Reform Church, Wigston, Leicester. Details from G8HAJ, Tel: 0553-403105.

91st LEICESTER SCOUT HQ ARC, G4NLS, G8JAM. Details from Mike Harriman, G4SJX, P O Box 49, Leicester.

LINCOLNSHIRE

Council Zone: B

RLO: Please see under Humberside, South.

FIVE BELLS GP, G4SIV.

GRANTHAM RC, G0GRC. Meets on the last Tuesday in the month, at Shirley Croft Hotel, Harrowby Road, Grantham, Lincs. Details from Mr J E Kirton, G8WWJ, 13 Saltersford Road, Grantham, Lincs, NG31 7HH. Tel: 0476-65743.

LINCOLN SHORT WAVE C, G5FZ. Meets 8.00pm on Wednesdays, at City Engineers Club, Waterside South, Lincoln. Details from Mrs P G Rose, G4STO, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln, LN1 2AS. Tel: 0427-788356.

LINX AR PACKET REPEATER GP, RS91386.

LOUTH & DARC, G4LRC. Meets 7.30pm on Wednesdays, at RAF Manby, Louth, Lincs. Details from Mr F J Smith, G1IZB, 6 Mill Close, Marshchapel, Grimsby, South Humberside, DN36 5TP. Tel: 047286-595.

SLEAFORD & DARC, RS88628. Meets 8.00, last Sunday in the month, at Hale Magna Village Hall, Great Hale, Sleaford, Lincs. Details from Mr G Dobbs, G3RGO, 14c St Andrews Crescent, Leasingham, Sleaford, Lincs NG34 8LS. Tel: 0529-303247.

SPALDING & DARS, G4DSP. Meets 7.30pm on 1st Friday in the month, at The Ship Albion, Albion Street, Spalding, Lincs. Details from Mr J R Hill, G4NBR, Gatehouse, Gubboles Drove, Surfleet, Cheal, Spalding, Lincs, PE11 4AX.

SPILSBY ARS, RS91468.

STAMFORD & DARC, RS84410. Meets 7.30pm on 1st and 3rd Wednesday in the month, at The Rugby Club, Hambleton Drive, Stamford, Lincs. Details from Peter Fancourt, G3HEE, 3 Tinwell Road, Stamford, Lincs, PE9 2QQ.

WILLIAM ROBERSTON SCHOOL ARC, G4WRS.

LOTHIAN

Council Zone: G

RLO: Post vacant, please refer to Zone G Council Member.

EDINBURGH & DARC, GM4HAM. Details from Mrs I S Paterson, GM4YNA, 37 Seaview Terrace, Joppa, Edinburgh, EH15 2HE.

LOTHIAN ARS, GM3HAM. Meets 7.30, 2nd and 4th Wednesdays, at Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. Details: Mr P J Dick, GM4DTH, 21 West Maitland Street, Edinburgh EH12 5EA.

SCOTTISH BORDERS REPEATER GP, RS43855. Details from Mr K B Glendinning, GM4EZJ, 6 Torry Bay Court, Main Street, New Mills, Fife KY12 8TH. Tel: 0383-881405

MERSEYSIDE

Council Zone: A

RLO: M Chappell, G0GQX, 43 Algburth Hall Avenue, Grassendale, Liverpool L19 9EA. Tel: 051-427 3499.

HESKETH ARC, G0HAR.

LIVERPOOL & DARS, G3AHD, G8WCL. 8.00pm, Tuesdays. Meets The Churchill Conservative Club, at Church Road, Wavertree, Liverpool. Details from Lynn, Tel: 051-486 5745.

SANDOWN COLLEGE, G3VXY. Sandown Road, Liverpool, L15 4JB. Details from Jim Loughlin, G4DKQ at the college.

ST HELENS & DARC, G4LCK. Meets at 7.45pm on Thursdays at Community Resource Centre, Old Central Secondary School, College Street, St Helens. Details from Mrs Carol Wainwright, G0CXT, 7 Woolacombe Avenue, Sutton Leach, St. Helens, WA9 4NQ.

WIRRAL ARS, G3NWR. Meets 8.00pm on 1st and 3rd Wednesdays in the month, at Club Room, Ivy Farm, Arrowe Park Road, Wirral, L49 5LW. Details from Mr Alex Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral, L63 5NE.

WIRRAL & DARC, G8WDC. Meets 8.00pm, at Irby Cricket Club, Mill Hill Road, Wirral. Details from Mr Alan Griffiths, G1XYP, 94 Rosslyn Drive, Moreton, Wirral, L49 0SZ. Tel: 051-677 7517.

MID GLAMORGAN

Council Zone: E

RLO: (also for Mid Glamorgan) Dave Phillips, GW4KQ, 54 Oaklands Road, Bridgend, Mid Glamorgan CF31 4SN. Tel: 0656-660819.

BRIDGEND & DARC, GW4LNP. Venue due to chnage at time of going to press. Details from Dave George, GW1OUP, 24 Tyfry Close, Brynmenyn, Bridgend CF32 8YB. Tel: 0656-723508.

CWMCYNON ARS, GW3FFE. Meets 7.30pm on 1st and 3rd Wednesdays in the month, at Cefn-Pennar Hotel, Mountain Ash, Mid Glamorgan. Details from Mr Roy Allwood, GW4UAJ, 7 Daniel Street, Cwmbach, Aberdare, Mid Glamorgan. Tel: 0685-879938.

HOOVER (MERTHYR) ARC, GW3RDB. Meets 7.30pm on Mondays, at Hoover Sports Pavillion, Hoover Ltd, Pentrebach, Merthyr Tydfil, Mid Glamorgan, CF48 4TU. Details from Mr Alvyn Hughes, GW1YSM, 35 Queen Street, Trefforest, Pontypridd. Tel: 0443-493671.

RHONDDA ARS, GW2FOF. Meets 7.30pm on Thursdays, at National Union Of Mineworkers Club, Tonypandy, Mid Glamorgan. Details from Mr John Howells, GW4BUZ, Bronllys, Vicarage Road, Penygraig, Rhondda, Mid Glamorgan, CF40 1HP. Tel: 0443-432542.

SOUTH WALES POLICE ARS, GW4SWP. (Restricted to members of the Police Federation.) Details from Mr Tom Davies, GW4JAT, c/o Police Headquarters, CCTV Department, Bridgend. Tel: 0656-55555.

NORFOLK

Council Zone: C

RLO: (also for Suffolk) Post vacant, please refer to Zone C Council Member.

GREAT YARMOUTH RS, G3YRC. Meets 8.00pm on Thursdays, at Drill Hall, York Road, Great Yarmouth, Norfolk. Details from Mr A D Besford, G3NHU, 2 A Halt Road, Caister, Norfolk, NR30 5NZ. Tel: 0493-721173.

NORFOLK ARS, G4ARN. Meets 8.00pm on Wednesdays, at The Norfolk Dumpling, Livestock Market, Harford, Norwich. Details from Steve Sewell, G4VCE, Medway, The Rosary, Mulbarton, Norfolk, NR14 8AL. Tel: 0508-78258.

NORFOLK COLLEGE OF ARTS & TECH ARC, G1XYZ, G3XYZ. Meets at 7.30pm every Thursday. Details from Ted Haskett, G4OZG, 23 Gloucester Road, Kings Lynn, Norfolk, PE30 4AB. Tel: 0553-768701. Alternatively contact Derek Franklin, G1TQK, tel: 0553-841189.

NORTH NORFOLK AR REPEATER GP, GB3NN.

NORTHAMPTONSHIRE

Council Zone: B

RLO: (also for Warwickshire) Ian Hopwood, G0EDT, 53 St Mary's Road, Stratford-upon-Avon, Warwickshire CV37 6XG. Tel: 0789-68863.

ARIEL RG (Daventry), G5XX. (Open only to BBC employees).

DAVENTRY ARC, G0FFI, G6ZZZ. Meets Wednesday evenings, at St John Ambulance HQ, Daventry. Details from Mr G Hayward, G0DPA, 9 Welton Park, Daventry, Northants, NN11 5JW. Tel: 0327-703105.
KETTERING & DARS, G5KN. Details from Mr D P Rogers, G4VID, 171 Havelock Street, Kettering, Northants, NN16 9QB. Tel: 0536-516547.
MID-NORTHANTS AR EXPEDITION GP, G0ING. Details from Mr Lionel Parker, G5LP, 128 Northampton Road, Wellingborough, Northants.
NENE VALLEY RC, G4NWZ. Meets 8.00pm on Wednesdays, at Prince of Wales Public House, Well Street, Finedon, Wellingborough, Northants. Details from Mr P Byles, G6UWS, 108 Kingsway, Wellingborough, Northants, NN8 2EN.
NORTHAMPTON RC, G3GWB, G8LED. Meets 8.00pm on Thursdays, at Kingsthorpe Community Centre, Northampton. Details from Mr P H Saul, G8EUX, 51 Windsor Close, Towcester, Northants, NN12 7JB.
NORTHANTS SCOUTS ARG, G6NDS. Details from Mr I Rivett, 25 Masefield Way, Northampton, NN2 7JT

NORTHUMBERLAND

Council Zone: A
RLO: Post vacant, please refer to Zone A Council Member.

BLYTH ARC, G4VKY. Meets Wednesday evenings, at Newsham Community Centre, Elliott Street, Blyth, Northumberland. Details from Mr R Little, G0ACR, 16 Greenwood Avenue, Bedlington, Northumberland, NE22 7EE. Tel: 0670-827585.
BORDER ARS, GM0BRS. Meets 1st and 3rd Friday in the month, at St. Johns Ambulance Hall, Berwick-upon-Tweed. Details from Mattie, GM1IRN, 1 Greenside Cottages, Ladykirk, Berwickshire.
NORTHUMBRIA ARC, G4AAX. Meets Thursday evenings, at Old Telephone Exchange, Cresswell Road, Ellington, Morpeth, Northumberland. Details from Mr D Stansfield, G0EVV, 22 Low Stobhill, Morpeth, Northumberland, NE61 2SG. Tel: 0670-513026.
WANSBECK ARA, G0FNQ. Meets Tuesday evenings and Friday afternoons, at The Antenna Farm, Colliery Baths, Cambois, Blyth, Northumberland. Details from Mr L Walters, G4NAX, The Bungalow, Foster Terrace, Cambois, Blyth, Northumberland, NE24 1RJ. Tel: 0670-818442.

NORTH YORKSHIRE

Council Zone: A
RLO: North East of River Ouse: Bob Wilkinson, G4YKO, 8 Laughton Avenue, Scarborough, North Yorkshire YO12 5DB. Tel: 0723-352823. South West of River Ouse: Gareth Foster, G1DRG, 19 Asquith Avenue, Burnholme, York YO3 0PZ. Tel: 0904-421392

ARMY APPRENTICE COLLEGE, G3HKR. (Only apprentices and staff). Details from Mr H Kay, G3HKR, Army Apprentice College, Harrogate, North Yorkshire, YO12 6JW. Tel: 0904-659811 ext. 835 - weekdays, 0423-780627 - evenings.
DARLEY ARC, G0FOS. Meets 5.00pm on 1st Wednesday in the month, at Menwith Hill Station, Darley, Harrogate, North Yorkshire, HG3 2RF. Details from MR G Bliss, G0CLY, 33 The Spinney, Knaresborough, North Yorkshire, HG5 0TD. Tel: 0423-865935.
HAMBLETON ARS, G0JQA. Meets 7.30pm fortnightly on Mondays, at Alletonshire School West, Brompton Road, Northallerton, North Yorkshire. Details from Mr Ken Shearman, G1XLZ, 17 Newlands, Northallerton, North Yorkshire, DL6 1SJ. Tel: 0609-775478.
HARROGATE COLLEGE RS, G0HCA. Meets irregularly, Harrogate Ladies College, Clarence Drive, Harrogate, North Yorkshire, HG1 2QG. Details from Mr Richard Horton, G3XWH, Harrogate Ladies College, Clarence Drive, Harrogate, North Yorkshire, HG1 2QG. Tel: 0423-504543.
RIPON & DARS, G4SJM, G1WCY. Meets 7.30pm, Thursdays, at The Bunker, Ripon Town Hall, Ripon, North Yorkshire. Details from Mr Mike Stockdale, G1XED, 1st Floor, 22 Commercial Street, Harrogate, North Yorkshire, HG1 1TY. Tel: 0423 64353 (9am-5.30pm).
SCARBOROUGH ARS, G4BP. Meets 7.30pm on Monday evenings, at Scarborough Cricket Club Pavillion, North Marine Road, Scarborough, North Yorkshire, YO12 7TJ. Details from Mr D P Tipper, G3JBR, 10 Lowdale Avenue, Scarborough, North Yorks, YO12 6JW. Tel: 0723-377296.
YORK ARS, G3HWW. Meets 7.30pm on Fridays, at United Services Club, 61 Micklegate, York. Details from Mr Keith Cass, G3WVO, 4 Heworth Village, York, YO3 0AF. Tel: 0904-422084.
YORK RC (AMATEUR), G4YRC, G1YRC. Meets 7.30pm, Wednesdays, at York City Arms Sports Club, Fawcett Street, York. Details from Mr Frank Webb, G3ZKS, 37 Alwyn Grove, York. Tel: 0904-625798.

NOTTINGHAMSHIRE

Council Zone: b
RLO: M J Leeson, G8GNN, 14 Woodside Avenue, Mansfield, Notts NG18 4RH.

ARNOLD & CARLTON F E COLLEGE ARS, G1ACC.
ARC OF NOTTINGHAM, G3EKW. Meets 7.30pm on Thursdays, at Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham. Details from Mr M C Shaw, G4EKW, 50 White Road, Nottingham, NG5 1JR. Tel: 0602-700262.
HUCKNALL R-R ARC, G0JJN. Details c/o 18 Colston Road, Bulwell, Nottingham.
MANSFIELD ARS, G3GQC. Meets 7.30pm on 1st Friday and 3rd Thursday in the month, at Victoria Social Club, Princes Street, Mansfield, Notts. Details from Mr K Lawson, G4AAH, 233 Southwell Road West, Mansfield, Notts, NG18 4HF. Tel: 0623-642719.
PLESSEY (BEESTON) ARS, G8ZK. Meets 8.00pm on Thursdays, at Plessey Communications, Beeston, Notts. Details from Mr C J Archer, G4VFK, 3 Alexandra Crescent, Beeston, Nottingham, NG9 2BS. Tel: 0602-226321.
WORKSOP ARS, G3RCW. Meets 8.00pm on alternate Tuesdays, at Woodhouse Inn, Rhodesia, Worksop, Notts. Details from Mr J. Huggins G0DZX, 51 The Oval, North Anston, Nr. Sheffield, S31 7BX Tel: 0909-565856
YAESU CLUB, G4TYC. Details from M. Dyson G4SKY, 44 Dawlish Close, Hucknall Nottingham, NG15 6NY.

ORKNEY

Council Zone: G
RLO: A W Wright, GM3IBU, Crosslea, Berstane Road, Kirkwall, Orkney KW15 1SZ. Tel: 0856-3273 (office hours).

ORKNEY CAITHNESS REPEATER GP, GB3OC. Details from Mrs Eleanor Wylie, GM0KHP, Dunedin, Dunnet, Caithness, Tel: 084785-604. Repeater keeper, Mr Bill Wright, GM3IBU, Crosslea, Berstane Road, Kirkwall, Orkney, KW15 1SZ.
ORKNEY AR GROUP, RS91349. Meets 7.30pm on 1st Wednesday in the month at Lynnfield Hotel, Kirkwall, Orkney. Details from Mr Alan Smith, GM4IOB, Hestivald, Downies Lane, Stromness, Orkney. Tel: 0856850-911.

OXFORDSHIRE

Council Zone: D
RLO: Neill Taylor, G4HLX, 46 Hunters Field, Stanford-in-the-Vale, Faringdon, Oxon SN7 8LX. Tel: 03677-503.

BANBURY ARS, G0BRA. Meets 7.30pm, 2nd and 4th Wednesdays in the month, at The Three Pigeons, Castle Street, Banbury, Oxon. Details from Mr Bryan Thornton, G1IIO, 21 Valley Road, Greenhills Est, Banbury, Oxon, OX16 9BQ. Tel: 0295-51774.
HARWELL ARS, G3PIA. Meets 8.00pm on 3rd Tuesday in the month, at Social Club, Harwell Laboratory, Didcot, Oxon. Details from Mr John Durban, G6LNU, 62 Westfield Way, Charlton Heights, Wantage, Oxon, OX12 7EP. Tel: 02357-68453.
OXFORD & DARS, G5LO. Meets 7.45pm on 2nd and 4th Thursdays in the month, at The Royal British Legion Club, Marston & District Branch, Hadow Road, New Marston, Oxford OX3 0JW. Details from Mr Glyn Hughes, G0AGJ, 90 Oxford Road, Old Marston, Oxford, OX3 0RD. Tel: 0865-242720.
RUTHERFORD APPLETON LAB ARC, G3RRS. Details from Mr John Eastment, G4LXO, R25, Rutherford Appleton Lab, Chilton, Didcot, Oxon, OX11 0QX. Tel: 0235-6546.
VALE OF WHITE HORSE ARS, G5RP, G4VWH, G6VWH. Details from Dr Ian White, G3SEK, 52 Abingdon Road, Drayton, Abingdon, Oxon, OX14 4HP.

POWYS

Council Zone: E
RLO: Paul Essery, GW3KFE, 287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1AR. Tel: 0686-28958.

POWYS ARC, GW4HVN. Meets 7.15, Thursdays, at Cricket Pavillion, Lymore Park, Montgomery, Powys. Details from Mr Mike Smith, GW4DWX, Tonn Marr, Bron-y-Buckley, Welshpool, Powys, SY21 7NQ. Tel: 0938-2068. (Please telephone, QTH difficult to find).

SHETLAND

Council Zone: G
RLO: Pete Weller, GM3XOQ, "Heimli", Levenwick, Shetland Isles ZE2 9HX. Tel: 09502-354.

LERWICK RC, GM3ZET. Meets 7.00pm on Thursdays, at Islesburgh Community Centre, King Harrold Street, Lerwick, Shetland. Details from Mr Bill Connolly, GM4ZET, Stenswall, Weisdale, Shetland, ZE2 9LW. Tel: 059572-393.
UNST RC, GM3STU. Meets irregularly. Details from Mr Cedric Auty GM4GPP, Valsgarth, Haroldswick, Unst, Shetland. Tel: 095781-349.
YELL ARC, GM4YEL. Meets 6.00pm on Thursdays at North Isles Motel, Yell, Shetland. Details from Mr Bruce Spence, GM4FNE, Cullivoe, Yell, Shetland.

SHROPSHIRE

Council Zone B
RLO: (also for Staffordshire) Post vacant, refer to Zone B Council Member.

OSWERSTRY & DARC, G4TTO. Details c/o 8 Yew Tree Avenue, Whittington, Oswerstry, Shropshire.
SALOP ARS, G3SRT. Meets 8.00pm on Thursdays, at Old Bucks Head, Frankwell, Shrewsbury. Details from Mr S G Pryce, G0EIY, "Strathmore", 48 Mount Street, Shrewsbury, SY3 8QH. Tel: 0743-67799. (Club QTH difficult to find - suggest contacting G0EIY for directions)
SEVERN VALLEY RS, G3SVR. Details from Mr E Churchyard, 11 Greenfields Drive, Birmingham.
TELFORD & DARS, G3ZME. Meets 8.00pm on Wednesdays, at Dawley Bank Community Centre, Dawley, Telford, Shropshire. Details from Mr R Roberts, G7BWQ, 16 Walton, High Ercall, Telford, Shropshire. Tel: 0952-770922.

SOMERSET

Council Zone: D
RLO: Post vacant, refer to Zone D Council Member.

DOWNSIDE SCHOOL ARS, G8WKL. (Open only to staff and pupils and ex-pupils). Meets at Computer Room, Downside School, Stratton-on-the-Fosse, Bath.
STANCHESTER SCHOOL RADIO CLUB, RS91903. Only open to members of the School.
STREET & DARS, G0FFW. Meets 7.30pm on 1st Thursday in the month, at The Toc H Hut, Brutach Terrace, Street, Somerset. Details from Mr D G Roney, G1RKM, 5 Highcroft, Woolavington, Bridgwater, Somerset, TA7 8EU. Tel: 0278-683110.
TAUNTON & DARC, G3XZW. Meets 7.30pm on 1st and 3rd Friday in the month, at The Basement, County Hall, The Crescent, Taunton. Details from Mr Peter Robison, G0EYR, 35 Stoke Road, Taunton. Tel: 0823-275973.
YEOVIL & DARC, G3CMH. Meets 7.30pm on Thursdays, at The Recreation Centre, Chilton Grove, Yeovil, Somerset. Details from Mr D J Bailey, G1MNM, 7 Thatcham Close, Yeovil, Somerset, BA21 3BS.

SOUTH GLAMORGAN

Council Zone: E
RLO: Please see under Mid Glamorgan.

BARRY COLLEGE of FE RS, GW3VKL, GW4BRS, GW6BRC. Meets 7.30pm on Thursdays, at The College Annex, Weycocks Cross, Barry, South Glam. Details from Mr Glyne Jones, GW0ANA, Nirvana, Castle Precint, Llandough, Cowbridge, S Wales, CF7 7LX. Tel: 04463-3370.
BRISTOL CHANNEL REPEATER GP, GB3BC, GB3SG, GB3VG. (Incorporating The SE Wales Repeater Gp.) Details from Mr Roy Selleck, GW0JZR, 12 Norseman Close, Rhoose, South Glam, CF6 9FY. Tel: 0446-711146.
BRITISH TELECOM (SOUTH WALES DISTRICT) ARS, GW0LST, GW7BTC. Meets 2nd Wednesday in the month, at The Conference Room, BT Complex, Coryton. Details from Mr Martyn Jenkins, c/o BT Headquarters, Coryton, Cardiff. Tel: 0222-379634. (0800-1600 only)
CARDIFF RSGB GP, GW5BI. Meets 7.30pm on 2nd Monday in the month, at The Pant Mawr Hotel, Tyla Teg, Whitchurch, Cardiff. Details from Mr Cyril Laws, GW0CUM, 7 Seys Close, Cowbridge, South Glam, CF7 7BW. Tel: 04463-3212.
HIGHFIELDS ARC, GW4LFO, GW1LFO. Meets 7.30pm on Thursdays, at Highfields Centre for the Physically Handicapped, Allens Bank Road, Cardiff. Details from Mr Roy Selleck, GW0JZR, 12 Norseman Close, Rhoose, South Glam, CF6 9FY. Tel: 0446-711146.
RAF ST ATHAN ARC, GW3CKB. (Open only to members and ex-members). Meets 7.00pm Tuesdays, at The Radio Clubhouse, on St. Athan Airbase. Details from Mr Dave Sage, GW0FJW, RAF St Athan, Barry, South Glam, CF6 9WA. Tel: 0446-750277.
SOUTH WALES ELEC BOARD RS, GW4DGD. (Restricted to SWEB employees only.) Details from Mr Neil Little, GW3YVN, c/o SWEB Telephone: 0222-792111.

SOUTH YORKSHIRE

Council Zone: A
RLO: Ian Abel, G3ZHI, 52 Hollytree Avenue, Maltby, Rotherham, South Yorkshire S66 8DY. Tel: 0709-814911.

BARNSLEY & DARC, G6AJ. Meets 7.30pm on alternative Mondays, at St Marys Church Hall, Laithes Lane, Barnsley. Details from Mr Ernie Bailey, G4LUE, 8 Hild Avenue, Cudworth, Barnsley. Tel: 0226-716339.
DONCASTER ARS, G0ITW. Meets 7.30pm on Mondays at Corporation Brewery Taps, Cleveland Street, Doncaster. Details from Mr K McMahon, G8JJR, 5 Cross Gates, Wadworth, Doncaster. Tel: 0302-852938.
HOYLAND & DARS, G0HGE. Meets at 7.30pm Wednesdays, at West Bank House, West Street, Hoyland. Details from Mr M Wardle, G0GDC, 11 Sokell Avenue, Wombwell, Barnsley.
MALTBY ARS, G4SKM. Meets Friday evenings, at Hellaby Community Hall, Hellaby, Nr Maltby. Details from Mr K E Johnson, G1PQW, 20 Rolling Dales Close, Maltby, Rotherham, South Yorks, S66 8EJ. Tel: 0709-814135.
MEXBOROUGH & DARS, G4BTS. Meets 7.30pm Fridays, at Harrop Hall, Mexborough, South Yorks. Details from Mr D Thomas G6FUM 48 Earlsmere Ave, Balby, Doncaster. Tel: 0302-859654.
MOUNT ST MARY'S RC, G4MSM. Spinkhill, Eckington, Sheffield. C/o Rev. P. McArdle, G0DAG, Barlborough Hall, Balborough, Chesterfield, Derbyshire.
SHEFFIELD ARC, G0INF. Meets 7.30pm Mondays, at Firth Park Pavillion, Firth Park, Sheffield. Details from Mrs M Sables, G4ZJN, 54 Harvey Street, Deepcar, Sheffield. Tel: 0742-886083.
SHEFFIELD TELECOM ARC, G4HOT. P.Green, G4PHL. 6 Yews Close, Worrel, Sheffield. (Open only to BT employees).

