Radio Communication

June 1989

The RadCom/Serenity Holidays DX competition

– see centre pages

First UK /AM station gets airborne

KENWOOD

More of everything - except cost

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

Every function that you could ever want is included in the specification - there is even an optional digital speech store which will store received or transmitted messages of up to 32 seconds, allowing the operator to quickly check or return any call. Even the microphone has been designed to give you full control of the transceiver from one hand, with tone burst, memory recall, VFO recall, and UP/DOWN functions provided; but the UP/DOWN is not just operating frequency but memory channel number and even the frequency of the built in sub-audible tone encoder.

There is even a fourth button on the microphone which can be user programmed to select MHz steps, or repeater shift, or reverse repeater, or digital record selection, or low power; all as you wish. Extremely comprehensive and easy to use in the Kenwood manner.

This exciting new range of FM mobiles from Kenwood is now available at your approved Kenwood dealer. Try them out; you will not be disappointed, particularly with the prices. As I said "More of everything, except cost".

TM-231E	(2m)	**£289**
TM-431E	(70cm)	**£318**
TM-531E	(23cm)	**£385**
TM-701E	(2/70)	**£469**

LOWE ELECTRONICS LTD.

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Prestel Page 8107

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***Radio Communication* is published by the Radio Society of Great Britain as its official journal on the last Friday of the previous month and is sent free and post paid to all members of the Society.**

Closing date for contributions, unless otherwise notified, is five weeks prior to publication date

Filmset by JJ Typographics Ltd, Cottis House, Locks Hill, Rochford, Essex. SS4 1BX

Printed by Mayhew McCrimmon Printers Ltd, Units 1-4 Star Lane Industrial Estate, Great Wakering, Essex. SS3 0PJ.

ABC MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS **36,070 copies per issue average circulation in 1987**

Radio Communication

VOLUME 65 No 6 **JUNE 1989**

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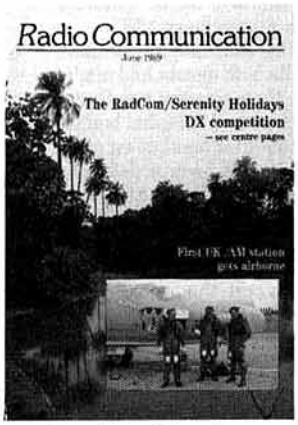

Main Photo: Abuko Nature Researve, The Gambia — just one of the exotic locations which may be visited by the winner of our DX Competition (p43). Inset: Flight Crew and T.17A Canberra of 360 Squadron following the GB2CAN/AM flight on 9th May (p7).

Ernie Sumption, C53GS, proprietor of the guest house at which the winner of our DX Competition (and their partner) will be staying for one week.

The Psion Organiser, host to our morse tutor program featured this month (p40).

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Once-off joining fee: £1.50
Corporate members: UK and overseas (*Radio Communication* by accelerated surface post): **£20.50**
UK associate member under 18: £6.95. Family member: £8.20
UK students over 18 and under 25: £10.45 (Applications should give applicant's age at last renewal date and include evidence of student status)
Affiliated club or society/registered group (UK): £20.50 (including *Radio Communication*): **£12.30** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)
Membership application forms available from RSGB HQ

COUNCIL BRIEF

21 January 1989

■All present were welcomed to the first Council meeting of 1989 and the President presented badges to the two new members of Council, G4JKS and G3RZP. Council studied copies of the accounts for the 75th Anniversary NEC convention and data symposium, and while both events had made a surplus, there was concern that expenditure had exceeded budget. A more detailed breakdown of the accounts would be provided to the Finance & Staff Committee, who would report back to Council.

■In his report, the Secretary outlined the current main goals of the Society. These included:
Encouraging recruitment into the hobby via Project Y.E.A.R.;
Negotiating with the licensing authority to maintain and improve facilities.
Producing favourable publicity about the hobby for the media;
Working at an international level with other national societies and IARU to support the hobby.

■Council appointed G4JLE as RSGB representative on the IARU DF Working Group.

■Council accepted an offer of a trophy, to be known as the G5RP Trophy, from the Vale of White Horse ARS. This was to be awarded to the RSGB member, permanently resident in the UK, who, in the opinion of the Vale of White Horse ARS and the HF Committee, has made the greatest progress in the DX field during the 12 month period from July to June on the HF bands.

■Affiliation was granted to the Martlesham DX and Contest Group.

■Council considered the question of personal accident liabiity insurance for Society staff and volunteers travelling in the course of their duties. A temporary cover would be arranged while the costs were discussed by the Finance & Staff Committee.

■The resignation of Mr Peter Hart, G3SJX as chairman of the Technical & Publications Committee was noted with regret. Council appointed Mr Peter Chadwick, G3RZP, to fulfil this role.

Keeping your subs down

Members will have seen details of the RSGB Credit Card in the May *RadCom*, and in a separate mailshot from the Society. We believe this to be a very useful additional RSGB service as it can offer members a low rate of interest.

What may not have been obvious is the real benefit to *all* members regardless of whether they take up the offer.

PLANNING ADVISORY COMMITTEE AND PANEL — please help us to redress a shortage

The Society maintains a panel of volunteers who offer their services to members experiencing difficulties with local planning authorities regarding aerials and masts. Unfortunately the number of difficult cases seems set to outweigh the level of support available, and the Committee is quite desperate to entice more volunteers into this vital service.

Qualifications which can prove of immense value are possessed by Planners, Surveyors, Architects, Solicitors and, indeed, anyone with considerable experience in submitting or processing Town & Country Planning applications.

Volunteers are co-opted onto the Planning Panel, and thus become corresponding members of the Planning Advisory Committee. They receive all of its papers, and are invited to attend meetings whenever an item of special interest is on the agenda. The Committee meets three or four times a year, in London. Their own areas of operation can be tailored according to their own wishes, of course; currently there is, however, a particular need for reinforcements in the South and West of England.

Please give this plea serious consideration, and if you feel that you can assist in any way, contact the Planning Advisory Committee Chairman, H Fenton, G8GG, at 5 Cromer Road, St Annes, Lytham St Annes, Lancashire FY8 3HD.

For every member who applies for a card, the bank administering the card will donate £5 to the Society (ie, roughly a quarter of the membership subscription). Additionally, the bank will give the RSGB 0.2p for every pound spent when using the card.

This will represent a substantial initial boost to our funds, and a steady income for years to come. At the time of writing, the offer had been with members for only about a week, and yet the Society was already several thousand pounds better off.

This increased income will help keep subscription fees down and help promote the art and science of radio. It is therefore of direct benefit to every single member.

So, even if you already have a credit card, do consider taking out this one because it will directly benefit your Society as well as yourself.

By the way, on page 4 of the May edition of *Radio Communication* a change of figures during the drafting stage led to an unfortunate error. The cost of the hypothetical HF rig should have been £700, not £1000 as stated. We hope that this drafting error was obvious to everyone who read the article. It would after all have been a very good credit card indeed which could have knocked £300 off the price of a rig!

HF Committee vacancy

The RSGB's HF Committee is looking for a corresponding member to prepare news releases for *Radio Communication* and other amateur radio publications. These news releases will cover such topics as:

- The winners of RSGB HF Awards, Certificates and Trophies
- Bandplanning news
- IARU news
- Beacon and repeater news
- Packet radio news
- DXCC and WPX news
- CW events (eg Straight Key Days, IARU high speed competitions etc)

Candidates will need to liaise with the appropriate Society volunteers and with the editorial staff at Radio Communication, and should be active participants in the HF scene. Anyone interested in this challenging and worthwhile committee position should write to the HF Committee Chairman, Martin Atherton, G3ZAY 41 Enniskillen Road, Cambridge CB4 1SQ.

PROJECT Y.E.A.R. - WHAT NEXT?

Plans for Project Y.E.A.R. are progressing well and some of the money raised by the 75th Anniversary lottery is being put to very good use. The Society can, however, do with much more volunteer and paid effort for the Project.

We are effectively still at the detailed planning stage - and believe me some of the planning has to be very detailed indeed. This report is intended to be a review of what has been done to date, and what remains to be accomplished. Progress can be summarised thus:

(1) In order to achieve positive results for Project Y.E.A.R. the Society will need to raise a lot more money. It's needed, for instance, just to provide the human effort so necessary for the project to be a guaranteed success.

The Society has therefore arranged, with the valued co-operation of the DTI, a Conference for Industry which will be held during July 1989. It will be opened by Robert Atkins, MP, Under-Secretary of State for Trade and Industry, who will also make a keynote opening address. Such Government support for Amateur Radio is almost without precedent, and it says much for the validity of the RSGB's plan to recruit more people into the hobby, thus helping to address the problem of skill shortages faced by the British Electronics Industry.

The format of the Project Y.E.A.R. Industry Conference is described elsewhere in this issue. The purpose of the Conference is, of course, to tell Industry what we, as radio amateurs, have to offer and as a result obtain some sponsorship from Industry for Project Y.E.A.R.

(2) Every member of the RSGB under the age of 25 has now been surveyed with a comprehensive questionnaire. From the information retrieved we have been able to deduce how existing young members of the Society were introduced to amateur radio, what attracted them and what their main interests and ambitions now are. The data collected will be invaluable for our introductory video, for *D-i-Y Radio* and for the books which we are writing to help introduce non-technical people to amateur radio.

(3) We now have a much better idea of what needs to be featured in our recruitment video tape. The Society has obtained professional support towards writing the script and conceiving the programme. We will probably utilise professional volunteers to go out and shoot the footage, but to a brief laid down by our advisers.

Once the material has been shot, £150,000-worth of post-production work will be forthcoming, as sponsorship, from a major TV company. With this level of assistance we believe that in addition to the recruitment video we will also be able to make some training films.

We are delighted to be able to say that TV weatherman and keen radio amateur, Jim Bacon, G3YLA, has agreed to act as the linkman for our proposed recruitment video; moreover, ICOM UK Ltd have agreed to sponsor part of the cost associated with distributing the final production to every affiliated club in the UK.

(4) Work on the Student (Novice) Licence proposal for the DTI has continued with the hope that it will go to the DTI in mid-Summer 1989. The proposal will be based fairly and squarely on the survey of the entire RSGB membership which took place last September, the results of which were published in the January 1989 issue of *RadCom*.

There is no doubt that if amateur radio in the UK is to flourish into the next century with most of its frequency bands intact, recruitment into the hobby is essential. All existing methods have not proven to be effective in procuring sufficient numbers of newcomers to the hobby; the Student Licence with its thorough from-the-start training and disciplines is seen to be the positive way forward. The arguments put forward by Council have already been recounted in earlier editorials and will not be repeated here now.

(5) The Society's new magazine, *D-i-Y Radio*, will be launched, subject to Council's agreement. The magazine will be similar in size, feel and content to the pilot issue published last year, covering basic aspects of amateur radio for beginners of all ages. It will initially be bi-monthly and priced around £6 per annum. It will be available on subscription to anyone, and probably marketed direct to the general public as well.

(6) As the main thrust of Project Y.E.A.R. work, the Society plans to publish some 12 small books aimed specifically at the absolute beginner. The surveys already conducted have helped us to identify the interests and needs of prospective young radio amateurs. The series of books will not only introduce amateur radio to the beginner, but also deal with the fun and serious (potential career and scientific) aspects of the hobby.

The series of booklets will take the beginner right through the Student Licence course with the prospect of him or her assembling several low-cost kits along the way as a practical introduction to amateur radio. The books will be the foundation of the Student Licence course which will be essential to attend in order to obtain a licence.

(7) Last, but by no means least, it is recognised that no plan to introduce beginners to amateur radio can succeed without a drastic reduction in the cost of amateur radio to the absolute beginner. Simple, low cost kits or equipment must be available if the hobby is to thrive.

Some equipment is available already, but more is needed. Text-book radio amateurs who have never listened on the amateur bands are missing out on their basic amateur radio education. The Society's technical people, staff and volunteers are working hard to develop the basic kits, and encouraging others to do the same. The more that are available the better.

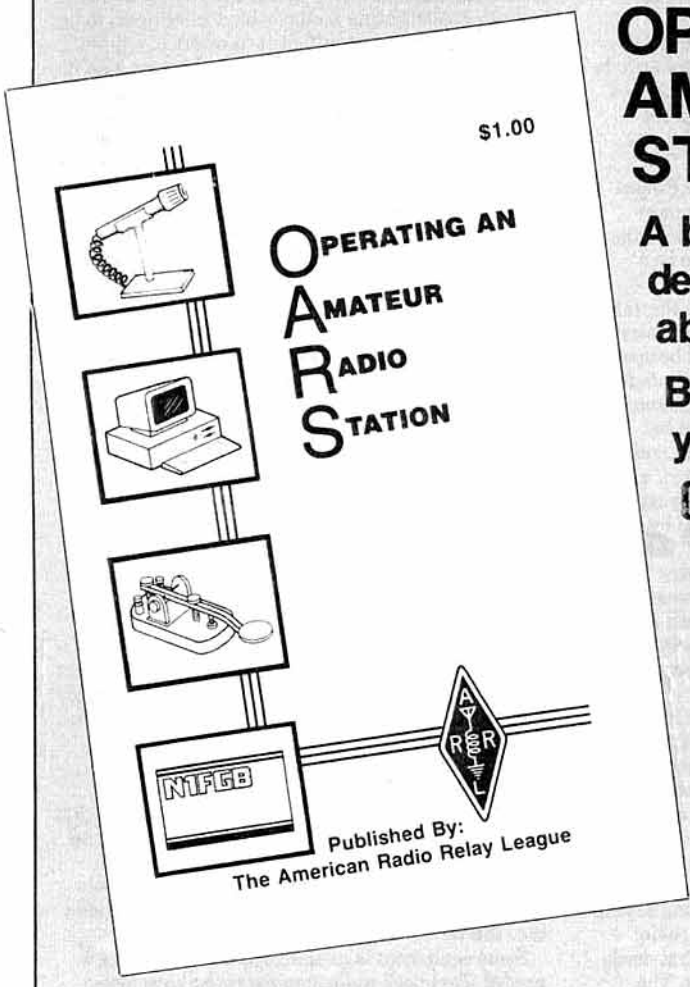
Beginners are put off by the high cost of some equipment that's essential to beginners if they are to explore the world of amateur radio from within their own homes. We must address that problem in a logical and sensible way.

All of the six main aspects of the Society's Project Y.E.A.R. work need to be co-ordinated. Any one part of the project cannot succeed without the rest, which is why more manpower is needed. All of the elements are, nevertheless, now in place and all are being developed with enthusiasm.

Votes of thanks are due to clubs and individuals who have written in to support and encourage the Project Y.E.A.R. initiative. We hope that you will now recognise more clearly the work which needs to be done at national level and that you will lend your support if you have the time at your disposal.

David Evans, G3OUF

NEW FROM ARRL

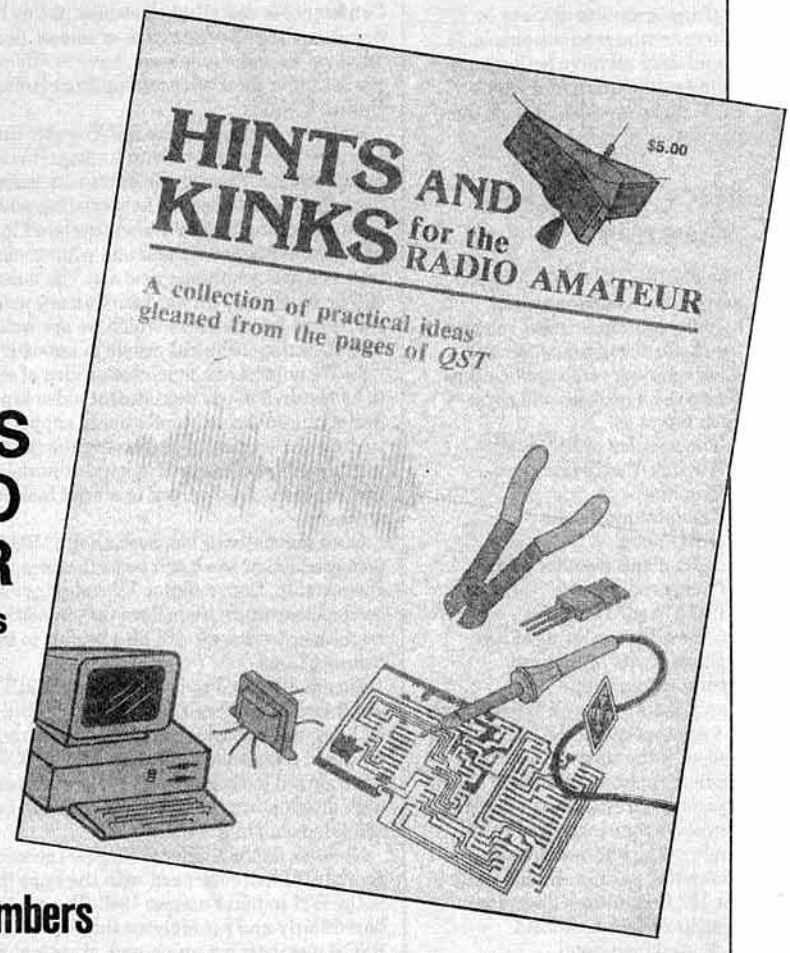


OPERATING AN AMATEUR RADIO STATION

A brand new beginners booklet detailing all you need to know about basic amateur radio skills.

Buy some for beginners at your club.

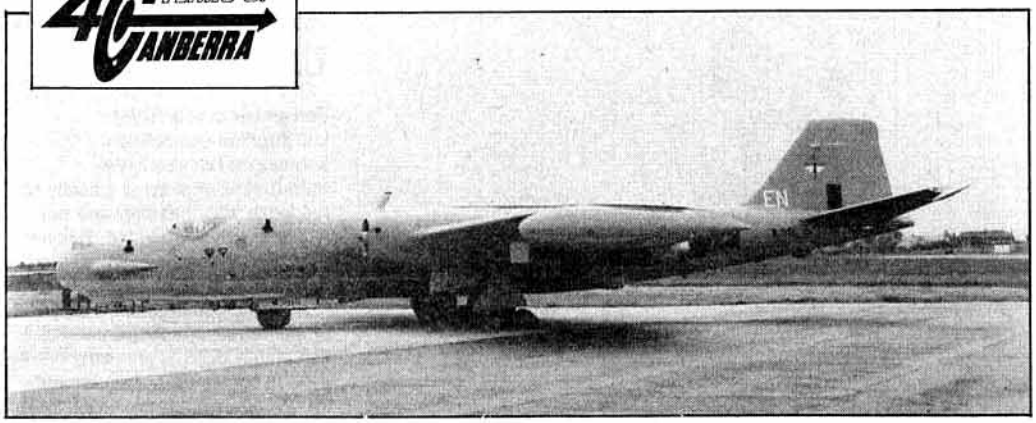
ONLY £2.25 by post to RSGB Members.



HINTS AND KINKS FOR THE RADIO AMATEUR

The brand new edition of this popular circuit handbook is now available, crammed with useful tips and topics on all aspects of radio equipment and antennas. A must for every amateurs shack.

ONLY £3.50 by post to RSGB Members



First UK /AM operation - a resounding success

On Tuesday 9 May a very special-event station came on the air. GB2CAN/AM was located in a Royal Air Force BAC Canberra T17A aircraft airborne from RAF Wyton in Cambridgeshire: it was celebrating the fortieth anniversary of the maiden flight of the first of these famous machines, which took place on 13 May 1949. The Canberra took off just after 1300 GMT and operation of the amateur station commenced at 1305 GMT. The aircraft followed a high-level track taking it almost due north from Wyton before turning back when abeam Glasgow. During the 1hr 20min flight, which was a routine training mission, GB2CAN/AM contacted 74 stations in the 21 and 28MHz bands. Almost immediately after the aircraft became airborne, the RAF Wyton ARC station - G3MMH - made contact and good signal reports were exchanged. The RSGB Headquarters station GB3RS made contact at 1320 on 28.400MHz. GB3RS received a report of 59 but GB2CAN/AM was only 4/5 and 5. Norman Fitch, G3FPK (our VHF columnist - what was he doing on these DC bands??) made contact at 1328 on the same frequency and G0DBE, a QRP station running only 5watts, made contact on 21MHz at 1345. Other stations worked included AA4CK in Palm Beach, W8, GM and several Gs. Despite earlier reports to the contrary, VP8BWL in the Falklands did manage to make contact on 28MHz as the aircraft was about to land at 1420 GMT. Reports of 42 and 43 were exchanged.

The crew (pictured on the front cover) consisted of (left to right) Sqn Ldr Dave Horton, pilot; Flt Lt Simon Savage, navigator; and Flt Lt Rod Angel, G4ZUP. As we said above, the aircraft was a Canberra T17A - WJ981 of 360 Squadron, which is formed from both Navy and RAF personnel. The flight was originally intended to last for two-and-a-half hours but was cut short because of power supply problems.

The on-board Collins 618T HF transceiver was used for the operation: it's capable of AM, SSB and CW operation on any one of 28,000 selectable channels between 2MHz and 30MHz. In the SSB mode the output power is 400W PEP, with 125W carrier power being available in AM and CW modes. The 618T is connected to the aircraft antenna via a coupling unit which provides an automatic tuning facility to ensure low VSWR. The special-event callsign was issued, and special approval for the operation was given, by the DTI. In granting permission for such an exceptional case, the DTI does not regard it as being a precedent for other airborne amateur radio operations. Nevertheless, the Society welcomes the DTI decision in the general spirit of liberalisation, which has been much in evidence in recent years.

While the licensing authority appears sympathetic to the question of aeronautical mobile operation, it is the Civil Aviation Authority which needs to be convinced that /AM operation is appropriate. The RSGB believes that, under certain conditions, amateur radio equipment can be operated from an aircraft without any risk. At the same time, we very much appreciate the need for caution.

We hope to have an in-depth feature about this historic flight in an imminent issue of *RadCom*.

The club station at RAF Wyton, G3MMH, with the club secretary Cpl Barrie Smallshaw, G7CSY (sitting) and Flt Lt Rod Angel, G4ZUP.

Robert Atkins MP to launch joint DTI/RSGB Industry Conference

In the March issue we mentioned that a joint DTI/RSGB Industry Conference, designed to launch the Society's 'Project YEAR' initiative to prospective sponsors and participants from British industry, would be taking place this year. The date of this conference has now been set for 20 July 1989 and it will be held in Kingsgate House, Victoria Street, London SW1.

Robert Atkins, MP, the Parliamentary Under Secretary of State for Industry (the gentleman in the pic right) will be giving the keynote opening address. He will outline the DTI's role in encouraging Project YEAR with a view to the development of new human skill resources for industry. He will also look at its past and future roles, such as harnessing Government agencies to assist Project Year at national level and encouraging industry to support and participate in it fully.

This will be followed by a brief history of the RSGB and its role in the support of amateurs and the amateur service over the past 76 ▷

years: this will be given by David Evans, G3OUF, the RSGB's Chief Executive. Mention will be made of the large number of radio amateurs holding leading and senior management positions within the electronics manufacturing and research industries whose careers developed from an early interest in amateur radio. David Evans will also look at the progress which has been already made since the launch of Project YEAR by the Society's Patron, HRH Prince Philip, Duke of Edinburgh, at last year's 75th Anniversary Convention. There has been strong support from both the Scout and Guide Movements in improving public awareness of the benefits of amateur radio while, at the same time, giving valuable training to youngsters in the art of radio communication.

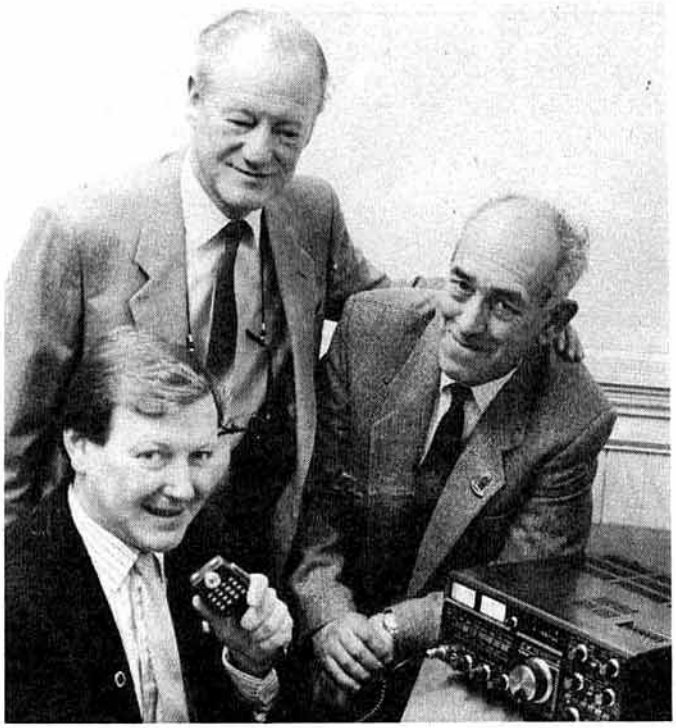
It will be stressed that Project YEAR is not just aimed at youth but that it also provides a means of attracting the more mature or retired members of the public. Amateur radio as a hobby is of great benefit to the blind, disabled and bed-ridden, giving them a 'view' of the outside world and the ability to communicate with other radio amateurs around the world or around the corner. Finally, David Evans will cover the unique and practical benefits which the scheme will provide in educational activities and enhanced employment possibilities through skills training, as well as the provision of a life-long hobby. He will also point out that to do this the Society needs the support and participation of industry, since its own resources are strictly limited.

A representative from the DTI will explain its role in the licensing of radio amateurs, its involvement in industry and enterprise and its support of Project Y.E.A.R. through the Young Amateur of the Year Award.

After a short break, Victor Brand, G3JNB, will discuss Project Y.E.A.R. in practice. He will be reiterating the need for funding, the provision of assistance in manufacturing and marketing areas, and in the production of project literature, such as experimental and training manuals.

The conference will end with a debate, giving the invited representative from industry an opportunity to speak in support of any points made, ask questions and pledges of assistance with the funding and running of Project Y.E.A.R.

See also this month's 'From the Secretary' for the Society's comments on this forthcoming Industry Conference.



On Friday 21 April, the Mid Lanark ARS held its official opening ceremony at its new premises, the Newarthill C.E. Centre, High Street, Newarthill. Just over a year ago the Society was forced to vacate its regular meeting place due to a policy change by the Local Authority. The official opening was performed by the Local Authority Regional Councillor, James Reddin (seated). Standing behind him are David Williams, GM1SSA, Secretary of the Mid Lanark ARS (left) and RSGB Executive Vice President Frank Hall, GM8BZX.

Bogus RIS officers operating in Durham

Early last month, a members telephoned RSGB HQ to say that he had been visited by two bogus RIS officers at his home in Durham City. Apparently, when questioned by the member, the two men fled. We contacted the DTI at Waterloo Bridge House and a spokesperson for the Radiocommunications Division issued the following statement:

"We understand that on Wednesday 3 May (1989) two men, who gave their names as Mitchell and Bell, called at the house of a radio amateur in Durham saying that they were RIS officers working in the Teeside district on secondment. They showed plastic identity cards which had photographs. Mitchell was described to us as well dressed and well spoken, and Bell spoke with a Scots accent. The men wanted to inspect the amateur station and asked specifically about modified CB equipment. The police have been informed."

The DTI has asked us to advise all members that if they are approached by anyone claiming to be an RIS officer whom they suspect may be bogus, they should contact the police immediately.

Late Rally news

The first North Cheshire Radio Club Mini-Rally and Car Boot Sale will be held on Sunday 23 July 1989 at the Morley Green Social Club, Mobberley Road, Morley Green, near Wilmslow.

The event opens at 11am and car-boot pitches can be booked in advance for 5, or on the day for £6. Full refreshment and bar facilities will be available and talk-in will be provided on S22 by G1NCR.

Further details abd booking forms can be obtained by contacting Peter, G4WCE on tel: Lymm 5959, or via packet @GB7NWP-2.

Attention all VHF-UHF Operators

Remember the 50/70MHz construction competition announced last year? Well, unfortunately it drew practically no response from members and was subsequently abandoned. This has prompted the following plea from the VHF Committee...

"Is home-construction in this part of the frequency spectrum completely dead or are you a serious constructor of equipment for use between 50 and 430MHz? If you build your own equipment, the RSGB's VHF Committee would like to hear from you; whether it be something like designing your own equipment and antennas, or the undertaking of elaborate and complicated projects such as multi-band transvertors. If you are a secret builder, please write to the Committee Chairman:

Malcolm Appleby, G3ZNU, Willowbank, Chapel Road, Otley, Ipswich IP6 9NX ...or via packet @GB7MXM and let him know what you're up to.

Mr Appleby would also like to hear from any kit manufacturers to get an idea of the proportion of sales for kits in the VHF-UHF spectrum.

So - go to it and let them know that home-brewing is *not* a dying art!

Youth Action '89 – help needed

Youth Action '89 will be held in the Wembley Conference Centre from 27-30 July inclusive. The event, which is being organised by the Scouts, is aimed at 14-24 year olds and is being sponsored jointly by the NatWest Bank and the Prince's Trust. The Scout Association has asked the Society to set up an amateur radio station as part of its Scouts and Technology display and - in turn - to allow the Society to promote its Project Y.E.A.R initiative. Any members who feel that they can assist with the running of this station are asked to write, giving details of they sort of assistance which they can provide, to:

David Evans, G3OUF,
The Secretary,
Radio Society of Great Britain,
Lambda House,
Cranborne Road,
Potters Bar,
Herts EN6 3JE
... marking the envelope "Youth Action '89"

VHF Managers meeting

A Region 1 VHF Manager's meeting took place last month in Germany. It was a very productive event and many topics were discussed, including bandplanning, beacons, packet radio, frequency allocations and plans for WARC. Several decisions are worth mentioning:

A working group was formed to look at bandplanning on 144MHz - and particularly the beacon allocations. RSGB is to continue its work of co-ordinating beacons in Region One.

The group is actively looking at the problem of obtaining common frequencies for international working in the microwave bands. This is a difficult problem to solve, since pressure from other spectrum users is steadily eroding our secondary allocations. However, they did agree that the narrowband segment on 24GHz should move down to 24048-24050GHz, so it's now in the primary segment of the band.

On a different tack, everyone knows by now that something is going to happen in 1992... European harmonisation is starting to affect our lives in all manner of ways, and amateur radio has not escaped its attentions.

A meeting was held on 18/19 February in Dusseldorf, Germany to discuss amateur radio and the European Community. It was very well attended, and included representatives from 10 out of the 12 EC countries - which contain around 200,000 amateurs. There were representatives from DL, I, SV, ON, CT, F, LX, OZ, PA, and G. HB sent an observer.

Harmonisation has meant that some issues are now being decided at a European level, so to speak, rather than between a national society and its own administration. National societies must be able to present a unified response to the European administration on such issues, and so it was suggested that an Association of EC National Societies should be formed to provide a forum for this work; its terms of reference would limit it to issues within the EC, so it would not conflict with IARU activities. The Society must therefore devote quite a bit of effort to obtaining representation on EC Technical working groups, and monitoring the activities of the European Parliament. All this represents an additional workload for the Society, but one which we can't afford to shirk.

The two main issues raised at this meeting were the EMC directive and common licensing.

The EMC Directive requires all apparatus put on the market to be certified to meet certain technical standards. We are fortunate insofar as homebuilt amateur equipment is almost unique in being exempted from this legislation. While commercial amateur equipment will not have to be type approved, it does seem inevitable that it will have to meet some technical standards. This issue was felt to be a very high priority. An EMC working group was formed to agree some basic technical standards, which could then be submitted to the relevant bodies. Obviously we want to specify the minimum amount necessary. It needs saying, however, that many of the practical implications of this legislation are still far from clear.

Harmonisation will also affect licensing. The concept of a single 'Eurolicence' has been proposed to simplify movement around the Community. However, it was felt that it would be easier to achieve this by getting countries to recognise each other's qualifications, and issue licences on that basis, rather than to unify their detailed licence conditions. It's important that each country is free to develop the licence conditions in its own way to meet the rapidly changing needs of the hobby. Such variety is an essential part of the way that the hobby develops.

The first step towards this aim could be to cater for long term visitors, by extending the system of reciprocal agreements to cover the issuing of permanent licences on the strength of these agreements. In the meantime, RSGB is encouraging all CEPT countries to implement the CEPT agreement - Recommendation TR 61-01 - which provides for temporary operation in other countries.

It was felt that more information should be circulated about frequency allocations and licence conditions in each country.

The increasing amount of legislation affecting amateur radio is giving us pause for thought - some examples being the 28MHz CB order, the EMC Directive, and the trend in some countries to have licence classes which are restricted to using type-approved or commercial equipment. These restrictions could stifle the constructional and experimental side of the hobby and set rather undesirable precedents. It was agreed that moves towards type approval and restrictions on equipment should be resisted, since they discouraged experimentation. The unique feature of the amateur service was that unlike other services, the licensee was technically qualified and responsible for maintaining his own technical standards. RSGB and other national societies have an important role in maintaining these standards, and safeguarding the interests of the amateur service.

By the by, issues such as these should bring home to all amateurs the importance of joining and supporting their national society. The society faces a very large number of problems, and relies heavily on the efforts of its members to help tackle these problems.

A final item of news. There's a good chance that the DTI will shortly allow amateurs from any other country to operate a UK amateur's station under the licensee's supervision - watch this space.

Members of the RNARS London Group ran an activity week from HMS Belfast over Easter. The photograph shows (left to right) Bob, G3PQH, Chairman of the London Group; Len, G4LIK, Communications Officer, HMS Belfast 1939; and Capt. A J C Morrow RN, Commanding Officer HMS Mercury. ***(Photo: G Allis, G1LRS)***

DataSpace '89

On page 12 of the April *RadCom* we ran an advertisement for DATASPACE '89 - which incorporates the RSGB Data Symposium and the AMSAT-UK Colloquium. The event takes place between 28-31 July inclusive, and we'd like to remind prospective lecturers and authors - on either data or satellite topics - that they *must* submit a synopsis of not more than 200 words by 15 May latest. The papers themselves *must* be submitted by 15 June. The addresses to which the synopses and papers should be sent are given in the advertisement. Those wishing to attend the event should obtain a booking form from: Ron Broadbent, G3AAJ (DATASPACE '89), AMSAT-UK, London E12 5EQ, or RSGB Headquarters (DATASPACE '89), Lambda House, Cranborne Road, Potters Bar, EN6 3JE.

International Satellite Meeting

In addition to DATASPACE '89, it's been suggested that an International Satellite Meeting be held under the same conditions as last year on Thursday 27 July - the day before DATASPACE '89 gets under way. This would be a policy and space politics meeting for all persons able to make decisions about space matters. Members of National Societies, VHF/UHF Managers, AMSAT Groups worldwide, and Executive Members of IARU Regions 1, 2 and 3 are especially welcome. Please register your intention of attendance with RSGB and/or AMSAT-UK by 1 June latest. The meeting itself is free of charge. Accommodation and meals are available at very reasonable costs.

ENTRY FORM

FOR THE 1989
YOUNG AMATEUR OF THE YEAR AWARD
sponsored by the Department of Trade & Industry

CANDIDATE'S DETAILS

Name _____ Age _____

Address _____

_____

Town _____ Postcode _____

Home telephone No _____

Male/Female (indicate)

Callsign/BRS (if any) _____

Club memberships _____

_____

Uniformed organisations _____

_____

Enter brief details of OUTSTANDING ACHIEVEMENTS here or on attached separate sheet

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

PROPOSER'S DETAILS

Name _____ **Callsign/BRS** _____

Address _____

_____

Town _____ **Postcode** _____

Club title (if club proposal)

_____

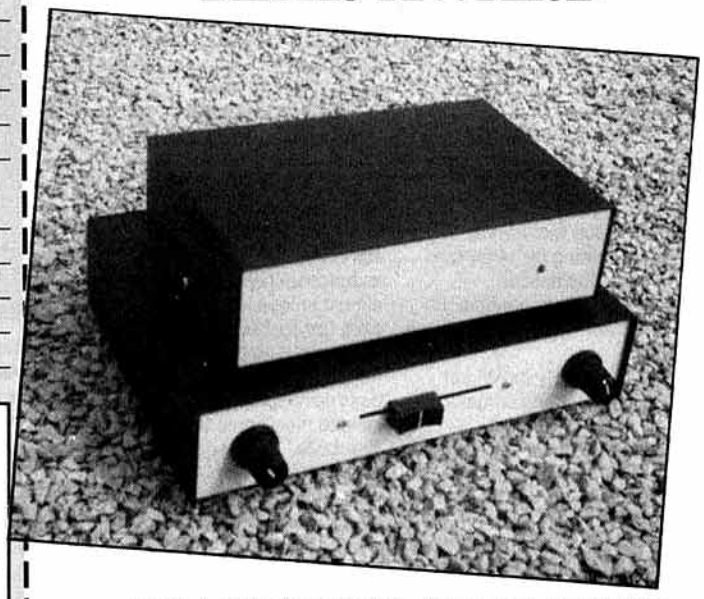
Contact telephone No. _____

Signed _____

Date _____

NB: Photocopies of this form appropriately completed or personal letters are equally acceptable as entries.

YOUNG AMATEUR OF THE YEAR AWARD



RC14 RECEIVERS AND 80 METRE CONVERTER KITS

TO BE AWARDED TO YOUNG AMATEURS OF THE YEAR 1989

RSGB Council is pleased to announce that an additional prize of the popular RC14 beginners' receiver, fully assembled and ready to go, will be presented to this year's winner - along with a kit for the 3.5MHz converter described in the April edition of Radio Communication. In addition to these extra prizes for the outright winner, both the leading YM and YL runners-up will each receive an RC14 kit presented by the Directors of Cirkit Ltd.

PICK YOUR WINNER — NOW!

The game's on - have you or your Club Committee put serious consideration into who you will nominate for the award? Remember, the nominee of the successful candidate will receive an engraved plaque from the RSGB - oh, and think of the local publicity possibilities which could benefit your club.
For full details see the April and May issues of Radio Communication.

Feel free to use the entry form or just send us a letter, but don't forget — the final closing date is 31 July 1989 at RSGB HQ!

PRIZES

DTI AWARD:

Title of "Young Amateur of the Year" plus....
£250 *cash prize* to the winner and a guided tour of the Radio Monitoring Station at Baldock

DTI GIFTS:

The latest 'UK Radio Frequency Allocation Chart' will be given to every entrant.

RSGB AWARDS:

A ready-built RC14 Receiver plus 3.5MHz converter kits to the winner.

CIRKIT AWARDS:

An RC14 Receiver kit to the leading YM and YL runners-up.

Late delivery of RADCOM

RadCom has constantly been plagued by late and inconsistent postal delivery within the UK. Copies are always posted in one batch, but *RadCom* frequently encounters a delivery period extending to more than a fortnight in parts of the country. Last month we moved to new printers, based in Southend-on-Sea. We had hoped for a better delivery service, on the premise that Southend's collection point already handles at least two large and influential bulk mailing clients - Access and the VAT unit. Alas, our hopes were dashed. Copies were mailed out on Thursday, 27 April, just prior to the bank holiday weekend, but a large proportion of copies failed to turn up within a fortnight, judging by the number of complaining telephone calls received at HQ.

Representation has been made to the Post Office, but with no explanation as yet. We are, however, cautiously pinning hopes on a new (obligatory) distribution system being introduced by the Royal Mail; it's the Presstream Mailsort scheme which allows us, and our printers, to bundle and bag *RadCom* into more finely defined PostCode destinations. The Royal Mail insist that this will, in most cases, slightly reduce postal costs for bulk mailings, speed up mailings, and reduce the incidence of misdirections and consequent delays. Despite the fact that 97% of addresses in the RSGB's computerised mailing list are fully PostCoded, regrettably the first condition isn't coming true for us - the bill looks as though it will be a few hundred pounds higher than under the previous PPA scheme. Hopefully this isn't an omen for the performance of the postings themselves.

This issue is being posted under the new scheme. For your sakes and ours, we hope it will have run a lot more efficiently than last month, and that this issue is safely in your hands before 1st of June. After a couple more months, when Presstream has at least had a chance to settle down, we will institute a survey amongst members to judge how efficient the distribution is, and to identify any specific problem 'pockets'.