STAFFORDSHIRE

Council Zone: B
RLO: Please see under Shropshire.

BRITISH TELECOM TECH COLL ARS, G4NJR. (Open only to BT staff and students). Meets 7.30pm on Tuesdays, at The College, Stone, Staffs. Details from Mr S Chettle, G8ATB, 10 Burrington Drive, Trentham, Stoke-on-Trent, ST4 8SP. Tel: (work) 0785-762593.
BURTON-ON-TRENT & DARS, G3NFC. Meets 8.00pm on Wednesdays, at Stapenhill Insitute, Main Street, Stapenhill, Burton-on-Trent, Staffs. Details from Mr M W Cotton, G4HBY.
CANNOCK CHASE ARS, G6SW. Meets 8.00pm, Thursdays, at the Victoria Club, Church Road, Hednesford. Details from Mr D A Baker, G0BSM, 9 Croft Crescent, Brownhills, Walsall, WS8 7DN. Tel: 0543-372958.
CHAD RC, G4CAR. Meets 8.30pm on Mondays, at The Swinfen Officer's Club, Swinfen, Lichfield, Staffs. Details from Bernard Jayne, G8BFL, 38 Townfields, Lichfield, Staffs WS13 8AA. Tel: 0543-268569
GEC MEASUREMENTS ARS, G3SBL. Details c/o Mr John Youde, G0GUF, St Leonards Works, Stafford.
ICL KIDSGROVE AR & PCC, G6ICL. (Open only to employees of ICL).
MOORLANDS ARS, G4NHT. Meets 3rd & 4th Wednesdays in the month, at Ex-Service Centre, Bank Street, Cheadle, Stoke-on-Trent. Details from Mr C F Beesley, G4OUG, 6 Thames Drive, Cheadle, Stoke-on-Trent, Staffs. ST10 1QD. Tel: 0538-756323.
NORTH STAFFS ARS, G4BEM. Meets 8.00pm, at Harold Clowes Community Centre, Dawlish Road, Bentilee, Stoke-on-Trent. Details from Mr Mervyn Bennett, G4HUO, 9 Lavender Avenue, Blythe Bridge, Stoke-on-Trent, ST11 9RN. Tel: 0782-394887.
RAF COSFORD ARC, G4CES. Details c/o Cpl D Wakefield, G0KTH, ARTF, RAF Cosford, Wolverhampton.
STAFFORD ARS, G4TTT. Meets 8.30pm on Tuesdays, at Coach & Horses Motel, Pasturefields, Great Haywood, Stafford. Details from Mr J J Brown, G6DAT, 33 Bush Drive, Rugeley, Staffs, WS15 2AQ. Tel: 08895-82453.
STOKE-ON-TRENT ARS, G3GBU. Meets 7.30pm on Thursdays, at The Cottage, 2 A Racecourse Road, Oak Hill, Stoke-on-Trent. Details from Mr J W Mollart, G4IMV, 8 Harrison Street, Newcastle-under-Lyme,

Staffs, ST5 1NH. Tel: 0762-613207.
TAMWORTH ARS, G4FWC. Meets 8.00pm on Mondays, at Rugby Club, Cotton Green, Tamworth, Staffs. Details from Mr R Robertson, G0GUH, 10 Athelston Way, Coton Green, Tamworth, Staffs. Tel: 0827-67004.

STRATHCLYDE

Council Zone: G
RLO: Bob Low, GM0ECU, 2 Craigie Place, Crosshouse, Ayrshire KA2 0JR. Tel: 0563-35738.

AYR ARG, GM0AYR. Meets at 7.00pm on 2nd Friday in the month, at The Community Leisure Centre, 24 Wellington Square, Ayr. Details from Mr R Paterson, GM4CUB, 'Glenala', 22 Doonfoot Road, Ayr, KA7 4DN. Tel: 0292-262496.
CENTRAL SCOTLAND FM GP, RS38728. Details from Mr Alastair Fraser, GM3AXX, Rigghead, Stewarton, Ayrshire, KA3 3DQ. Tel: 0560-82720.
CUMNOCK & DARG, GM0LOB. Meets 7.30pm on 2nd Thursday in the month, at Cumnock Academy, Cumnock, Ayrshire. Details from Ann Campbell, GM1YKE, 15 Birchwood Road, Cumnock, KA18 1NG. Tel: 0290-22168.
CUNNINGHAME & DARC, GM3USL. Meets 7.00pm on Thursdays, at Green Room, Magnum Leisure Centre, Irvine, Ayrshire. Details from Mr John McCreight, GM3DJS, 40 Auchenharvie Road, Saltcoats, Ayrshire KA21 5RL. Tel: 0294-602464.
GREENOCK & DARC, GM3ZRC. Meets 7.00pm on Tuesdays and Fridays, at 22 Inverkip Street, Greenock, Renfrewshire. Details from Mr David McKinnon, GM0ADF, 5 Octavia Terrace, Greenock, Renfrewshire. Tel: 0475-25075.
HELENSBURGH ARC, GM4HEL. Meets 7.30pm on Mondays and Thursdays, at Cairndhu House, Rhu Road, Helensburgh, Dunbartonshire. Secretary: Mr Barry Spinks, 9 St Andrews Crescent, Mansewood Estate, Dumbarton, G82 3AR. Further details also available from Alan White at Cairndhu House, tel: 0436-78111.
IBM GREENOCK ARC, GM0GNK. (Open only to employees). Details from Mr Colin Henery, GM0HBT, Mailpont 10A, IBM UK Ltd, Inverkip Road, Spango Valley, Greenock.
KILMARNOCK & LOUDOUN ARC, GM0ADX. Meets 7.30pm on 2nd Tuesday in the month, at Glenfield Social Club, Queens Drive, Kilmarnock, Ayrshire. Details from Mr John Hemphill, GM3CTG, 31 Dundonald Road, Kilmarnock, Ayrshire KA1 1RU. Tel: 0563-25312.
LOCH LOMOND ARC, GM4URZ. Meets 7.30pm on 1st Tuesday in the month, at Bonhill High Dykes Primary Sch, Bonhill, Dumbarton. Details from Mr E Bell, GM4LKJ, 21 St Andrews Crescent, Dumbarton.
LORN ARS, RS92226. Details c/o "Ardchuan", Taynuilt, Argyll.
MID-LANARK ARS, GM3PXK, GM1XOI. Meets 7.30pm on Fridays, Newarthill Community Education Centre, Main Street, Newarthill, Lanarkshire. Details from Mr David Williams, GM1SSA, 32/34 Carlin Street, New Stevenson, Motherwell, Lanarkshire, ML1 4JL. Tel: 0698-732403.
PAISLEY (YMCA) ARC, GM0KIV. Meets 7.30pm, 2nd Wednesday in the month, YMCA, 5 New Street, Paisley. Details from Mr Tom Wylie, GM4FDM, 'Torranmhor', 3 Kings Crescent, Elderslie, PA5 9AD. Tel: 0505-22749.
SCOTTISH DIGITAL COMMUNICATIONS GP (MACPAC), GM1ZQM.
SCOTTISH TOURIST BOARD (RADIO AMATEUR) EXPEDITION GROUP, RS91809. Details c/o 9 Ramsey Place, Coatbridge, Lanarkshire.
WEST OF SCOTLAND ARS, GM4AGG. Meets 7.30pm on Tuesdays and Fridays, at 29 Old Dumbarton Road, Glasgow. Details from Patricia MacKenzie, GM0HNV, PO Box 599, Glasgow, G1 1EW. Tel: 0360-310766.

SUFFOLK

Council Zone: C
RLO: Please see under Norfolk.

BURY ST EDMUNDS ARS, G2TO. Meets 7.30pm on 3rd Tuesday in the month, at County Upper School, Beetons Way, Bury St Edmunds, Suffolk. Details from Barry Lowe, G1UGJ, Little Maltings, Bradfield St Clare, Bury St Edmunds, Suffolk, IP28 6AY. Tel: 028486-595.
FELIXSTOWE & DARS, G4ZFR. Meets 8.00pm on alternate Mondays in the month, at The Scout Hut, Bath Road, Felixstowe, Suffolk. Details from Mr Paul Whiting, G4YQC, 77 Melford Way, Felixstowe, Suffolk, IP11 8UH. Tel: 0473-642595.
IPSWICH RC, G4IRC G1IRC. Meets 8.00pm on 2nd and last Wednesdays in the month, at the Red Lion, Bramford Road, Ipswich. Details from Reg Elden, G8VNP, 124 Larchcroft Road, Ipswich, IP1 6PQ. Tel: 0473-42072.
LEISTON ARC, RS85732. Meets 7.30pm for 8pm, 1st Tuesday in the month, at Sizewell Sports & Social Club, King George's Avenue, Leiston, Suffolk. Details from David Parsons, G7BDX, 7 Buller Road, Leiston, Suffolk, IP16 4HA. Tel: 0728-832709.
LOWESTOFT ARS, G3JRM. Meets in abeyance, at Details from Mr Alan Seago, G4KDL, 50 Kimberley Road, Lowestoft, NR33 0TZ. Tel: 0502-566289.
MARTLESHAM RS, G4MRS. (visitors must book in advance with Sec). Meets 7.30pm on occasional 1st Wednesdays in the month, at British Telecom Research Labs, Martlesham Heath, Ipswich. Details from Mr Paul Tattersall, G4SYG, Anchor Cottage, The Street, Nacton, Ipswich, IP10 0EU. Tel: (work) 0473-643317.

SURREY

Council Zone: C
RLO: Please see under Greater London (South).

CATERHAM RG, RS37608.
DORKING & DRS, G3CZU. Meets 2nd & 4th Tuesdays in the month. Details from Mr John Greenwell, G3AEZ, Tel: 0306-77236.
ECHELFORD ARS, G3UES. Meets 8.00pm on 2nd and 4th Mondays in the month, at The Congregational Church Hall, Kingston Road, Ashford, Middx. Details from Mr P Fauchon, G0JSP, 114 Petersfield Avenue, Staines, Middx. Tel: 0784-56169.
FARNHAM VHF GP, G6ALE. Meets 8.00pm on 2nd and 4th Mondays in the month, at Farnham Central Club, Farnham, Surrey. Details from Mr Dave Chater-Lea, G4EPX, 11 Waterloo Crescent, Wokingham, Berks, RG11 2JJ.
FRENSHAM HEIGHTS ARC, G4FHR.
GUILDFORD & DRS, G6GS. Meets 8.00pm on 2nd and 4th Fridays in the month, at Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey. Details from Mr A Pevy, G4XYW. Tel: 04868-22107.
GUILDFORD COLL OF TECH AR & EC, RS8600.
GUILDFORD UHF REPEATER GP, GB3GF.
RACAL ARC, G3RAC.
REIGATE ATS, G5LK. Meets 8.00pm on 3rd Tuesday in the month, at Constitutional & Conserv Club, Warwick Road, Redhill, Surrey. Details from Peter Gittins, G8ITY, 55 Gloucester Road, Tilgate, Crawley, Sussex, RH10 5HR. Tel: 0293-36193.
THAMES VALLEY ARTS, G3TVS. Meets 8.00pm on 1st Tuesday in the month, at Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton, Surrey. Details from Cdr J Pegler, G3ENI, Brook House, Forest Close, East Horsley, Leatherhead, Surrey, KT24 5BU. Tel: 0486-54279.
UNIVERSITY OF SURREY, G3IGO.

TAYSIDE

Council Zone: G
RLO: Please see under Fife.

DUNDEE ARC, GM4AAF. Meets 7.30pm on Tuesdays, at Dundee College of Further Ed, Graham Street Annexe, Dundee. Details from Mr Alfred Low, 21 Earn Crescent, Menzieshill, Dundee, DD2 4BS. Tel: 0382-644597.
PERTH & DARG, GM4EAF. Meets Wednesday evenings, at Perth Sports and Social Club, Leonard Street, Perth. Details from Mr Iain Fergeson, GM4YXK, 52 Bute Drive, Perth, PH1 3BL. Tel: 0738-37121.
STRATHMORE & DARC, GM3GBZ. Meets Monday evenings, at 46 High Street, Kirriemuir. Details from Mr Alan Glashan, GM4JCM, 35a Lochinver Crescent, Gowrie Park, Dundee, DD2 4UA. Tel: 0382-644585.

TYNE & WEAR

Council Zone: A
RLO: Eamonn Malone, G4MRT, 65 Grosvenor Avenue, Newcastle-upon-Tyne NE2 2NP. Tel: 091-281 0994.

HAZELRIGG ARC, G4YPT. Meets on Monday evenings at the Hazelrigg Community Centre, Coach Lane, Hazlerigg, Newcastle-upon-Tyne, NE13 9BX. Details from Mr M E Frear, G1XOJ, 18 Boulsworth Road, North Shields, Tyne & Wear, NE29 9EN. Tel: 091-257 3464.
HOUGHTON-LE-SPRING ARC, G3NMD. Meets on Thursday evenings, at Fencehouses Old Comrades Club, Eastfield House, Station Avenue North, Fencehouses, Tyne & Wear. Details from Mr Foster Aungles, G0ABF, 158 Burn Park Road, Houghton-le-Spring, Tyne & Wear, DH4 5DH. Tel: 091-584 4673
SUNDERLAND ARS, G4LPK, G6BXJ. Meets Monday & Thursday evenings, at The Brewery, Westbourne Road, Sunderland, Tyne & Wear. Details from Mr F Smith, G6AGZ, 103 Station Road, Seaham, Co Durham SD7 0BD.
TYNESIDE ARS, G3ZQM. Meets Wednesday evenings, at St Teresa's Club, 200 B Heaton Road, Newcastle-upon-Tyne, NE6 5HP. Details from G Lindsay, G4KOT, 80 Sandingham Road, Newcastle-upon-Tyne.
WASHINGTON & DARC, G4YGW. Meets Sunday evenings, at Oval Community Centre, District 12, Washington, Tyne & Wear. Details from Mr J Kennedy, G0JCW, 60 Burnway, Albany, Washington, Tyne & Wear, NE37 1QQ.

WARWICKSHIRE

Council Zone: B
RLO: Please see under Northamptonshire.

ATHERSTONE ARC, G4LCQ, G6ARC. Meets 2nd and 4th Mondays in the month, at Upper School, Long Street, Atherstone, Warwickshire. Details from Mr J.R. Arrowsmith, G4IWA, 16 Mancetter Road, Mancetter, Atherstone, Warwickshire. CV9 1NZ Tel: 0827-713670.
EAST MIDLANDS REPEATER GP, GB3ME.
MID-WARWICKSHIRE ARS, G3UDN. Meets 8.00pm on 2nd and 4th Tuesdays in the month, at St John Ambulance HQ, 61 Emscote Road, Warwick. Details from G6VHI.
RUGBY ATS, G4APD. Meets 7.30pm on twice monthly, at Cricket Pavillion, B entrance, Rugby Transmitting Station, Warwickshire. Details from Mr Kevin Marriott, G8TWH, 41 Foxonsbarn Road, Brownsover, Rugby, Warwickshire, CV21 1LA.
STRATFORD-UPON-AVON & DRC, G3PGU. Meets 7.30pm on 2nd and 4th Mondays in the month, at Baptist Church, Payton Street, Stratford-upon-Avon, Warwickshire. Details from Mr H D Boocock, G8OVC, 181 Lower Binton, Stratford-upon-Avon, Warwickshire, CV37 9TQ. Tel: 0789-750584.

WEST GLAMORGAN

Council Zone: E
RLO: Please see under Dyfed

BSC (PORT TALBOT) ARS, GW3EOP, GW0BSC. Meets 7.30pm on Thursdays, at British Steel Sports & Soc Club, Port Talbot, West Glamorgan. Details from Mr J Griffiths, GW4IGR, 6 High Street, Cwmgrach, Neath, West Glamorgan, SA11 5SY. Tel: 0639-720416.
SWANSEA (UNIV COLLEGE) ARS, GW3UWS. (Primarily intended for students). Details from Mr Malcolm Bowen, GW3KGI, c/o Electrical Eng Dept, University College, Singleton Park, Swansea.
SWANSEA ARS, GW4CC. Meets 7.30pm on 1st and 3rd Thursdays in the month, at Lecture Room 303, Applied Sciences Building, Swansea University, Swansea. Details from Mr Jim Standbury, GW0BBO, 23 Crymlyn Parc, Skewen, Neath, West Glamorgan, SA10 6DG. Tel: 0792-818100.
SWANSEA RACC, GW4UNV. Meets 7.30pm on Fridays, at 3 Gloucester Place, Swansea. Details from Mr M Pilot, GW1DTA, 92 Llanienwen Road, Morriston, Swansea, West Glamorgan, SA6 6LU.

WEST MIDLANDS

Council Zone: B
RLO: Post vacant, refer to Zonal Council Member.

ASTON UNIVERSITY ARS, G3UOA. Meets Monday lunchtimes and Thursday evenings. Details from Mr Ian Criddle, G6VWA, Tel: 021-359 3611 Ex 5115.
BARR BEACON ARC, G1TLK. Meets 7.30pm on alternate Mondays, at Barr Beacon Community School, Old Hall Lane, Aldridge, West Midlands. Details from Mr Charles Baker, G1LRP. Tel: 0922-25983.
BIRMINGHAM UNIVERSITY RS, G3IUB, G8IUB. Meets 1.00pm on daily, at Club Room, 2nd Floor, Union Buildings, (Midland Bank entrance and, follow signs). Details from GW4YEG,
BBC CLUB ARG (PEBBLE MILL), G2BBC. (Open only to BBC employees).
CENTRAL ITV PLC ARC, G0CTV. (Open only to employees). Details from Central ITV Amateur Radio Club, Central House, Broad Street, Birmingham.
COVENTRY ARS, G2ASF. Meets 8.00pm on Fridays, at Scout HQ, 121 St Nicholas Street, Coventry. Details from Mr Jon Ward, G4HHT, 3 Shirley Road, Coventry. Tel: 0203-610408.
DUDLEY ARC, G4DAR. Meets 7.45, Mondays, at The Allied Centre, Greeman Ally on Tower Street, Dudley, West Midlands. Details from Mr Bob Derricott, G4UPE. Tel: 0384-392009.
KING EDWARD'S SCHOOL ARS, G8ZKE. (Open only to staff and pupils). Meets at King Edward's School, Edgbaston Park Road, Birmingham.
KYNOCH R & TVS, G3HPP.
LICHFIELD ARS, G3WAS.
MIDLAND ARS, G3MAR. Meets several times each week, at Unit 5, Henstead House, Henstead St, (off Bromsgrove St), Birmingham. Details from Mr Norman Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham, B32 1LB. Tel: 021-422 9787.
MIDLANDS AX-25 PACKET REPEATER GP, RS91143.
MIDLANDS ELECTRICITY BOARD RS, G4MEB. Meets 8.00pm twice monthly, at MEB Social Club, Mucklow Hill, Halesowen, West Midlands. Details: Mr Dave Ackrill, G0DJA, 421 Redditch Road, Kings Norton, Birmingham B38 8ND. Tel: 021-459 9854.
MIRFIELD ARC, G0CLU. Meets 7.00pm on several times each week, at Mirfield Centre, Lea Village, Birmingham.
OLD SWINFORD HOSPITAL SCHOOL, G4CVK.
SANDWELL ARC, G0CWC. Meets 7.30pm on Mondays and Thursdays, at Broadway, Olbury, Warley, West Midlands. Details from Mr Steve Jackson, G0CCD, 100 Warley Road, Oldbury, West Midlands, B68 9SZ. Tel: 021-544 4759.
SLADE RS, G3SRS. Meets 7.45pm on 1st Friday in the month, at Community Centre, 75 Kingsbury Road, Erdington, Birmingham. Details from Mr Dennis Chapman. Tel: 0922-647687.
SOLIHULL ARS, G3GEI. Meets 3rd Thursday in the month, at The Shirley Centre, Stratford Road, Shirley, Solihull, West Midlands. Details from Mr P T Gaskin, G8AYY, 58 Elmcroft Road, South Yardley, Birmingham, B26 1PL. Tel: 021-783 2996.
SOUTH BIRMINGHAM RS, G3OHM. Meets 8.00pm on Wednesdays and Thursdays, at Hampstead House, Fairfax Road, West Heath, Birmingham. Details from Mr W. Meers, 29 Bagnell Road, Kings Heath, Birmingham, B13 0SJ. Tel: 021-444 1681.
SQN ATC RC, G0LAC. Details c/o 28 Westbourne Road, West Bromwich, West Midlands.
STOURBRIDGE & DRS, G6OI. Meets 8.00pm on 1st and 3rd Mondays in the month, at Robin Woods Centre, School Road (off Enville St), Stourbridge, West Midlands. Details from Mr D R Pearson, G3ZOM, 6 Fellows Avenue, Wall Heath, Kingswinford, West Midlands, DY6 9ET. Tel: 0384-288900.
SUTTON COLDFIELD RS, G3RSC. Meets 7.30pm on 2nd and 4th Mondays in the month, at Public Library, Sainsbury Centre, Sutton Coldfield, West Midlands. Details from Mr Mike Jones, G4MFN. Tel: 0827-282360.
WALSALL ARC, G4HLL. Meets 8 00pm on Wednesdays, at Forest Comprehensive School, Bloxwich, Walsall. Details from Mr Bob Sadler, G4FAJ. Tel: 0543-372169.
WARWICK UNIVERSITY ARC, G4EWU. Meets 7.30pm on Thursdays, at The Cholo. Details from Students Union, Coventry. Tel: 0203-417220.
WEST BROMWICH CENTRAL RC, G4WBC. Meets 7.30pm on Sundays, at The Victoria, Lyng Lane, West Bromwich, West Midlands. Details from Mr G L Kitson, G4ZAD, 33 Pace Crescent, Bradley, Bilston, West Midlands, WV14 8BJ. Tel: 0902-48263.
WEST MIDLANDS POLICE ARC, G0COP. Details from Mr D Mytton, Tel: 021-458 3236.
WILLENHALL & DARS, G4ETW. Meets 8.30pm on Wednesdays, at Cross Keys, Willenhall, West Midlands. Details from Mr J R Perkins, G4LWI, 115 Elston Hall Lane, Bushbury, Wolverhampton, WV10 9HD.
WOLVERHAMPTON ARS, G8TA. Meets 8.00pm on Tuesdays, at Electricity Board Sports Club, St Marks Road, Chapel Ash, Wolverhampton. Details from Mr K Jenkinson, Tel: 0902-24870.
WORDSLEY RADIO CLUB, G4WRA. Meets at Rose and Crown, High Street, Wordsley, Dudley, West Midlands. Details from Sue Sands G6YAC. Gabledown, Bridgnorth Road, Stourton, West Midlands DY7 6RW.

WEST SUSSEX

Council Zone: C
RLO: Kim Newland, G7AIE, Park Lodge, Park Road, Burgess Hill, West Sussex, RH15 8HQ.

CHICHESTER ARC, G3ISO. Meets 7.30pm on 1st and 3rd Tuesdays in the month, at St Pancras Hall, Chichester. Details from Henry Kaminski, G1NBX, Nebraska, Southover Way, Hunston, Chichester, West Sussex, PO20 6NY. Tel: 0243-781785.
CIBA-GEIGY RS, G4CGY. (Open only to employees). Meets at Radio Section, Ciba Geigy Sports & Social Cb, Wimblehurst Road, Horsham, West Sussex.

CRAWLEY ARC, G3WSC, G6RC.RS86259. Meets 8.00pm on 4th Wednesday in the month, at Crawley Leisure Centre, Haslett Avenue, Crawley, West Sussex. Details from Mr D L Hill, G4IOM, 14 The Garrones, Worth, Crawley, West Sussex, RH10 4YT. Tel: 0293-882641.
HAYWARDS HEATH COLLEGE ARS, RS88194. Meets at Haywards Heath College, Harlands Road, Haywards Heath, West Sussex.
HORSHAM ARC, G4HRS. Meets 8.00pm on 1st Thursday in the month, at Guide Hall, Denne, Horsham, West Sussx. Details from Mrs J. Shaw, G1XFM. "Caprice", Mill Lane, Ashington, Pulborough, West Sussex, RH20 3BX. Tel: 0908-893060; also Phil Goddard, tel: 0903-814516.
MID SUSSEX ARS, G1ZMS, G3ZMS. Meets 7.45pm on Thursdays, at Marle Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C R Cook, G0GMC, 45 Stonepound Road, Hassocks, West Sussex, BN6 8PR. Tel: 07918-2937.
SUSSEX REPEATER GP, GB3SR. Details from 43 North Farm Road, Lancing, West Sussex.
WORTH & DV RG, G6WOR.
WORTHING & DARC, G3WOR. Meets 7.30pm on Wednesdays, at Lancing Parish Hall, South Street, Lancing, West Sussex. Details from Mr R E Bannister, G4GPX, 43 North Farm Road, Lancing, Sussex, BN15 9BT. Tel: 0903-753893.

WEST YORKSHIRE

Council Zone: A
RLO: Martin Stokes, G3ZXZ, 20 High Street, Scapegoat Hill, Huddersfield, West Yorkshire HD7 4NJ. Tel: 0484-657669.

BRADFORD ARS, G3NN.
DENBY DALE & DARS, G4CDD. Wednesdays. Meets Pie Hall, at Denby Dale, West Yorks. Details from Mr J K Nicholson, G1MOZ, 35 Royds Avenue, Newmill, Huddersfield, West Yorks, HD7 7LJ. Tel: 0484-686573.
HARROGATE REPEATER GP, GB3HG. Details form Mr Kevin Cleary, G4ATZ, Chairman, 1 Bownas Road, Boston Spa, Wetherby, North Yorkshire, LS23 6EX. Tel: 0937-842790, or Mr Don Cameron, G4STT, Secretary, 5 Westminster Gate, Burn Bridge, Harrogate HG3 1LU. Tel:0423-871954.
HALIFAX & DARS, G2UG. Meets monthly, at Running Man Public House, Halifax, West Yorkshire. Details from Mr D L Moss, G0DLM, Beechwood Lodge, Leeds Road, Lightcliffe, Halifax, West Yorks, HX3 8NU. Tel: 0422-202306.
KEIGHLEY ARS, RS84851. Meets twice monthly, at Victoria Hotel, Keighley, West Yorks. Details from Mrs K A Conlon, G1IGH, Braunfels, 76 Deanwood Cresc, Allerton, Bradford, West Yorks, BD15 9BL. Tel: 0274-496222.
LEEDS & DARS, G4LAD. Meets Monday evenings, at Yarbury RUFC, Leeds. Details from Mr G L Tatterson, G0ETL, 2 Eden Road, Kirkstall Hill, Leeds, LS4 2TT. Tel: 0532-784080.
LEEDS POLYTECHNIC STUDENT UNION ARS, G1POL. Details c/o Student Union, Leeds Polytechnic, Leeds.
NORTH WAKEFIELD RC, G4NOK. Meets Thursday evenings, at White Horse Public House, Wakefield, West Yorks. Details from Mr S Thompson, G4RCH, 2 Alden Close, Morley, West Yorks, LS27 0SG. Tel: 0532-536633.
NORTHERN HEIGHTS ARS, G2SU. Meets twice monthly, at Bradshaw Tavern, Halifax, West Yorks. Details from Mr L L N Cobb, G3UI, 27 Moorlands Crescent, Halifax, West Yorks, HX2 8AA. Tel: 0422-60574.
OTLEY ARS, G3XNO.
PENNINE ARS, G0DRP.
PONTEFRACT & DARC, G3FYQ. Meets monthly, at Carleton Community Centre, Pontefract, West Yorks. Details from Mr E A Grayson, G6OJX, 3 Spurriers Avenue, Hilltop, Knottingley, WEst Yorks, WF11 0ER. Tel: 0977-83792.
SPEN VALLEY ARS, G3SVC. Meets 8.00pm on twice monthly, at Old Bank WMC, Mirfield, West Yorks. Details from Mr T J Clough, G4PHR, 37 Park Avenue, Mirfield, West Yorks, WF14 9PB. Tel: 0924-499397.
TODMORDEN & DARS, G4WYT. Meets twice monthly, at Queen Hotel, Todmorden, Lancs. Details from Mrs V Mitchell, G1GZB, Parrock Farm, Shore Grove, Cornholme, Todmorden, Lancs, OL14 8SF. Tel: 0706-817572.
UK FM GP NORTHERN, G8KFM. Meets at 7.30pm on 1st Sunday in the month, at East Ardsley Cricket Club, East Ardsley, Wakefield, West Yorks. Details from Mrs J L Laughton, G4UNA, Claremont, Main Street, East Ardsley, Wakefield, West Yorkshire. Tel: 0924-822579.
WAKEFIELD & DRS, G3WRS. Meets 8.00pm on Tuesdays, at Ossett Community Centre, Ossett, West Yorks. Details from Mr D J Bryan, G4VRY, 1 Haighside Drive, Rothwell, Leeds, LS26 0UR. Tel: 0532-820198.
WEST YORKS POLICE ARC, G3WYP. Details from W Yorks Police Amateur Radio C, Odsal Police Station, Odsal, Bradford, West Yorks.
WHARFEDALE REPEATER GP, GB3WF.
WHITE ROSE ARS, G3XEP. Meets Wednesday evenings, at Moortown RUFC, Moss Valley, Kings Lane, Leeds. Details from Mr K M Cleary, G4ATZ, 1 Bownas Road, Boston Spa, Wetherby, West Yorks, LS23 6EX. Tel: 0937-842790.
YAXPAK, RS92311. Details c/o 48 Bromley Road, Hanging Heaton, Batley, West Yorks.
1466 (HOLMFIRTH) SQN ATC, G0ATC.

WESTERN ISLES

Council Zone: G
RLO: Please see under Highland

WILTSHIRE

Council Zone: D
RLO: Ron Freeman, G4XTH, 90 Allington Way, Chippenham, Wilts SN14 0JU. Tel: 0249-650800.

BLACKMORE VALE ARS, G4RBV. 7.45pm, 2nd and 4th Tuesdays in the month. Meets Old Coach House, at Bell & Crown, Zeals, Wilts. Details from Mr Stuart Brunton, G0EXI, 5 Mill Rise, Bourton, Gillingham, Dorset, SP8 5DB. Tel: 0747-840558.
CHIPPENHAM & DARS, G3VRE. Details from Mr John Barrington, G4ZUV, 50 Greenway Lane, Chippenham, Wiltshire, SN15 1AU. Tel: 0249-651001.
DEVIZES & DARC, G4WIK. Meets weekly, Fridays, 8.00pm. Devizes FC, Nursteed Road, Devizes. Details from Mr H N Woolxych, 20 Meadow Drive, Devizes. Tel: 0380-4533.
RIDGEWAY REPEATER GP, RS91329.
SALISBURY R & ES, G3FKF. Meets 7.30pm on Tuesdays (except August), at Grosvenor House Centre, Churchfields Road, Salisbury, Wilts. Details from Mr Neil Underwood, G4LDR, 26 Pains Way, Amesbury, Salisbury, Wilts. Tel: 0980-22809.
SWINDON & DARC, G3FEC, G8SRC. Meets 7.30pm on Thursdays, at Oakfield School, Marlowe Avenue, Swindon.
TROWBRIDGE & DARS, RS86261. Meets 8.00pm on alternate Wednesdays in the month, at Territorial Army Centre, Bythsea Road, Trowbridge, Wilts. Details from Mr David Birch, G0GKH, 32 Union Street, Trowbridge, Wiltshire, BA14 8RY. Tel: 0225-755980.

OVERSEAS

AMATORRADIOKLUBB, RS37992. Details c/o Standard Radio & Telefon AB, Box 501, S-16215 Vallingby, Sweden.
AREC C, 9H1ARC. Details c/o P O Box 114, Valletta Malta.
BAHRAIN ARA, A92C. Details c/o PO Box 22381, Muharraq, Bahrain.
BEMRS SOCIAL CLUB RADIO GP, 5B4BBC. Details c/o BEMRS BFPO 53.
CORK RC, EI5CRC. Details c/o Wilton Park House, Wilton, Cork, Eire.
DE NORMANDIE, RS46196. Details c/o 1867 Avenue du Gaulle, 76350 Oissel, France.
ENGLISH SCHOOL RADIO CLUB, 5B4ES. Details c/o The English School, Nicosia, Cyprus.
ERICSSON AMATORRADIO KLUBB, SK0LM. Details c/o Telefon AB LM Ericsson, S-12625 Stockholm, Sweden.
ESBA ARC, ZC4ESB. Details c/o CWAO, 9 Sig Regt, BFPO 58.
ESCOM CLUB, OAKDALE RADIO AMATEUR SECTION, ZS1ESC. Details c/o P O Box 2132, Bellville, South Africa 7530.
GILBRALTAR ARS, PO Box 292, Gilbraltar.
GRENLANDS GR NRRL, LA1G. Details c/o Box 435, 3701 Skien, Norway.
RADIO CLUB GENISTA, FF6KNN. Details c/o 4 Le Viaduc, 34660 Cournonterral, France.
RADIOAMATOORIT RY, OH1AF. Details c/o Co Karvo, Pres Puistokatu 29 B 13 Pori, SF-28130, Finland.
RADIOKLUBBEN VID, SK0CT. Details c/o Ericsson Radio Systems AB, Dep F/Fbr, Mats-Ingvar, S-16380, Stockholm, Sweden.
SYDKUSTENS RAC, SK7OA. Details c/o Box 92, S-27012 Rydsgard, Sweden.
SA OF HONG KONG ARS, VS6EA. Details c/o Morse House, 9 Cox Road, Kowloon, Hong Kong.
TAEBY SAENDARAMATOER, SK0MT. Details c/o Sjoflygvagen 4, S-18362 Taby, Sweden.
WSBA ARC, ZC4EPI. Details c/o Joint Signals Board, HQ BFC, BFPO 53.

RSGB AFFILIATED SOCIETIES

Listed below are all the RSGB affiliated societies who have a national membership.

AMSAT-UK (G0AUK)

Formed 13 years ago, this is the UK national society specialising in amateur satellite matters. It has approximately 3,000 paid-up members, produces a regular publication, Oscar News, for its members six times per year and holds three weekly nets on 3,780kHz +/- QRM. (Mondays and Wednesdays at 1900 and Sunday at 1015 local time). Membership by donations, which are always welcome. Funds raised are used to build satellites for all to use. Enquiries, and application forms for membership, with an SASE to the honorary secretary:

Ron Broadbent, G3AAJ
94 Herongate Road
LONDON E12 5EQ
Tel: 01-989 6741

BARTG (BRITISH AMATEUR RADIO TELEDATA GROUP, G4ATG, GB2ATG)

Are you interested in Packet, Amtor, RTTY or Fax? If you are then you should find out more about BARTG, the national specialist group for the data enthusiast. BARTG offers you its quarterly journal 'DATACOM', contests on HF and VHF, operates the GB2ATG news service on HF and VHF, runs an annual rally, runs an awards scheme, supplies a range of components and lots more. Interested? Contact:

Miss Ann Reynolds, G6ZTF
169 Bell Green Lane
COVENTRY
CV6 7GW

BRITISH AMATEUR TELEVISION CLUB (BATC - RS38114)

The Club was founded in 1949 and represents the interests of amateur television enthusiasts both in the UK and abroad. It has a membership of nearly 2,500, 10 per cent of which are overseas. BATC not only produces a quarterly magazine, CQ-TV but also a series of books and publications. It also has available the pcbs and certain components for items featured in its publications. The membership secretary is:

Mr Dave Lawton, G0ANO
"Grenehurst",
Pinewood Road,
HIGH WYCOMBE
Bucks HP12 4DD

BRITISH RAIL ARS, G4LMR.

This Society is intended for rail orientated radio amateurs. Details from:

Mr G Sims,
85 Surrey Street,
GLOSSOP,
Derbyshire.
SK13 9AJ

BRITISH YOUNG LADIES AMATEUR RADIO ASSOCIATION (BYLARA)

BYLARA was formed in April 1979 to further YL operation in Britain and so promote friendship, stimulate interest, and in particular encourage good operating techniques and courtesy to all operators at all times. A weekly net on Mondays at 7.15pm local time 3.688 or 3.703 +/- QRM. OM welcome to join 7.45pm. The Chairperson is Ann Skinner, G0BIR.
Details from secretary; Alison Soars, G0ALI

84 Ridge Road
KINGSWINFORD
West Midlands DY6 9RG.

CIVIL SERVICE ARS, G1CSR & G3CSR.

Meets 12.30pm, 1st and 3rd Monday in the month, at Civil Service Recreation Centre, Monck Street, Westminster, London, SW1. HF and VHF station available for members use. Details from:-

Mr C P Woolley, G6IMM
195 Conisborough Crescent
Catford
LONDON, SE6 2SF
Tel: 01-698 4437.

G-QRP CLUB (RS38364)

This club specialises in low power operation (hence the QRP), primarily morse on the HF bands. It produces a quarterly magazine for its members called Sprat. Membership is in excess of 4,000. The secretary is:

Rev George Dobbs, G3RJV
St Aidans Vicarage
498 Manchester Road
ROCHDALE
Lancs OL11 3HE

INTERNATIONAL LISTENERS' ASSOCIATION (RS88763)

Known as the ILA, the association was formed in 1985 to create a self help link between listeners of all interests. A quarterly "Newsletter" keeps members informed of activities and give hints and tips to help newcomers. An awards scheme is in operation to encourage serious listening. Further details from:

Tevor Morgan, GW4OXB
1 Jersey Street
Hafod
SWANSEA SA1 2HF

INTERNATIONAL POLICE ASSN RADIO CLUB (IPARC - G4IPA)

This club is open to any serving or pensioned member of the police service. Aims of the club are expressed in the motto: "service through friendship". Regular weekly nets, both national and international. Contact address is:

M Starkey, G4IEJ
c/o PO Box 9,
WAKEFIELD
West Yorkshire WF1 3QP

INTERNATIONAL SHORT WAVE LEAGUE G4BJC

Known as the ISWL, the League was formed in October 1946 and caters for members with interests in both the amateur and broadcast bands, membership being open to SWLs and licensed amateurs. A monthly journal "Monitor" covers HF and VHF reception conditions, the SW BC bands, transmitting topics, technical and various general articles. The League holds monthly contests and has a comprehensive awards programme. Details from Honorary Secretary:

Yvonne Blain, G7DMN
6 Moorhead
Preston Upon the Weald Moors
TELFORD
Shropshire TF6 6DC

MORONI ARA (UK), G1LDS.

Details from the President:

Mr John Wiles
38 Northwood Lane
Clayton
NEWCASTLE-UNDER-LYME
Staffs ST5 4BN

OPERATION RALEIGH ARC (GB4ORH)

ORHARC is open to amateurs interested in participating in Operation Raleigh expeditions or communicating with projects in the field.

David Hopkins, G1TFT
Operation Raleigh Hull ARC
10 Prince Street
HULL HU1 2LJ
Tel: 0482-210763

QTI-TNA (RS84894)

QTI Talking Newspaper Association is a voluntary organisation which is dedicated to helping radio amateurs and short wave listeners who are visually handicapped to enjoy radio and electronics magazines. QTI-TNA produces QTI - a tape magazine which comprises two C90 cassettes from technical articles selected from current radio magazines. It is available to all handicapped radio amateurs world-wide. New

members are always welcome, and donations, large or small, are gratefully accepted. Contact:

Mr Harry Longley, G0JKT
QTI-Talking Newspaper Association
7 Anderson Close
LANCASTER LA1 3JE

RADIO AMATEUR OLD TIMERS' ASSOCIATION (RAOTA - G2OT)

Known as RAOTA, membership is open to all persons in amateur radio for over twenty five years, either as a licensed amateur or a short wave listener (a QSL card or a recommendation from another member is all that is required as proof). Full details from the Honorary Secretary/Treasurer:-

Mrs Sheila Gabrial, G3HCQ
Millbrook House
3 Mill Drove
BOURNE
Lincolnshire PE10 9BX

RADIO AMATEURS INVALID & BLIND CLUB (RAIBC - G4IBC, GB0IBC, GB1IBC)

Founded in 1954, the RAIBC caters for the special needs of handicapped amateurs and short wave listeners. They offer many services and a local representation scheme. For more details, please see the section "Services and Facilities Available for Disabled or Blind Amateurs" elsewhere in this call-book. RAIBC chairman: Johnny Clinch, G3MJK. Subscriptions and donations to the honorary treasurer/membership sec:

Mrs Shelagh Chambers
78 Durley Avenue
PINNER
Middx HA5 1JH
Advice & Helpline - Mrs Margery Hey, tel: 0953-454920. (1000-1700 and 2000-2200 hrs weekdays only)

REMOTE IMAGING GROUP (RS88803)

Interest in receiving weather satellite pictures has risen steadily over the past few years. This group was formed in 1985 to promote and further interest in weather satellite watching and now has close to 1,000 members. The group publishes a quarterly newsletter which gives satellite predictions, constructional projects, news and views. Further details from the secretary:

Phil Seaford, G8XTW
14 Nevis Close
LEIGHTON BUZZARD
Beds LU7 7XD
Tel: 0525-384419

ROYAL AIR FORCE AMATEUR RADIO SOCIETY (RAFARS - G8FC, G3RAF, G8RAF)

The Royal Air Force Amateur Radio Society (RAFARS) is the national society for amateur radio enthusiasts who are, or have been, serving members of the Royal Air Force, Commonwealth Air Forces, Allied Air Forces, RAF reserves or civilians directly connected with the RAF. The contact address is:

Admin Secretary
Royal Air Force ARS
RAF Locking
WESTON-SUPER-MARE
Avon BS24 7AA

ROYAL NAVAL AMATEUR RADIO SOCIETY (RNARS - G3BZU)

Membership of RNARS is open to Radio Amateurs worldwide who have, or have had, connections with the Royal Navy, Merchant Navy or Foreign Navies/ Merchant Navies. Further details from:

The Secretary
Royal Naval Amateur Radio Society
HMS MERCURY
Leydene
PETERSFIELD
Hampshire GU32 1HE

ROYAL SIGNALS AMATEUR RADIO SOCIETY (RSARS - G4RS)

RSARS is open to past and present members of the Royal Corps of Signals, including the TA and other military personnel. For information contact:

General Secretary, HQ RSARS
8th Signal Regiment
Vimy Barracks
CATTERICK GARRISON
North Yorkshire DL9 3PS

PRUDENTIAL AMATEUR RADIO SOCIETY (G8PRU)

This is open to employees of the Prudential companies. Details from:

Mr G E Haines, G4SXY
26 High View Close
Upper Norwood
LONDON SE19 2DS

ST DUNSTAN'S AMATEUR RADIO SOCIETY, G3STD, G8STD

A national organisation for the War Blinded. Details:

c/o 52 Broadway Avenue
WALLASEY
Wirral L45 6TD.

THE SCOUT ASSOCIATION (RS85972)

Details from:

Programme & Training Adviser (Activities)
The Scout Association,
Gilwell Park
Chingford
LONDON E4 7QW
Tel: 01-524 5246

UK SIX METRE GROUP

The group was formed in 1981 by the present chairman, Steve G4JCC with the aim of opening up the use of 50MHz to UK amateurs. It now works to encourage the use of 50.
MHz both here and in the rest of the world by exchanging ideas, information and providing beacons. More information from the secretary:

Alan Wright
6 Cwm Eithin
WREXHAM
Clwyd LL12 8JY

Membership forms and subscriptions to:

Peter Turner
Flat 6, 132 Marine Parade
BRIGHTON BN2 1DE

WORKED ALL BRITAIN AWARDS (WAB) GROUP (G4WAB)

This group was founded in 1969 by the late John Morris, G3ABG, to further greater amateur radio interest in Britain. The group promotes an award programme, contests and activity weekends and makes regular donations to organisations such as the Radio Amateur Invalid and Blind Club who help the less fortunate members of the amateur radio fraternity.
The award scheme, which is open to licensed amateurs and short wave listeners, is based on the geographical and administrative division of Great Britain and Northern Ireland. QSL cards are not required, only log entries, and special record books are available to assist in the claiming of awards. Full details checklists of all the areas and counties for all the WAB awards are contained in the "WAB book".
For further details of the book, awards and newsletter please write to the membership secretary:

Brian Morris, G4KSQ
22 Burdell Avenue
Sandhills Estate
Headington
OXFORD OX3 8ED.

WORLD ASSOCIATION OF CHRISTIAN RADIO AMATEURS & LISTENERS (WACRAL - G3NJB)

This organisation was founded in 1957 by a Methodist minister and welcomes all christian radio amateurs regardless of denomination. The president/secretary is:

Len Colley, G3AGX
"Micasa", 13 Ferry Road
Wawne
HULL HU7 5XU

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A beautifully built 25 Watt 2 metre rig that last month was our best selling 2m FM transceiver. Lots of extras including airband reception, 20 memories, scanning, searching etc and supplied with mobile mounting brackets and microphone. No other transceiver can match its features! Supplied with full 12 month's parts and labour warranty.

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The new Sagant Single Hand HF Zepps are pure magic! An end fed horizontal antenna that on test beat a standard dipole! No hanging heavy centre feeder, perfect 50 Ohm match and no extra ATU needed. Just connect one end to the house and the far end to a convenient support point, a short length of 50 Ohm feeder in through the window and straight into the transceiver (150W output). Simple! Full-size and half-size models are available. And when comparing cost, remember that you save on coax cable (and the losses) and you don't need an ATU. "Now that's magic!" Add £1.75 postage.

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ZA14	20m Full-size halfwave 10 metres long	£55.00

HF TRANSCEIVER DISCOUNTS!

Most transceivers are designed for 12 volts. The manufacturer's own PSUs are expensive. But our REVEX "BIG BERTHA" P300 is just as good and a lot, lot cheaper. Fully protected, large hunky transformer, and thermal fan cooled! Below is a list of autumn packages that we invite you to consider. Part exchange welcome. Credit? Most certainly. Just ask for quote.

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Kenwood TS440S	~~£1360.00~~	£1200.00
Kenwood TS140S	~~£1035.00~~	£959.00
Kenwood TS680S	~~£1158.00~~	£1080.00
Yaesu FT747GX	~~£918.00~~	£759.00
Yaesu FT757GX2	~~£1228.00~~	£1069.00
Yaesu FT767GX	~~£1858.00~~	£1699.00
ICOM IC751A	~~£1878.00~~	£1589.00
ICOM IC735	~~£1357.00~~	£1069.00
ICOM IC725	~~£1137.00~~	£859.00

The above price comparisons use the manufacturer's nearest equivalent PSU to the P300. Each Revex is fully guaranteed for 12 months as is the matching HF transceiver. All mail orders against credit cards are despatched by 24 hour Securicor at our risk. If payment is made by cheque please allow an extra couple of days for clearance.

A "WORLD FIRST" in SCANNERS!

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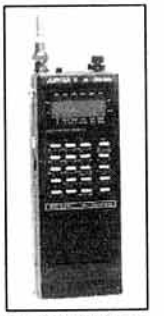

- ★ AM/FM
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- ★ 5, 10, 12.5, 25, 30 KHz steps
- ★ 100 memories
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★ Does not cover 550-800MHz.

No other similar receivers offer the same features at anywhere near the price! And inside the construction is a Joy! Lots of space, nicely laid out boards all linked with quick connect plugs. Not a "Taiwanese Rat's Nest!

- **Direct up/down control.**

No need to punch anything into memories. Just enter frequency and use up/down buttons for manual or electronic tuning.

- **AF Scan.**

No more annoying blank carriers for the receiver to lock on to. Simply tell it to ignore carrierss not containing audio and it will!