Norbreck rally 1989

The annual radio and electronics exhibition organised by the Northern Amateur Radio Societies Association (NARSA) took place in January this year at the Norbreck Castle Hotel, Blackpool. Two years ago the rally was moved from Belle Vue, Manchester because the site was - finally - to be bulldozed. NARSA selected the new venue for last year's rally and it proved to be a popular choice. This year the attendance had risen to around 4000 visitors, who were able to browse around 80-odd trade stands and 30 club stands. The club stands are judged and a prize awarded to the best stand, which adds a friendly competitive spirit.

One of the problems this year was the sheer volume of people squeezing their way down the narrow gangways, particularly around the bring-and-buy stall and the RSGB stand. However, the organisers will be modifying the layout for next year's event to help relieve the situation.

Interestingly, there's been a noticeable increase in the number of computer-orientated stands over the last few years. To reflect this, next year's event on 18 March, will be called the 'NARSA Amateur Radio, Electronics & Computing Exhibition'

Quotations of technical interest

The QTI Talking Newspaper Association (QTI-TNA) has moved to its new base in Lancaster, from where it's being run by the Chairman - Harry Longley, G0JKT - following his election at last July's AGM. The transfer from John and Diz Feeley, who founded QTI-TNA eight years ago has now been completed. QTI-TNA is a voluntary organisation which is dedicated to producing 'QTI' - the tape magazine for visually-handicapped radio amateurs and short wave listeners. The magazine is a compilation of technical articles selected from current radio publications and is read on to tape by a team of readers from around the UK. Currently there are more than 120 visually handicapped people who receive QTI on a fortnightly basis post-free under the Post Office's 'Articles for the Blind' scheme. As an additional service, recordings of a more specialist nature in the field of radio communications can be undertaken to meet individual requests. Further details can be obtained from:

Harry Longley, G0JKT
Chairman/Organiser QTI
Talking Newspaper Association,
7 Anderson Close, Lancaster
LA1 3JE, tel: 0524 33207

WAB news

The WAB Awards Manager, Dave Brooks, G4IAR, reports more 'firsts' for this month and is already convinced that 1988/89 may well beat previous years in terms of the number of awards issued. John, G4LBB, has earned the first Diamond Award for working 3000 areas on 7MHz SSB. This took a great deal of effort since 40m is really only suitable for inter-UK working at the peak of the sun-spot cycle. Congratulations to John for his persistence over more than one cycle and for working so many WAB areas with indoor wires and loops. G4WZA/M has been activating more areas for overseas WAB members and has earned the WABEMA Basic Award for activating 100 areas on 14MHz SSB and the Bronze Award for activating 200 Areas on 28MHz SSB. GI4IBD has become the first operator to work 40 overseas bookholders on mixed bands SSB. 4X4JU has become the first WAB members of the DX Honour Roll (outside Europe) with 2100 and 2200 areas worked on SSB. Finally, on the VHF front, G1EUU has now worked 1400 3rd Series bookholders on 144MHz SSB. Further details about the Worked All Britain Awards Scheme can be obtained from:

Brian Morris, G4KSQ, 22 Burdell Avenue, Sandhills Estate, Headington, Oxford OX3 8ED

Masonic waves

It is hereby announced that Mr Richard Benham-Holman, G2DYM, has succeeded Mr Fred Ward, G2CVV, a Past President of the RSGB, as Worshipful Master of the Radio Fraternity Lodge of Freemasons for 1989-90. Both Mr Holman and Mr Ward send greetings to RSGB Members who belong to a Lodge. They would be pleased to hear from Lodge members on the Nine o'Clock Net on Sunday Mornings around 3755kHz, via the Secretary of the Lodge, Maurice A Pyle, G2BLA, QTHR, or direct. The Radio Fraternity Lodge No.8040 consists almost entirely of radio amateurs and has over 70 members.

Calf of Man DX-pedition

The Isle of Man ARS is planning to repeat its successful setting-up of a station on the Calf of Man, a small island about half-a-kilometre south-west of the main island. The Calf of Man is a nature reserve and bird sanctuary and during the summer months has a population of only 5 — until the GDs arrive, that is! The party of amateurs will be active between Friday 7 and Sunday 9 July, weather permitting, and will use the callsigns GD0IOM and GD3FLH in the HF bands, and GD4IOM in the VHF bands. HF activity will centre on the following frequencies:

14.250MHz SSB
21.250MHz SSB
28.525MHz SSB

There will also be activity on 144 and 430MHz, with a possibility of some activity on 50, 70 and 1296MHz. Contacts made during the Calf of Man DXpedition will count towards the Golf Delta Award.

RAF Trans-Atlantic Challenge

The RAF Finningley Amateur Radio Club is planning its own form of Trans- Atlantic Challenge. Between 16-27 July, members of the club will endeavour to cross the Atlantic with radio signals from the Mull of Kintyre. This will be attempted on some -er- interesting frequencies on which, up to now, no QSOs have been made. The group hopes to make use of aurora but other paths will be explored. To mark the occasion, the club will not be using its regular callsign, G0GHK, but instead will use the special event callsign GB2TAC - Trans-Atlantic Challenge. Below is a list of frequencies and modes proposed for the expedition. During slack periods there'll be some operation in the WAB 80m and 20m nets, since the Mull of Kintyre is rarish. However, the main aim of the expedition is to cross the Atlantic either direct or via aurora. The proposed frequencies and modes are as follows:

3760kHz - SSB
14.330MHz - SSB
21.330MHz - SSB
50MHz spot frequency (TBA)
70.144MHz - CW/SSB
144.010MHz - CW
144.225MHz - SSB

As well as attempting the trans-Atlantic contact, the group will also be carrying out a number of other experiments: (1) To log weather, electromagnetic, atmospheric noise and solar radiation patterns to assist in the prediction of auroral activity so that a study of anomalous VHF radio propagation can be carried out. (2) To monitor amateur radio beacons in the north American continent. (3) To study the following propagation modes and mechanisms: i. Radio propagation by sporadic E (NB: see part 2 of G3YLA's article on sporadic E); ii. Communication paths utilising EME and MS; iii. The effect of various weather patterns on propagation; iv. The effect of long-range VHF propagation over water. (4) To study the effect of auroral activity on HF propagation by monitoring the 14.100MHz world-wide beacon network, as established by the North California DX Foundation.

All technical information resulting from these experiments will be made available to various amateur radio organisations, the media, and MoD establishments involved in the field of communications and propagation studies. A full report will also be made for possible inclusion in a future issue of Radio Communication.

ATTENTION - all US and Canadian stations.

It would greatly assist the group if US and Canadian stations would keep a listening watch for transmissions from GB2TAC between 16-27 July on the HF frequencies given above to arrange possible VHF skeds. If the group is successful it will be an outstanding achievement for British amateur radio.

If you would like to get in touch with the group before they go off to Scotland, please write to: Cpl Nigel R Fenton, F8117951, Search & Rescue, RAF Finningley, Doncaster, South Yorks.

...before Wednesday, 5 July 1989.

The venue for the North Cornwall Radio Rally, which took place on Sunday 2 April) was the Sports Hall at Launceston College - the antenna system was on top of a mobile platform crane. Inside the radio caravan were (left to right) Jim, G0ANM, and Richard, an aspiring amateur who sat his RAE last month (hope you did well Richard - Ed). Contacts were made with stations across Europe and as far afield as New Zealand.

Lincolnshire Raynet members were among delegates who attended a two-day seminar recently organised by the Lincolnshire County Council Emergency Planning Department. Talks were given by the Red Cross, the Health Authority, the Police, British Nuclear Fuels, and a hospital spokesman. The photograph - courtesy of G3SCD - shows (left to right) G4FSS, Raynet Zone 3 Controller; G6AZS, East Lindsey Raynet Controller; G8EVI, West Lindsey Raynet Controller; Terry Drayton, Divisional Officer and Head of Emergency Planning Dept; Tony Borhem, South Lindsey Raynet Controller; M Sinnat, Assistant Divisional Officer; and Alan Burton, Chairman of the Lincs Landrover Club. Exercises involving Raynet and the Lincs Landrover Club have been held successfully in the past and similar events are planned for the future.

G-Plates

The question of UK amateurs being able to obtain attractive registration numbers for their cars has been knocking around for some time. When the Society first approached the Department of Transport a couple of years ago - following requests from a number of members - the Department's answer was no, since a decision had been made not to issue single-digit registrations.

However, having tumbled to the commercial possibilities of attractive 'personalised' plates, the DoT has had a change of heart. Consequently, the Society has again been in touch with the DVLC in Swansea to investigate the possibility of 'callsign' plates being issued. In a letter dated 13 March 1989, a spokesman for the DoT said, "...the Department is continuing to develop proposals for the sale of attractive registration numbers with a view to the necessary legislation being introduced in due course." The Society's HF Committee has been asked to take an active interest in this matter and the Chairman of the Committee, Martin Atherton, G3ZAY, will accompany David Evans to a meeting with the DoT in the near future. More news as we get it.

Ilford RSGB group

When Fred Ruth, G2BRH, died in February 1968, the Ilford RSGB Group lost its meeting-place. Rather than let the club break up, G3PCA offered his QTH as a temporary venue and the first meeting there took place in January 1969. The group still meets at G3PCA's QTH and - except for holidays - there has never been a break in the last 20 years. G3PCA offers the full use of his workshop, tools and test gear, as well as giving help with building and testing equipment. Members can also design and etch their own printed circuit boards. The group has always entered the National Field Day contest and has never missed an entry.

There are not many people who would allow their QTH to be used for club meetings, let alone for 20 years! Is this a record?

Thanks to Raynet

We've received the following message from the Dumfries & Galloway Raynet Group:

"The Dumfries & Galloway Raynet Group would like to thank all members of Raynet who gave so willingly of their time, equipment and expertise at the Lockerbie incident. Their willingness and enthusiasm was much appreciated by the group."

Some members have written to RSGB HQ asking when the full report of Raynet's involvement during the Lockerbie incident will be published. We expect to be featuring this when the final draft has been received from the Raynet Committee.

Square Bashers in Canaries 'til 14 June

By the time you read this, the Square Bashers will be doing their thing down at Porto Santo in the Canaries, about 28 miles north-east of Madeira. Callsigns to listen for are CT3/G4VXE, G0DAZ, GW4LXO, GW8TVX, GW4TTU, G4HGT and G8ROU; oh, and spare a thought for Mrs 'DAZ trying to keep the unruly mob in order. They'll be there until 14 June - their locator is IM13TA and it counts as Africa. Frequencies to listen on are 14.345, 28.885, 50.165 and 144.265 together with the usual calling frequencies. They're not taking skeds, but the QSL info is via G4VXE, PO Box 136, Cardiff CF4 6YL. An ansafone message about the expedition will be available daily on 0905 23607.

A special request from the Square Bashers - if you work them once, PLEASE don't call them again. This applies especially to 50 MHz.

We expect to have a feature about how they did in an early edition of *RadCom* — watch this space.

STOP PRESS

18 and 24MHz update

It now looks highly probable that the 18 and 24MHz bands will be de-restricted as from 1 July 1989.

The RSGB has been given to understand that, contrary to the report appearing in April '89 *RadCom* (p7), re-allocation of existing services by the IFRB (International Frequency Registration Board) has now been successfully undertaken. As a result the DTI will shortly be issuing a Notice to UK amateurs concerning the use of these bands.

It is expected that the existing 18 and 24MHz restrictions, concerning mode, power, polarisation and antenna design, will be lifted following a forthcoming announcement in the London, Belfast and Edinburgh Gazettes. This will result in the two bands falling into line with the usual amateur band regulations. More information will be published in these new columns as soon as it is made available.

James Lovatt, eldest son of Martin, G0JCN, is a possible contender for the 'Youngest' Amateur of the Year Award. At 20 months he's already doing his CW practice for HF Field Day and was the youngest member of the Telford & DARS at last year's event.

VACANCIES

RADCOM NEWS EDITOR

RadCom's News Editor, David Gough, G6EFQ, is emigrating to Perth, Western Australia. We urgently seek his successor. It's an exciting, interesting and challenging staff position; the successful applicant will be closely involved with the modern 'electronic' communication and production methods being introduced into the offices at RSGB HQ in Potters Bar.

The most important facet of the News Editor's role is to sleuth out and write interesting topical stories for our News & Reports pages and GB2RS news broadcasts. It also encompasses compilation of RadCom's Diary of Events/ Helplines pages, and working in close liaison with our Spectrum Analysis Band Editors. It is also very important for the News Editor to maintain regular contact with feature writers, such as DXpeditionists and propagation experts, to arrange commissions.

Skills must include recognising a good story, following leads, 'writing to fit' and working to tight deadlines. Personality and telephone manner need to be appropriate to dealing with members, public and all levels of management in various organisations. He or she will need to be familiar with procedures for obtaining and reproducing photographs from all sources, including photo-libraries. An active knowledge of Amateur Radio is essential, and it will be particularly valuable if talents include photography and PC wordprocessing.

EDITORIAL ASSISTANT

A new position arises within RadCom's editorial team for an editorial assistant. He or she will be required to sub-edit and key copy, transmit it to our typesetters, proof-read galleys/pages and perform a myriad of other tasks normally expected of an editorial assistant in a small team! Publishing experience, or successful completion of an approved course in printing and publishing, plus an empathy with amateur radio are the basic requirements for intending applicants.

Salaries will be negotiable according to age, experience and qualifications.

Apply in writing, enclosing your CV, to The Editor, Radio Communication, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

Please mark the envelope "Editorial Vacancies. Private & Confidential."

Pennine Way Walk

The Pennine Way Walk, in aid of the Multiple Sclerosis Society, will take place between 1-14 July.

During this two-week event, G1YFT and others will be operating the special event stations GB1PWW, on VHF, and GB2PWW, on HF from a number of rare WAB areas in SJ, SP and NY squares. Six metre operation may be possible but will depend on the weight carried by the back-packers. Activity will take place in the evenings when the party camps under canvas at various points along the route. The total distance to be covered is 200 miles.

CEPT-latest list

The fact that Spain had signed the CEPT agreement - which enables amateurs from signatory countries to operate in each others' countries without the need to apply formally for a reciprocal licence - was omitted from last month's *RadCom*: sorry about that. The current list of signatory countries is as follows:

Austria
Belgium
Federal Republic of Germany
France
Liechtenstein
Luxembourg
Monaco
The Netherlands
Norway
Spain
Sweden
Switzerland
Turkey

OBITUARY

Mrs Freda Taylor

(HQ Accounts Dept) died 30 April 1989. Freda joined the HQ Accounts Department staff on the 11 May, 1983 as Sales Ledger Clerk and later became Cashier. For the past two years she combined both jobs. Freda was a very highly respected and loved member of the staff who gave of herself unstintingly to her work for the Society. Even during the months of her illness she came into work between treatments in hospital. Freda will be sadly missed by all the staff and the many friends she had among the Society membership.

Freda leaves a 16 year old daughter, Gabrielle, to whom we all offer our heartfelt sympathy.

The 'Geochron World Time Indicator'

This remarkable 'world clock' was invented in the early 1960s by James Kilburgh, a native of Luxembourg, who was more interested in inventing than marketing. Until recently, the 'Geochron' was unavailable in the UK, although ex-President Ronald Reagan had one in the White House and also presented one to Soviet Leader Mikhail Gorbachev at the Geneva Summit in 1985. Thousands are in use around the world in banks, universities, embassies, schools, airports, travel agencies and libraries. NASA also has one in use for tracking purposes and Toolan International is now able to introduce the Geochron to the British market. The Geochron reveals, at a glance, time zones, the daylight and darkness areas of the globe, the month, day and time, the sun's zenith position, and much more. It measures 34.25" x 22.5",has a depth of 4.5" and can be mounted on any flat surface, hung from a special bracket, or can be recessed in the wall, again with special brackets. It is electrically powered and uses two fluorescent tubes for illumination. It is fully guaranteed for two years and is very popular with radio amateurs around the world, particularly in the USA. To celebrate its introduction to the UK market, Toolan International is making it available to Radio Amateurs at the special price of £875 plus VAT. If the prospect of owning the "...ultimate world time clock" turns you on, you can obtain a brochure and full details from:

Toolan International, 165 Victoria Road, East Cleveleys, nr. Blackpool, Lancs. FY5 3ST. tel: 0253 855963 (Photo: Courtesy of the Blackpool Evening Gazette)

New mics from Nevada

Two new base microphones, the XL-30 and CM-40, are now available from Nevada, Portsmouth. Both mics have been specially developed and use an electret element with a tailored audio response to bring out the best in modern amateur transceivers (it says here). When used with Kenwood equipment they may be powered directly from the microphone socket of the transceiver. For other brands, a standard PP3 battery may be fitted as an internal power source. The XL-30 is a basic amplified microphone and retails at £46.50. The CM-40 uses an audio processor with volume and tone controls. This model retails at £55.75.

The Sadelta MM90 Mobile microphone is suitable for use will all amateur transceivers and gives 'hands-free' operation. It uses an electret uni-directional mic insert for crisp audio quality and comes complete with a control box that allows up/down control of appropriate rigs. It can be powered either directly from the transceiver or from the vehicle battery. The MM90 costs £49.95.

Nevada, tel: 0705 662145, telex: 869107 TELCOM G, fax: 0705 690626

New crimping tools from Maplin

With co-axial wiring now becoming standard issue in the workplace and at home, an easy, fast and cost-effective method of making connections is essential (says their press release). The new Maplin Co-Ax Crimp Tool scores on all points. It is cheap - less than half the cost of competitive products; it is fast - just one action is needed to break the tool open; and it is safe - no danger of damaging the cable. Dies are provided to suit connectors for RG58 and RG59 cables. The Co-Ax Crimp Tool (JK32K) costs £24.95 incl VAT.

The Maplin Heavy Duty Crimping Tool has been designed for use with red, yellow and blue insulated crimp terminals. The Crimp Tool Ratchet (JH19V) costs £24.95 incl VAT.

Both of these new crimping tools are available by direct mail or from the Maplin nationwide shops.

Maplin Electronics, tel: 0702 554161 (Sales) or 552911 (Enquiries), telex: 995695, fax: 0702 553935

Nevada brings in new Bearcat scanner

This unit, the latest from the Bearcat stable, has 100 programmable memories in five 20 channel banks. It also has extended frequency coverage, including the 900MHz UHF band.

Frequency coverage: 29-54MHz; 118-174MHz; 406-512MHz; 806-952MHz. Features: 15 channels/sec scan speed; Memory lock-out facility; Programmable frequency search facility; Programmable memory delay; Back lit controls for night use. Cost: £269.00.

Nevada: tel: 0705 662145, telex: 869107 TELCOM G, fax: 0705 690626.

New low-cost bench PSUs

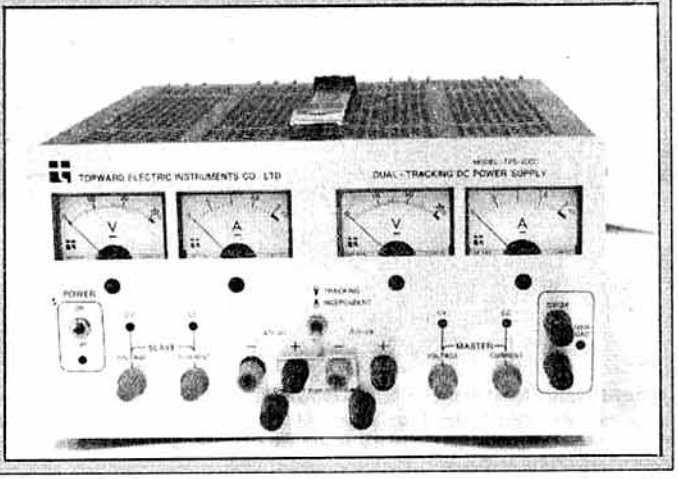
A new range of high quality bench power supplies is now available ex-stock from Tandem Technology Ltd.

There are 16 models available with digital or analogue metering, constant-current or voltage operation and with full overload and short-circuit protection. Single and triple output with tracking is available in several versions, with outputs up to 60V and 10A.

These rugged easy-to-use PSUs weigh between 3.4kg and 7.8kg and the prices commence with the 30V/2A model at £89.