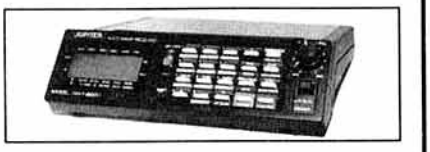
- **One Button Memo Read.**

A single button takes you directly into the memory bank. Up/down or scan will quickly move you around or use direct access for a particular channel number.

- **Battery Saver.**

For long term single channel monitoring this feature will reduce battery consumption by 70%.

25-1300 MHz* Mini-mobile/base JUPITER 6000 inc. P.S.U. £379



- **Skip Function**

Whether you want to bypass a single memory channel or an entire bank, this control provides the answer.

- **High Speed Scan.**

Select high speed scan or search and you will whiz through the range at a healthy 20 steps per second! That means you can scan 100 memories in 5 seconds or 1 MHz of space (25kHz steps) in 2 seconds. It really works!

- **Fast Memo Write.**

Enables you to quickly write into the memories, no need to select a number, the receiver will use the next empty memory.

- **User Friendly Search Programm.**

You can search in either direction and change direction at the press of a button. Total agility with a speed to match.

- **Unique Multiband Programme.**

No less than 10 separate band segments can be stored in the receiver's memory.

- **Total Flexibility.**

The basis upon which the receiver has been designed. It means you tailor the receiver to do exactly what you want it to do, almost like having a receiver that was designed for your own personal needs. No other receiver can match it, feature for feature and the good news is the cost.

World demand is tremendous. We are getting only small quantities so pick up the phone now and you could be lucky!

FREE CATALOGUE & PRICE LIST! We now have an illustrated catalogue of some interesting products for the radio amateur that we have never had the space to advertise. Also details of new items coming along. Just drop us a first class stamp and we will send you this plus our price list of over 700 items!

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Now in stock these 2 watt single banders for 80, 40 or 20 metres are real beauties. VXO control (one xtal supplied) gives 25kHz segments on 80 and 40, and 50kHz on 20 metres. Features IRT, noise blanker, S-meter, speaker, morse key, BNC socket. Powered from AA cells or external supply. Pocket size 66W x 39H x 142mm deep. As used by GBSRN on Ben Nevis. Over 100 in use already. Send for gen.

NEW! SHORT WAVE LISTENERS "CONFIDENTIAL" FREQUENCY LIST. Now replaces old edition of "UKCEL." Full up-dated it is probably the most comprehensive guide available. £7.95 post + £1.

DIAMOND AERIALS etc.

X50 2m/70cm 4.5/7.2dB	£59.00
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D130N Discona 26-1300MHz	£82.00
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CLP5130-2 105-1300MHz beam 13dB	£89.00
CP22J 2m 6.5dB base antenna	£49.95
M285 2m Mobile 5/6th PL259	£14.95
EL770H 2m/70cm Mobile PL259	£30.00
NR72M 70cm mobile 5.5dB PL259	£24.00
GLECH Gutter mount/cable for mobiles	£18.00
D24N Duplxer 2m/70cms	£26.95
CP4 40-10m vert + radials	£149.00
CP5 80-10m vert + radials	£189.00

VSWR METERS etc (New Design)

SX100 1.6-60MHz 3KW	£95.00
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SX600 1.6-525MHz 5/20/200w	£119.00
MS1 Monitor Scope Pep etc	£269.00

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ADONIS AM503G Base mic	£65.95
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RETAIL ONLY:- 12, North Street, Hornchurch, Essex RM11 1QX.
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Standard have done it again! You all know how popular the C500 is, well now here is their latest dual bander — the **C528** (not to be confused with the Japanese only version, the C520), The European version has all the facilities that you want in a base station, let alone a hand held!!

- ★ Direct 13.8V in for 5 Watts out.
- ★ VHF 2.5W, UHF 2W with CNB151 NiCad pack.
- ★ Dual displays
- ★ Power save function.
- ★ Multiple memories.
- ★ Priority channel.
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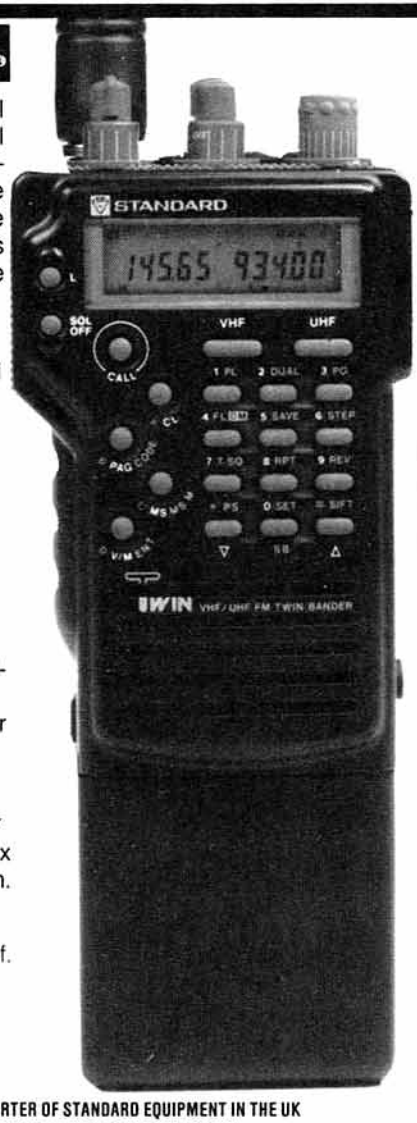

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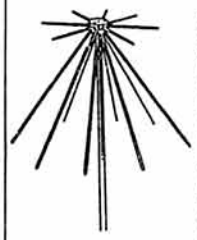


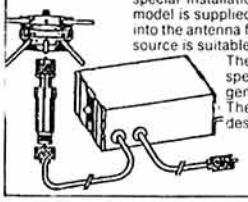
The UK's favourite discone composed of traditional British quality engineering.
The REVCONE works well without exaggerated advertising claims. It is designed to cover 50 to 500MHz, and thousands of satisfied users will testify to its efficiency. Unlike some manufacturers we do not claim a wider frequency coverage, and we do not quote inflated figures for gain. A gain figure is meaningless unless the reference point is stated.
Optional vertical whip feature. It is possible to fit a vertical whip section to a discone. We do not want to give you the "hard sell" where this vertical element is concerned but there is some evidence that it may improve the performance of the antenna around the reasonant frequency of the whip. That's why we make it an optional feature.
Another option is the N-type connector instead of the popular S0239. N-types give a better UHF performance, but they coast a bit more. The choice is yours.
Because the REVCONE is British-made by a Company which has been in business for 30 years, you buy with confidence knowing that there is back-up should anything go wrong.

RADAC

This Wide-band antenna offers an interesting alternative to the discone. It is simply an array of dipoles, but the clever bit involves arranging the dipoles to maximise bandwidth and minimise interation. The RADAC can be set up for a range of frequencies from 27MHz to 500 MHz, and because very good impedance matches can be obtained the user can specify any six frequency bands in this range for optimised performance, either for receiving, or more usefully, for transmitting. For example, all the Amateur Bands from 10M to 70CM can be covered in one antenna. If you are in the PMR business, the RADAC can be customised for your needs. Aircraft listening enthusiasts can specify VHF & UHF Airband coverage.
What a versatile antenna! Design and engineering excellence from REVCO!

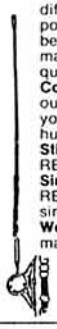
WIDE-BAND PRE-AMPLIFIERS

The problem with omni-directional wide-band antennas is their lack of gain.
The REVCO PA3 range of wide-band pre-amplifiers complement the antennas and compensate for their short-comings.
The basic specification of the products is similar: coverage 20MHz-1GHz, at 1GHz: minimum gain 13dB, noise factor 5.5dB. Choose from a mast-head version (PA3) or a standard die-cast box style (PA3I). Best results are normally obtained from the masthead model which gives a boost to weak signals which would otherwise have been lost in the feeder cable. Also feeder cable noise is not amplified which is the case if the amplifer is mounted at the base of the feeder. On the other hand, the die-cast box version requires no special installation and is readily taken out of circuit. The masthead model is supplied with a special power unit which feeds the DC supply into the antenna feeder. No psu is provided for the PA3I, as any 9-15v DC source is suitable (current requirement about 25mA).



The PA3I finds application in instrument work, e.g. input to spectrum analysers, boosting the output from signal generators to give a low-power Tx.
The standard version of the PA3I has BNC sockets and is designated "PA3I/B"; available to special order N-type sockets ("PA3I/N") or SO239 ("PA3I/S").
A special feature of the PA3 series is a high-pass filter to attenuate frequencies below 20MHz: high-power HF & MF broadcast stations can be very troublesome!

ON-GLASS ANTENNAS



This type of antenna mount has been around for a long time, but they are very difficult to produce successfully at VHF. The Cellular Radio Industry has popularised the glass-mount, but there are fewer problems at 900MHz, because the coupling assemblies are small. REVCO's extensive experience in making the UK's best Cellular On-glass has lead to the production of superior quality VHF and UHF models. Here are a few facts which you should know:
Coupling efficiency: apart from the question of effective power transfer to the outside world, you don't want too much RF floating around inside the car, do you? Not healthy for vehicle electronic systems, and possibly not good for humans either. REVCO glass mounts feature very efficient power transfer.
Sticking power: no good if they fall off half way home. A properly installed REVCO stays on. Should you change your car, a refit kit is available.
Simplicity: some of the competition has a multitude of loose components: the REVCO has 2 pre-assembled parts: inside and outside. What could be simpler?
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The REVCO glass mounts do cost a bit more, which reflects these superior features.

REVCO also make a full range of mobile antennas for frequencies from 27MHz to 950MHz, and new products are constantly under development. Contact your local Dealer or in case of difficulty write, phone or fax. Trade enquiries welcome.

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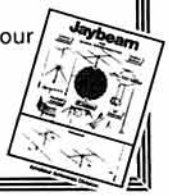

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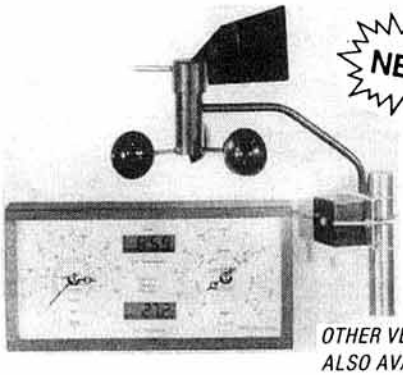

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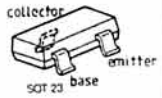

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Members visiting HQ are advised to telephone first to confirm availability of goods – 0707 59015.

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PRICES. These include postage, packing, and VAT (where applicable) and are subject to change without notice.

AVAILABILITY. Goods are available less postage and packing from RSGB Headquarters between 9.15am and 5.15pm Monday to Friday. However you are advised to confirm availability of goods by telephone before visiting Headquarters. We attempt to keep ample stocks of all our sales items, however as this list has to be prepared several weeks in advance we cannot guarantee that any item on this price list is immediately available.

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ORDER FROM:
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Lambda House, Cranborne Road,
Potters Bar, Herts, EN6 3JE

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RAYNET NEWS

Raynet News is the RSGB's bi-monthly newsletter devoted entirely to topics of interest to Raynet members. This newsletter is currently edited by Philip Howarth, G3YAC, who is chairman of the Raynet Committee, and is printed and circulated by RSGB Headquarters.

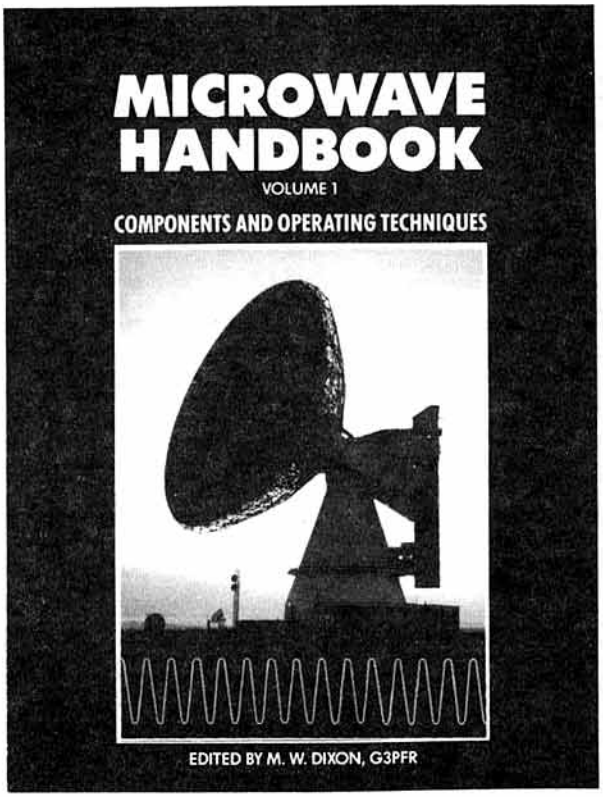
Regular features will include the Raynet diary, international happenings, educational and training items, reports on exercises and other events, features on active Raynet personnel and groups, letters, views from user services, small ads, useful names and addresses, short items of general interest, and much more.

If you would like a FREE sample copy, just drop a note to 'RSGB NEWSLETTERS' at Headquarters. A year's subscription to Raynet News costs £4.95 to RSGB members, and £5.82 to non-members to addresses in the UK and EEC Europe. Please contact RSGB for other overseas rates.

Announcing another new publication from the RSGB!

Microwave Handbook

Edited by M. W. Dixon, G3PFR



In the last few years there has been an almost explosive growth in amateur microwave techniques, designs and devices available, leading to increased band occupancy and to some quite startling practical results. As a consequence, the need for an authoritative yet accessible source book for the growing numbers of enthusiasts involved has never been greater.

The *Microwave Handbook* meets this need, and more. It contains a largely non-mathematical review of microwave theory and practice applicable to the amateur bands, including much reference information. But it is also a timely collection of practical designs, hints and tips that have evolved from the advances recently made.

The *Microwave Handbook* will be published in three volumes. The chapter titles in this first volume are:
Introduction - Operating techniques - System analysis and propagation - Microwave antennas - Transmission lines and components - Microwave semiconductors and valves..

See this month's mail order list for details - pages 104-5

An invaluable addition to the keen amateur's bookshelf – of course, especially useful to the microwave enthusiast.

Members' Ads

Conditions of acceptance are published on the Members' Ad order form inserted into the wrapper with every issue of *Radio Communication* posted to members. This form must be used when placing an advertisement; and please note that FOR SALE, WANTED and EXCHANGE advertisements must not be mixed on the same form. A new, more flexible, pricing scheme has been introduced. Details are on the form. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into.

FOR SALE

● COMPLETE Yaesu HF station. FT757GX, FC757AT, FP757HD, MD1 desk mic, low pass filter: £865. FRG7700 rcvr with ATU and 2m cvtr: £250. KW108 monitor scope: £45. CWR610E CW and RTTY decoder c/w amber monitor: £150. All in PWO and exc unmarked cond. Orig.packing c/w h/books and full inst. Genuine sale due to bad health. Frank, G0HAO QTHR. (Cowes) 0983 293402.

● FT102 tcvr, SP102, AM/FM board. VGC: £625. Hallicrafters SX62 RX: £120. Drake SPR4 RX: £95. SX400 scanner 25-520MHz: £300. Eddystone 990R Mk2. VGC: £350. Pt.exch. ICR7000 or I830/I837 series HF RX. Bob, G4AFY QTHR. (Kidderminster) 0562 747480.

● TS530P, VFO240, SP230. All in mint cond. No split: £650. Tranzmatch ATU with built-in dummy load and Ezitune: £100. All above items 1yr old and in exc working order. G4SLG QTHR. 0522 751920.

● ICOM 28E 2m FM tcvr with extended RX. Exc.cond, still in box: £249. G6MRZ. 0782 630843.

● SHACK clearance sale continues. TX/CVR gone, still have Sota 2m 100W linear: £90. PSU: £10 with it. Omni-Match: £16. Scope, sig.gen, transformers, other gear and components. Prefer SAE for lists, no phone. G8YBF QTHR. Else leave message/enquiry 061-477 5303.

● TS711E 2m multi: £525. Also 10m multi: £165. Linear amp, 400W output 10-100 mobile: £30. Mains filter c/w box: £25. All GWO. As new. Tony, G0HSZ QTHR. 01-241 1212 eve.

● WW rigs. RXR1077, CATZA25266, S/N1765, RX208, CATZA10083, S/NRGD3057 clean. 2 scopes S/NFRG60, APPATW6172. As new with 2 spare tubes. 12V PSU. Used test set OF/1050/16C ex silent key. See and collect. G4YUG QTHR. 0473 830147 anytime.

● YAESU FT480R: £290. TNC220: £70. G3NOH QTHR. 01-997 5756.

● HW100 HF tcvr: £200. C58: £200. FT208: £150. MMT432/144 tvtr: £100. 2m linear amp: £100. Rotator: £40. PSUs, meters, ants, accs. £100. ATU: £50. Spkrs: £10. Will split. Going QRT. G1OKD. 0249 659042.

● FT290R, nicads, chrgr, Mutek F/E, case, helical whip, spkr, mic. Good cond: £220. FT208R, 2x nicads, 12V chrgr, spkr, mic: £120. FT790R, spkr, mic, nicads, case. As new: £220. G6NQY QTHR. 0782 771876.

● COMPLETE 23cm station inc 4x23ele tonna aerial, MM1296 cvtr to 2m, SSB products 10W amp. Cost new £450. Accept: £300. G3JKV QTHR.

● ESSEX Telecom VHF hi PMR basestation type ET702TT with talkthru' CTCSS in wooden cabinet. £150ono. G4AJE. (Camb) 0354 741168.

● MM tvtrs 28-144MHz: £45. 144-1296MHz: £100. 55ele tonna for 1296MHz: £25. No offers. (Kent) 0227 360841 7.30-10.30pm.

● COLLINS KWM380 processor, extra filters. Mint: £1750. Reluctant sale, reason given, TX2 tailtwister rotator bench tested: £200. Hy-gain beams 402BA: £200. 153BA: £70. Collins 30L1 mains transformer, new: £25. Kurnaish quality model dummy load, 20-200W: £40. BC221AJ modulated model charts PSU: £40. Variac 0-270V: £45. Collins mechanical filter. Newtronics ant, Collins blanker NB40 new. 572B, 6146B, 5R4GYA, 5U4G, limited use. 4x572B, 3x 811A. Heathkit GD110/120 intercom manuals 75S3B/C, 32S3, 30L1, SB220. 312B4/5. Genuine enquiries please. No cheques. 0386 41951.

● TS500 recent overhaul, perfect working order with PSU/spkr unit. Mic, h/book. Ideal 1st time HF tcvr: £185ono. Brian, G0JEZ QTHR. 0705 813130 day 0705 462699 eve.

● YAESU FT101ZD, fan, mic, SP901 spkr: £425. Yaesu YS2000 2kW PEP meter: £45. Altron tower 44ft: £385. 2ele gem quad: £150. Shure 444D mic: £40. KR400 rotator: £80. Yaesu low pass filter 2kW: £30. Welz ant switch 2kW: £25. Full wave rectifier board 3.5kW 1A: £20. Filter stack 3200V: £20. Linear 2x3500Z 95per cent built. All new parts to complete inc valves, vacuum relays etc. 1500W out. Serious offers only. No time wasters please. G4SGV QTHR. (Redditch) 0527 45304

● FLAT dweller selling all HF gear. Sommerkamp FT277, alias Yaesu FT101. Inst manual, GWO except 21MHz: £175. BC221 wavemeter, built-in pwr pack with book: £15. Homebrew Z-match. Homebrew S-match. Shure 444 mic: £15. Ext LS 15ohm, swr/pwr meter: £20. Low-pass TX output filter: £20. Mains voltage adjustment transformer: £10. 20-15-10 trap dipole: £10. Grid dip oscillator, 2 coils need repair. Unbound vols Radcom 1976-1988. Rotel hi-fi rcvr amp with manual. Naval morse keys. Books, h/books, Instrument and other wire. Black plastic ant rope. HV variable condensers. 65ft 600ohm feeder. Stand-off insulators. Ant insulators. Plugs, sockets etc. Offers considered for above. Buyers collect for cash. Eric G3HOD. (Solihull) 021-705 3996

● TRIO 120S HF TX/RX with 120 ext VFO and 25A BNOS PSU: £550ono. Trio 9130 2m TX/RX: £330ono. Datong FL3 multimode audio filter: £85ono. 2m Polarphaser: £35. MM144/30LS 2m linear £75. Datong D70 morse tutor: £35. Variety HF and VHF ants plus other gear. Everything in VGC. SAE list. G4AYP QTHR. (Harrogate) 0423 563196

● FT101E, YD844A: £250. Icom IC202 with QQVO6-40 linear: £180. Will split. 10m multimode with 4m and 6m tvtrs. 12W on 10m, 3W on 4m and 6m. Self-contained with built-in PSU: £160. FT709R, unused: £150. G4GZS QTHR. (Rugby) 0788 815506

● POLY Fritzel HF beams, new, boxed. FB53 5ele 2kW tribander, 25ft boom plus 7/10MHz add-on kit: £425. FB33 3ele 2kW tribander, 16ft boom plus 7/10MHz add-on kit: £275. Optional conversion kit available to convert FB23/33 to 5ele FB53: £150. FB333 3ele 5kW trapless driven eles tribander. Unique design by Kurt Fritzel with blueprint: £250ono. FB333 trapless driven eles tribander and NR8543 conversion kit of 4 trapped eles to make 5ele 5kW tribander: £350ono. 7/10MHz single ele add-on kit for FB33/53 tribanders: £60. Fritzel WARC band GP ant 10/18/24MHz with radial kit 1kW: £75. Most items use stainless steel fittings and utilise thicker tubing than most tribanders available. (Leyland, Lancs) 0772 622009

● TEKTRONIX 545B scope with plug-in units type H and 1A2 x2. Plus trolley with plug-in unit storage space. H/books and Tektronix waveform generator type 162. Also spare copies of h/books for 545B and 465. Offers. G4JUM QTHR. (Ashtead) 03722 75798

● YAESU FT208R h/held c/w NC8A PSU and quick chrgr, leather case and soft cases. 4 nicads, m/mount, s/mic, too much to list. Exc. cond: £195. Bargain. Trio TS830S, boxed c/w manual and 270Hz filter, exc. cond: £675. Paul, G0KPH QTHR. 0926 429719

● KW204 transmitter, DM501 dynamic mic, Lafayette rcvr model HA350 c/w spkr, morse key and manuals for both RX/TX: £150. G0AQJ. (Codsall) 09074 2617

● AOR AR2001 scanning RX. Covers 25-550MHz. IOm/2m/70cm. Well used but works OK, hence: £210ono. AOR AR800E h/held scanning RX. Covers 75-174MHz, 406--495MHz, 830-950MHz. 2m/70cm 934MHz. In orig. packing: £150ono. Icom IC4E 70cm h/held tcvr. In orig.packing. Batt pack down but otherwise OK, hence: £100ono. (Southampton) 0703 262246

● YAESU FT290 Mk2 FBA8 boxed. Perfect. Balance guarantee: £300. Collect cash. G1XWZ. (Burnham-on-Sea) 0278 781513

● YAESU FT726R with satellite board and 144MHz, 430MHz and HF modules. Plus minibeam ant: £750. (Limekilns) 0383 872846

● TRIO TR751E DCL voice boards fitted. Desk mic speech processor 8ele yagi. Welz SP420 swr meter: £700. G1VHM. (Nottingham) 0602 462320

● FT901D plus AM filter, mem unit: £400. FV901DM scanning VFO: £100 or £450 the pair. G3VYP. (Ludlow) 056885 296

● KENWOOD TS140S as new: £630. Also PSU PS430: £130. Kenwood/Trio TS830S: £635. AT230: £100. VFO230: £85. SP230: £45. All in GWO. Icom IC02E h/held: £175. G4XTO QTHR. (Norwich) 0603 624573

● FT707, FT707DM, YM40. Ideal first station: £405. Heathkit HW101, HP23A: £160. Sailor 96D/66TS Offers. Others ovno. G0HPO. (Watford) 0923 244956

● KENWOOD SP230 matching spkr for TS530/830S. Absolutely mint. As new, only few hours use. You won't find a better second hand unit: £50. G0KPH QTHR. 0926 429719

● NRD525 RX with CMK165 VHF/UHF cvtr. Sony active ant LW/MW/SW. Diamond D130N discone VHF ant. All items as new. Very little use. Inst manuals for all items: £1050ono. G3LLZ QTHR. (Swindon) 0793 828188

● RAE correspondence exam, as new. Half price: £35. 20 books and exam practice papers. George GW7 EYF. (Cardiff) 0222 487299

● TRIO TS440S with auto ATU voice synth 1.8kHz extra filter PS50HD PSU. Mint: £1100. G3YFQ QTHR. 0923 241461

● ICOM 740 FL44A. Mem pack. 2 mics. H/book. Boxed. Exc.cond: £585. SS Design HB 10A 13.8V metered reg PSU: £40. Int 50W switch in 740 allows using 10A PSU. Both together: £595. Any tests. No offers. G3RHM QTHR. (W.London) 01-423 2329

● YAESU FT709R h/held, spkr/mic. DC/DC batt pack, case. Mint. Icom IC2E h/held spkr/mic, case, 3 batt packs, wall, base chrgrs. DC/DC 10V PA. Good cond. Yaesu FT290R 2m m/mode, tatty but GWO: £165ea, all: £450. Buyer collects. C.Rolls, G0EBC not QTHR. (Feltham) 01-751 3417

● ITT2300/5 electronic teleprinter, 2x PSU/interfaces, matching stand, new RSGB teleprinter h/book, Bartg info etc: £25. 2x Pye Cambridges, AMIOD, suitable 2m conversion, UEL Lion M2J2 UHF PMR TX468.25, RX454.25: £10ea.ono. Various fibreglass marine VHF/HF whip aerials: £5-10ea. Simon, G4ODX QTHR. (Crawley) 0293 512924

● TRIO TS530SP 10m-160m tcvr in mint cond: £600ono. Buyer collects, pays carr. Stuart GM0CAQ. Eve-w/e. 0261 32723

● HYGAIN 18AVT/WB ground plane c/w inst manual 80-40-20-15-10m vert. GWO: £50ono. Plus carr. G3GMC QTHR. (Weston-super-Mare) 0934 620130

● 128 repeat 128 valves octal and post war. All glass. Many boxed: £50 the lot. Plus £5 post. G5WW QTHR. (Gt.Yarmouth) 0493 740033

● HF on a budget? Yaesu FT201 3.5-28MHz multimode mic and manual: £250 or poss exch 2m multimode. Eve-w/e. (Bromsgrove) 021-445 5870

● FRG7 SSB filter, FM det: £90. MM 2-10m tvtr: £100. KW Atlanta 5-band HF, KW VFO: £180. G3FYP QTHR. Letters only.

● SELLING for Oxfam who will receive total proceeds. MM linear amps 144/40W: £25. 432/50W: £100. G4GGV QTHR. (Maidenhead) 0628 20651

● IC251E Mutek built-in PSU c/w cir.diags and ICHM7 mic:£450. Buyer collects. Paul G1PDC. (Amersham) 0494 727557

● 42FT 3-section telescopic tower, wall mounted with spare winch and AR22 rotator with cables. Buyer collects: £230. Yaesu FT101 CW filter. Datong speech processor: £220. FT23R h/held NC28B 110V chrgr. PA6 car chrgr. Region 3 spec hence only: £185. G3UOV QTHR. (Crawley) 0293 883075

● YAESU FT290R, FRG7, FRT7700, MML144/30W amp, swr 25 meter, HB9CV 2L 7ele. All GWO, good cond. Nigel, G0ILA QTHR. (Southampton) 0703 433642

● FT290R, Mutek, m/mount, nicads, chrgr, case. Rubber duck, 5/8 telescopic whip: £270. TR2300 2m FM tcvr c/w nicads, chrgr, case: £95. G4OXD. (Hitchin) 0462 435248

● TS711E as new, boxed: £600. Butternut Butterfly, VGC: £180. All papers on both. G4VOT QTHR. (Witham) 0376 515017

● BELCOM LS202E h/held 2m SSB/FM, chrgr, case, nicads: £125. BNOS 100W linear with preamp: £115. Both good cond. G0DOE QTHR. (Chessington) 01-391 0514

● TRIO TH2LE FM pocket tcvr, c/w 2x PB21 nicads, BC3 batt chrgr, SC8, soft case. Daiwa VHF linear amp, LA2035R. All boxed. Plus complete fittings for mobile use, inc gutter mounted ant: £200. G4UTG QTHR. (Poole) 0202 674285

● NEW Megear, c/w leather case 0-50ohms and 0-200Mohms at 1000V-max: £60. Type D83 Telequipment dual-scope regularly serviced: £150. G3PH QTHR. (Atherstone) 0827 712348

● BRAUN Paximat 1000 automatic slide projector. Remote control, folding stand c/w 48x48in screen and self supporting foldaway. In new cond, used once due to lack of space in new bungalow: £120. Buyer inspect/collect. G8UQ not QTHR. (nr.Kendal) 05395 61117

● D-RAMS 20x256k x1 150ns: £3ea. £50 the lot. 2x Acorn Atom computers plus manuals plus s/ware. Offers. NEC PC8201 portable computer, like Tandy model 100, c/w batt/modem case, 3.5in portable disk drive, portable printer, Centronics interface. Suitable packet and/or dxpedition? Sensible offers only. By mail to Richard, G4RIK QTHR.

● FT101ZD Mk2 6-bands, SSB/CW 600Hz CW filter, fan, mic, manual. Good cond: £425ono. G4VIW QTHR. (Hornchurch)04024 45199 eve-w/e

● FRG8800 VHF cvtr fitted: £490. SEM Tranzmatch, in-built Ezitune: £90. Bearcat 220FB scanner: £60. Datong active ant, PSU, preamp: £40. Morse talker: £60. Trio MC60 mic: £50. KW1000 amp, new transformer: £320. Yaesu NB2 quick chrgr: £5. G4PKH QTHR. (Berkhamsted) 0442 864059

● TH3 Thunderbird: £175. 25ft mast section and head unit: £130. Yaesu FL7000 linear: £825. Yaesu FT1 tcvr: £950. Yaesu FL2100B linear: £425. Class-D wavemeter, mains conv: £15. All in exc.cond. Buyer collects. G3NUG QTHR. (Hemel Hempstead) 0442 62929

● KENWOOD TS770E VHF/UHF multimode tcvr. Exc.cond: £500ono. G4DKB QTHR. (Billericay) 0277 653561 after 6pm

● DR600 airband monitor with 10 spare xtals. Plus electronic switcher for recording. Nicad batt and chrgr, insts. Good cond: £85. Rohde Schwarz ESM180 rcvr, 30-180MHz cov. Exc. German rcvr: £150ono. Dressler ARA 900 active ant 50-1300MHz cov. Cost £149. Mint cond. N sockets, indoor use only: £95. (Kettering) 0536 511940

● YAESU FT77 100W compact HF rig fitted FM c/w mic. Orig. box and manual. WARC bands: £400. G4UHS QTHR. (Gosport) 0329 289662

● TONO 5000E CW/RTTY/ASCII/AMTOR terminal with built-in 4in monitor and keyboard. Cond as new: £350. Nick G0EOV. (Tunbridge Wells) 0892 863871

● AMSTRAD PC1512 personal computer with double drive, mono monitor and mouse. Amstrad DMP3160 dot matrix printer. Package includes Wordstar and Supercalc s/ware and a collection of amateur radio programs. All in new cond: £500. David G4ERW. (Surbiton) 01-399 0922 eve

● SHACK clearout. Marconi audio gen with manual: £25. RTTY terminal ST6 with G3PLX VDU and free Creed 444. Bargain: £65. Active audio filter: £35. German h/duty portable cassette recorder: £20. ST5 RTTY T/U: £30. Sony Watchman 2in TV: £50. EG100 B/W monitor: £25. Sharp MZ731 colour computer, s/ware, books. Giveaway: £125. Codar PR40 preselector: £10. Collectors radios, HMV 1200: £99. Ekco PB189: £65. RadCom 1970 to date. PSUs, PCBs, junk etc. G4GXE QTHR. (Buxton) 0298 78861

● TRIO TS820 HF tcvr in VGC with digital readout and service manual. Boxed. 10MHz band fitted. New 6146s. Exc working order. Work load forces reluctant QRT. No offers. Will accept: £475. Prefer buyer collects. Bob G4MWR. (York)0904 425619 eve

● KENWOOD TS680S tcvr: £750. FC102 ATU with FAS1-4R: £200. Electronic keyer and paddle: £50. Will take: £950 for the lot. (nr.Bristol) 0454 327429

● ICOM 1271E 23cm all-mode tcvr: £825. Icom 505 6m tcvr SSB/CW/FM: £295. FT290 Mutek F/E case etc: £270. FT790 case etc: £265. All mint with manuals and boxes. Genuine reason for sale. Prefer buyer collects. (Huddersfield) 0484 666497

● DYMAR Lynx 12V 25W hi-band PMR dash mount CTCSS. Selcal, EEA, status: £25ono. VHF hi-band mobile Tait T172A with cradle. Also mains PSU. To operate as base if required: £65ono. Marconi modulation meter TF2303: £100. Storno COM 614 basestation. Hi-band with duplexer: £200. G4AJE. (Cambs) 0354 741168

● RN Electronics 2m/6m tvtr 2.5W output, worked W2 and FP barefoot: £95. Philips 6m linear 2.5W drive, 40W output: £45. Jaybeam 6m 4ele beam: £30. John, G6IJM QTHR. (Blackpool) 0253 47992

● SCOPE HP175A, 4x40MHz, delayed timebase, full documentation, some spares. All for: £75. Buyer collects. (Somerset) 0934 712140 eve-w/e

● ICOM IC2E 2m h/held, chrgr, DC/DC cvtr, case, VGC: £120. Howes HCZ80 2-80m tvtr. Cased: £45. G0EVZ QTHR. (Stevenage) 0438 369460

● CORNWALL. Midway between Falmouth and Helston, coast 5 miles. Good take-off in all directions. 600ft ASL. 5 acre registered smallholding. 2 bedroom modern cottage and 6 berth caravan, Oil-fired CH. 12x8ft undercover Cedarwood shack. Large farmhouse kitchen. Triple aspect lounge/diner. Sun-lounge, vinery, dairy. Large attached garage. Sheltered ornamental gardens, soft fruit, apple trees. Greenhouse. Conservatories, aviary. 3 additional fields. Good range of buildings suitable for horses, goats, other livestock. Secluded but not isolated. Approached from minor road by private drive. Good bus service from gate. Easy access all west Cornish resorts. Opportunity to acquire home, self-sufficiency potential income holiday letting and farmgate sales of plants, fruit, vegetables, eggs, goats milk. Freehold: £125,000. G1AJB QTHR. (Stithians) 0209 860297

● KENWOOD TS520SE HF tcvr with MC50 desk mic and manual in orig.box: £385. Buyer collect or arrange carr. G4GSE QTHR. (Hextable) 0322 66063

● SCOPE Telequipment DM53A twin-beam storage tube, incs 4 Y-amps DC to 15MHz manuals: £75. G3UGL QTHR. 0234 750050

● YAESU FC757AT auto-tuner: £230. Hitachi

portable video system recorder VT6500E, tuner VTTU65E, camera VKC600E, cases, batts. All exc.cond: £425. G4LYB QTHR. (Haverhill) 0440 702852

● HF225 comm rcvr 30kHz-30MHz, new and boxed: £325ovno. G6IGW QTHR. (Crewe) 0270 60062

● YAESU FT290R with nicads and mobile bracket: £220. Trio VFO120 for TS120/TS130: £45. Howes QRP 80m tcvr for CW built and boxed: £50. Offers welcome. Mike, G4GOC QTHR. (St. Neots) 0480 405560

● SATELLITE ants 15 turn helical 70MHz. New unused: £50. Tonna Oscar special new: £30. Jaybeam 6ele quad 2m: £20. 2m colinear base ant with ground plane: £20. (Statford) 0889 881488

● KENWOOD TS520. H/book, 2x 6146Bs, 2x 12BY7As, MC35S mic: £200. R109 reception set WD working order. Complete. Service phones. Few spare valves. 6V MG car batt, copy h/book: £100. Buyers to collect, collectors item: £100. Peter, G4VUN QTHR. (Cleveland) 0287 34397

● TEDDINGTON. 3 bed terrace cottage in FB cond. To inc free mast: £130,000. Further info available on request. Yaesu FT102/FC102: £600ono. Nevada ATU: £140ono. KR400 rotator: £75. FT401B, FV401: £280ono. FC901 tuner: £140. Mike. 01-977 7491 anytime

● PANASONIC DR31 RX 32-band inc FM/LW/MW. Its a PLL synthesiser rcvr and its normally left on Radio 1. What a waste! I would like: £75ono. (Chulmleigh,Devon) 0769 80449

● SURPLUS to requirements. Eddystone 840C, GWO, manual: £50. Icom ICB1050 mod 10m FM c/w mic: £20. MFJ 901B Versatuner: £30. 6 Powerlytic caps 470uF 400V, new: £6. Silver Rod vert ant, new:£10.G3AZW QTHR. (Trowbridge)0225 752655

● QTH for sale. 1930s semi, 140ft long rear gdn, good VHF location, 300ft ASL. Custom shack. £98 500. G3ZHZ QTHR. (Maidstone) 0622 744152

● AVO 9 Mk2 with hide carrying case: £45. G4LRT. (Northampton) 0604 740633

● KENPRO KP100 electronic twin paddle keyer. Good cond, 12V/240V: £70ovno. G0IOR. (Grimsby) 0472 358449

● HEATHKIT SB104A tvcr. Good reception, all bands, all modes. Good low pwr transmission. Requires new PA transistors for high pwr output: £40. Bargain with all manuals. G3UVS QTHR. (Plymouth) 0752 774405

● YAESU FT726 2m, 6m, 70cm boxed. Mint cond: £850. Trio 9300 6m PS plinth spkr. Exc.cond: £400. G0CAP. (Uttoxeter) 0889 562713

● SPECTRUM 48k, transform keyboard, I/F1, 2x microdrives RTTY and Fax-I/F and s/ware. A-D and gen purpose I/F. Loads of s/ware, books and cartridges. OIR: £200. G3RVD QTHR. (Twyford,Reading) 0734 340961

● SCANNER, Regency 4X850E AM/FM 75-106, 118-174, 406-495MHz: £150. DX/TV VHF hi/low, UHF 4.5in screen: £40. David G6FKK. (Birmingham) 021-786 1963

● JUNKER hand key, good cond. £25. Kent twin paddle, as new: £25. Both carr.extra. G3TSS QTHR. 0434 633125

● FT726R. 2m, 6m, 70cm satellite modules, mint cond: £925. Daiwa MR300E heavy duty rotator. 2 motors fitted: £175. G0FAJ QTHR. (Weymouth) 0305 789022

● YAESU FTONE gen.cov all-mode tcvr, all options, manual: £700ono. Dave G7AOT. 0322 845120

● FT767GX HF tcvr. Incs 144MHz module, few months old: £1195. Buyer collects or carr.extra. (Horsham) 0705 674081 day 0403 732851 eve

● ANT sale, 2m 9ele and 17ele, 6m 3ele. Also Howes 2-6m tvtr: £175 the lot or will split. John G7DOX. (Dukinfield) 061-338 8731

● ICOM IC720A HF all-band plus gen.cov with ICPS15 PSU: £650. Yaesu FC707 ATU 80/10m: £75. Brian G1SPW. (Worthing) 0903 65831

● HIGH band FM 1W 5ch portable with easy 2m mod details: £40. G3YGM. (Lowestoft) 0502 731708

● YAESU FT221. Good cond with manual. Great 2m basestation: £295. KW2000 ideal 1st rig. Recently realigned by KW: £195. Yaesu FT290R, nicads, chrgr, m/mount, listen on input. Soft case etc: £225. Trio TH21 tiny h/held, new cond. loadsa extras: £145. burndept h/held, for conversion 70cm: £30. Burndept chrgr: £15. Yaesu FT101B, good cond: £295. Generator 12V about 30A, nice cond: £75. Movement of shack to much smaller room forces consolidation of finances. Dick, G0BPS QTHR. (Folkestone) 0303 276171

● STRUMECH P60 tower. Hy-gain TH3JNR beam, Ham-m rotator and control, inop. All for: £600. TS830S orig.packing. Spare valves. Re-built Hammarlund HT41 linear 20-15-10, spare valves, both: £800. G3RNV. (Stockport) 061-477 0315

● IBM clone XT, 500k mono monitor, ham s/ware and xtras. Used only twice. Unwanted gift from US: £400. G4MPQ QTHR. (Liskeard) 05034 432

● HEATHKIT DX100U TX. Also BC221 wavemeter. Both in gc. Offers in writing to: Rev J. Wylam, Alwinton Vicarage, Alwinton, Northumberland.

● TANDY 100 portable computer 32k. Ideal for packet: £150. Tandy video/disc interface, 2 drives: £150. Michael, G4OMP QTHR. (Birmingham) 021-382 3606

● APPLE IIe computer. Kaga monitor, colour card, serial parallel card, language card etc. 2 disc drives, s/ware, joysticks, manuals: £250. Fluke 8020B multimeter, manual, leads, probes etc: £130. RS price £204. Would consider p/exch for 2m equip. KW2000B HF tcvr, c/w mic, PSU/spkr, h/book, circuits, spares etc. VGC: £220. All plus carr. G0HRM QTHR. (Rugby) 0788 832115

● REALISTIC PRO2004 scanning rcvr 25-520, 760-1300MHz cont. AM/FM, wide/narrow, 300mem, 250V 13.8DC: £250. G8VHG QTHR. (Hull) 0482 855436

● TRIO R2000 comm rcvr with VC10 VHF cvtr. VGC c/w manual accs and orig.packing: £400. G8MMN QTHR. (Skipton) 0282 843725

● YAESU FT107R tvtr also suitable for FT101R, FT707R and FT901R c/w 2m, 6m and 70cm modules, plus SMC relay unit for use with FT707R. All items boxed and in new cond: £350. G1LUI. (Bristol) 0272 551134

● TRIO 9130 5W/25W 2m multimode, boxed, manual, m/mount, memory backup, VGC. Any demo at my QTH: £320. GW0JTE QTHR. (Merthyr Tydfil) 0685 6464

● TRIO TS430S HF tcvr, gen.cov RX, CW filter and FM, PS430 matching PSU, SP430 spkr. All exc.cond, orig.boxes and inst: £800. Will not separate. Buyer must collect. Rob, GW0DFY QTHR. (Rhyl) 0745 590257

● ICOM IC271E 2m base 25W all-mode. Mint, boxed: £500ono. FT780R, 70cm 10W tcvr, exc.cond: £275. 8ele/2m and 21ele/70cm free to purchasers or exch IBM PC/AT or XT clone WHY. Can deliver 100miles. All enq answered. Will haggle after 6pm. G4RXR QTHR. (Peterlee) 091-586 7725

● JOIN us on six at half price. Tvtr MMT50/144: £140. Met 50MHz 3ele beam: £20. G5NU QTHR. (Reading) 0734 871200

● TS430S, AT250, PS430. Buyer collects or will send via Securicor. You pay. Vendor handicapped: £1000ono plus freight charge. G3DYY QTHR. (Huntingdon) 0487 841558

● CLAUDE Lyons auto voltage stabiliser. 15kVA rating. 219-249V input, 240V plus/minus 0.5per cent output. Will overcome supply variations at remote shack! Buyer collects at: £150. G6ALK QTHR.

● BIRD Thruline 43 with leather case and 7ele. As new: £380. Drake B1000 balun for MN2700 ATU: £65. 0846 689622

● G3TSO modular tcvr, PCB set: £35. Yaesu FL2100 linear: £350. 80m DC rcvr: £10. 80m 6W CW tx : £15. G3TSO. (Cirencester) 028575 532

● TOP class modern station consisting TS940 fitted Lowe phase noise modification: £1460. TL922 linear: £1070. SM220 monitorscope with BS8 panadaptor: £250. SP930 spkr: £65. Daiwa CNW518 ant tuner with swr/PO meter rated 2.5kW: £250. Datong FL3 multimode filter: £85. Yaesu G800SDX rotator 360d rotation hi/lo speeds: £240. Fritzel FB33 beam with 7MHz add-on kit: £195. Versatower P60 fitted auto brake winches, price negotiable. Kenwood MC60 mic fitted DX 4-way coax switch: £32. Servicing inst manuals. Much prefer buyer collects or carr at cost. G4CHP QTHR. (Norwich) 0508 470365

● SCOPE Advance OS250 d/beam: £95. STC Novatel 9in TV, videotext: £25. RS232-IEEE488 adaptor SSELB: £30. Keyboard, full Qwerty, serial data: £10. Videotext edit keyboard: £10. Video sync generator National WV611N: £10. 80 min SPCO: £5. 2m flexiwhip: £2. G8AYN. (Lutterworth) 0455 557790

● TRIO TS830S fitted CW filter: £700. Trio SM220 station monitor. Fitted band scope unit: £200. Trio AT230 ATU: £145. Trio SP230 spkr: £40. Trio TS780: £700. All boxed with h/books and service manuals. MM tvtrs 2m 144/28: £75. 6m 50/144: £175. 23cm 1296/144: £200. Buyer collects or pay carr. G8HPD QTHR. (Wheathampstead) 058283 3307 after 7pm

● TRIO 430S tcvr c/w FM and YK88SN SSB filter. 18mths old: £745. Yaesu FP707, 20A PSU: £125. Both immac. G4OFR QTHR. (Plymouth) 0752 880784

● STANDARD 5200ED 2 plus 70cm dual readout. Extended coverage, sub tones fitted 50W 2m 40W 70cm boxed, never TX: £480ono. Also 35A PSU: £60. Unused 4 terminals plus full protection. G0DLP QTHR. (Coulsdon) 0737 553920

● PROFESSIONAL computer development system. 10 slots, hard disk, terminal, hi-res colour graphics, DA/AD board, speech, RAM disk. S100 based with loads of s/ware. Looks new: £890. 8in floppy drives. Brand new with data CDC/Shugart: £39ea. Simon, G8POO QTHR. 0661 842389

● SCANNER AR2002 25-550 800-1300MHz, PSU. Absolutely mint: £325. Icom AH7000 discone for above, 14m UR67 cable. Mint: £45. Both boxed, 6mths use. Will split. Free 1989 freq guide to scanner buyer. Equip of silent key. (Sevenoaks) 0732 883600

● YAESU FT23R: £195. FT73R: £215. Both have soft cases, nicad packs FNB10, PA6DC chrgr adaptors, technical supplements and h/books etc. All orig.packing, little used and in exc.cond. Philips 12in green screen monitor. As new, good tube: £55. Mick G4ITF. (Portsmouth) 0705 386184

● ENCAPSULATED PSUs, 240VAC input, dual 15V at 200mA output, never used: £20. Marconi 301E 1MHz inductance bridge: £15. WandG pwr oscillator 4-108MHz: £15. Casiotune 201 4 octave organ. Offers? Many CMOS, LSTTL, chips, valves throbbing beauties, equip cases, metal and plastic, enamelled copper and Litz wire various gauges, mags, PE, PW, BBC Computing. SAE with requirements. Temp controlled soldering iron: £5. Sanyo CD3125NB RGB monitor with BBC-B lead: £100. IC Master 1983 vols 1 and 2. Offers? Trio TH41E 430MHz h/held chrgrs, batts, spkr/mic and packing: £120. 3.5 octave organ keyboard. Offers? Ex GPO multimeter: £20. SAE preferred. G4BXT QTHR. (Dartford) 0322 77401

● TRIO TR8400 70cm FM tcvr, orig.packing: £150. MM 10.50W 2m linear: £50. Andy, G4WGZ QTHR. (Bromley) 01-290 0031

● TRIO R2000 HF rcvr with VC10 VHF cvtr, boxed as new: £450. GW3IVK QTHR. (Mold) 0352 55826

● ATLAS 210X, very small HF tcvr. Ideal mobile or portable rig. Rated 200W input: £220. Peter, G3XJS QTHR. (High Wycombe) 0494 712344