Further details can be obtained from:

Tandem Technology Ltd The Old Bakery, Petworth, West Sussex GU28 0AH. tel: 0798 43642



AWARDS

INTERNATIONAL

The WIA Antarctic Award

On Tuesday 25 April, the Wireless institute of Australia announced the rules for its new 'Antarctic Award'.

Applicants must have confirmed contacts with 10 amateur stations conducting valid operations in Antarctica, and these must include stations authorised by at least six different national licensing authorities, one such station to be VK0.

Antarctica is defined as the land mass, including islands, and permanent ice shelf below latitude 60° south.

Contacts may be made on any amateur band, including 10MHz, 18MHz and 24MHz, but crossband contacts are not eligible. All modes, except use of terrestrial repeaters, are acceptable and endorsements will be given for particular bands and modes. Contacts with aircraft or ships under way or capable of being put under way, are not eligible.

Contacts must have been made after 0001 UTC, 23 February 1988, the 75th Anniversary of the first two-way radio communication between the Antarctic and the outside world. This was on 23 February 1913, when the exploration team, led by Australian geologist Douglas Mawson, sent messages to the Governor-General of Australia and to King George V.

All certificates will be numbered and issue will commence on 31 July 1989. All valid applications received by that date will be ranked by the time and date on which the last qualifying QSO needed for the award was made. The certificates will be numbered in that order. Endorsements will be given for 'firsts' to achieve the award on each band and by each mode.

Certificates sent in response to applications received after 31 July 1989, will be numbered in the usual way, (ie, in the order in which they are processed).

The normal WIA verification rules apply, (ie. cards need not be sent provided that two amateurs certify that they have personally inspected them). However, the WIA Awards Manager reserves the right to call for cards and/or photocopies of them.

The cost of the award is US$5.00, post paid and is also available to SWLs.

Applications should be sent to: *K D Gott, WIA Federal Awards Manager, 38A Lansdowne Road, St.Kilda, Victoria 3183, Australia.*

La Blanquilla Island Award

The Venezuelan Navy celebrates its anniversary in mid-July and, in order to draw world-wide attention to this and the island of La Blanquilla - 95 miles north of Venezuela in the Caribbean - three Venezuelan Amateur Radio Clubs have got together to sponsor a special event station located on the island and an award for making contact with it.

The special station will bare the callsign YY5LB and will be operational from 0000 hours UTC on 19 July, to 2400 hours UTC on 22 July. Activity will be in the 160m, 80m, 40m, 20m, 15, and 10m HF bands, and in the VHF bands using Phone, CW and RTTY.

The Venezuelan Navy has donated the following awards:
1st) A bronze relief of La Blanquilla Island.
2nd) A trophy
3rd) A trophy
4th) A commemorative plaque
5th) A commemorative plaque
6th) A certificate - awarded to all stations making contact with YY5LB and who haven't been awarded any of the above awards.

To qualify for any of the above awards it will be necessary to contact YY5LB in at least three different bands using any mode (including mixed) and have the contact confirmed by QSL cards. All entries must be postmarked no later than 29 September 1989 and QSL cards should be sent to the IARU Bureau for Venezuela, as follows:
Radio Club Venezolano, PO Box 2285, Caracas 1010-A, Venezuela.

30 Metre Century Award

This is being offered by the *DX Magazine* to try to create more activity on 10MHz. The 100 countries must have been worked since 1 January 1988 and no QSLs are required unless a claim is made for credit for a country which has not so far been given permission to use the band. The *DX Magazine* suggests that a normal DXCC application form can be used when applying. The cost is US $2 or four IRCs. Apply to *The DX Magazine*, PO Box 50, Fulton, Cal 95439, USA.

WORLD NEWS BRIEF

BERMUDA

Following a request from members, the Radio Society of Bermuda's Board of Management applied to the Department of Telecommunications for amendments to the modes of emission allowed in the 18 and 24MHz bands. It's understood that these amendments will shortly be confirmed. (TNX: Splatter Splatter)

EIRE

Annual General Meeting, 30 April 1989. Since no nominations were received under rule 23.2, the following who were nominated (rule 23.1) by the outgoing Committee will form the new committee:

President - Con Hunter, EI9V
Vice President - Stephen Wright, EI5DD
Committee Members - Jim Barry, EI8GS; Joe Dillon, EI4FV; Gerry Fitzgerald, EI8FE; Paul Kearney, EI7GM; Derek McGonagle, EI7CHB; Aedan O'Meara, EI3EG; Derek Peyton, EI7FM; Tom Rea, EI2GP; Benjamin Rodriguez, EI5BYB; Jim Ryan, EI3DP; and Bill Somerville-Large, EI9FK.

GIBRALTAR

Following the recent AGM of the Gibraltar Amateur Radio Society, the following were elected to serve on the committee for the year 1989/90:

President - Jimmy Bruzon, ZB2BL
Secretary - Jim Watt, ZB0D
Treasurer - Ross Kelly, ZB2AZ
Awards Manager - Gordon Black, ZB2J
QSL Manager - C Gurrero, ZB2IH

It's understood that ZB2BU will soon be active on packet. The ZB2VHF 50 MHz beacon has been running again, but there are still some problems in finding a suitable permanent site.

IARU news - 10MHz

A number of interesting developments which may have a profound effect on the use of the 10MHz band occurred as a result of the ARRL Board of Directors' meeting on 20 and 21 January. At this meeting it was decided that ARRL would attempt to bring IARU Region 2 policy regarding awards activity on 10MHz into conformity with that of IARU Regions 1 and 3 at the Region 2 Conference in Orlando. If that change is accomplished, the ARRL will accept 10MHz contacts for the WAS Award and the DX Century Club (but not 5BDXCC). If this proposal is accepted by the Conference, the band will be transformed overnight! There seems to be no doubt that the reason for the present low activity is because QSOs don't count for DXCO. For the record, at the present time Region 1 does allow award credit to be given for contacts on 10MHz and the position in Region 3 is similar.

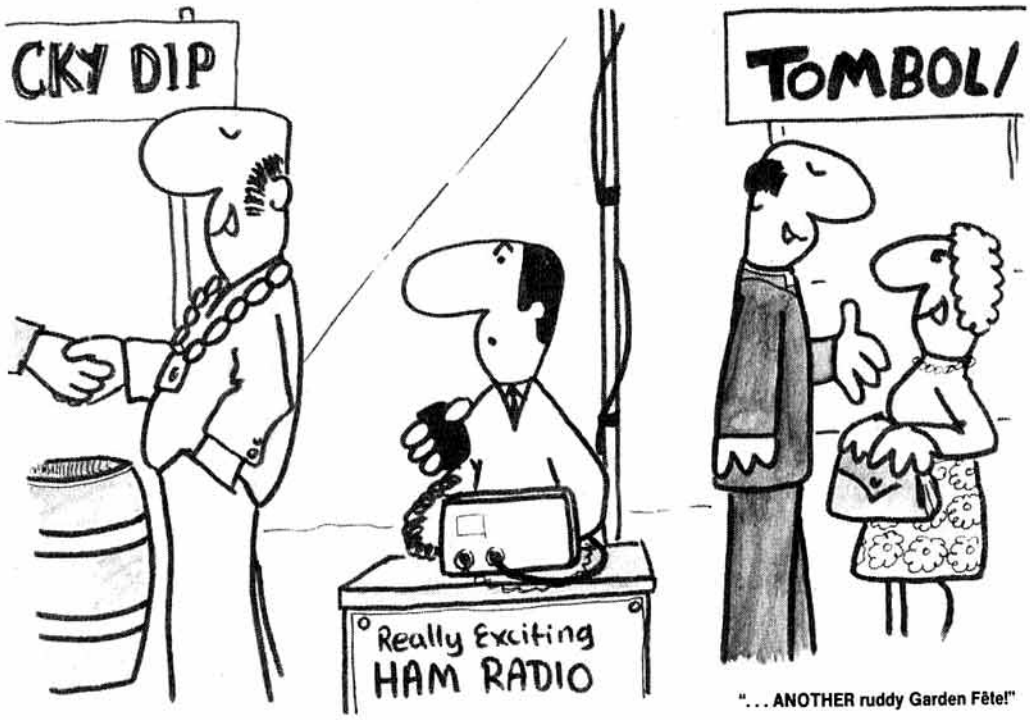
PORTUGAL

To celebrate the Portuguese National Day the Rede dos Emissoes Portugueses (REP) will be sponsoring the Portuguese National Day Contest. The contest takes place on Sunday 11 June between 0700GMT and 2359GMT, and is open to all amateurs around the world. Operation will be in the 3.5, 7, 14, 21 and 28MHz bands, SSB single-operator only.

USA

The American Radio Relay League (ARRL) celebrated its 75th Anniversary on 14 May 1989. The RSGB's President, Dr Julian Gannaway, G3YGF, sent a special greetings message to the President of ARRL, Mr Larry Price, W4RA, the text of which is given below;

"Dear Larry,
"We have pleasure in writing to congratulate all members of the ARRL on the occasion of your 75th Anniversary.
"What would Hiram Percy Maxim have thought of modern day amateur radio with all of its intracacies, complexities and its legislative framework? Undoubtedly he would have warmed to the active leadership which the League has contributed to the development and fostering of amateur radio throughout its magnificent history.
"The success of amateur radio in terms of technical achievement and international goodwill owes much to the sustained enthusiasm of the League's supporters and the professionalism of its staff. May your next 75 years be as notable and rewarding as the last.
"On behalf of the Council, staff and members of the Radio Society of Great Britain may we offer, in true friendship, our best wishes for your anniversary and for the future.
"Yours sincerely Julian Gannaway G3YGF, President."



"... ANOTHER ruddy Garden Fête!"

MAKE THAT EVENT - SPECIAL

With the special event season almost upon us Paul Thompson, G6MEN, offers some timely advice on becoming an ambassador for amateur radio.

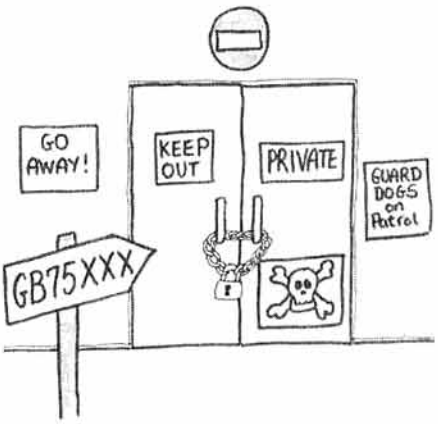
This is not going to be an exercise in 'Soap-box radio', such as you tend to get on packet bulletin boards or in 'The Last Word' in *Radcom*. Rather it is a series of observations, based mainly on the best public amateur radio station I have ever seen (at a small electronics fair in East Lancashire), and on the worst (at a traction engine rally in Cheshire). I hope that these observations, and the gentle advice which I give, will encourage you to plan your event well.

Recently a chap with whom I was in QSO said to me: 'At least it's not another ruddy Garden Fete!' When I explained to him the reason for the GB call I was using, I was only going to touch on the subject of special call signs in passing. After all, this article was planned to be about the actual running of a station in public. However, that comment along with many others heard when the subject came up in conversation, leads me to think that the topic deserves special attention. So, what is wrong with GB call signs?

Since the administration of these passed from civil servants, into the hands of our own national society, many aspects of the granting of special calls have been liberalised. No bad thing in itself. However, there are more and more GB calls on the air, creating less and less interest the commoner they become. So when you are tempted to apply for one, ask yourself if it will be really vital to the running of your station.

In fact, ponder whether you are kidding yourself that there will be any call for your station *at all!* Will you get a polite word from the vicar and his wife as they pass from the tombola to the lucky dip, and then be ignored by the rest of the small crowd as you witter to boring bods ten miles away, on 2 metres? Is your station actually going to be any use? No? Don't bother, then; go to the fete and have a lucky dip yourself!

Seriously, though, will you need a GB call for your purposes? If you do not intend to pass greetings from the public, for example, will your club call sign /P do just as well? Most rally talk-in stations I have heard could function without a special call; indeed the worst abuse of the facility *was* by a talk-in station. It was proudly sporting a GB75 call sign, which was a special privilege granted for stations with public access. In fact the talk-in station was upstairs from the rally, in a suite of private offices reached by several corridors from which the owner of the premises discouraged public access. In short the station was not being operated in the spirit of special callsign rules.



"... not being operated in the spirit of special calls..."

Paradoxically, in the case of stations like those hard-workers who run the Red Rose Award, public access is irrelevant! However you must remember that the RSGB now makes public access a pre-requisite for issuing special event callsigns, and also reserves the right to publish your address. In the case of a "Jamboree on the Air" station for example, where much passing of greetings to and from non-licensed people is planned, a GB prefix is essential of course. No argument about that!

LET'S RUN A STATION

But back to the main topic. Fred or Bill down at the club says "Let's run a station" at some forthcoming event. "Great" says everyone. Fred has a rig, Bill can lend his tent. Charlie will apply for the GB call. Andy can get a trestle table. Nothing could be simpler. Wrong!. Of course equipment, call sign etc. are essential, but much more important is the question; *can you run it?* You may think that any fool can. Wrong again, it's just that many fools do! So the first thing to do when Fred or Bill makes his suggestion is to sit down, figure out what you would *like* to do, and ask yourselves whether you have the resources, time, manpower, and willpower to run it *properly*.

These four considerations run through the three major stages of organisation, which I call Before, During, and After, although as you would expect it's not as easy as that; edges do get blurred as we go along.

BEFORE

This includes all the planning, advance publicity etc., and of course you are already into this stage as soon as the suggestion of the station is made. Many of the resources you need are obvious; overhead cover, tables, display stands, power sources with back-up, transceivers with back-up, efficient aerials, cables with the right connectors, and so on. Some are less obvious, such as tape, fuses, first aid kit(!) TV filters for neighbouring houses, and spares for everything. I often find that having a roll of soft toilet paper in a bag is handy for all sorts of emergencies from spilt coffee onwards. One *really* essential piece of kit is an arrangement whereby received signals can be heard over a loudspeaker by visitors at the same time as the operator monitors them on his own headphones. Psychiatric wards are full of ops who have tried to copy English as she is spoke in Ulan Bator, or boxing-glove morse, whilst struggling to hear above the din of a busy venue.

Planning the layout of the station is important. You need an eye-catching display which will say to every passer-by: 'here is something really exciting — I must get a piece of the action'. If you happen to be stuck in a tent at the side of some event, get yourself a large (and I mean LARGE) banner or hoarding, announcing that amateur radio is on display.

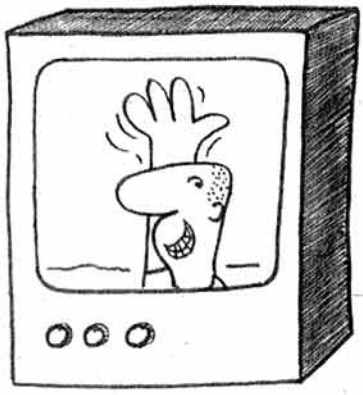
The worst layout I have ever seen consisted of a long trestle table on which was a couple of used coffee mugs, discarded copy of a tabloid newspaper open at page 3, and a tatty, half open ordnance survey map! Behind this, a bored-looking individual lounged on a folding chair, whilst at an HF rig the op flicked between stations. Behind all that a large tent was open, showing an untidy array of sleeping bag, clothes, food etc. Bad planning, bad image, *ergo* bad station.

Sorting out time and manpower does not mean that if you can't man the station constantly during the event you should forget the idea. Far from it. When you are planning the layout, give consideration to the idea of a 'dumb display' when personnel need a break. Can a rig be left monitoring a reliable repeater? Can a screen be left showing traffic on a packet frequency?

You need to be able to put your *best* operators actually at the station controls. Tactfully find other jobs for those who are a touch tongue tied. You also need someone to explain your activity to the public. This is not necessarily your technical expert, rather it should be someone who is a good talker. Unfortunately that will often be your best operator too!

What will the public want to see and hear at your station? So many times, when listening to our news broadcast, I am lulled to sleep by the repetition of the phrase 'operation will be on HF and possibly 2 metres.' HF can be very good, but please remember to check propagation forecasts and operate on the bands where you will get many clear, frequent contacts. Avoid forming pile ups for rare and exotic DX. The public are usually impressed by the slick operating of the best European stations, the friendly chat of the Americans, and most of all by the fact that you can actually talk to someone in Russia.

Bearing in mind people cannot help stopping if they can see their picture on a closed-circuit monitor, why not consider making amateur TV a central part of your display. Doing it on spec is not much good, skeds should be made. Also it is essential to arrange a talk-back facility that does not blot out the monitoring system. Also, bear in



"... people can't help stopping ..."

mind that computers still hold a fascination, especially for young people. Consider demonstrating packet, and consider organising a 'hands-on' opportunity if the licence will permit.

WILLPOWER

Well, if you have got this far, apply for the GB call (if necessary!). By the way, choose a good one. For example, GB4SJS can be ruined if given the mnemonic GB4 Sometown-JOTA-Scouts, and would be better expressed as GB4 Sometown Jamboree Station. For a JOTA station, something like GB1ROB which could stand for GB First Robertsville is a brilliant idea. Blessings on the Red Nose people who consistently had three Rs in most of their calls; one wag was heard calling 'GB8 Romeo, Romeo, wherefore art thou Romeo'!

The last item I offer for your consideration in the before category is Forward Publicity. Sure the local press will be at the vintage car rally — to photograph the cars. Or at the fete — to photograph the Lady Mayoress bowling for a pig. To them you will just be an anonymous component of the goings on, unless you have composed a press release about your club and the station you are planning, and have made sure the editor has had a copy.

DURING

Let me say this straight away: NEVER lose your temper with a visitor to the station. However crass or annoying you think he is being. DO NOT launch into a tirade, and then stump off to puff angrily at a cigarette. I have seen this done. It stinks.

We amateurs tend to take ourselves very seriously, and this sometimes makes us seem a little po-

"... Never lose your temper with a visitor."

faced when talking about the mysteries of our hobby to outsiders. Relax! I have even seen a station where there was a large picture of Tony Hancock as the centrepiece, and I bless the organisers for their willingness to break the ice. The worst station I ever saw did have rather a good idea incorporated in its HF set up — a blackboard marked out to display the weather at places contacted. 'Rome — hot' it said, and nothing more! If the station with the Hancock picture had had the same idea, I am sure that they would have included 'Tokyo — it is ah raining not', and I would have blessed them again!

When having slight linguistic problems with a Spanish station, do not try to address him in dog-Italian. Make it a rubber stamp QSO and clear. Do not smoke. Do not litter.

The During bit ought to go like a dream.

AFTER

This is when the hard work starts. I would leave designing and printing the QSL card until *after* the event, if I were you. It is heartbreaking to have had a print run of a thousand, and then find you have only worked 150 stations, or worse still that the whole event was cancelled. Design of the QSL card should be eye-catching, in order to reflect that there has been a special reason for the station. A postcard-and-felt-tip-pen job will not do at all. If one of your club members or friends has a flair for art or cartoonery, give the job to him or her. An eye-catching design only needs monochrome printing by a local offset-litho firm, and need not cost the earth.

Before you congratulate yourself on a station well run, ask yourself whether the publicity gained was sufficient. The reporter didn't turn up? Well this is where you need an articulate club member to run up a quick press release again, within 24 hours of the event. If you are canny, some of this can even be written beforehand, and if one of your club members is also an amateur or pro photographer you can get some decent shots taken.

I once ran a very small station celebrating the 21st anniversary of a certain national motorcyling club. The handout and photos I supplied resulted in coverage in all three motorcycling magazines I sent them to, the local paper, my employers's in-house magazine, and every amateur radio magazine I sent them to.

If anyone writes to you, whether with praise or complaint, *do not ignore the letter.* Answer it promptly and politely; by politely I also imply *friendly,* because in my book being icily polite isn't being polite at all. Initiate a few letters; thank the organisers of the event, thank anyone special who took an interest, thank everyone who took part in your station. Always vow to do better next time, however well you have done.

I expect I have omitted a great deal which readers consider important. Insurance. Having items on sale. Giving away back copies of radio magazines. If pictures of Tony Hancock are on display, why not those of real hams like King Hussein, Brian Rix or Jim Bacon.