● FC902 ATU: £120. MC60 as new: £50ono. Jim, G0BGY QTHR. 01-949 5549 after 6pm

● ICOM 735 gen.cov TX/RX. Datong auto RF speech processor wired for IC735. Both VGC. Upgrading station: £750. G0EHO QTHR. (Bromsgrove) 0527 79636

● ELAN E2 Eprom programmer: £175ono. HP85A computer: £250ono. Modulation meter type MMI: £90. (Derby) 0332 774825

● RACAL RA17L RX, cabinet model. VGC. Spare valves, manual: £165. Trio R1000 RX, manual: £180. GW0FPY QTHR. (Llanfairfechan)

● FT102 HF TX/RX, WARC, FM fitted, IF width/shift, digital display, immac with matching SP102 filter/spkr. All orig.packing: £550. Philips true dual beam scope, PM3230, DC-10MHz with h/book. VGC: £45. Goldring Lenco, immac: £20. G4FYY. (Crawley) 0293 514788

● PIECE of radio history. Marconi diversity rcvr SSB/HR24 c/w very rare orig inst manual. 3-27.5MHz in 4 ranges. 84.25inH, 24inW, 20inD. 500lb. 8 removable units/steel cabinet. Buyer removes/transports. Suit radio club, museum or collector. Offers to G0DGA QTHR. (Langport) 0458 250296

● AMSTRAD PPC640D: £495. Tandy 102 laptop c/w acoustic coupler, s/ware, manuals: £180. PK64 packet, RTTY/AMTOR/CW modem for C64: £175. Icom IC740 HF tcvr c/w narrow filters, keyer, calibrator, manuals: £550. Datong FL2: £95. ASP: £80. Trio 2300 with nicads, chrgr, case: £95. Trio 3200 with nicads, chrgr, case, fully xtalled: £85. Sony AIR7: £175. Chris, G3TUX QTHR. (Haslemere) 0428 61515

● TRIO TS120V 80-10m HF tcvr, TL120 matching 100W linear, PS30 PSU and SP30 spkr: £450ono. Also Myford ML10 model engineers lathe, 2mths use: £650ono. G4XDI QTHR. (Manchester) 0457 874026

● TEN-TEC Omni-A 545 100W SSB/CW. H/book: £275. G4OII QTHR. (Grimsby) 0472 813450

● KW2000A with PSU and mic. Recently serviced but has small fault. VGC with h/book. Buyer to collect: £80. (Warminster) 0985 215166

● TELEREADER CWR685E RTTY/CW baudot ASCII reader. One compact unit, built-in CRT c/w keyboard, manuals and boxed: £300ono. G0FXQ not QTHR. (Nottingham) 0602 625047

● HOKUSHIN HS HF5 5-band trap vert ant with radial kit wall mounting brackets. Full assembly inst: £40. John, G0JUO QTHR. (Stratford-upon-Avon) 0789 511

● FT209RH with FNB4 nicad pwr unit, NC18C chrgr: £150ono. FT480R, little used, never mobile, VGC: £240ono. HRO-M 8GC coils 200kHz-30MHz with suitable pwr unit. Some spare valves: £65ono. Plessey PR155 rcvr 15kHz-30MHz: £140ono. Delivery reasonable distance or will discuss. All with h/books. Peter G8PB. (Chichester) 0243 513584

● TR7500 144-146MHz FM tcvr. Exc.cond plus m/mount and mic: £140. Prefer inspect and collect or plus PP. H/book and full service manual inc. FT227 conversion kit for 25KYS stepping plus full inst. and users h/book. Cost £24. Accept: £12 to inc PP. Reason for sale, rig went walkabout from car. 10m FM rig. DNT plus m/mount, inline RF/ADK preamp and amp 70W: £55. Collected or plus post. G5PW. (Cleckheaton) 0274 875566

● 8ELE cross tonna c/w heavy duty rotator, control box, cable, also HF5. £120. Buyer pays carr. GM0ALS QTHR. (Edinburgh) 031-334 6825 after 8pm

● TRIO TR9130, mint, boxed: £280. Daiwa PS120M 12A PSU. Mint: £50. Kenwood SW100A swr/pwr meter. Hardly used: £20. Datong FL3 audio filter: £75. Heathkit HFT9 ATU: £25. Trio 9R59DS gen.cov RX: £25. Hi-mound HK702 morse key: £25. SMCL monitor scope: £25. JIL SX200 VHF/UHF scanner with discone ant and cable: £130. Will swap any items for good gen.cov RX. John. (Derbys) 0773 540119

● YAESU FRG9600 Mk5 scanner, 100kHz-950MHz multimode. Yaesu PA4C PSU, as new: £490. S. Clifton GW4WBT. (Llandudno) 0492 78107

● SWAN 350 PSU, spare matched finals plus others. VGC: £185ono. G4WJB. (Peterborough) 0733 43021 eve

● COMPLETE HF SSB station. KW77 rcvr plus matching KW Viceroy transmitter. Both super cond with h/books and circuits. No mods, no damage. The pair for: £125 cash. You collect. Write or phone first. G4LJ QTHR. (Downham Market) 0366 383573

● FT101ZD tcvr with mic, fan, 12V mobile pwr pack, manual. Mint cond, boxed: £400ono. Matching FV901DM scanning VFO. Mint, boxed: £150ono. Sell both for: £500. G3OFJ QTHR. (nr.Bordon,Hants) 0428 712947

● CLEAROUT. SEM Zmatch Amcomm, 9000 ATU 100W, p/swr meter swr-100m, 100 plus valves, list available. RF sig.gen sine/square generator, HD20 xtal calibrator, IT27 diode checker c/w Heathkit manuals. Consider p/exch with adj all for working 3ele beam. Gen offers. John G4KGT. 01-920 8142

● BNOS 70cm 100W linear and preamp, 10W input. As new: £195. Also Commodore 128 computer, 1570 disk drive, 1525 printer. Datacassette, mono monitor plus books, programs and disks: £350ovno. Buyer to pay PP or collect. G4NTY QTHR. (Manchester) 061-790 7673

● LINER 2 with 10m conversion, covers 144.320/144.90 and 28,490/28,720. Exc working order: £85. Radio Television Servicing Vol 1 to VII and 1959-70, 18vols. Offers. RadComs complete vols from 1968 to 1983. Offers. G3ZLJ QTHR. (Wolverhampton) 0902 761339

● KENWOOD TW4000A dual band 2m/70cm mobile. Boxed, VGC. Complete: £325ono. Bearcat 100XL, h/held scanner, c/w chrgr, case etc. Boxed, VGC: £120. Pye 470 TX/RX basestation c/w all screens, cabinet, etc. Orig. cond unmodified. Ideal for mod to 70cm packet or repeater: £35ono. JVC mono camera, zoom, auto/F, with PSU connectors, fits most VCRs. ATV slow/s etc. Brand new: £60. Pye PFIs TX/RX 2-pairs, RB4, 6-way chrgr, spare batts, xtals etc, manuals: £25. Philips portable VCR, tuner/timer, case. Philips camera zoom, macro etc, tapes, leads. As new: £300. G6BDY QTHR. (Kidderminster) 0562 755501 after 7pm

● PSION Organiser model XP 32k plus 16k Datapak formula and Spreadsheet. Manuals and book: £150. Also Microwriter, portable WP: £50. G7BNP QTHR. (Stoke-on-Trent) 0538 753545

● RACAL RA17L, recently re-valved and re-aligned by RAF c/w manual. VGC: £195. Carr.extra. Trio VHF multimode model 711E. Mint cond, boxed, c/w manual and service manual: £620. Carr.extra. 0202 534933 after 6pm

●BNOS Power Supply 12V, 12A: £80. Ex condx. Himound HK704 Morse Key: £15. G0IXA, tel (Doncaster) 0302 876154.

WANTED

● PRESELECTOR wanted, made by Plessey, type number PV158. Allan Edwards. 0277 810241.

● 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.

● DRAKE L7 linear amp, Drake MN2700 matching network, Drake PS7 PSU. Immediate top cash price for mint units! 0602 609345 anytime.

● EX BBC micro users! Redundant books needed. Disk Drive Projects for Micros, by Michael Milan. Disc Filing System User Guide, by Acorn Computers. Photocopy Acornsoft Linkword German insts. Also, copy owner manual Heathkit VVM AV3U. G8YBF QTHR or leave messages 061-477 5303.

● LOW-PASS filter for 40m rated 150W, or info on source of same. Also, for Revox B77, info on means of access to underside of level meters for bulb renewal. G4DJH QTHR. (Falmouth) 0326 250078.

● 18AVT multiband vertical. Must be in good condition. G0JFX.

● FT690, 4CX250B and bases. G3NOH QTHR. 01-997 4756.

● INFO Solartron scope type 561A. Will buy or photocopy and return. G4GHG QTHR. (Torquay) 0803 327050.

● 10MHZ oven controlled oscillator similar to Cathodeon type FS5951 or FS5953. G4AJE. (Cambs) 0354 741168.

● DATONG direction finder or similar. Manual for Marconi marine VHF Argonaut or 2m conversion details. Spec for RF transistor PT7555. I have circuits for Storno 600 series for anyone doing conversions. Des Walsh, EI5CD. QTHR. 01035321 371652.

● Mutek 28-144MHz tvtr and Gasfet masthead preamp. (Kent) 0227 360841 7.30-10.30pm.

● TRIO JR599 HF rcvr boards, A. 50MHz cvtr CC69, UC2302J, B. 144MHz cvtr CC29, UC2301J. Also for std C146A, 144MHz TX/RX CTN5 toneburst board, CMP12 ext mic with tone button. Richard Persyna G8ITB. (Bromley, Kent) 0689 52177

● CIRCUIT and info Redifon SSB module A6315/L. G3BGK QTHR. (Cheltenham) 0242 672212

● 60M co-ax cable UR67 10.2mm low loss. G3MJK QTHR. (Basingstoke) 0256 87439

● ANTENNA tuning unit wanted. Prefer KW107/9 but WHY. Mode switch or wafers for Swan 500C tcvr. Phone anytime. G0GGI. (Kirkby-in-Furness) 0229 89635

● KW Vespa Mk2 or KW Atlanta or KW 204. G6DZ QTHR. (Devon) 0395 68779

● DEVIATION meter Heathkit IM4180 or similar. No rubbish. G0LIC c/o Underwood Electronics, Underwood Rd, Plymton, Devon, PL7 3SY. 0752 336594

● OPERATING manual for Advance dual beam scope type OS100A. Also CCT diag. Photocopy OK. Maint inst circuit diag for Wayne Kerr LCR bridge. Universal CT492. Expenses covered. Write

or phone. G4YJZ QTHR. (Bridgwater) 0278 422017
● TRIO TL120 linear any cond working or not. GM2ASU not QTHR. (Ross-shire) 03818 362
● CIRCUIT or any info on Bearcat BC210. All expenses met. John, G0IKZ QTHR. (Sandy,Beds) 0767 292058
● SPARES and bits for 390A Collins made by EAC WHY. Brian. (London) 01-736 6581
● OPERATING manual for rcvr Matsui MR4099. Sale, loan or p/copy. Exp paid. W.Burchell RS92254, 7 Deweys Way, Gillingham, Dorset, SP8 4BW.
● STEP down mains transformer secondary 110V 150mA. G3KH QTHR. (Leicester)
● INTERNAL RF amp or mods for Bearcat 580XLT. Junior op wants Fischer Technik sets and computerised chess game. G4WJX. (Stoke-on-Trent) 0782 330613
● MK123 h/book or copy, also covert radios. All letters answered. John, G8BXO QTHR. (S.Molton) 07695 3382
● KW1000 PA. Old style MM144/100 PA, huge heatsink. Old style F9FT 432MHz 21ele yagis, Lucar connectors. Dave G4FRE. (Ipswich) 0473 642639 day
● 4CX250 bases SK600, SK610 or SK620. Neil Ackerley, G3RIR QTHR. 0533 717272 x2709 day, packet AJGB7LRG. (Lutterworth) 0455 554522 eve
● ANY info for quartz lock radio telephone test set model 282A. Any spare parts for 1952 Ford Prefect, 1955 Humber Hawk. G4AJE. (Cambs) 0354 741168
● KENWOOD YK88C 500Hz and YG455C 500Hz filters for TS830. John, G4XTS QTHR. 0268 521915
● EDDYSTONE EC10 Mk2 for SWL to monitor while on dialysis. Must be in good cond. Price to G1EYL QTHR. 0246 415667 after 5pm
● HRO 28MHz bandspread coil unit with gen.cov 14-30MHz. Large tuning knob plus drive from TU5B. G3MBL QTHR. (Bury St. Edmunds) 0284 760984
● YAESU FT902DM in mint cond or Yaesu 101ZD Mk3 with FM but prefer FT902DM as 1st choice. (Wallasey,Wirral) 051-678 6052
● RETIRED amateur seeks HF rig. TS940, 930, 830, FT980, 102, IC751A. Doyle, 4 Wricklemarsh Road, London, SE3 0NF. 01-856 7478
● ANY ex-PMR gear converted to 70MHz. Must be fully operational and in reasonable cond. Ned, G8GZZ QTHR. (Woking) 04862 23506
● T1083 RAF transmitter wanted to complete display for Battle of Britain museum. Up to £300 offered for a suitable item. (Canterbury) 0227 764000 3245
● RACAL RA117E. Metal case required for this rcvr. Will collect. Ken G3RDG. (NW London) 01-455 8831
● COLLINS. Any quantity xtals for KWM2A, CP1 packs, 312B5 ext VFO, any spares for recon S'line are of interest. Collins mobile mics for exch. Write with price info. DW Aird, British Embassy, BFPO5.
● KIT-built TRF RXs by Eddystone, HAC, Petoscott. Also pre-war baseboard components particularly Eddystone baseboard coil. Valve holders. Any pre-war coils, condensers, coil packs, xformers, for home-built RXs WHY. G4HHZ QTHR. 0962 822401 day () 0703 268705 eve-w/e
● 12AVQ Hy-gain trap vert for 10-15-20. G0HKG QTHR. (nr.Colchester) 0787 223356
● CUB Scouts require HF rcvr and 2m cvtr. Also 48k Spectrum for morse tuition. Limited cash. G6BCG QTHR. (Darlington) 0325 482983 eve
● EDDYSTONE cabin tuners wanted working or not. EB35, 870 and Mimco's. 670's also wanted. Leave message. Nick. () 01-852 4065
● HANSEN FS50HP swr/pwr meter. Heathkit IM25 VOM, must have manual please. G3ESB QTHR. (Derby) 0332 671536
● HF linear amp, commerical or homebrew, also pwr meter Olympus OM10 plus many accs in exch or sell. G0BLR QTHR. (Wilmslow) 0625 535644
● 150-0-150 or 300V 500mA mains transformer. Small physical size preferred. G0GVC QTHR. (Huddersfield)
● TEN-TEC Argosy II, model 525D. Top band tvtr, from HF set wanted. (Manchester) 061-998 3264
● COUNTER unit and digital display for FT101Z c/w parts needed for installation. (Hessle, N.Humberside) 0482 648092
● DRAKE rcvr model 2B, 2C or R4B. State price and condition. G3HCT QTHR. (Henley-in-Arden) 05642 2176
● WORKING Dynamotor type DM28 on mounting plate c/w filters for Signal Corps rcvr BC348. G8CUN QTHR. (Basildon) 0268 526837
● SOMMERKAMP TS280F 2m mobile. Must be in mint cond. Please send details to G4LJZ QTHR. ()
● FOR restoration of BC348C rcvr, xtal filter assembly contained in IF xformer can, and front panel nameplate. G3JJG QTHR. (Cheltenham) 0242 862445
● DG5 digital display c/w all plugs, cables and manual. Doug, G4BEQ QTHR. (Locks Heath) 0489 582423 after 6pm

EXCHANGE

● COLLINS 5ISI and 55G1 almost mint. R/EM all leads and books. Offers or possibly exch for NRD or solid state Racal 1772 or HRO500 with preselector WHY. (London) 01-736 6581

We start this month with a rather unusual one. Thames Television tells us that a 7-year old boy named Craig is in the Royal Marsden Hospital with an extremely serious illness. His ambition is to get into the Guinness Book of Records, and friends have suggested that one way to do this is to be the recipient of the greatest-ever number of 'Get Well' cards! How about helping him by sending a card to his home address and getting your friends and colleagues to do the same? Send your card to Craig Shergold, 56 Selby Road, Carshalton, Surrey SN5 1LD.

REALISTIC PRO31 FM SCANNING RECEIVER

Coming back to radio, a letter from Mr C Watson, BRS46958, says "I have a Realistic PRO31 hand-held scanning receiver which covers FM only. Is there any make of external BFO on the market so that I can listen to SSB transmissions on 70, 144 and 430MHz?" Actually, there's quite a bit more to making an FM receiver cope with SSB than adding a BFO and you've got quite a job on your hands there. Anyone who's ever converted an FM scanner for SSB reception is invited to drop a line to Colin Watson at 10 Torbrex Road, Carbrain, Cumbernauld, Dunbartonshire G67 2JR.

CYBERNET CB MODS

Mr S Dyke, G3ROZ, has written in with a bit more information on modifying the Cybernet CB chassis. He says, "The most common Cybernet modification is to re-crystal and align the RF stages on to 28MHz. If you do this, beware of the 2 x VCO term which approaches ever-closer to the passband of the local oscillator chain filter as the signal frequency increases. By the time you get above 29MHz, the spurious response consisting of (2 x VCO) - IF which appears within the CEPT UK CB allocation is quite strong. You'll also hear strong CB signals in the band. Don't accuse them of working illegally on 28MHz - they're not!

"The PLL02A LSI synthesizer chip in the Cybernet has a 'wrong-way-round' output insofar as it needs the varicap cathode to be biased positive and the anode taken to the chip's Vc out. This makes it very hard to use a VCO based on two back-to-back diodes, which is the most popular way of preventing the degradation in VCO noise performance due to diode conduction on peaks of the oscillator waveform. It's probably this mechanism which causes 'Cybernet hiss' - a white noise output which is about 2.5MHz wide and which seems to accompany all Cybernet transmissions. Some sets are worse than others, but all those I've tried do it! One way round the problem is to use a 7611 op-amp configured as a unity-gain inverting amplifier using the original +5V rail as a 'false earth', the normal +9V rail as Vcc and the negative supply rail as real earth. This op-amp is placed between the chip's Vc out and the replacement home-brew VCO using back-to-back diodes. There is also the possibility of increasing the VCO pull-in range by running the op-amp with a gain of 2.

"If anyone has modified a down-market Uniden (Cobra 146 or similar) 40-channel AM/SSB rig to Top Band other than by using a transverter, please get in touch with me. This is a possible next CB project!"

Many thanks, sir, and please keep the information coming. Stephen Dyke's address is 13 Abbey Grove, Sandy, Beds SG19 1QP.

CANADIAN WIRELESS SET 52

Mr A Humphries, BRS34368, would like to know whether anyone has the assembly instructions for the 'flick' mechanism of a Canadian Wireless Set No 52? If you do, Andrew would greatly appreciate knowing something about it. Write to him at 'Polperro', 21 Gould Road, Hampton Magna, Warwick CV35 8TU - or give him a ring on 0926 400876.

AUTOPLEX BUG KEY

Mr C Waters, G3TSS, is trying to collect any information on the 'Auto-plex' bug keys produced by David Marshall in the 1930s. He says that these keys "...were of all-brass construction, including the base, and were advertised in the T & R Bulletin over a number of months between 1932 and 1934. Despite a good deal of effort, I have as yet been unable to trace one of these keys. If any members still own an 'Auto-plex' bug, or if any OTs can remember at any time owning one, I would be grateful if they could contact me - I will refund their expenses." Can anyone help Mr Waters in his quest? Write to him at 1 Chantry Estate, Corbridge, Northumberland NE45 5JH, or ring him on 0434 633125.

WHERE'S MR BROOKS?

Mr B Castle, G4DYF, writes 'For many years, Mr A J Brooks of 5 Farrant House, Winstanley Road, London SW11 2EJ has provided photocopies of circuits and data for an enormous range of old equipment dating from World War 2 and later. Now my letter to his address has been returned by the PO with the message 'Moved Away'. Can anyone tell me whether Mr Brooks is still providing his marvellous and essential service or has someone else taken over?' If you know, maybe you could write to Brian Castle at 36 Dartford Road, Sevenoaks, Kent TN13 3TQ, or ring him on 0732 456708.

WARTIME EQUIPMENT LIBRARY

A letter now from Mr J E Cookson, G4XWD, who says "First of all, as an avid restorer and collector of military radio equipment, I would be pleased to help people seeking information on various pieces of wartime and post-war equipment. My information library is not exhaustive but it is reasonably well-equipped. All I would ask is that any costs are covered.

"Secondly, may I ask for help with three points: (1) I need either a scrap Eddystone 770U or R whose case is in reasonable condition - or just the case (the Mk II pattern).
(2) A case for a Hammarlund SP600, or perhaps some close-up photographs of the internals of the original one.
(3) An original manual for an AR77, or perhaps contact with the owner of an original receiver, so that I can re-construct the bits which are missing and copy the colour scheme and panel lettering for mine."

Mr Cookson's address is 40 Oldnall Road, Kidderminster, Worcs DY10 3HW, and his telephone number is 0562 823674; he adds that people are very welcome to telephone "...at reasonable times."

FT290 BATTERY BACKUP

Here's an easy one. Mr K Howard, G1RZA, writes 'The backup battery on my FT290 has failed; I have obtained a new one but don't know the correct way to get to the dud battery and remove it. Can anyone let me have instructions for dismantling the rig - or is it a job for a dealer?' With the number of '290s around, there must be heaps of people who know the answer to this one! Write to Mr Howard at 70 Lakeside Avenue, Lydney, Glos GL15 5QA.

LAFAYETTE HANDBOOK

Mr F J Longman, G3HQH, writes 'I recently bought a Lafayette HE30 receiver for my son, who is interested in short-wave listening. Unfortunmately, a handbook or circuit diagram weren't provided with it and it seems very peculiar to handle. Could anyone please provide me with any information on this receiver? All costs will be paid for any assistance offered, but no-one I have met has heard of it!' Take heart, sir - we've certainly heard of it, and there were some advertisments for this machine in a Practical Wireless for May 1969 (sigh - where have all the proper shops in Tottenham Court Road gone?). Anyway - if you can help, please write to Mr Longman at 22 Queens Court, High Street North, Dunstable, Beds LU6 1LD.

RAY COLEY - ARE YOU OUT THERE?

Mr J Battle-Welch, G4NYZ, is trying to contact an old friend of his by the name of Ray Coley. Ray was a radio amateur, and about 30 years ago his address was 1 Ashmead Drive, Rednal, Birmingham - however, Mr Battle-Welch thinks that he may have moved to Havant in Hampshire. Anyone who can help find him is asked to contact G4NYZ at 325 Bromsgrove Road, Webheath, Redditch, Worcs, or ring him on 0527 45800. We've actually got another of these 'missing persons' enquiries here but we're a trifle short of space, so we hope G1RAY will QRX until next month.

POWER METER INFO

Mr Barry Hitchen, G1VZW, writes, 'I would be grateful if anyone can supply a manual and circuit (or photocopy) for a Hewlett Packard C34-431C Power Meter which I need to repair'. Short and sweet - if you can help, write to him at 31 Langham Road, Blackburn, Lancs BB1 8BN or ring 0254 581949.

Helplines is designed to help put people in touch with each other. If you have a problem, it's more likely there's someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell the rest of us. 'Helplines' is there to help you and to give you the opportunity of helping others. Write to us marking your envelope 'Helplines' and we'll do what we can to get the message out.

CLUB NEWS

DEADLINE - Items for inclusion in the JANUARY 1990 issue must be sent to HQ marked "Club News - DIARY", to be received by 20 November 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 - 8, HF night on the air; 15, committee meeting; 22, video night; Dec 6, talk.
South Bristol ARC - 1, lecture TBA; 8, 2 metre activity evening; 15, 10 metre activity evening; 22, free ice-cream evening; 29, bring & buy/junk sale. Details Whitchurch 832222 on a Wednesday evening.
Thornbury & DARC - 1, amateur radio video; 15, project evening; Dec 6, quiz.

BEDFORDSHIRE

Dunstable Downs RC - 10, talk "Test Equipment" by G0CPN; 18, DDRC birthday dinner (venue TBA); 24, talk "Plant Management" by G1JCC.
Shefford & DARC - 16, junk sale; 23, constructors contest; 30, field day equipment sort out evening; Dec 7, NFD washup meeting; 14, talks from Construction Contest winners and runners up. Details 0707 372211.