Meanwhile, stay calm all, and *enjoy* yourselves.

Readers are reminded that Publicity Packs and Special Event Callsign Application Forms are available, free of charge, from the Members Services Department at RSGB HQ. Further details concerning the operation of special event stations can be found in Chapter 10 (page 139) of the Amateur Radio Operating Manual.

ANYONE FOR CARDS?

The QSL Bureau is one of the most important RSGB services for members — yet an amazing 40% of cards go uncollected. E G Allen, G3DRN, gives some pointers for a more efficient service — such as knowing when not to 'QSL 100% OM!'

Despite the information supplied upon joining, and also published in the Callbook and other RSGB publications, many members are still not using the QSL Bureau to their own advantage, or indeed in a manner which makes best use of the Society's resources.

It is therefore thought that it will be useful to discuss our guidelines in some detail, together with the reasoning behind them which, after all, constitute the contract under which the Society undertakes to handle cards on behalf of members. Whilst we obviously cannot ask members *not* to QSL, we must entreat them to consider carefully before proceeding. The often-heard phrases like '100% QSL' and 'The last courtesy of a QSO is a QSL' are, to say the very least, unrealistic; and 'My QSL certain' cannot always be relied upon.

40% UNCOLLECTED

Very few amateurs realise that up to 40% of the cards reaching the Bureau remain uncollected and are subsequently destroyed, the position probably being worse in those overseas bureaux where cards are not delivered to non-members of their national society. So far as the RSGB is concerned this results in an annual wastage of over £1,000 in postage. These funds come from members' pockets, and could be better used elsewhere, not to mention the cost of the unproductive cards.

Improving propagation conditions have already greatly increased the Bureau work-load, and as there are limited numbers of staff to handle the extra work, please attempt to rationalise your output. We are sure that readers will understand the necessity to request that only important QSOs are QSLed.

For example, it would certainly help if cards were not obligatory for some awards, and cards are not recommended for contest QSOs or for those made through repeaters. In fact, 'Moderation in all things' is probably as good advice as it ever was. It could be argued that satellite operation is merely 'working a machine', but we will not press the point!

CARD SIZE AND CLARITY

It has always surprised us that so many amateurs, upon entering the hobby, do not ascertain the optimum type of card to adopt. They should be sized 5½" x 3½" and of usual texture, this being an IARU recommendation which will hopefully become mandatory. As most cards for overseas are despatched in open-ended packets, no card larger than this will arrive at its destination without being folded or dog-eared, whereas small cards or those of a paper-like texture are easily lost or creased. Many Special Event stations are guilty in this respect, despite all the prior advice given. It is appreciated that their cards are often supplied gratis or at a discount, but more consultation before the event would prevent much disappointment later.

When filling out your cards, *please* print clearly. This may seem obvious, but some of the scrawl we see would tax the brain of a Scotland Yard handwriting expert! If possible print the addressee's callsign on both sides of the card, so that regardless of how you stack them, we can still read from A to Z.

SORTING

Sort your cards the same way up, alphabetically by prefix. Having said that, since the object is to keep cards for each country together, special calls should be included with the more traditional ones ie EW, LY, R, and YL with U; 4N, YT, and YZ with the YU batch etc. When a QSL Manager is involved, the card obviously goes to him and is sorted accordingly, so that HZ1AB via K8PYD is included with others for the USA. When reciprocal licensing is involved the card goes to the station's home call eg W1/G3DRN in with the Gs and GØ/FZ9AA to France.

In the case of cards for the USA, sort them out according to the numeral in the callsign (we used to say call areas but nowadays they do not always have any geographical significance), regardless of whether the prefix is A, K, N, or W. If you wish to be even more 'on the ball' you can divide those for the 4th area into one-letter and two-letter prefixes. This sorting of cards may not seem too important to Joe Ham with his batch of two dozen, but it assumes major importance to anyone receiving up to three sacks of mail six days per week — a total of about 2½ million cards per year. In fact it could mean the difference between smooth operation of the Bureau and its grinding to a gradual halt.

Please do not space the cards with paper markers, rubber bands etc, as more time is wasted removing these than the sender was trying to save.

Just send in one batch, firmly secured, and the more cards the better — one large bundle, sent every month, is processed more quickly than three or four smaller ones. When sending cards for other G stations, it is not necessary to mention the sub-manager's callsign. This causes confusion, as we sort them according to the addressee's callsign. However it does help when sending cards to /P or /M stations, if an indication can be given as to whether a change of prefix is involved, as we cannot check every one in the Callbook.

Some Special Event stations ask people to QSL via one of their operators or organisers. But this is unnecessary as all incoming cards are routed to the GB Sub-manager, to whom envelopes should be sent.

Send just **one** card per contact, it is increasingly becoming the tendency to send one of the Club or Special Event callsign, plus one's own, plus perhaps one in RSARS or WAB format, with the possible addition of a local picture postcard. This is just not playing the game, folks!

Whilst we are pleased to accept cards from our SWL members, it is fair to say that most which we see give very little useful information to the transmitting amateur. It is felt that as the number of cards increases, they are more likely to respond to those giving details such as general band conditions and other stations being heard at the time.

CARD ROUTES

All outgoing cards must be sent to G3DRN and not to Society Headquarters or our volunteer Sub-managers. It is permissible, if you have a large

batch of cards for one callsign group, to send direct to the appropriate Sub-manager; but make sure you get it right, otherwise you will not be too popular.

Everything possible is done to send parcels of cards to the Sub-managers at intervals of nominally one month, but we are not machines, and circumstances can alter cases. Over the past two years the average interval has been 35 days including weekends.

Having decided to QSL, send your cards as soon as possible after the QSO for, although the Bureau is not the quickest method of despatch, a lot of the delay is caused by the users. The writer is old-fashioned enough to believe that once a promise has been made, it should be honoured even if the other chap's card never materialises.

No-one in the QSL business has the wish, or the space, to delay cards unnecessarily, so please do not make general enquiries to either your Sub-manager or the main Bureau, unless there seems to be a real problem. Many of the calls I receive, usually at unsocial hours, are for information which should already be in the caller's possession.

For the benefit of the newly-licensed, it is usually some months before cards for a fresh callsign group begin reaching the Bureau in quantity, probably because many amateurs do not QSL until receipt of the incoming card.

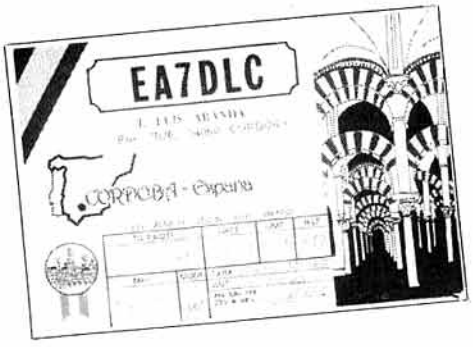
SASEs

Self-addressed envelopes, stamped 14p unless you are exceedingly active (it is surprising how many omit stamps or callsign — one clown had National Savings stamps on his) should be sent to your Sub-manager for incoming cards. The envelopes should be of the manila type, 8" x 6" being a convenient size. The A4 type of envelope will not accept wide cards, and the white 'birthday card' type are far too flimsy, whereas the large ones 'acquired' from your place of employment just clog up the system. Your callsign should be printed clearly in the upper left-hand corner, together with, say, 'Wait Six' if you wish to receive cards before the maximum weight has accumulated. The last one should be marked accordingly so you know when to replenish supplies.

Unclaimed cards are retained for three months before being disposed of, and if you are a regular collecter we prefer you not to wait the full period before sending a fresh batch of SAEs.

If expecting cards as a result of /P or /M operation which involved a change of prefix, it is prudent to lodge at least one envelope with the appropriate Sub-manager covering the area of operation, so as to avoid loss or delay. As was mentioned earlier, 40% of cards go uncollected, so hopefully this article will bring about a change. Either we will see an inrush of new SASEs to QSL sub-managers or fewer 'dupe' cards — maybe even both!

Finally, dear reader, thank your for reading thus far — I am sure that full attention to the points raised will be to the benefit of our Society in general and the smooth running of the QSL Bureau in particular. I cannot however close without thanking them for the many letters of appreciation received. If you hear me during one of my rare appearances on the air, please give me a call. I may even agree to QSL!! □



SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3 FKM

This month from G2HKU, G4QK, GM3CSM, G3s GVV, KSH, YRM, GM4CHX, G4EHQ, GM4ELV, GW4KGR, G4s MUW, NXG/M, OBK, SJG, XAH, XRV, GD4XTT, G0s BXQ/M, CKP, and IHB - to whom many thanks. CW stations in italics:-

3.5MHz

0000 *KP2BH*
0100 *TU4CO*
0200 *ZD8JP*
0300 9Y4MJK
0600 *ZL3GQ*
2200 T5GG
2300 *VQ9QM*

7MHz

0300 V29OA
0500 CE0OHB
0600 *XF4L*
0700 CE0ZAM, CQ3DL, D44BC, TE1L
2100 *TA1W, 8Q7MT*
2200 GM4DMA/VE8, *VK6s LW,RU, ZD8JP*
2300 *9M2AX*

10MHz

0200 *W5TZC*
0600 *W7EXR, ZL3ADX*
0700 *FY5FB, W5PWG/J8, W5-W6*
0800 *K6SS, KL7UPS*
1900 *UW3TT/UJ6J*
2100 *EA8QJ, K5HK/KP5, VK5KL*
2200 *VQ9RM*

14MHz

0000 VU7JX
0600 *KN0E/KH3*, KC6JC, 3D2VN
0700 FO0EXV/M, KL7RA, VR6ID
0800 FO0/DK7UY, NL7HH, VR6KY, ZL7TZ
0900 *FK0BJ*, FO0EXV/A, KP2A/KP5, XF4L
1000 *FO0CW/M, V31BB*
1200 7X5VRK/P
1400 *BYs 1QH, 4RB, XF4L*
1500 *5W1YL*
1600 *JA2NQ/JD1*, P29VOX
1700 T5GG
1800 *N6HR/KX6*, US0SU
1900 AH2AH, JX1UG, SU1FN, VU7APR, ZS8MI
2000 A71BK, S92LB, ZL4BO
2100 S79F, 6T2MG, 9M2CW
2200 A61AB, J52US, JT1T, *VP5V*, 6O1YD
2300 KP2A/KP5, W6, *6O1GG*

21MHz

0600 ZK1TB
0700 JT1BO/3, *KH6IJ*, YI1BGD, ZL7TZ
0800 BYs 1PK, 5QA, FW0BX, KH2/NY6M, UV3CC/UA1P, VK, ZL
1000 JT1KAA, *BY4RSA, FO0CW/A*
1200 JW1UW, 4S7VW
1300 KC6IN, SU1EE, 4D0P
1500 *JT1BR, XU1SS*
1600 *XX9YD*
1700 KP2A/KP5
1800 S01A, *S79MST*, XF4L, ZD8Z
1900 *KH6IJ, S79M*, TL8HW
2000 S79F, VU7JX, 1Z9A
2100 PY0FF, S92LB, ZLs
2200 JA, VK0CC, W6-W7, ZL

28MHz

0600 T5MF
0700 A22RB, BYs 1QH, 5NC, 5RH
0800 A35DX, BY5RA, FW0BX, JT1KAA, S79MST, XX9KM, YK1AA, 3C1MB
0900 S77A, ZL4BU, 5H0T
1000 A41JW, BY1QH, PY0FF, XU1SS, VS6VK
1100 BY1KTG, FH5EF, HS0A, P29VMS, ZLs, 8Q7MR
1200 AP2MB, D44BC, H44/DL2GAC, JY4MB, YI0ACC, 8Q7JJ
1300 *BV2DA*, EP2DL, FR0VD, HL3IID, J52US, KC6s IN, VW, TY9SI, TZ0MAR, VK9LA, SL9FD
1400 A47RS, *VS6DT, VQ9AX*, 6T2MG
1500 D68JL, KP2A/KP5, 9V1XM
1600 FK/JH0NZU, KH6FOO, P40V, VP8UK, *VU2NRO*, XF4L
1700 D68SG, FH8CB, S01A, TL8FF, VP8BUB (S.Ga), XX9TO, ZD9BV, ZP0Y, 3B9FR
1800 FO0EXV, HC8GR, W5-W7, XF4L, ZD9MB
1900 C9MKT, CE0MTY, J52US, V29OA, 4U1U
2000 ZL4OD, 8R1AH
2100 S92LB, V44KG

Acknowledgements to *DX News Sheet* (G4DYO), the *Ex-G Radio Club Bulletin* (WA8TGA), *DX Report* (VK9NS), the *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), *CQ Magazine* (W1WY), *DX Bulletin* (VP2ML), and the *Long Island DX Bulletin* (W2IYX).

For August issue everything must reach me by 22 June please.

QSL BUREAU CLOSURE

Please note that the RSGB QSL bureau will be closed for the whole of June and that it would be very helpful if nothing could be mailed to G3DRN during the month. This break will be used mainly for clearing the backlog of cards on hand and dealing with incoming overseas cards.

1989 FIRST YEARLY TABLE

	1.8	3.5	7.0	14	21	28	TOTAL
G40RK	49	42	98	48	31	85	353
C3SXW	30	39	41	43	38	61	231(CW)
G3TXF	40	18	61	44	15	40	210(CW)
GM3YOR	0	21	71	16	58	23	189(CW)
G3NXG/M	0	3	21	35	28	78	165

Next deadline — to reach YG3GIQ by 8 July. Please note that no new entries will be accepted for the yearly tables after their second appearance. It has also been decided that mobile stations may enter even if they have no 1.8MHz score.

STRAIGHT KEY DAY

The European CW Association's first Straight Key Day will be held on 24 June, organised by SCAG (the Scandinavian CW Activity Group). Everyone is invited to join in and it is *not* a contest but a chance to use a hand key for some relaxed QSOs.

Use frequencies in the segments 3.540-3.570MHz, 7.020-7.040MHz, 14.050-14.070MHz or anywhere on 10MHz. If you make five or more QSOs you are entitled to vote for the best 'fists' worked - one vote for each of the best three chosen. A 'Straight Key Award' will be given to those who receive two or more votes. Send logs and votes to the SKD Manager, SM7RXD, Adjunktsgatan 3D, S-214 56 Malmo, Sweden; no later than 18 July.

QSL Via...

A lot of QSL'ing info came in this month and there was not room to put it in QTH Corner so here is a list : **BY4RSA** Box 538, Nanjing, PR China. **BY5NC** Box 1033, Nachang, PR China. **C45A** via 5B4SA. **C53FV** via G3YMM. **D68CY** Box 85, Moroni, Comoro. **D68JL** via AK1E. **EK0AH** via RW3AH. **KP2A/KP5** via N6CW. **P29PL** via VK9NS. **S79F, S79M, S79T** all via JI3ERV. **SV0AA/5** via N2OO. **TA3B** PO Box 839, Izmir. **V29OA** via W7KNT. **V31BB** via K3FEN. **VP8BFW** via GM4ILS. **XX9YD** via K8PYD. **ZD8CW** via N4CID. **ZP0Y** via ZP5JCY. **3D2VN** via DF3VN. **5W1YL** via HB9CUY. **6O1GG** via I2MQP. Please note that cards for **ZC4AK** should not be sent to G3VHE - this is a club station and problems always arise over QSLing...

DX NEWS

During July, LRAA, the Liberian national radio society, will celebrate the country's 142nd Independence anniversary with on-the-air activities - all licensed amateurs in the country will be using the 6Z prefix in place of the normal EL. There will be an award available to anyone working (or hearing) five 6Z stations during the month - send a certified list and US$5 or ten IRCs to: The Awards Manager, PO Box 987, Monrovia Liberia. TU4BR/5U7 is now in Liberia but his callsign is not known at the time of writing. However, QSLs will continue to be dealt with by KN4F. The *DX Bulletin* says that SU1EK can be found on 28.746MHz at 1300 on Thursdays and Fridays.

OE5NOK/ZL5 is in the New Zealand base area in **Antarctica**. Keith Morrison, G4GCK, who works for the British Antarctic Survey made 1500 contacts from Halley Bay during February as VP8BUY. He visited the **S.Orkney Is** where he did not have an opportunity to operate and also **S.Georgia** where he spent an hour calling CQ without getting a reply!

In response to a proposal from the SARL, the authorities in Windhoek have introduced a new callsign prefix for amateurs in **Namibia** who are members of the United Nations Transitional Assistance Group. The foreign amateur's callsign will follow the prefix ZS3UN/. It seems that

I now have the results of the **1988 CO WWPX (SSB) Contest.**
UK scores are as follows (all single-operator):

GB2FXB	(All-band)	3,374,100	G4OBE	(All-band)	3,430
GB5CO	(All-band)	582,062	**G3XWZ**	(1.8)	3,854
GB5AR	(All-band)	80,838	**GM4HRJ**	(3.5)	19,928
G4KHF	(All-band)	35,108	**GW4BLE**	(21)	720,792
G4YEK	(All-band)	17,052	**GW0DJX**	(28)	1,976

In the QRP Section GW0ARK scored 30.806 and came 23rd in the world listing. In the Multi-operator Single-transmitter class **GB4CDX** scored 3,261,440 points and was 10th European. He was followed by GB5HC with 1,643,224, GB8AU with 877,734, **GD4UFB** with 574,500, GB8PX with 270,336, GB4PRS with 161,109, and GB6SC with 142,262 points.

members of the group who hold a valid CEPT Class 1 or Class 2 licence will be able to operate.

G4OHX advises me that he is *not* the QSL manager for Z21FN although batches of cards have been reaching him. However, he is willing to take on the job if Z21FN will contact him - G4OHX does still QSL on behalf of 5N0ELT.

DX News Sheet mentions reports of an 'A51PN' on 14MHz CW but this could well be a pirate as operation from **Bhutan** seems unlikely just now.. The *Long Island DX Bulletin* says that BY4AA is now very active from 1100 near 14.180MHz.

There will be special activity from Mt Wilhelm (in the Victor Emanuel Range) the highest mountain in **Papua New Guinea** on 3 and 4 June. The callsign will be P29CEH and likely frequencies are 14.195 and 14.305MHz.

Steve, G0HCR, is now living in the **Seychelles Is** for 18 months. His callsign is S79MST and he is currently active on 14, 21, and 28MHz. He has an FT707 and triband dipole. Listen for him particularly on Tuesday evenings at 1800 near either 14.215 or 21.215MHz when he keeps a sked with his QSL manager G4IRG. Other times suggested are between 0900 and 1300 near 28.5MHz or between 0000 and 0100 on the 14MHz frequency. If you QSL via G4IRG please include a stamped self-addressed envelope or IRCs to cover postage.

In a further letter, Emad one of the operators of YI1BGD, says that there are plans to have a special callsign for the University soon and that a diploma is being designed. He emphasises the fact that they do not have a QSL manager outside Iraq and says that YI2ARB is operating from outside Iraq. YI10BGD (April 1988) celebrated the club's 10th anniversary and YI0BIF is on the air every year from 1 to 15 November for Baghdad International Fair. YI0SW was to mark the Arab Youth Scientific Congress between 3 and 7 July 1988. YI1BGD uses a Yaesu FT201 and three-element antenna as well as Atlas and Drake transceivers and a Drake linear. Anyone needing a direct QSL should send two IRCs and a suitably self addressed envelope to the operator worked as follows : Ali (PO Box 7075), Diya (Box 7361), Emad (Box 7482), Majid (PO Box 5864), Saad (PO Box 6100), and Raed and Faris (PO Box 7147).

Steve Bowden (ex-ZD8SB) is now ZC4BS and active on all modes from 7 to 28MHz. He will be in the **Sovereign Base Area of Cyprus** until November 1991 and is happy to QSY to other bands when asked. He has a TS130S and four band parallel dipole and hopes to be upgraded to a TS940S soon.

The trip by Kirsty and Jim Smith to **Banaba (Ocean) Is** may well have already taken place because they were due to be at Tarawa en route for their two weeks stay at the end of April. However, there may have been delays. The callsign to be

OTH CORNER

C56/G3SXW	R Western, 7 Field Close, Chessington, Surrey, KT9 2QD
C56/G3TXF	N Cawthorne, Holt Cottage, Kingston Hill, Kingston upon Thames, Surrey, KT2 7JH
FO0CW/A	French DX Foundation, Box 88, F-35170 Bruz, France
FO0CW/M	As above
FO0EXV/A	As above
FO0EXV/M	As above
JX7DFA	LA2KD, Box 300, 1202 Oslo 12, Norway
T33JS	via HIDXA, PO Box 90, Norfolk Is, Australia 2899
T5YD	via F6AJA, 515 Rue du Petit Ham, Bouvignies, F-59870 Marchiennes, France
US0SU/1	UA0KK, PO Box 44, Pevek 686610, USSR
VP8BUY	via G4GCK, 20 Silverdale Av, Coton, Cambridge, CB3 7PP
XF4L	OH2BN, Kiilitie 5-C-30, SF 00710, Helsinki, Finland
ZC4BS	via G4KIV, Warren Cottage, 14 Pool Hey Lane, Scarsbrick, Southport, PR8 5HS
ZY0SW/S/Y	Natal DX Group, Caixa Postal 597, 59021 Natal, RN, Brazil
8Q7CS	(corrected) via G3NOH, Flat 1, 47 The Avenue, Ealing, London W13 8JR

HF F-LAYER PROPAGATION PREDICTIONS FOR JUNE 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 0000011111122 02468024680 2	24MHz 0000011111122 02468024680 2	21MHz 0000011111122 02468024680 2	18MHz 0000011111122 02468024680 2	14MHz 0000011111122 02468024680 2	10MHz 0000011111122 02468024680 2	7MHz 0000011111122 02468024680 2	3.5MHz 0000011111122 02468024680 2
** EUROPE								
MOSCOW	.....	....1....11.	1.1233222442	3245554456 75	7666655567 88	8643333335 78	64211...1256	3.....24
MALTA	.....	...111111211	2.1333333543	5246655567 76	9787666678 99	9875333346 89	8752111113 57	542.....25
GIBRALTAR	.....	.....	1..121111221	3113433335 53	7557766667 88	9876544446 89	8853211123 68	+52.....35
ICELAND	.....	.....	.....	1...11.11222	5223443345 66	7765444445 67	6653211122 35	332.....2
** ASIA								
OSAKA	.....	.....11.	...121112331	...121112563	....1...1572	.....25.	.....2.	.....
HONGKONG	.....1..	..1111111221	1.1122123553	2...11113675	2.....1576	254	21	.....
BANGKOK	...111..111.	..1222112331	2112232246 64	41..12124787	5.....1588	2.....257	34	.....
SINGAPORE	..111111122.	..1222223442	2121332346 75	52..12124787	5.....1588	3.....257	35	2
NEW DELHI	..111111122.	.12222223442	3222222246 75	5411.1114787	72.....1589	5.....257	2.....35	2
TEHERAN	..1222112221	1133332345 53	4453222357 86	7651..124788	862.....1589	74.....267	51.....35	2.....2
COLOMBO	..1222112231	1123333345 53	4332242357 86	7511121247 88	83.....1589	61.....267	3.....35	2
BAHRAIN	..2222223332	2144333345 54	5453223357 87	87511.124799	973.....1589	84.....267	62.....35	3.....2
CYPRUS	..1222223332	2135444455 54	5467666678 87	8777556789 99	9874322357 89	8741...12478	751.....146	42.....23
ADEN	1123233344 43	4244344666 66	7664223368 88	9872..114799	985.....1589	862.....268	63.....35	3.....2
** OCEANIA								
SUVA/S	.....	.....	....1...122.	..1211.12431	..331...144.	..11.....21.	.....	.....
SUVA/L	3112.....53	4334.....75	33671.....85	12672.....73	..551....25.	..22.....22.	.....	.....
WELLINGTON/S	.....	.....	..1111....21	113221....53	11531.....63	..21.....141	.....1.	.....
WELLINGTON/L	3111.....3	5332.....15	6665.....47	66761.....67	33651....275	.132.....242	..1.....2.	.....
SYDNEY/S	.....	..11211....1	1134321....3	2135311111.5	1.131....1326	...1.....253	.....3.	.....
SYDNEY/L	21.1.....2	4212.....4	53352.....17	43463.....37	2.351.....66	...2.....153	.....2.	.....
PERTH	..12221.....	1134433.....	43344321....	63233211....	62.....12.	3.....251	1.....34	2
HONOLULU	.....	.....	.....111.	..1111..12..	..331...11..	..21.....	.....	.....
** AFRICA								
SEYCHELLES	1.2323334222	4244344464 44	7564233367 77	9762111147 89	984.....1589	851.....268	63.....35	3.....2
MAURITIUS	1.2323444544	2.4435556766	6.6424346889	8272121248 99	965.....1589	862.....267	64.....35	3.....2
NAIROBI	3123234455 44	5345345567 67	8675334468 89	9884111248 99	9961....1589	874.....267	651.....35	32.....2
HARARE	31.3235566 55	6225445578 77	8657333368 99	9876211147 99	9973....1589	8751.....267	652.....35	32.....2
CAPETOWN	...33356674.	...5445678 62	1..7533368 85	3..7321147 98	84.41....1589	8711.....268	652.....35	32.....2
LAGOS	31.2325567 54	5324435578 76	8656533358 99	9873111379 99	9974.....589	8851.....268	652.....35	32.....2
ASCENSION Is	11..3245564 1	231.5345687 3	6632533358 86	8864421137 98	99741....589	8852.....257	652.....35	32.....2
DAKAR	3112323545 43	5334534557 75	8767532337 88	9987421169 99	99751....379	8852.....157	652.....25	32.....2
LAS PALMAS	1..1211223 21	3113433435 53	7446756667 87	9777766668 99	9987644446 89	9874311113 78	7741.....146	44.....23
** S. AMERICA								
Sth SHETLAND	......35453.	......45675.	.....134588.	1113783	1.....577	623.....257	652.....25	32.....2
FALKLAND Is	354542	2....1455765	5....2345888	811..1113789	9541.....579	8752.....257	652.....25	32.....2
R DE JANEIRO	311..2243442	532..3455665	8762133346 88	9883221125 89	99741....279	8852.....47	652.....25	32.....2
BUENOS AIRES	3111.2243442	5322.3355565	8655.3335688	9876.2113489	9975.....169	8852.....37	652.....15	32.....2
LIMA	2...1.121122	4211212322 44	7534422322 47	9866411111 37	99751.....6	8752.....3	552.....1	22.....
BOGOTA	1....1.11122	31.1221222 34	7433432322 36	8755421112 7	89752.....5	7752.....2	552.....	22.....
** N. AMERICA								
BARBADOS	2...11111122	4211222322 44	7534432212 57	9866421114 8	99751.....17	8752.....4	652.....1	32.....
JAMAICA	1.....11	31..1111112 3	6322221211 25	8644321116	88752.....4	6752.....1	352.....	.2.....
BERMUDA	1.....11	21...1111123	6322221211 36	8644321127	88752.....5	6752.....2	452.....	.2.....
NEW YORK	1	1.....12	421..1111124	7532111115	78641.....3	5752.....1	252.....	.2.....
MEXICO	.....	1.....12	42111.111113	6532211113	58641.....	2752.....	.42.....	.....
MONTREAL	.....	1.....12	42...1111124	6421111112 5	78641.....3	4752.....1	242.....	.2.....
DENVER	.....	.....	21.....1	4321.....1	3653.....	1452.....	.22.....	.....
LOS ANGELES	.....	.....	11.....1	2211....1..1	15531.....	.352.....	.12.....	.....
VANCOUVER	.....	.....	1.....	1111.....	13531.....	.242.....	..2.....	.....
FAIRBANKS	.....	.....	.....	11111....1..	.1331....1..	..21.....	.....	.....

The provisional mean sunspot number for April 1989, issued by the Sunspot Index Data Centre, Brussels, was 129.3. The maximum daily sunspot number was 185 on 8 April, and the minimum was 92 on 13 April. The predicted smoothed sunspot numbers for June, July, August and September are respectively: (classical method) 175, 181, 183 and 183; (SIDC adjusted values) 179, 185, 187 and 186.

8Q7CS January 1989 — George, G3NOH (left) and Gareth, G4HIP

used is T33JS and QSLs will be dealt with by the HIDXA. Jim asks for only T33JS cards to be sent and no others at the same time. It is believed that Banaba Is may well count as a new country and the DXCC desk has already been approached. Donations to HIDXA are welcomed and those exceeding $10 will be receipted. Jim hopes to set up arrangements for a future multi-operator expedition at a later date.

John, G3XWK, has pointed out an error in April HF where the CQ zones of Chinese stations were referred to. To make amends here is a complete list of prefixes and the provinces to which they apply:-

BY1 (Beijing);
BY2AA-IZZ (Hei Long Jian)
BY2JA-QZZ (Jilin);
BY2RA-ZZZ (Liaoning)
BY3AA-FZZ (Trianjin);
BY3GA-LZZ (Nei Monggol Zizhiqu)
BY3MA-SZZ (Hebei),
BY3TA-ZZZ (Shanxi)
BY4AA-IZZ (Shanghai):
BY4JA-QZZ (Shandong)
BY4RA-ZZZ (Jiangsu);
BY5AA-IZZ (Zhejian)
BY5JA-QZZ (Jiangxi);
BY5RA-ZZZ (Fujian)
BY6AA-IZZ (Henan);
BY6JA-QZZ (Anhui)
BY6RA-ZZZ (Hubei);
BY7AA-IZZ (Hunan)
BY7JA-QZZ (Guangxi Zhuangzu Zizhiqu)
BY7RA-ZZZ (Guangdon);
BY8AA-IZZ (Sichuan)
BY8JA-QZZ (Guizhou);
BY8RA-ZZZ (Hunnan)
BY9AA-FZZ (Ningxia Huizu Zizhiqu);
BY9GA-LZZ (Qinghai)
BY9MA-SZZ (Shaanxi);
BY9TA-ZZZ (Gansu)
BY0AA-MZZ (Xinjian Uygur Zizhiqu); and
BY0NA-ZZZ (Xizang Zizhiqu).

As far as *CQ* Zones are concerned only stations with prefixes in the series BY3GA-LZZ, BY9A-FZZ, BY9G-LZZ, 9TA-ZZZ, and all BY0s are in Zone 23.

Advice from *DX-NL* if you need a card from YN3CC, who asks for cards by registered mail. These are being stolen, but requests marked 'printed matter' seem to get through!

Bear Is, which counts as a separate country for some awards, will be activated by JW7FD from now until the end of the year. JX7DFA is on **Jan Mayen Is** until early October - look for him at the low ends of the CW bands.

TABLE SERIAL NO 28
ALL-TIME BAND TABLE CURRENT COUNTRIES NO 10

CALL	1.8	3.5	7.0	14	21	28	TOTAL	
G3KMA	130	242	307	321	319	305	1624	
G3GIQ	71	210	265	319	318	300	1483	
G3XTT	160	209	259	301	289	265	1483	
G3MCS	64	211	259	314	314	294	1456	
G4GIR	103	216	256	299	289	269	1432	
G4BWP	107	220	256	299	279	263	1424	
VK9NS	109	205	259	309	285	250	1417	
G4DYO	66	184	233	309	302	283	1377	
G3UML	33	219	238	317	289	251	1347	
G3XQU	58	181	211	303	279	261	1293	
G3ALI	2	223	238	305	278	240	1286	
G4OBK	124	154	200	274	242	221	1215	
G4LJF	31	201	231	287	252	207	1209	
G3NOF	5	98	101	317	318	276	1115	
G3IGW	105	148	234	226	190	172	1075	
G3YMC	80	110	183	248	252	199	1072	
A92BE	40	126	159	290	235	201	1051	
GM3YOR	75	139	193	220	205	182	1014	(CW)
GW4OFQ	52	222	196	215	189	135	1009	
GM3PPE	69	164	167	199	191	152	942	
G4JBR	62	142	124	142	156	172	798	
GM4ELV	36	93	142	189	126	129	715	(QRP)
G0HSD	1	100	105	147	168	161	682	
G3JXN	19	46	104	154	129	191	643	
G3NXG/M	0	29	56	185	191	180	641	
AVERAGE	64	164	199	260	244	222	1153	

Next deadline — All-Time (with deletions) to reach G3GIQ by 8 July.

BEACONS

W6WX/B - the 14.1MHz beacon located at Stanford University which was stolen a few months ago should be on the air again by now. The eight-year old TS-130 which was stolen has been replaced with a TS-140. N6EK has been working on the prototype of the new multi-band beacon control unit based on an updated system created by W6QHS, and N6ST on the clock systems. The assembly will be done by K6LLK and it is hoped that all three chains on 14, 21, and 28MHz will be operational. It would be great if only the packet users who are at present making the 14.1MHz beacon chain difficult to hear could be persuaded to move away - but how can we do this?

PROPAGATION

Smithy's report this month reads as follows:

"Much has already been said and written about the events of March 1989. The good HF conditions of the second half of February extended into the first week of the new month but on March 6th a very active sunspot region emerged from behind the sun and there began a succession of major solar flares lasting 12 days. The first of these is said to have been the largest since the record flare of August 1974 but it did not greatly affect HF band conditions because of its position at the edge of the disc. Another, three days later, was reported as being even more powerful.

Though not up to February's standard, conditions remained reasonably good up to the Commonwealth Contest weekend but on 13 March the recent flares resulted in a severe geomagnetic storm accompanied by a major visible and radio aurora. There followed 48hours of virtual blackout of HF communications except at low latitudes and the second half of the month remained mostly disturbed with an average A-index

1989 28MHz COUNTRIES TABLE

G0CKP	151 (CW)	G4OBK	100
G0IHB	135	GD4XTT	98
G4XAH	134 (SSB)	G0BXQ/M	85
G4MUW	130 (SSB)	G4NXG/M	83
G4DXW	128	G4SJG	72
GM4ELV	122	G4SDK/M	54
G4ZYQ	112	G0JSM	41

of 25 and only two days below 15. Prior to all this the average geomagnetic activity associated with the present solar cycle had been distinctly lower than with its predecessor. It will be a month or more before the final magnetic indices are available but there are signs that the average for March may prove to be among the highest on record.

As might be expected, the solar indices also rose with the passage of the active region, though not as high as in the period from December to February. The provisional monthly average solar flux was down to 208 SFU and the corresponding monthly sunspot number was only 131. One solar rotation after the March peak the daily solar flux had fallen to only 180 sfu and by the middle of April the 27-day average had sunk from its late January high of 242 to only 187. It is not at all unusual for there to be such a fall after a rapid rise such as occurred in December and at such times the movements of average solar flux and sunspot numbers are sometimes out of step by about a month as they seem to be at present.

Both will probably be moving upwards again by the time this is read but the fall, coinciding as it did with the seasonal decline in northern hemisphere MUFs, made a very marked difference in HF band conditions. The latest available official predictions still point to a high peak, comparable with, if not above that of, Cycle 19 and occurring late this year or early in 1990.

VHF/UHF

NORMAN FITCH G3FPK

Whenever there is a massive aurora - like the one we enjoyed on 13/14 March - there's an even chance that a repeat could occur 27 days later. So we were eagerly awaiting a return match around April 9/10 - but unfortunately the fixture was cancelled. Incidentally, the 27-day repeat is not because the sun makes a complete revolution on its own axis in that time; it actually does that in about 25 days. By the time a particular point on the sun's surface is pointing directly at Earth

again, our planet has moved approximately 27 degrees around its orbit in the same direction, which accounts for the extra couple of days.

The only band which has produced anything interesting during the past month is 50MHz. The majority of today's radio amateurs would not have been licensed when this part of the VHF spectrum was available in the pre-war and immediate post-war eras, so there's everything to play for in the way of new countries to work and propagation puzzles to be solved. "Smithy" G8KG, has some observations on the latter - read on...

50MHz

Most observers of the opening to Japan on 25/26 February noted that the signals were strongest well off the Great Circle azimuths and "Smithy," G8KG (SFK) has written, "It seems most likely they were (propagated) by means of scatter. Although F2 MUFs were very high at the time, as evidenced by the contacts with VS6 and VK, the median prediction for those paths with the existing level of solar activity was in the low 40s, calling for a 'lift' of no more than 25%, well within the probabilities on 'Six.'

"The most likely scatter region was the area south of the Caspian Sea, needing only about 20% lift, and the very strong Russian video signals supports this. The path from Tokyo would not have needed more than 30% lift and that only at the Tokyo end. This scatter location fits the beam headings observed by G stations and would imply that the JAs found it necessary to beam around 295° rather that the 336° of the direct path. An alternative, but less likely, scatter region would have been south of India, JAs beaming about 285° The rather wide spread of beam headings seen by UK stations is characteristic of a scatter path.

"The geometry of the suggested path is quite similar to that by which Gs contact North American stations with both ends beaming towards the Caribbean or South Atlantic, and this is a familiar mode on the HF bands when the direct path has faded or did not quite make it. If asked to stick my neck out, I would say that G/JA by direct path is most likely to occur in November near a solar peak - say 1989 or 1990."

Smithy's deductions emphasize the need to record unusual quirks of propagation on your Rx input.

On 144MHz we are quite used to very selective Sporadic-E propagation; a DX station 70dB over noise at your QTH may be inaudible a few kilometres away. The same thing is being reported on 50MHz, even though the propagation mode is different, a typical example occurring on 21 April when CX4HS (GF17) gave several Gs their first Uruguay contact. Ted Collins, G4UPS (DVN) ascertained that CX4HS started at 1715 with ZF1FC. Next, he worked David Evans, G3OUF (HFD) at 1716 for the first G/CX contact - good to see El Supremo at HQ working the DX, nice one Sir - followed by G3JVL, G4NDG, G4JGD, then at 1722 F6CSX in Marseilles, G6ATW, G4JCC, G3WOS, G8ADM and at 1726 G1NRM. Ted heard nothing of him in Hemyock in this brief event and I don't know if the beam headings were Great Circle or something odd; did any of the above have time to check?

During the last week of March Mike Devereux, G3SED (HPH) lists many QSOs with southern African stations on a daily basis via TEP mode. Peak times were between 1000 and 1300, and on good days he noted a further 'greyline' peak at around 1730. Other African contacts included TR8CA at 1450 and J52US at 1520 on the 26th, G3GJQ/5N0 at 1115 on the 29th (on which day Z23JO copied Mike's CW at RST519 at 1126) and J52US again at 1315. LU9AEA was worked at 1205, with LU8MBL and HC5K heard but all on the same frequency! KP2A was contacted at 1240. The first three days in April brought more ZSs plus TR8CA at 1345 and F6BJH at 1809 on the 2nd.

George Ripley, GD3AHV, runs 8W to a 4-element Yagi and mentions DX worked from February to early April. In the aurora of 13/14 March he worked 87 stations including nine PAs, with SM7BAE on the 13th and SM6PU on the 14th. On 1 April he caught the opening to Argentina, which seemed to favour stations in the west of the British Isles. Between 1320 and 1356 he contacted LU8AHW, LU9AEA and LU1DMA (GF05) and LU6DLB. George wishes to remind readers that UK stamps are not valid in the Isle of Man, which - like the Channel Islands - has its own stamps. An IRC should be sent if a direct QSL is needed.

Geoff Brown, GJ4ICD, gave me his report at the VHF Convention. He lists QSOs as follows; 22 March from 1314, ZS3AT, ZS6s CE, ADH and LW. 6CE and 6ADH were worked on 50.400MHz FM at S5. Other QSOs were with ZS6XL, ZS4AAB, ZS6BMS and ZS6LN. On the 25th from 1335, ZS5QM, ZR6A, ZR6WI, ZS4NS and ZR6ARN; on the 26th from 1030, ZS6s CE, XL, A, BMS, ZS4s NS and AVR, ZS3AT, ZS5AAX (KG50) and ZS6AXT with J52US, ZS3DM and ZS6XL from 1400.