BERKSHIRE

Maidenhead & DARC - 2, talk "Raynet" by Graham, G1CSF; 21, talk "Cable Television Equipment" by Andy G4EZT; Dec 7, Christmas social, including construction contest and prize giving. Details Maidenhead 25952.
Reading & DARS - 9, talk "Tactical Radio" by R. Hodgson from Racal Tacticom; 23, construction contest and alignment evening; Dec 14, AGM and wine & cheese evening. Details 0734 774042.

BUCKINGHAMSHIRE

Aylesbury Vale RS - 1, talk "Transverters vs Black Box Rigs" by Angus McKenzie, G3OSS; Dec 6, "The G6NB Bill Biltcliffe Trophy Construction Contest", 20, informal evening reflecting on the successes of 1989. Details 0280 817496.

CAMBRIDGESHIRE

Cambridge & DARC - 3, informal - evening in shack - Morse class; 10, talk by John Worsnop, G4BAO (subject TBA); 17, talk "The Business of Air Traffic Control" by Alan Godfrey, Cambridge Airport; 24, visit to Magnetic Resonance Scanner, Addenbrooke's Hospital, Professor Laurence Hall; Dec 1, informal - evening in shack - Morse class; 8, Club Christmas party.

CHESHIRE

Chester & DARS - 14, talk and video "Society DXpedition to the Faroe Islands"; 21, discussion "What Do You Want?" 28, constructional workshop

CLWYD

Conwy Valley ARC - 2, talk "Satellite Oceanography" by Dr. W. Roberts; Dec 7, talk "Power Supply Construction" by John Lawrence, GW3JGA. Details 0492 530725.
Delyn RC - 7, talk and demo "Packet Radio" by Malcolm, GW4IEQ; 21, Reunion of ex-club members; Dec 5, RSGB video. Details 0244 819618.

CO ANTRIM

Carrickfergus ARG - From the first Tuesday in November there will also be Morse classes for beginners (Club members only). 7, basic electronics - construction and CW; 14, construction and CW; 21, construction and CW; 28, talk "Utilizing Surplus Transformers" by Fred, GI4NFG; Dec 5, construction and CW; 12, social evening.

DERBYSHIRE

Buxton RAS - 14, AGM. Details 0298 25506.
Derby & DARS - 1, junk sale; 8, visit to Derby Power Signal box - limit of 12 persons; 15, TBA; 22, slide show "DADARS 20 years ago" by G8BAV; 29, TBA; Dec 6, junk sale; 13, constructors contest. Details 0332 669157.

DEVON
▶Torbay ARS - 3 & 10, club nights; 17, monthly meeting; 24, club night; Dec 1, 8, club nights; 15, Christmas party.

DORSET
▶Plessey Christchurch ARS - 9, talk "Microwaves" by RSGB President G3YGF.
▶South Dorset RS - 7, talk "Packet Radio, Past, Present and Future".

ESSEX
▶Braintree & DARS - 6, junk sale; 20, "HF Operations" - discussion by John, G3OLU; Dec 4, TBA.
▶Chelmsford ARS - 7, talk "Sporadic E" by Jim Bacon; Dec 5, junk sale.
▶Loughton & DARS - 3, talk "How Not to Write Computer Programs" by John Short, G1DJI; 17, junk sale - 10% to club funds; Dec 1, films and video from the past years of the Club and 1989 Field weekends by Jack Atkinson, G3OPA and John Short, G1DJI; 15, Christmas meal - venue TBA.
▶Vange ARS - 2, junk sale; 9, talk "Power Supplies" by G3IDI; 23, talk "Crime Prevention" by Essex Police.

GREATER LONDON
▶Acton, Brentford & Chiswick ARC - 21, discussion "Traps - Theory & Construction".
▶Edgware & DARS - 9, talk "Frequency & PEP Power Measurements"; 23, quiz evening; Dec 14, annual junk sale.
▶Southgate ARC - 9, construction contest judging night for the G6QM trophy; 23,informal; Dec 14, AGM. Details 01-360-2453.
▶Wimbledon & DARS - 10, talk "Fibre Optics" by Paul Matthews, G4AWZ; 24, film night "The Crowded Sky" and "Nothing on the Clock"; Dec 8, Christmas social evening.

GREATER MANCHESTER
▶Eccles & DARS - 7, talk "MegaStream Data Lines" by G6MEI' Dec 5, demonstration "Superconductors" by G8DTF.
▶South Manchester RS - 3, Halloween radio direction finding contest. Map, compass, receiver and wellies required. Pub afterwards; 24, annual dinner at Belmore Hotel. Guest speaker Rev George Dobbs G3RJV. Details 061 231 5870.
▶Stockport RS - 8, QRP by Rev. George Dobbs, G3RJV; 22, construction competition; Dec 13, AGM.

HAMPSHIRE
▶Basingstoke ARC - 6, constructors competition; 19, direction finding foxhunt, 10.30am, 2M FM channel S17; 20, practical quiz by G8FMH and G1MDS; Dec 4, talk "An Insight into Radio Control of Model Aircraft" and presentation of G3CBU Memorial Operating Award. Details 0734 332777.
▶Eastleigh (Itchen Valley ARC) - 10, "Great Grandfather's Watch" G3XUO; 24, "Operating evening"; Dec 8, Christmas Social. Details 0703 736784
▶Fareham & DARC - 8, talk "The Siskin Electronics Nite" by Phil, G6DLJ; 22, talk "Radio and the Olympics" by Peter, G0FIM; Dec 6, talk "Setting up Aerials Using Simple Test Equipment" by Ron, G3XPH.
▶Farnborough & DARS - 8, surplus equipment sale; 22, AGM; Dec 13, Christmas Social. Details 0252 519773.
▶Horndean & DARC - 2, talk "Naval Communications" by G3JFF, Dec 7, Survival by G4DIU. Details 0705 483676.
▶Liphook (Three Counties ARC) 8, "Film night", 22, "Aircraft Radio 2", David Cotterell; Dec 6 "Quiz night", 16 Christmas Social. Details Liphook 723415.
▶Winchester ARC - 17, talk "The Basics of Home Construction" by G2DBT; Dec 15, Christmas Social. Details 0962 880605.

HEREFORD & WORCESTER
▶Bromsgrove ARS - 14, talk "ATVs and Matching" by G3PGO; 28, technical topics.
▶Bromsgrove & DARC - 10, guest speaker.
▶Hereford ARS - 3, annual junk sale.
▶Malvern Hills ARC - 14, club meeting.
▶Redditch ARS - 9, talk by DTI "Radio Investigation Service and Equipment Testing".
▶Vale of Evesham ARC - 5, SWL contest for all members.
▶Wythall RC - 7, committee meeting; 14, night on the air; 21, technical topics; 28, night on the air.

HERTFORDSHIRE
▶Stevenage & DARS - 7, talk "Portable Radar African Style" by Tony, G1ZZH; 14, talk "CW Customs Technique & Practice" by Frank, G4ISO; Dec 5, junk sale.
▶Verulam ARC - 28, TBA.

HUMBERSIDE
▶Goole RES - 3, discussion on construction project; 10, film "Troposcatter"; 17, talk "BC Listening"; 24, social evening; Dec 1, discussion on Project YEAR; 8 Christmas dinner; 15, talk "Airshows" by G6AJM.
▶Grimsby ARS - 9, talk on Raynet; 23, talk by John, G3DOT; Dec 14, Christmas party.
▶Hornsea Amateur Radio Club - 1, AGM; 8, committee meeting; 15, talk "Video Recorders" Pt.1 by Clive, G8EOZ; 22, talk "Video Recorders" Pt II by Clive, G8EOZ; 29, natter night; Dec 6, talk "Switched Mode Power Supplies:" by Steve, G8EWX; 13, talk "Middle East Trucking" by Stuart, G1KT.

KENT
▶South East Kent (YMCA) ARC - 1, committee meeting; 8, chairman's choice; 15, talk by G3RJV; 22, talk & video "From 'Dacs' to Concorde" by Jeff Smith; Dec 13, top-band foxhunt.

LANCASHIRE
▶Fylde ARS - 9, equipment sale; 23, construction competition; Dec 14, supper and social evening.
▶Thornton Cleveleys ARS - 6, video show "Ben Nevis Expedition"; 13, talk "Voyager from Jupiter to Neptune" by Ken Porter, G3KEN; 20, talk "Learning to Fly a Helicopter" by Pete Reilly, G4BVW.

LINCOLNSHIRE
▶Spalding & DARS - Meets every Friday evening at the Club Room, The Old Fire Station, Double Street, Spalding. Details G3NSF, QTHR, tel: Holbeach 24523.

LOTHIAN
▶Lothian RS - 8, junk sale; 22, talk by GM4DIJ; Dec 13, social evening.

MERSEYSIDE
▶Liverpool & DARS - 7, talk "EMC" by G4DKQ; 14, surplus equipment sale.

NORFOLK
▶Norfolk ARC - 1, talk "Project YEAR" by Victor Brand, G3JNB; 8, surplus equipment auction/bring & buy sale (doors open 7pm); 15, talk "Oscilloscope Techniques" by Mike Lemin, G4UUB; 22, informal; 29, debate "Should all Amateurs belong to the RSGB"; Dec 6, informal and committee meeting; 13, talk "Beyond Packet - The Computer Works" by Alan Wright, G0KRU; 19, Christmas Party. Details 0508 78258.

NORTHAMPTONSHIRE
▶Nene Valley RC - 15, home brew contest.

ORKNEY
▶Orkney AR Group - 1, video "Melbourne Radio Club"; Dec 6, Nosh up.

OXFORDSHIRE
▶Oxford & DARS - 9 & 23, club nights; Dec 14, club night.

SHROPSHIRE
▶Telford & DARS - 1, G3ZME on the LF bands; 8, talk "Stone Polishing & Cutting" by G7AWU; 15, guest speaker (or surplus equipment sale); 22, surplus equipment sale (or guest speaker); 29, technical tips by G8UPF. All meetings at Dawley Bank Community Centre, Telford, at 7.30pm. Details from Bob, G7BWO, tel: Telford 770922.

SOMERSET
▶Yeovil ARC - 2, RSGB video; 9, junk sale; 16, talk "Photography" by Mr. C. Pursey; 23, talk "RF Resistance" by G3MYM; Dec 7 video night.

SOUTH GLAMORGAN
▶British Telecom (S.Wales District) ARS - 22, visit to the maintenance sheds at Heathrow Airport. Chance to wander around Concorde. Membership of BTARS is now open to any radio amateur who would like to join. For those living outside a 20 mile radius of Cardiff the membership fee will be £2 to cover administration costs. Details from Martyn Jenkins, GW7EYP, tel: 0222 379634 (office hours).
▶Cardiff RSGB Group - 13, talk "Power Supplies - A to Z" by Roger Alban, GW3SPA; Dec 11, Christmas dinner at Pantmawr Inn. Details 04463 3212.

STAFFORDSHIRE
▶Stafford & DARS - Meets each Tuesday at 8pm at Universal Sports Club, Doxey Road, Stafford. 14, night on the air; 21, RSGB videos "Aerial Circus - G6CJ" and "VP8ANT Expedition"; 28, members construction night; Dec 12 night on the air. Details from Bernard Insull, G3ESW, 0785 662350.

STRATHCLYDE
▶West of Scotland ARS - 3, talk "Repeater Mystique" by Jon, GM0HYY; 10, talk by Jack - GM4 COX/W6 & W7; 24, talk by Gerry McDaid (International and Olympic Cycle Judge).

SUFFOLK
▶Felixstowe & DARS - 13, club station planning meting; 27, contest planning and natter night; Dec 11, night on the air. Orwell Park School. Details 0473-642595 (daytime).

SURREY
▶Dorking & DARS - 3, Autumn dinner - reservation made at the PATIO - numbers limited - let G3AEZ know if you wish to come; 28, talk and demo "Packet" by Paul Drawmer, G4YFY; Dec 12, construction contest. Details 0306 77236.
▶Sutton & Cheam RS - 6, natter night in Downs Bar; 17, TBA; Dec 3, 144MHz fixed and AFS contest.

TAYSIDE
▶Dundee ARC - 7, talk "Morse Topics" by Joe Kelly, GM4AQM, at 7.15; 14, construction demonstration"Build a T/X Tonight for 80p", by Mel Evans, GM6JAQ. Lothian ARC at 6.30pm; 21, talk; 28, construction and demonstration; Dec 5 talk "Certificate Chasing" by Sam Hall, GM2AOL, at 7.15; 12, construction and demonstration.

WARWICKSHIRE
▶Mid-Warwickshire ARS - 14, RSGB video night with Malcolm, G0GLU; 28, technical topics and draft programme for 1990; Dec 12, Christmas supper night with RSGB guest.
▶Rugby ATS - 7, talk "Satellite Television" by Mr P. Wells, G0JEW; 21, talk "Escape from Norway" by Mr. J.D. Berry, G4DDW; Dec 5, talk "The UC1332 Upconverter" by Mr. S. Hunt, G3TSQ; annual dinner - see Denise, G8HYU.
▶Stratford upon Avon & DARS - 13, practical projects evening; 27, visit to Stratford Exchange (provisional); Dec 11, RSGB video plus visit by RLO.

WEST MIDLANDS
▶Coventry ARS - 3, Guy Fawkes supper; 10, night on the air and Morse tuition; 17, illustrated talk "St. Kilda, Island on the Edge of the World"; 24, night on the air and Morse tuition.
▶Midland ARS - Morse tuition 7pm every Wednesday at Unit 16, 60 Regent Place, Hockley.
▶Sandwell ARC - Meets 7.30pm Monday evenings for general AR activities at The Broadway, Warley. Wednesday nights are dedicated to training and practice of Morse code. Details Mr. Steve Jackson, G0CCD, 100 Warley Road, Oldbury, Warley.
▶Solihull ARS - 16, surplus sale.
▶Stourbridge ARS - 6, on the air and natter night; 20, Winter surplus sale; Dec 4, on the air and natter night.

WEST SUSSEX
▶Chichester & DARC - 7, talk "How Linear is your Linear" by G3WZT; 21, visit to ICS Ford Airfield; Dec 5, chat night.
▶Horsham ARC - 2, G3LDO Antenna Modelling; Dec 7 AGM.
▶Mid Sussex ARS - 2, informal; 9, junk sale; 16, informal; 23, talk "Microwave Modules" by Mick, G4EFO; 30, informal; Dec 7, Christmas dinner - Inn the Priory

WEST YORKSHIRE
▶Halifax & DARS - 21, talk "PCBs" by John, G3BBD.
▶Keighley ARS - 7, night on the air; 14, film show; 21, natter night; 28, demonstration "Short Wave Data Listener" by G4ZVD; Dec 5, talk "The Sun" by L.M. Dougherty, MSc; 12, natter night.
▶Northern Heights ARS - 1, talk "Fax and Other Data Modes" by Jack Birse, G4ZVD; 15, talk "Getting Started in the 1930s" by L. Cobb, G3UI; Dec 6, members equipment, alignment evening.
▶Otley ARS - 7, night on the air; 14, talk "GB2RS Solar Data and Propagation" by Charles Newton, G2FKZ; 21, free and esay; 28, Howard Fagleman, G6XFM will be here to show us how the RAYNET system operates and give us a history of events covered during the last few months; Dec 5, night on the air.
▶Pontefract & DARS - 2, night on the air; 9, talk "Lites From Space" by Charlie Newton; 16, committee meeting/night on the air; 23, night on the air; 30, visit to West Yorkshire Astronomy Observatory; Dec 7, night on the air; 14, Christmas social night (XYLs & families invited).
▶Spen Valley ARS - 2, talk "Police and Search and Rescue Dogs" by Mr. Neville Sharp; 16, talk "Britain's Roads" by Terry Sismey, G4XQV; Dec 7, packet radio demonstration by John Bowyer, G4KGS; 21, Christmas social.
▶Todmorden & DARS - 6, talk "Sun Earth and Radio" by Gordon Adams, G3LEQ; Dec 4, George Dobbs annual Christmas lecture.
▶White Rose ARS - 1, talk "WAB Dxpedition '89" by Steve, G1SGB; 8, informal; 15, Birkett, the yearly visit when you can buy all those important components; 22, informal; 29, talk; Dec 6, informal; 9, Christmas dinner.

WILTSHIRE
▶Blackmore Vale ARS - 14, talks "Safety in the Shack" by Dave, G0GVC and "Filters" by Steve, G1ZTO; 28, club station on the air; Dec 12, Christmas dinner.
▶Trowbridge & DARC - 8, judging of entries for constructors' cup; 22, social evening. Details from G0GRI, tel: 0380 830383.

MOBILE RALLIES

This is a list of all rallies, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

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.Opens 11am both days with talk in on S22 and 70cm. 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.
▶Midland ARS - Birmingham Mini-Mobile Rally - Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Opens 10am. Local traders, clubs, bring & buy etc. Talk in S22. Details Peter, G6DRN, tel: 021 326 7515 or Bob, tel: 021 472 7998.
▶Bridgend & DARC Radio Rally - Bridgend Recreation Centre, Angel Street, Bridgend, Mid-Glamorgan. Doors open 11am. Details GW4YKL, tel 0443 226198 or GW1OUP, tel: 0656 723508.

26 NOVEMBER
▶Verulam ARC Christmas Rally - City Hall, St Albans. Usual traders - Bumper Raffle - Pre-Christmas Bargains. Details Hilary G4JKS tel 0727 59318. Trade bookings, tel Watford 52959. (Date changed from 3 December).

11 DECEMBER
▶Commemoration of the reception of 1st transatlantic amateur signals, Ardrossen, Scotland.

10 DECEMBER
▶Leeds & DARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, nr Leeds. Details G Stubbs, tel 0532 585801.

24 FEBRUARY 1990
▶Rainham Radio Rally - Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. Details from Bob, G0LKE, tel: 0634 362154.

25 FEBRUARY 1990
▶The 3rd TAW & Torridge Rally - BAAC Hall, Bideford, Devon. Doors open 10.30am. Trade stands, bring & buy, bar, refreshments, talk-in S22. Details: G0GFK 02372 76402.

4 MARCH 1990
▶Trafford Rally - G-MEX, The Greater Manchester Exhibition & Events Centre, City Centre, Manchester. Doors open at 10.30. Details Graham, G1IJK tel 061-748 9804.

11 MARCH 1990
▶South Essex ARS Mobile Rally - The Paddocks, Canvey Island, Essex. Starts 10am. Trade stands, bring & buy etc, refreshments. Details Ken Hendry, G0BBN, tel: 0268 755350.
▶Welsh Mobile Rally - Barry Leisure Centre, off Horton Road, Barry, South Glamorgan. Details GW6RCK.

18 MARCH 1990
▶Wythall Rally - Wythall Park, Worcs, G0EYO

◗Norbreck Rally - Norbreck Castle, Blackpool. Details Chris Harrison, 061 275 5705.

OTHER EVENTS

6 NOVEMBER

wBangor & DARS Annual Bring & Buy Sale - Bangor Technical College, Castle Park, Bangor, Co Down. Starts at 7pm. Traders, QSL Bureau, RSGB bookstall etc. Talk in S22. Details from Stewart, GI4OCK, QTHR.

9 DECEMBER

◗RSGB Annual Meeting - AGM, Queens Hall, Dunoon, Argyll. Doors open 12 noon, meeting commences 2pm.

10 DECEMBER

◗Coulsdon ATS Annual Bazaar at 4th Purley Scout HQ, Lion Green Road, Coulsdon. Bookings for flea market tables must be received by Wednesday 15 Nov. Details 01-684 0610.

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 form 1 to 28 days. The callsign in parentheses is the source for further information.

1 NOVEMBER

◗ GB2CPF CHESHIRE POLICE FORCE - G4TUS
◗ GB4BTS BRITISH TELECOM STONE - G4JKF
◗ GB4CIN CHILDREN IN NEED - G4TCK
◗ GB4RRG RED ROSE GOLD - G0FRL
◗ GB6RRA RED ROSE AWARD - G1TAR
◗ GB6RRG RED ROSE GOLD - G1AKN
◗ GB8MAD MULTI ACTIVITY DAY - G6TZE

3 NOVEMBER

◗ GB2RCC RADIO CARAVAN CAMPING - G4EPN
◗ GB4RSL ROYAL SIGNALS LLANDUDNO - GW4XKE

4 NOVEMBER

◗ GB2CDQ COASTAL DEFENCE 'Q' - G0DHZ
◗ GB2CSB CLEEVE SCHOOL BIZARRE - G0LRI

6 NOVEMBER

◗ GB2PPC PRIOR PARK COLLEGE - G3LYW
◗ GB4RSL ROYAL SIGNALS LLANDUDNO - GW4XKE

7 NOVEMBER

◗ GB2BFQ BELFAST FESTIVAL AT QUEENS - GI4WVN

8 NOVEMBER

◗ GB0TAC TRANS-ATLANTIC CABLE - G0KBT

9 NOVEMBER

◗ GB0XXV 25TH ANNIVERSARY BRISTOL ARC - G3ZKI

10 NOVEMBER

◗ GB4WMF WEEKE METHODIST FESTIVAL - G4BKE

11 NOVEMBER

◗ GB1AMS ALTERNATIVE MICRO SHOW - G0EYO

16 NOVEMBER

◗ GB2BBC BRITISH BROADCASTING CORP. - G3VGW
◗ GB6CN CHILDREN IN NEED - GI0LDI

17 NOVEMBER

◗ GB4KID CHILDREN IN NEED - G0EVU

18 NOVEMBER

◗ GB4HMS HER MAJESTIES SHIP - G0ERS

19 NOVEMBER

◗ GB0BCC BRAINTREE COMMUNITY CENTRE - G0IAG

24 NOVEMBER

◗ GB2LOA LIONS ON AIR - GW0ANA
◗ GB5XI (XI IS ID FOR FINNINGLEY BCN) - G4CFS

1 DECEMBER

◗ GB0RRA RED ROSE AWARD - G0JBR
◗ GB0RRR RED ROSE RALLY - G0JWU
◗ GB4RRS RED ROSE SILVER - G0IZR

2 DECEMBER

◗ GB2CDR COASTAL DEFENCE 'R' - G0DHZ

7 DECEMBER

◗ GB8XXV 25TH ANNIVERSARY BRISTOL ARC - G3ZKI

8 DECEMBER

◗ GB4CYP CHRISTCHURCH YOUTH, PURLEY - G4AOJ

9 DECEMBER

◗ GB4DX "DX" - G4BWP

16 DECEMBER

◗ GB4HMS HER MAJESTY'S SHIP - G0ERS

RSGB LIST OF PACKET RADIO MAILBOXES AT 13/10/89.

(All are operational only on 144.650MHz except where otherwise stated).