SM 50 MHz PERMIT HOLDERS AND WORKING CONDITIONS

Call	Grid	QTH	ERP	Notes
SK0UX	J099	Kvarnberget	3	
SM0CHH	J089	Tullinge	3	Also SM6CHH
SM0DRV	J089	Skarholmen	3	Also SM5DRV
SM0HP	J099	Brottby	3	
SM0MXR	J089	Tumba	3	Also SM3MXR
SK2BF	KP05	Lulea	10	
SM2BYA	KP07	Kiruna	50	
SM2CEW	KP15	Lulea	10	
SM2LTA	KP07	Kiruna	50	
SK3SN	JP80	Sandviken	3	
SM3MXR	JP80	Jarbo	3	Also SMOMXR
SM5CPD	J089	Huddinge	3	
SM5DRV	J087	Osterbymo	3	Also SMODRV
SM6AEK	J066	Aled	50	
SM6ASD	J067	Goteborg	10	
SM6CHH	J057	Hono	10	Also SMOCHH
SM6CKU	J067	Fjares	50	
SM6CMU	J057	Kingsbacks	50	
SM6CVL	J067	Partille	10	
SM6DWF	J057	Goteborg	10	
SM6EHY	J067	Hindas	3	
SM6ESG	J067	Varberg	50	
SM6PU	J067	Malsryd	10	
SM7AED	J065	Trelleborg	50	
SM7BAE	J065	Staffanstorp	50	
SM7BKH	J065	Malmo	50	
SM7FJE	J065	Vellinge	50	
SM7FWZ	J077	Tennhult	10	

Frequency range 50-51MHz
Modes A1A, J2B, F1B, J3E and packet radio
Permits expire 31 December 1989
Transmissions on 50MHz forbidden during TV hours

Power restrictions are based upon distance from the TV transmitter on Ch.2 in Orebro (J079), QRG 48.2396MHz vision and 53.7396MHz sound. Up to 150km from TV TX, no amateurs have been granted permits. 150-200km 3W ERP. 200-250km 10W ERP and over 250km 50W ERP.

There is another Ch.2 TV TX in southern Sweden running one watt. No permits have been issued to any SMs within 75km of it. From 75-125km 3W ERP. 125-175km 10W ERP and over 175km 50W ERP.

More African QSOs were made from 1216 on the 27th, with many ZS6s, ZS5AV (KF59) and other ZS/ZR5s, G3GJQ/5N0 and ZS4BU, all plus 9H1CG via backscatter. At 1250 5H1HK was copied on CW. From mid-morning on the 29th, ZS3 and ZD8 beacons were copied, and at 1140 the FY7 beacon was S6 at QTE 210°. The first GJ/LU QSO was with LU9AEA at 1204, followed by LU8MBL (FF57), with LU8s YYO and EKB heard. 9H1BT was worked at 1230, again via backscatter; later on, beacons CT0WW at S4 and FY7THF at S6 were heard. The ZS3 beacon was copied most of the day on 8-11 April, and LU1 and LU3 stations were heard on the 12th at 2030.

Keith Boleat, GJ6TMM, also handed his report to me at the Convention. He operated in the big aurora from 2200 to 0215 and worked 22 squares, eleven of which were new. His tally comprised 39 Gs, two GIs, three GWs, seven PEs, a GM and an EI. On the 15th at 2200 he contacted 9H1s CG and GB; on the 25th from 1206, ZS4AAB (KG11), ZS6SS (KG34) and ZS4NS (KG32); on the 26th at 1327 J52US (IK21) and on 12 April at 2024, LU1DMA, LU2EIO and LU3EX - all in GF05.

Dick Drake-Brockman, GM4UPL (HLD) reports a confirmed QSO with CX4HS at 1331 on 29 March, when he also heard a couple of LUs. He uses an IC-202S, MuTek transverter and ". . . a 3 element Yagi behind a large block of granite and gneiss." He admits to hating CW but realizes that it could occasionally bring a little more in the way of exotic contacts.

To conclude the 50MHz section, some items from G4UPS's daily record of activity and news. In Brazil a robot station, PY5EJ - sounds similar to the Italian one on 28MHz - is operating on 50.280MHz. It will respond to calls on CW, FM and SSB and runs 10W to a vertical antenna at present: more power is promised, according to informant PY5ZBU. The Diego Garcia station - VQ9SG, presumably - has worked JA, VS6 and YB0, and VQ9 operators are monitoring 50.110MHz continuously. ZS8MI on Marion Island is now QRV using an Icom IC-551D at 80W. QSL via his home call, ZS6PT, which is only correct in the 1988-9 Callbook. G3GJQ/5N0 QSLs have been rejected by the RSGB Awards Manager; it seems that no permits have been issued in Nigeria because the military uses this part of the spectrum. SV1DH (SZ2DH) said on 20 April that further 50MHz permits would soon be issued in Greece.

STOP PRESS: Ted reports a good

opening to ZS on 28 April and that Greek stations were working into South Africa. It seems that many permits were issued on 26 April. More details later.

On 4 April, Ted recorded auroral QSOs from 1808 with GM0EWX, GM3WYL (IO75), GW3MFY (IO81) and GI6GBK (IO65). He heard GM8COX on CW. The event fizzled out by 1920. On 11 April from 2150 ZD8MB had SSB QSOs with G4GLT, GW8ZCP, G3UVR, GW3LDH, G1KDF, G1SMI, G1SWH, G3USF, G1AHM, SV1OE, G4IFX, GI8YDZ, G6ION, CT1OQ and CT4PI. On CW, Mike contacted G4PUH, G2ADR, FC1MKV, GI4OPH and G0GZI. He called GM0EWX at 2222 but Calum did not reply. The last QSO was at 2353 and note the geographical spread of those QSOs - from Portugal to the Hebrides, and Ulster to Greece.

On 21 April, LU8MBL worked G3ZYY and G6ION (CNL) at 1520. At 1717 CX4HS was working G4NDG and G3JVL but nothing was heard chez G4UPS and G3ZYY. Fascinating that some openings are quite widespread while others are so very selective.

70MHz

The only reader mentioning 70MHz this month is John Acton, G1DOX (AVN), who records contacts on 5 March with GJ6CSY/P and on the 26th with G3UKV (SPE) and GW3MHW (DFD). The Fixed Contest took place just after the deadline, so hopefully there will be something more to report next month.

Issue 5 of QSB, Roger Banks's newsletter, has been published and now includes an annual activity table. In his editorial, Roger criticizes the Society for holding one leg of the Cumulatives on a Bank Holiday weekend - 26 March. What do others think; should holiday weekends be free of contests? Your comments, please! Technical offerings include notes on various Pye products which can be adapted for 70MHz use, the third part of the 4CX250 amplifier project and antenna notes. There is a page of 'Who's on Where' which lists GM0EWX on the Isle of Skye with 10W and a Cue-Dee 50/70MHz dual-band Yagi; GM0FET (WIL) with 0.25W; EI9FK on 70.205MHz and GM3TAL (FFE) with 50W and a 4-element Yagi, who may be out portable at Loch Fyne (SCD) in the summer. G3UKV may be /P from a Scottish island; Martyn's telephone number is 0952 255416 if anyone wants the latest news.

144MHz

As observed from G3FPK, tropo conditions have been — well — awful for several weeks, which probably accounts for the relatively few letters this month. Reports about the huge aurora of 13/14 March are still coming in, so no apologies for harking back to it.

Andrzej Kaleta, SP6GVU, from Wroclaw is an RSGB and G-QRP Club member and took part in the event. At his home station (JO81LC) he uses an IC-202S, 30W PA and 17-element F9FT Yagi; Andrzej operated from 1525- 1855 on 13 March and made 20 CW QSOs with D, LA, ON. OZ, PA, RB5SM and Y stations. From 2116 he operated as SP6GVU/A (JO81NG) using the same equipment but with two Yagis and this session brought a further 40 CW and 12 SSB contacts. The Gs worked were 0s AEI, BBZ, KPH; 3s KPV, NNG, NOH; 4s ASR, MKF, PIQ, RRA, XBF, XDZ. Other countries contacted were D, F, HG, I, LA, ON, OZ, PA, SM, UQ2 and YU. Best DX were OH5LK (KP30), UZ3DD (KO86) and RW3AZ (KO85). He closed down at 0236 on the 14th. Later that evening Andrzej worked SM5CBN (JO78) and DK1KO (JO53).

David Farries, G4VBG (TWR) uses an FT-102 and LT2S transverter from SSB Electronics. The output is 100W to a 14-element MET Yagi. Dave confined his report for the first quarter of the year to auroral events, 17 being listed; in the 'big one' on 13 March he made 38 QSOs with a dozen countries. From 1742 his best DX includes OK3TTL (JN88), UB5YAR (KN28), HG0HO (KN07), HB9QQ (JN47), SP9CSQ (JN99), OK2PZW (JN89), HB9DKM (JN37), HG1YA (JN87), SP6LB (JO70), OY9JD (IP61), OZ2KZR/P (JN89) and SP1KGU (JO74). Others heard included I4XCC, YU2VR and YU3ZO.

On the 14th David worked G, GM, OZ and SM6 stations between 1825 and 1903; on the 18th at 1600 GM4UFD (IO97); on the 19th, 1345-1626 D and LA stations, and at 1600 some GMs. Beacon SK4MPI was copied at 1800 on the 22nd with GM1SZF (IO88) worked on SSB at 1806. Next QSO was with OZ2ST (JO45) at 2246, with UR2RJ heard at 2255. The last contacts started at 2317 with SM4KYN (JO79), both stations beaming 30°, and LA8KV (JP52) with SK3LR heard. No G stations were heard in this latter event from 2130 onwards. Another station only eight miles from Gateshead heard no auroral signals at all! The last event reported was on 28 March when G, GM, OZ and PA stations were heard between 1800-1900.

John Wimble, G4TGK (KNT) has been rather inactive so far this year but did work GM1SZF in the big March aurora. He wonders why Humberside has been split into north and south areas; dunno guv, another one for the Contests Committee to ponder. And yes, John, there is an RSGB Squares Award. Send an SASE to Ian Cornes, G4OUT, for all the details.

Mark Holloway, G4YRY, (DOR) uses 25W to two stacked 14-element Parabeams, the top one at 40ft, but his QTH is at sea level. He lists auroral contacts on 13 March, best DX being SP8AOV and SP9CSQ. The visual event was nearly overhead with a large red band from the north till about 2330. On 8 April, at moonset, he made his first EME QSO with W5UN (who else?) doing the honours at the other end - this time Mark ran 80W.

Tom Astbury, GM0GMD (CTR) uses a TS-700 with preamp, 80W amplifier and 9-element Yagi at 18ft. He reports on the big aurora on 13 March, starting at 1800. Most QSOs till midnight were with more local countries, but after midnight he worked SP2HHX (JO94), RQ2GAG (KO26) and SP6GZZ (JO82) on CW. On the 14th from 1920 many Gs were contacted on CW, with loud GMs and weak LAs and SMs heard. On 19 March Tom operated in another aurora from 1355-1700, best DX being OY9JD at 1400. Other countries worked included D, G, LA, ON, OZ, PA and SM. GM4IPK was audible till 1910. Further events were noted on 22 and 27 March in the late evening and on the 29th from 1908 CW QSOs were made with G4YHF (IO92), G4ZTR (JO01) and G0GAG (IO93). There was a weak event from 1625 on 1 April and a better aurora was in progress at switch-on on the 4th; this produced CW QSOs with G1DWQ (IO90), EI4DQ and EI5FK (IO51), G4YHF, G0FLP (JO02) and GW3KJW (IO72).

GM0EXN reports that Arthur Dorsett, GM4PSX, on the island of Sanday (OKE) is installing a tower and plans to deck it out with four Yagis - should be good when he gets going. Incidentally, GM4IPK a little further to the north on Shetland had a JCB on site at press-time digging the foundations for his heavy-duty tower. Andy is threatening to put up four five-wavelength Yagis although he's intending to start off in a small way with four 15-element Cue-Dees. His 3CX1500 amplifier is still misbehaving somewhat but Andy reckons he'll have it sorted soon. Andy has also put the Lerwick beacon, GB3LER, back on the air; it's now running the proper 10W into some decent feeder.

ANNUAL VHF/UHF TABLE

Callsign	50MHz Cty	50MHz Ctr	70MHz Cty	70MHz Ctr	144MHz Cty	144MHz Ctr	430MHz Cty	430MHz Ctr	1.3GHz Cty	1.3GHz Ctr	Total Points
G6HKM	49	16	—	—	59	22	34	12	5	5	202
G1DOX	26	3	33	6	57	13	20	3	2	1	164
GG8PYP	23	6	—	—	35	13	18	6	—	—	101
GJ6TMM	28	12	—	—	23	9	1	4	—	—	77
G3FPK	—	—	—	—	52	19	—	—	—	—	71
GW4FRX	—	—	—	—	44	21	—	—	—	—	65
G4TGK	—	—	—	—	34	5	—	—	—	—	39
GM0JOL	—	—	—	—	26	10	—	—	—	—	36

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

RULE 16

My comments in the April issue concerning the VHF Contest Rule 16 caused some dismay, to put it mildly. It now seems that the VHF Contests Committee did not intend that the use of amplifiers with two 4CX-series valves would necessarily contravene the rule in unrestricted power events. John Quarmby, G3XDY, who was the Committee's Chairman at the time, drew my attention to a note on page 70 in the March *RadCom* modifying the wording of the rule as published in January. I wrote my comments before that issue arrived, so was unaware that the Committee's intentions had been so widely misinterpreted that an amendment had been made.

THE TABLES

In my opening piece in the April issue I promised you a couple of tables to introduce a little friendly competition into this column. The response so far has been disappointing, but these ideas usually take a while to get established. A modest start has been made, as you'll see, so perhaps others will now go through their records and put in entries.

Such tables will be a useful addition to Spectrum Analysis since they enable us to judge how good, or poor, conditions were over a particular period; the better the conditions, the more counties, countries and squares we work. They also reveal that some operators in unexceptional locations consistently achieve good results, so if that sets you thinking, "Why can't I match his performance?" that's no bad thing!

To recap briefly, the Annual Five-Band Table covers the 50MHz to 1.3GHz bands, the counties being the 79 listed on page 63 in the January *RadCom*. Up to three contacts with different stations in each of the twelve Scottish regions may be counted, so there's a maximum of 36 points available from Scotland. No Irish Republic counties though, and the countries are the accepted DXCC ones. The Locator Squares Table covers 50MHz, 144MHz, 430MHz and 1.3GHz and the starting date is 1 January 1979, not as incorrectly printed in the April issue (sri - Ed). Both tables are based on unconfirmed contacts by all direct station-to-station modes - which means that repeater, packet relay and satellite-transponded QSOs are unacceptable.

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	144MHz	430MHz	1.3GHz	Total
G6HKM	71	197	107	45	420
GJ6TMM	62	151	47	—	260
G3FPK	—	236	—	—	236
GW4FRX	—	212	—	—	212
G4TGK	—	130	—	—	130
G8PYP	32	77	15	—	124
G1DOX	33	61	11	3	108

No satellite, repater or packet radio QSOs.

REPEATERS

Paul Taylor, G4OHB, writes to say that the UHF repeater GB3EH commenced operation on channel RB8 on 18 January from Edge Hill, six miles NW of Banbury. The hardware comprises a Pye 412 base station with two Pye AE450 cavities (one in notch mode on TX, the other in bandpass mode on RX), a four-stack dipoles array for the TX producing 18W ERP, and a C8 type colinear antenna for the RX. Coverage of the Banbury and Stratford-upon-Avon areas is now very satisfactory. The logic was built by Steve Powell, G8PYT, and provides a signalling tone of 875Hz with callsign interval and timeout set at 256 seconds. Initial access requires the normal 1750Hz toneburst, a reply pip being sent after any over exceeding four seconds. The repeater waits eight seconds for further input before closing down. For further information, reports and donations contact G4OHB or G8CQH, both QTHR.

DXPEDITIONS

First of all, a reminder that VHF operation from the Out Skerries group in the Shetland Islands should be in progress when you read this; see 'WAB News' on page 15 in the April issue for full details. Next some tempting bait for squares hunters. Many readers were able to make their first contact with VR square (IO57) last year, thanks to the members of the Five Bells Group who operated from St.Kilda. This year they have obtained permission to operate from the uninhabited island of North Rona, 45 miles north of Cape Wrath. G4NPH, G4ODA, G4YHF and G8IJC are confirmed operators so far.

The QRA Locator is XT71b (WAB HW83) and the callsign GB4XT has been requested. Most of the coastline consists of cliff faces, and they aim to land on 11 July and operate from the 12th to 19th inclusive in the 50MHz, 144MHz and possibly 430MHz bands. Further details will be given next month; however, they will not be making any prior skeds since the landing will depend on the weather. Once there, they will be on the 14MHz VHF net around 14.345MHz. VHF propagation from these northern climes can be quite fascinating, as the St. Kilda operation last year proved. Auroral scatter activity is very likely from XT (IO79), with auroral-E mode also on the cards - particularly on 50MHz.

Lastly, I was handed a leaflet at the VHF Convention detailing another northern DXpedition, by members of the Aberdeen ARS - this time to Foula Island in the Shetlands Group. The locators are YU70d, IP80XD and HT93 and the dates are 9-14 August to coincide with the Perseids meteor shower. Activity on 50, 70 and 144MHz is promised, as follows: GM0FRT/P, 50.160MHz all modes; GM0FRT/P, 70.170MHz all modes; GM4CAN/P, 144.180MHz SSB and GM4CAN/P, 144.080MHz CW and CW MS. Stewart Cooper, GM4AFF, will arrange skeds, and he can be contacted via packet radio at GB7CQV or through the Aberdeen ARS at 35 Thistle Lane, Aberdeen. They will monitor 14.330MHz daily, 1400- 1600 during the expedition to arrange skeds.

METEOR SCATTER

June is quite a good month for MS enthusiasts for both shower and random operation. The radiant of the Arietids shower (Right Ascension 39° Declination 24°) is above the UK horizon between 0100 and 1800. Best sked times in various directions are as follows: N/S, 0600 and 1300; NE/SW, 0700, with a lesser peak at 1430; E/W, 0900 and NW/SE, 1200 with a lesser peak at 0430. 11 June should be the best day. Next, we have the Zeta (usually called June) Perseids (RA 63° DEC 27°) "available" between 0200 and 1930. Best sked times: S 0700 and 1500; NE/SW 0900 and a lesser peak at 1600; E/W 1100 and NW/SE 1300 with a lesser peak at 0600. June 13 should be the best day. Four minor showers should peak around 17-21 June so random operation could be profitable.

Several more showers should peak around the 26th, such as the Beta Taurids (RA 84°, DEC 24°) whose radiant is above our horizon from 0300 to 2000. The curves are very similar to those for the June Perseids. Note that a few hours either side of all these best sked times should bring reasonable reflections.

I have written a couple of comprehensive computer programs for the Amstrad PCWs, based on the DL5MCG program published in issue 1/86 of DUBUS magazine. The first gives percentage efficiencies of reflections from your QTH in eight directions round the compass at 22.5° intervals. The second is for a sked between two specific locations, with the efficiencies displayed in percentage and histogram form. I will copy to your formatted CF-2 or CF-2DD discs, but please write to me first for further details enclosing an SASE.

OBSERVATIONS

Self-training in radio communication is one of the main reasons why we are granted amateur radio licences. Amongst other things, the amateur does not have to account financially for the time he spends in research! Much of our detailed knowledge of the mechanics of propagation has resulted from years of patient collection, collation and analysis of data which commercial organisations might be reluctant to fund.

A typical example of such dedication is Charlie Newton, G2FKZ, whose research into auroral propagation is quite unique. In turn, he relies upon our reports and observations like the one sent by John Eden, GM0EXN (HLD). In six years at Dunnet Head, he has been monitoring the reception of distant, Scottish repeaters which he uses as beacons. His Rx system comprises a 10-element crossed Yagi at 30ft with UR67 feeder and 3SK88 preamp. The Perth repeater, GB3PR, is 255km due south. The first 42km lies across hilly country, the next 60km across the Moray Firth and the remainder over the Grampian Mountains - the highest in Britain. In the summers of 1982-84 GB3PR was detectable daily although subject to fading, and he could access it at odd times. In 1985 access was less frequent and in 1986-88 insignificant. So far this year, the repeater seems detectable on a daily basis again in stable conditions, ie, an undisturbed troposphere and no large rain clouds along the path. John does not think that temperature inversions can necessarily account for favourable reception since they were present in the 1986-88 period when signals were poor. Even on good days in these years, GB3PR was undetectable.