Mailbox	SysOp	Location	Notes
GB3KP	G8LWY	Kingston, Surrey	See also GB7KUT
GB3UP	G0/K8KA	Guildford, Surrey.	DCE Satellite gateway.
GB7AAA	G0HWC	Northampton	
GB7ABC	GW3TMH	Rhyl	
GB7AEU	G4AEU	Southampton	
GB7AKE	G6AKE	Shrewsbury	
GB7AOB	GM8AOB	Fort William	
GB7APC	G1APC	Swindon	
GB7AVM	G0DFP	Chinnor, Oxford	Formerly GB7DFP 430MHz port operational Oct 89
GB7AWA	GM4AWA	Scone, Perth	
GB7BBS	G1DIL	Highley, Shropshire	430MHz port licensed
GB7BEQ	G0BEQ	Swindon	
GB7BIR	G7BGP	Birmingham	No 144MHz port
GB7BMX	G1YAA	Alnwick, Northumbs	
GB7BNI	GI4XFN	Belfast	14MHz port licensed
GB7BNM	G4WPT	Wimborne, Dorset	
GB7BPL	G4YVQ	Blackpool, Lancs	
GB7BRK	G1AWD	Reading	
GB7BST	G0BST	Northwood	430MHz port licensed
GB7BYS	G1BYS	Bromley	
GB7CDM	G4BVE	Northwich	430MHz port.
GB7CFB	G6CFB	Halesworth, Suffolk	
GB7CHS	G3WCS	Northwich	430MHz port licensed
GB7CQV	GM0CQV	Aberdeen	
GB7CRG	G4WSD	Knutsford, Cheshire	
GB7CYM	G1FTA	York	
GB7DAD	G3MME	Matlock	430MHz port
GB7DDX	G0DDX	Cambridge	
GB7DFT	G1DFT	Southport, Mersey	
GB7DGK	G4DGK	London	
GB7DQW	G0DQW	Evesham, Worcs	432.675MHz port operational.
GB7ELO	G1SJU	East Ham, London	Formerly GB7SJU.
GB7ERA	G0DXX	Shrewsbury	432.675MHz port. 70MHz port licensed.
GB7ESX	G1NNB	Witham, Essex	433.650MHz user port operational
GGB7EYM	G4HRM	Scarborough, N.Yorks	
GB7FCI	G6FCI	Blackpool	
GB7FRI	GM0FRI	Oban	
GB7GBY	G4DXB	Grimsby, S.Humberside	
GB7GHU	G4GHU	Greenford, Middx	No 144MHz port.
GB7GLP	G6GLP	Newton Abbot, Devon	
GB7GLW	GM4HCO	Stewarton, Ayrshire	
B7GMX	G3VOM	Manchester	
GB7GRN	G4MQM	Grantham, Lincs	
GB7GUR	GU4YMV	Guernsey	432.675MHz and 14.103MHz ports operational. 70MHz port licensed.
GB7HAS	G1HSM	Hastings, E.Sussex	
GB7HDS	G4HDS	Peterlee, Durham.	Operational on 50.650MHz 432.675MHz port.
GB7HEZ	GW8HEZ	Penarth, S.Glamorgan	
GB7HFF	GM4PLM	Paisley	
GB7HHH	G3OUF	Hemel Hempstead	No 144MHz port.
GB7HIU	G6HIU	Edgware	50.670MHz and 432.675MHz ports. 1.3GHz forwarding port operational 430MHz port operational. 1.3GHz forwarding port operational
GB7HJP	G6HJP	Portsmouth, Hants	
GB7HMI	GI3TLT	Newtownards, Co.Down	
GB7HQQ	GB3RS	RSGB HQ, Potters Bar,	User port operational on 433.650MHz. 1.3GHz forwarding port operational.
GB7HSN	G1HSN	London	
GB7HXA	G4UXV	Huntingdon	
GB7ILO	G3ILO	Nailsworth, Glos	
GB7IMB	G8IMB	Bristol	430MHz port licensed. 70MHz port applied for.
GB7IOT	GI0IOT	Kilfennan	
GB7JED	GM4UPX	Jedburgh, Roxburgh	
GB7JSC	GM1VBE	Bothwell	430MHz port licensed.
GB7JTY	G4JTY	Daventry	
GB7KCM	G4KCM	Southampton	
GB7KEV	G3KEV	Scarborough, N.Yorks	
GB7KHW	G6KHW	Biggleswade	
GB7KJL	G0JNH	Stockport, Cheshire	
GB7KLN	G4RQN	Kings Lynn, Norfolk	
GB7KLX	G4KLX	Bolehill, Derbys	
GB7KUT	G8LWY	Kingston, Surrey	See also GB3KP. 430MHz port.
GB7KVD	G1KVD	Taunton.	
GB7LDI	G3LDI	Norwich	14 and 21MHz ports licensed.
GB7LDS	G3WNR	Leeds, W.Yorks	
GB7LED	G4XMH	Nottingham	
GB7LNX	G4GOU	Lincoln	
GB7LRG	G0CND	Leicester	
GB7MAC	GM4AUP	Airdrie	29.250MHz (FM) port operational 430MHz ports licensed.
GB7MAN	GD7BMG	Douglas, Isle of Man	
GB7MAX	G4TEC	Wolverhampton	
GB7MUM	G6HOQ	Brinsley, Notts	
GB7MXM	G4GBA	Stowmarket	
GB7NEM	G8EIA	Middlesborough	
GB7NET	GM7AOM	Larkhall, Lanarks	
GB7NEW	G4XBA	Newbury, Berks	
GB7NHU	G6NHU	Perivale, Middx	1.3GHz forwarding port operational.
GB7NNA	G1NNA	Witham, Essex	
GB7NOS	GM0HBI	Golspie, Sutherland	
GB7NRC	G4NRC	Melton Mowbray	
GB7NUN	G1KBB	Nuneaton	
GB7NWI	G4TUP	Southport	
GB7NWP	G1ULA	Manchester	430MHz port off waiting DTI clearance of site change.
GB7OAR	G4OAR	Birkenhead, Mersey	
GB7OXF	G6MKK	Headington, Oxford	
GB7PBL	G4PBL	Stanmore, Middx	50.630MHz only.
GB7PEN	G6BSK	Penrith, Cumbria	
GB7PET	G4PYR	Peterborough	
GB7PLX	G3PLX	Gosport, Hants	Packet on 144.650MHz. AMTOR ports on 7, 10, and 14MHz operational. AMTOR ports on 3.5, 21 and 28MHz licensed.
GB7PVR	G1PVR	Bicester	
GB7RDG	G4YFB	Reading	70.4875MHz, 432.675MHz and 50.670MHz ports operational
GB7RMN	G4RMN	Norwich, Norfolk	
GB7RTJ	G3RTJ	Market Harborough	
GB7SAM	G3TJP	Newcastle, Staffs	430MHz port licensed
GB7SAN	GM3SAN	Glasgow	
GB7SAU	GM8SAU	North Uist	
GB7SCA	G4SCA	Plymouth, Devon	
GB7SEK	G4IDX	Ashford, Kent	432.675MHz port operational.
GB7SIG	G6FPC	Blandford, Dorset	
GB7SMT	G6ELD	Sale, Cheshire	No 144MHz port
GB7SNE	GM8SNE	Dunfermline	
GB7SPV	G4SPV	Stevenage	430MHz port operational
GB7SRC	G3ZPB	Old Coulsdon, Surrey	No 144MHz port 50.670MHz port operational
GB7SRL	GM4SRL	Netherlee, Glasgow	
GB7SUF	GM4SUF	Edderton, Ross-shire	
GB7SUT	G8AMD	Sutton Coldfield	Forwarding port on 1.3GHz
GB7TCM	G8ADH	Upton on Severn	
GB7TED	GI4AHP	Belfast	
GB7TLH	G1TLH	E. Dereham, Norfolk	
GB7TVM	G1HZI	Hexham	
GB7TXA	G4TXA	Basingstoke	
GB7UWS	G1UWS	Eltham	430MHz port operational
GB7VLS	G4VLS	Norwich	
GB7VMR	G3VMR	Maidenhead, Berks	
GB7VRB	G8VEH	Lancing, W.Sussex	
GB7WIR	G1LMI	Slough	
GB7WMR	G7APL	Birmingham	
GB7WOK	G3WGV	Wokingham	
GB7WQM	GW1WQM	Milford Haven, Dyfed	
GB7WRG	G0COA	Wakefield, W.Yorks	No 144MHz port
GB7WRI	GI4WRI	Co.Antrim	
GB7YAX	G0EOJ	Huddersfield	Formerly GB7HUD. 430MHz port (GB7HUD) licensed
GB7YHF	G4SEQ	Batley, W. Yorks	
GB7ZAA	G6ZAA	Canterbury	
GB7ZBA	G4ZBA	Norwich	
GB7ZPU	G1ZPU	Sandy	50.670MHz port operational 430MHz port licensed
GB7ZZZ	G1TDM	Burgess Hill,W.Sussex	

Dr Dain Stedman Evans, PhD, FIM, G3RPE

It is with great sadness that we report the death on 31 May 1989 of Dain Evans a Vice President and former President of the RSGB, aged 54. Dain suffered a long illness during which he was both brave and uncomplaining, astounding doctors with his determination and strength during numerous complications and setbacks.

Dain was educated at Swansea Grammar School, where he won an open scholarship to the University of Wales. Having gained an honours degree in metallurgy, he went on to work for GEC at Wembley. In 1960 he was awarded his doctorate at Birmingham University, the year he joined the RSGB.

A Fellow of the Institute of Metals and a Chartered Engineer, he headed the Metallurgy Division of the Materials Science Laboratory at GEC's Hirst Research Centre. In 1986 he was seconded to join the NET team (Next European Torus) at the Max Planck Institute in Munich, researching the generation of electricity from atomic fusion. The 18 months he spent in Germany was an experience Dain greatly treasured, loving both the work, and life in Germany until ill health forced his return to the UK in April 1988.

Although not professionally involved with radio, he was a knowledgeable and most enthusiastic amateur and devoted his considerable talents and energy to the cause of the RSGB and of amateur radio in general.

Amongst the many official positions held, he was a member of Council from 1976 to 1979 and again from 1981 to 1986. In 1978 he became the Society's 44th President and in his New Year's message to the members he re-stated his belief that "the members are the Society".

He was a great believer in the aims of the IARU and represented the Society at several Region 1 Conferences. He was involved with much of the organisation of the 1981 IARU Conference in Brighton.

Dain's greatest expertise was with microwaves. His early work to stimulate interest in the microwave bands has left its mark worldwide. He gained a number of 'firsts' making a fundamental and most notable contribution to promoting microwave activity within the amateur radio service. Though winner of the Marconi medal, perhaps the highlight was Dain's presentation on amateur microwave activity to delegates at the World Administrative Radio Conference in Geneva in 1979. Five new amateur microwave bands resulted from the WARC 1979 Conference. He became the RSGB's first Microwave Manager in 1976 and only relinquished the post in 1987 when his profession took him to Germany.

A strong supporter of the magazine and book publishing activities of the RSGB, he served on the Editorial Board of *Radio Communication* and was Chairman of the Technical and Publications Committee. Personal contributions included editing the *RadCom* 'Microwaves' column for eight years and the co-authorship of the VHF-UHF Manual. Several years ago, Dain started the ball rolling on the production of a comprehensive *RSGB Microwave Handbook*. It is a very great pity that he did not survive to see the completed book, volume one of which will be produced this month and which will be dedicated to his memory

Dain always loved the sea and in February this year, decided to return to his roots and moved back to Swansea having a few months previously married Heather, a former RSGB HQ staff member.

It was Dain's attention to detail, meticulously professional approach and his wide range of thinking which will be missed most of all. All of the members of the Society owe a lot to Dain who was a truly dedicated and staunch supporter of all that was good in amateur radio.

The Society's President and Secretary represented the Society at Dain's funeral as did many other Council members and amateur radio friends.

Mr KG Aston, RS91633
Mr AS Andrews, G4XOA, 28.4.89
Mr EH Blanking, G1FFY, 14.3.89
Capt WE Ingram, G8VQW, 30.4.89
Mr T Kennedy, G6UC, 22.4.89
Mr W Pickard, G8KP, 6.5.89
Mr GA Perrins, G3FBP, 5.5.89
Mr JC Rijkeboer, PA0XSA, 6.3.89
Mr JC Schofield, G4RBY
Mr TS Skelton, G3MWW, 22.4.89
Mr I Boyd, G1TGK, 26.4.89
Mr W Bee, G4TDX, 26.2.89
Mr RPP Chapman, RS47628, Feb 89
Mr CF Claydon, GM4GNB, 28.4.88
Mr KLB Dalby, RS 16949, 14.2.89
Mr G Durrant, G4NGG, 10.4.89
Rev R Dow, G4LHK, 6.5.89
Mr AR Goode, G8OHI, 4.2.89
Mr RV Cornelius, G4MCJ, 2.6.89
Mr VH Cladd, RS91542, 6.6.89
Mr HL Stevens, G3XVD, 13.5.89
Mr J Orr, G8JO, 24.3.89
Mr R Beckton, G4KNY, 5.3.89
Mr JJ Padley, G3NHJ, 19.5.89
Mr A Brown, G6UWG, 12.6.89
Mr JJ Gelderen, PA0VGR, 17.5.89
Mr FD Cawley, G2GM, 24.6.89
Mr HW Heath, G2HHD, 10.4.89
Mr WH Jaye, G6ZEV, 25.6.89
Mr JR Smith, G3WYY, 7.6.89
Mr WJ Partridge, G4POS, 7.4.89
Mr GC Eyre, G8OJ, 15.6.89
Mr EG Rose, GW0BHN, 8.6.89
Mr TM Galloway, G8CU, 4.6.89
Maj AI Gillett, G0HYQ, 15.12.88
Mr DG Wright, RS5806
Mr J Heesom, G4FHL, 11.4.89
Mr J Weaving, G3OWW, 29.3.89, aged 83
Mr JJG Taylor, G6XD, 29.5.89, aged 89
Mr H Busen, G0CVK, 26.5.89
Mr J Douglas, GM4XUP
Mr JDGS Gallagher, RS90929, 13.4.89
Mr L Peace, G3SLP
Mr EJ Davis, G3SXY, 26.2.89
Mr R Welch, G4VNH
Mr WR Flowers, G1MTK, 25.4.89
Mr WO Sturmey, WB6BPA/G8KL, 17.6.89
Mr K Sands, G5JZ, aged 83
Mr AM Sutherland, GM4HNA, 1.6.89
Mr BN Clayton, G1ELY, 4.6.89
Mr WT Wardle, G1PSN, 22.9.89
Mr A Sharp, GM3HDI, 8.8.89, aged 87
Mr JH Batchelor, G3XMV, 23.7.89
Mr ME Whatton, G8FUR
Mr R Vincent, 30.6.89
Mr M Shaw, G6OF, 2.1.89
Mr E Burgess, G6FB, 23.6.89, aged 71
Mr T Healey, G4WMV
Mr IJ Allen, GM3LAL, 29.7.89
Mr D Marshall, GM4RKA, 16.6.89
Mr HD Boocock, G0HWZ, 1.8.89
Mr PW Hand, G4IGA, 8.6.89
Mr JF Whelan, GW3EWU, 21.6.89
Mr WAW Kemp, G6ITG, 10.8.89
Mr AE Harrowell, G3IMI
Mr R Twentyman, G1THI
Mr AD Morris, G0IDM, aged 80
Mr G Edwards, G4BBD, 19.8.89
Mr R Hotchin, G4ATA, 29.1.89
Mr W Mulholland, GM6BOY, 12.7.89
Mr GE Cox, G3DCF, 30.4.89 aged 82.
Mr PFD Cornish, G3COR, 21.2.89
Mr B Baxter, G4KWI
Mr GA Martin, G3MVA, 7.9.89
Mr J Cartwright, RS5807
Mr S Nicoll, GM4MFZ, 20.10.89
Mr AM Braaten, W2BSR, 3.8.89
Mr WNL Seward, G3AED, March 1989
Mr AG Chambers, RS91833, 3.9.89
Mr H Williams, RS39580, 15.9.89
Mr J Wilson, G4YVT

the last...

BORING AMATEURS!

Why is it that boring amateurs both new and old insist upon wasting air time by giving their callsigns at the beginning and end of every over? This boring habit reaches ludicrous proportions on many 2m repeaters where it is not uncommon to hear conversations like G9ABC G9DEF the name is Mike Mike-India-Kilo-Echo, G9ABC G9DEF.

Communications should be an efficient means of passing information between one station and the other. On the amateur bands where our conversation is far from private, and the frequency is in demand by others, we should not only strive to complete our QSO in the most efficient way possible, but we should also try to make the conversation enjoyable to others listening. An endless gabble of often indecipherable callsigns is certainly not interesting.

Besides which, these is no legal requirement to give your call every over. May I quote from the new Amateur Radio Licence, which those at RSGB worked so hard to achieve for us Para 7 (1)(b):

"The Licensee shall transmit his/her callsign at the beginning and end of each period of communication is longer than 15 minutes, at the end of each interval of 15 minutes." Period of communication means QSO, and does not refer to the over length, unless you are a real waffler and manage to have overs longer than 15 minutes! Have amateurs forgotten the use of such words as "over" or "go ahead"?

Come on everybody, new and old. Don't be a boring parrot. Let's brighten up amateur radio. Maybe that way we might encourage those that listen to join us and take the RAE.

Mr I Shepherd, G4LJF

ENGLISH AS SHE IS SPOKE

While we are on the subject of English, could I protest about the mangling of the word "kilometre"?

A little background first: a device for measuring is a METER, which when added to another word is pronounced "MITTER". There are barometers, speedometers, thermometers and mileometers, etc, the stress being on the "o". The first part of the word refers to the thing to be measured. A measure of length is a METRE, pronounced "MEETER"; millimetre, centimetre, decimetre, etc, with the stress on the "EE" sound.

So why in heavens name do people pronounce the word for 1000 metres "KILOMITTER", stressing the "o"? By the rules of pronunciation, this is not a distance, but a device for measuring "kils". From what I hear on the TV and radio, the cause is almost lost, (like "pee" for "penny") but to me, 100 metres will always be a "KILO-MEETER".

Mr G Lee, G3UJX

CURB CONTENTIOUS COLLEAGUES

Despite the fact that controversy seems to be the lifeblood of correspondence columns nowadays, may I enter a plea to my more contentious colleagues to stop the bickering and get on with the pursuit of a hobby which can offer so much enjoyment to so many?

Let's face it - provided anyone operates his station strictly within the terms of his licence, it is his prerogative to concentrate upon whatever aspect of amateur radio he chooses. Personally, I have little interest in contests, so I rarely participate. But when they happen to be in progress there are plenty of alternatives; it is usually possible to switch to another band, and the WARC bands (which are contest-free) could well benefit from increased occupancy. And if all else fails, one could always try a good book! The RSGB offers a wide selection of mind-improving literature about amateur radio.

Much of the recent controversy about home-brew versus commercially-constructed equipment is irrelevant and pointless. In the 40's, when most of us G3+threes were licensed, money wasn't all that plentiful, and "surplus" of excellent quality abounded. So we rolled our own, mainly from necessity rather than from desire. Any many of us learnt a great deal in the process; but that doesn't entitle any of us to make a virtue out of necessity, or to adopt a holier-than-thou attitude to fellow amateurs who have the means and the inclination to buy ready-built rigs off the shelf. Even the most ardent DIY enthusiast would be hard put to duplicate the convenience and versatility of one of the contemporary Japanese transceivers. Whilst they may not do any one thing to the standard of excellence achievable with a custom built single band rig, they do a whole range of things at least as well as the six- foot racks of yesteryear; and all that in a good-looking desktop sized box!

Ancillary units are a different proposition. Personally, my frugal soul would revolt at the thought of buying items such as power-supplies, antenna tuning units, or SWR meters, all of which may be home-brewed from reasonably easily-obtainable components at about one tenth of the cost of commercially built units. The latter usually look more attractive, but rarely function any better than the home-brewed alternative, if as well.

Mr HM Humphreys, GI3EVU

SEXIST CALL-BOOK?

I have had a copy of the latest RSGB call-book since shortly after it was published and I am delighted with the information it contains. I refer to it as often for the many "extra" items as for the basis of any call-book, the location of UK calls heard and worked. I did think twice about the price; it isn't cheap, but it is rattling good value for money and I am very glad I have it.

I expect you have had many suggestions regarding the format and content from the hordes of "experts" who have bought one - perhaps I'm included because I do have a comment (NOT a criticism) that I would like to put before you. It is, I submit, NOT necessary for lady (or women/female if they or you prefer) operators to be listed in the call-book as "Miss" or "Mrs" - or even "Ms"! The fact of the gender of the operator is of absolutely NO consequence to the efficiency, or otherwise, of the station and is totally irrelevant to anyone contacting, or wishing to contact him/her. It also takes up valuable space in the Book, sometimes, involving an extra line unnecessarily. Might I recommend that, in this "enlightened" age, the RSGB is seen to treat all members equally and demonstrate it in subsequent editions of this excellent publication?

No, I won't be tempted to make any nasty remark about "particulars withheld" entries - each knows his own business best, but could I record a vote for some location, however brief to be given? Thanks.

Mr NEA Rush, G3HBZ

I wonder what the feelings of female operators are on this point? - Ed

NOTE FOR THE BAND PLANNERS

Channelisation and Repeaters work extremely well for mobiles and perform an invaluable service, long may it so remain.

However, we are not all mobile. If a CQ is put out on S20 almost inevitably a mobile comes back. We are not all interested in road conditions, nor the inexplicable antics of the driver in front.

Could we not have a 2m base calling frequency on FM? We could then QSY to an unused spot in the all-mode section of the band or to a vacant S channel. I am sure such an innovation would be welcomed by many.

Mr EG Greenslade, G8LBW

CONGRATULATIONS 'IN PRACTICE'

Congratulations on the series of articles in September's issue under the heading "In Practice". I believe this kind of material will be of great value to the home constructor who, all too often, even after consulting textbooks, finds himself unable to solve a particular problem.

I am glad that the Society's proposals for a Novice Licence have now reached the stage of direct negotiation with the DTI. Correct me if I am wrong, but may not a certain anomaly arise with regard to the future position of the class B licence holder who at the end of the day would appear to have less access to the radio spectrum than the Novice. I refer in particular, of course, to the fact that the Novice will almost certainly have access, albeit limited, to the HF bands.

Considering that the Class B Licensee has already completed a full-blown RAE course in theory and practice and the Novice Licence is, among other things, a stepping stone to a full A or B licence, then surely the class B licensee may have a legitimate complaint.

I should like to know if the RSGB have considered this matter.

Mr H Gilchrist, GM0EWK

At a recent meeting with the DTI, we proposed that holders of the Class B licence be granted a Novice Licence on passing the 5 wpm morse test. A formal response is awaited - Ed

TNX FROM QSL BUREAU

May I, through your columns, thank those members who did *not* send cards to the QSL Bureau during June, as requested in RadCom and on GB2RS. As stated at the time, although officially on holiday, much of that period was spent working for the benefit of the membership.

To those who managed to send the 700 packets to us, I trust that you have enjoyed a summer break without too much interruption!

Mr EG Allen, G3DRN

THANKS TO RSGB...

I would like to drop you a line supporting some of the good work which the RSGB carries out for members.

The RSGB Planning Advisory Committee and panel have provided a very good service. I would like to say a big thank you to the RSGB Planning Advisory Committee, particularly so to Mr H Fenton, G8GG who carried out the appeal to the DOE on their my refusal for a 40' mast this year.

From February to August 1989, Mr Fenton carried out the required hard work to help with my appeal. The good news is that the appeal has been successful and the DOE have granted me permission to erect a proposed 40' mast at my location. It has taken six months for my appeal to go through. Some amateurs may not feel that the success is all that special, but to me, being an RSGB member who mainly uses the QSL Bureau and once a year has run a special event station for Brownies and Guides Thinking Day, it is another foot forward for amateur radio, even if some people feel "its only a mast".

So thanks again to the RSGB and I hope members can at least see that someone has benefited from being a member.

Mr NR Higgins, G4ZQL

CHALK PITS MUSEUM

I understand than an article published in the September issue of RadCom suggests that early wireless equipment could be offered to The Chalk Pits Museum, at Amberley, West Sussex.

May I thank the author and any of the Society's members who are considering this action for thinking of us, but, due to the lack of space, we must decline any further offers of sets, components, magazines, valves, etc.

Your readers who have visited the museum will appreciate that we already display a representative range of equipment from the telegraph of the 1890s to television in the 1970s and we really cannot do justice to any more.

Thanks again for your kind thoughts.

Mr R Ham, Hon Curator of Wireless Exhibition, Chalk Pits Museum

DX 'OUTSIDE OF EUROPE'

Following recent correspondence on the alleged bad behaviour of European operators in DX pile ups, a view from this side is needed to balance the discussion.

I am an active DXer. Like most others, I gratefully appreciate the efforts of DXpeditioners in activating rare countries for us. However, let us not forget that the motives of such operators are not entirely altruistic. Many of us dream of becoming "rare DX", and a large part of the reason for mounting DXpeditions is the pleasure derived from international fame, and drawing massive attention to themselves on the bands.

We Europeans accept our lowly position and patiently sit in the pile-ups for hours (or even days), tolerating conditions akin to animals in a sheep dip. When the DX operator starts to become intolerant of the great noise he has created however, it all starts to wear a bit thin. Perhaps we too are becoming tired of the disparaging comments and lambasting some of these DX "prima donnas" mete out to those of us unlucky enough to live in Europe.

Let us remind them that it takes two to QSO, and the success of their operation also depends on the world's willingness to talk to **them**. So come on guys, you'll be back home amongst the rest of us one day. Be nice to us!

Mr P Godolophin, G4XTA

...word

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