He wonders whether "..the solar cycle has some other effect like the particle effect on the troposphere as an aurora builds up. This sometimes causes enhanced conditions noticed on VHF paths to repeaters." Monitoring other repeaters to the south often shows that they become copyable when they were not before, or signals will be enhanced if they are already audible. In either case the effect is short-lived, perhaps lasting only ten minutes. John concludes, "On noticing such effects, one learns to look for the aurora and expect it to be there. Is there any connection between the two?"

These are interesting observations, although they must be subject to the usual all-things-being-equal caveat. John would know that his receiving conditions were constant, but not necessarily that GB3PR was always radiating the same ERP to the north. For my part, I have observed a tropo 'lift' following major auroral events over the years and John Nelson, GW4FRX (PWS) says that his logbook suggests this to be a frequent phenomenon; several French beacons and HB9HB were audible with him just before the big aurora in March, for example, although there was no obvious weather mechanism around to cause this. Any thoughts on this topic?

BEACON NOTES

A new beacon has appeared on 144.935MHz. All it sends is its callsign, PI7CIS, followed by a carrier. It seems to be an FSK transmission, the shift being around 200Hz and the note a bit wobbly. I believe Dutch amateurs may be permitted to operate low power, private beacons. Does anyone have

firm details on this one?

The ZB2VHF beacon (IM76HE) came back on 50.035MHz on 16 April. It was copied at 2000 by ZL2KT, ZL7TPY and other via long path on the 16th and again on the 19th. ZD8MB has heard CE3BXK in beacon mode on 50.000MHz giving the QTH as Santiago; is it a beacon or a keyer?

SIGN OFF

In case you're wondering what happened to the reports on 430MHz and 1.3GHz activity - well, I'm afraid that only G1DOX mentioned these bands. But then conditions have been abysmal, and also there haven't been any contests to create activity.

Please note forthcoming deadlines for your reports and table entries, which are 24 June and 22 July. By the way, you can now jump on to the office telex machine when the boss isn't looking and send telex messages to me. The number is 9312132268 and the answerback is SA (for Spectrum Analysis, what else?). The 93121 part is common to all Telecom Gold users and replaces all that boring "265871 MONREF G quoting 75:XYZ12345" stuff, by the way! Of course, if you're on Telecom Gold, then direct messages to 76:MSX022.

SWL

BOB TREACHER BRS32525

HF REPORTS

Plenty of reports this month, all reflecting very good conditions on the HF bands. A shift of emphasis had been noticed with less Stateside QRM, and more DX from South Africa, Far East, Australia, Central and Southern America and the Caribbean.

Best DX during the period was probably the French expedition to the Marquesas and Austral Is, but the XF4L trip to Rivilla Gigedo stirred the bands during mid April. The Marquesas and Austral Is might soon count for DXCC, so I hope you all heard them. Rivilla Gigedo has been a DXCC country for years, but the number of successful expeditions in recent years can be counted on one hand. The mainly Finnish group certainly put the island on the map this time around and the QSL can be obtained from OH2BN. Z88MI had started operation from Marion Island, the first time there had been amateur radio on the island since the days of ZS2MI in the early seventies. The WARC bands provided some interest too, with VP5/W4NPX on 24MHz and ZL2APW on 18MHz.

Back to the more established bands, where 14MHz gave the enthusiastic such goodies as S79MBT, S01MZ, T30BC, 6O1 YD, JT1BG, KH0AC, V85NR, VK0GC, XX9KA and ZD8JP. The band had given your scribe some good DX after midnight, so in mid April, the band is certainly staying open. 21MHz conditions were quite good during the month with TL8HW, YI7EDZ, FK0AW, WL7E/WH6, EL2BX/9L1, FR0VD, 3X1SG, NY6M/KH2, S01A and V31BB.

Once again, 28MHz had been in good shape with KC6VW (Western Carolines), VP8BUB (South Georgia) and VK9LA (Lord Howe Is) perhaps being the pick of the stations reported. Other DX stations noted included FK/JH0SPE, HS0A, J20RAD (Maskali Is), 3DA0DX, CE0MTY (Juan Fernandez Is), A25/EA5GGV, 3B9FR, 5H3TW (via K3ZO) and HK0/HK4HHG (Providencia Is). Thanks to the many listeners who provided log extracts which enabled me to pick out this rather tasty bunch.

It was especially good to hear from a number of listeners for the first time. I will mention Bill McConachie BRS88921 in this. He provided his log for 1989, which showed much good DX heard on CW on all bands, including a 4X4 on 1.8MHz and a VK3 on 7MHz. It was good to receive a CW log and I hope we will get many more.

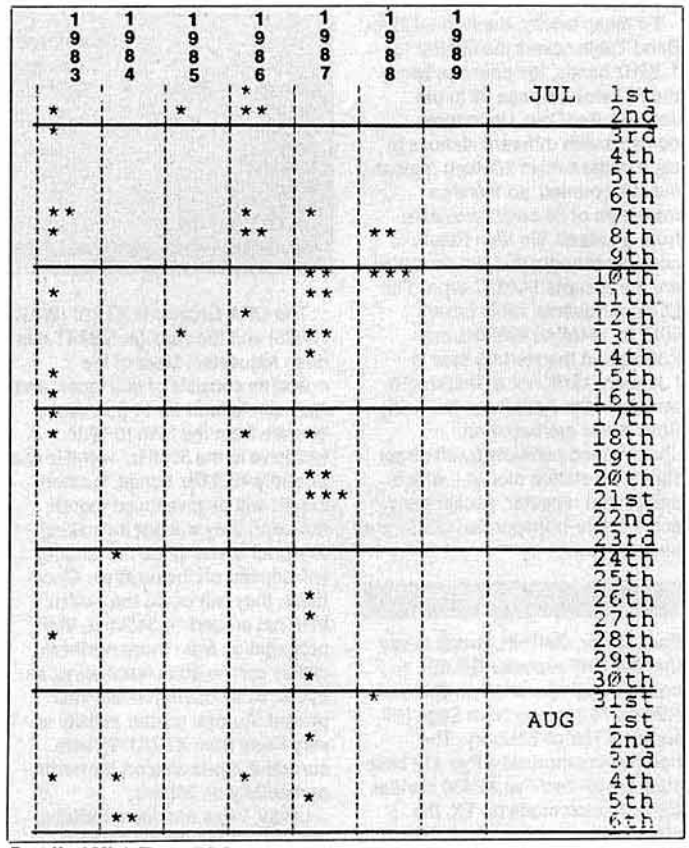
Chris Chadburn BRS91244 referred to fine conditions for the RTTY contest in March. Over 50 stations were logged, including some in North and South America. Chris remarked that G4UCD should be complimented on his swift return of a QSL for a report sent to SP6SH. Also on the QSL scene, Robert Small BRS8841 had a good month with a large batch via the bureau, and direct cards from W0RLX/KH5, 4W0PA, 5H1HK, PJ1B, V29A, CY9DXX (St Paul Is) and D68JL.

Martin Parry BRS52543 had endured a spell in hospital, but the convalescence period enabled him to spend a fair amount of time by the rig.

VHF LISTENING NEWS

Judging from Mick Toms' analysis published last month of 144MHz Sporadic-E openings, I hope that everyone has booked leave for the early part of the week beginning 5th June. I correctly predicted a big opening around that time last year and there is every chance of one around this time this year — we hope! Mick's analysis for July and early August is reprinted this month.

Last month I gave my impressions of the big aurora on 13



Part II of Mick Toms BRS31976 analysis of six years Es activity on 144MHz, this time for the months of July and early August. Hopefully this will help VHF operators pick the correct day to be at home!

March and now I have two further reports. One is from Colin Watson BRS46598 (IO85) who heard OE5OLL, SP3MFI, SP6HII and OZ1BTH together with assorted GWs and EIs. Further south, Mick Toms BRS31976 (JO01) logged around 100 stations. The most northerly was in IO88, the most southerly in JNO5, the most westerly in IO51 and the most easterly in KN07. Some of the choice DX logged included SP9LCV, HG0HO and Y21EA, while scores of 59+ DLs were heard and a good selection of Scottish and Irish stations. Mick had QRN at his QTH, which meant that many of the weaker stations were lost. The gotaways included a UB5, an OH and a UA2. No new squares were logged but it boosted the 1989 tally. As we all know, the event did not produce a 28 day repeat around the 9th/10th April (and your scribe even took the day off!).

Elsewhere on VHF, Martin Parry reported completion of his 50MHz preamp, and was anxiously awaiting the start of the Es season (which should now be upon us). The band will hopefully be good this year — we have the Squarebashers CT3 jaunt (thanks for the belated ZB2 card, guys!), and greater activity from Scandinavia to look forward to. I know of at least five British SWLs who are active on 50MHz now — BRS18529, 25429, 31976, 32525 and 52543, while Michel (F11ATZ) is active from central France. If there are any more, please let me know. The VHF table appears for the first time this month. Please send a few more scores to make its appearance worth while.

NEW QSL MANAGERS

Once again I have collected a great deal of QSL information and my 4th list compiled from DX publications around the world is now available for £1, which covers the cost of photocopying and postage. First come, first served!

VHF TABLE — 1989

Station	50	70	144	432	Total
BRS31976	-/-	1/1	66/17	26/9	120
F11ATZ	4/4	-/-	59/20	7/3	97
BRS32525	26/13	-/-	32/13	-/-	84
BRS25429	10/4	-/-	27/11	16/17	75
BRS62088	-/-	-/-	12/6	-/-	18

The format of the table is squares and countries added together. Please send your scores to show there is more SWL activity at VHF.

AZDEN PCS 6000 2M FM RIG

+ "Free Scanning Receiver"

£329

The Azden PCS 6000 crept on the scene with very little announcement. Those in the "know" immediately realised its potential and snapped the first shipment up. By the time you read this we hope to have bulk supplies. So what is all the fuss about?

The basic transceiver is the same as the competition; 25 Watts of rf output, 144-146MHz, 20 memories, auto tone-burst, excellent receiver sensitivity etc. On the face of it nothing to get excited about! But that's only the beginning, the next part is really exciting. The receiver coverage has been extended from 108 to 179MHz. Yes it covers the aircraft band with a built-in AM detector for reception up to 136MHz and a properly designed front end with AGC and 5kHz steps for offset-VOLMET transmissions. Above this range, reception is FM. The transmitter side has a programmable CTSS module which is also used to programme the tone-burst of 1750Hz. The shift frequency is also programmable and is made to error-out on transmit beyond the range 144-146MHz. However, this can be used in conjunction with the reverse repeater switch to instantly monitor duplex transmissions throughout the entire receiver range. What is particularly attractive is the ability to programme into each memory, a unique shift and if appropriate, a unique CTSS tone. This makes the rig somewhat unique when looked at in conjunction with the frequency range. Finally the price: most rigs are well in excess of £350 these days, without all the above listed features. So for £329, we think you will agree that this has to be a very special deal indeed.

ALINCO PRODUCTS

We now have in stock the new DJ500E dual band hand-held for 2m and 70cm. This hand-held comes complete with ni-cad pack, AC charger and helical for **£375**. Send for details.

- ★ 2M FM 144-146MHz
- ★ RX 140-170MHz!
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- ★ 10 memories
- ★ LCD Readout
- ★ S-meter
- ★ Tone Burst
- ★ Priority
- ★ 12.5KHz steps
- ★ 12v DC operation!

Another winner from ALINCO. A true handy transceiver with no extras to buy! Unlike its competitors, you get the nicad pack (500mAH) AC charger, and provisions for direct 12v DC charge. Measuring 168 × 61 × 30mm it's a beauty! Optional accessories include speaker-mic, mobile bracket and high power packs. Get the facts today!

- ★ 2m/70cm. Full duplex operation.
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- ★ Single antenna socket output.
- ★ 21 memories & 2 "call channels".
- ★ Programmable scanning and priority.
- ★ 12.5KHz & 25KHz steps.
- ★ Includes all hardware & microphone.
- ★ Bright LCD readout.
- ★ Reverse repeater operation.
- ★ 12 months warranty parts & labour.

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!

QRP & AERIALS!

We are about to introduce a range of compact single band rf rigs (80/40/20m) for the QRP enthusiast. Each one provides SSB/CW output of 2 watts. Features include VXO tuning, RIT, optional noise blanker and break-in module, built-in Morse key, internal dry cells or external supply, analogue power/S-meter, good dynamic range, excellent IF rejection and ultra stable. Send SAE for further details, prices and availability.

The GLOBAL, LF-80/40 dipole kit is now in stock and gives you a two band antenna for 80 & 40 metres with a total length of 70ft. £29 + £1.50.

GLOBAL Mini G5RV kit. We can now supply a trap kit that will enable you to turn your half-size G5RV into one that covers 80 metres. Total length becomes 66ft approx. (80-10m). £17.95 + 1.00.

NEW! SHORT WAVE LISTENERS "CONFIDENTIAL" FREQUENCY LIST. Now replaces old edition of "UKCFL." Fully up-dated it is probably the most comprehensive guide available. £7.95 post

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CLP5130 1-50-1300MHz beam 12dB	£179.00
CLP5130-2 105-1300MHz beam 13dB	£89.00
CP22J 2m 6.5dB base antenna	£49.95
M265 2m Mobile 5/6th PL259	£14.95
EL770H 2m/70cm Mobile PL259	£30.00
NR72M 70cm mobile 5.5dB PL259	£27.00
GLS Gutter mount/cable for mobiles	£14.95
D24N Duplxer 2m/70cms	£26.95
CP4 40-10m vert + radials	£149.00
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SX200 1.8-200MHz 5/20/200w	£65.00
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ADONIS AM303G Base mic	£49.95
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ADONIS FX-1 Mobile Goose Neck	£55.00
2m 5/8th BNC telescopic ant	£12.95
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'Limpet' Rubber mag base. It won't move!	£19.00
VHF/UHF Airband Guide 2nd Ed	£5.95
UK Confidential Frequency List	£6.95
Secret of Learning Morse Code	£4.95
Complete Guide To VHF/UHF Frequencies	£5.95
Pocket Guide to RTTY & FAX Frequencies	£2.95
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PLUS HUGE STOCKS OF KENWOOD; YAESU; ICOM: DATONG: JAYBEAM: TONNA: etc. If its in this magazine we have probably got it!

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25 years in amateur radio

What's the difference... (apart from new lower prices)

between Kenwood hand held transceivers and those from other makers? Simple quality; in design, in concept, in manufacture, in use, and in sheer enjoyment of ownership. Strangely enough this all comes at competitive prices which are now even lower, so there is little reason to choose any other handheld than one from Kenwood.

Kenwood scored a real hit with the TH-205 and TH-215 which give you high power in a handy size with a wide choice of facilities, but the TH-25E family really opened up the choices available because of its small size (shirt pocket), high power (up to 5W), and wide range of accessories including a VOX operated headset. Frequency readout is by LCD on the top face, and despite everything including car dashboards having keypads, the TH-25E uses a friendly tuning knob to cover the band in 12.5kHz steps.

As always, I advise you to ask for brochures on these sets because it is impossible to list all the features in a small space like this.

The TH-25E family of course has a new addition in the shape of the new TH-75E dual band 2/70 handheld. So new in fact that I don't have a decent photo of it, but believe me it's a winner from any angle.

Funny thing about Kenwood equipment; it always 'feels right,' and this applies to everything they make from the TS-940S to the smallest accessory. Why not call in at your nearest Kenwood APPROVED dealer and ask to see (and hold) a Kenwood handheld. You will not be disappointed.

If you care to send £1 to us at Matlock (to cover post and packing), we will be pleased to return the full Kenwood catalogue and detailed information on any rig you particularly specify.

TS-940S WARNING

CAVEAT EMPTOR

Which simply means "Let the buyer beware"

As the sole appointed distributor of Kenwood amateur radio products for the UK, we have been asked to bring to your attention the fact that a batch of TS-940S transceivers intended for the Japanese home market have been imported through irregular channels and sold in the UK. The significance of this is that the home market TS-940S is fitted with a mains transformer designed for use on 100V ac supply only, but the construction of the transformer is such that there are two separate 100V primaries connected in parallel inside the transformer. Someone in the chain of irregular supply has opened the transformer, connected the windings in series and announced that they are then suitable for UK use. This is not so, because even after modification you only have a 200V primary, and if the modified TS-940S is used on normal 240V UK mains supply, the secondary voltage is so high that the regulation system cannot cope, with the result that the power supply overheats and eventually fails. The resultant high voltage is applied to the entire supply system of the transceiver, and this causes further damage to the whole unit. We have now seen three examples of these TS-940 transceivers, and feel that the situation is serious enough to warrant this warning.

You can easily recognise the unsuitable transceivers by the fact that there is no mains voltage selector plate on the rear panel. If you are offered one of these transceivers and it has been used on normal UK mains supply, it is almost certain to have suffered electrical overload and may become unreliable in use.

It's all too expensive

Although it can be shown that amateur radio equipment is not expensive in purely relative terms, it is nevertheless a fact that some of the top HF transceivers are out of reach for many amateurs. This need not mean that amateur radio itself is out of reach, because there is a wealth of good equipment on the second user market.

With some transceivers now costing upwards of £2000, doesn't it make sense to consider for example a used JRC JST-100 instead. I mention this model simply because I happened to see one on our second user display here at Matlock. With JRC quality and performance in such a transceiver and a price tag of £850, I think that it's a tempting proposition.

However, there are points to watch, the most important being that you should buy second user equipment only from someone you know you can trust. In this respect, I make no apologies for saying that we at Lowe Electronics are unquestionably the best in the business. Not only have we more experience than anyone else in the country, we try to handle only equipment we would like to own ourselves.

In addition to this we back up all second user sales with a meaningful warranty, and look after every aspect of service and assistance thereafter. We will not sell you cheap junk, and we tell the truth about what we sell; indeed there are some makes of equipment we will NOT sell under any circumstances.

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ICOM

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The IC-2SE measures only 49(W) x 103.5(H) x 33(D)* mm with the BP-82 Battery Pack. Hold the IC-2SE in your hand to truly appreciate its miniature size. Weighing just 270g† with the BP-82, the IC-2SE will easily fit anywhere – on belts in shirt pockets, handbags, etc. *1.9(W) x 4(H) x 1.3(D) in. † 9.5 oz.

Simple design for operating convenience.

Even with its tremendous versatility and a wide variety of functions, the IC-2SE is easy to use. All functions are performed by a total of just six switches and three controls. The IC2SE includes both simple and multi-function modes. The result is two transceivers in one: both an easy-operation and multi-function transceiver. Simple mode ensures totally error-free operations. Multi-function mode allows you a variety of function settings depending on your operating requirements.

Other advanced features:

Reduced size doesn't have to mean reduced quality. The IC-2SE proves this with a wide variety of advanced functions.

- Tuning control on the top panel for quick QSYing.
- Monitor function that allows checking of the input frequency of a repeater.
- Function display that clearly shows all information required for operations.
- Splash resistant design and durable aluminum die-cast rear panel for dependable outdoor operations.

Options

• BA-11, Bottom Cap. Protective cap for terminals on the base of the IC-2SE.

• Battery packs and case.

BP-81	7.2V, 110mAh
BP-82	7.2V, 300mAh
BP-83	7.2V, 600mAh
BP-84	7.2V, 1000mAh
BP-85	12V, 340mAh
BP-86	Case for six R6 (AA) size batteries

• BC-72E, AC Battery Charger.
Desk top charger for the BP-81 - BP-85.

• CP-12, Cigarette lighter cable with noise filter. Allows you to use the IC-2SE through a 12V cigarette lighter socket. Also charges the BP-81 - BP-85.

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Flexible antenna for 144MHz band operation. Same type supplied with the IC-2SE.

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Combination speaker and microphone equipped with an earphone jack. Clips to your shirt or lapel.

•HS-51, Headset. Headset with VOX function that allows you hands-free operation.

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Carrying Case	Battery Packs, Battery Case
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The IC-2SE has 48 fully-programmable memory channels and one call channel. Each memory and call channel stores an operating frequency and other information required for repeater operations.

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The IC-2SE is equipped with programmable offset frequencies for accessing repeaters. All memory channels and a call channel store repeater information for your convenience. The IC-2SE includes a newly designed 1750 Hz tone call transmit function. A 1750 Hz tone call transmits when the PTT switch is pushed twice quickly.

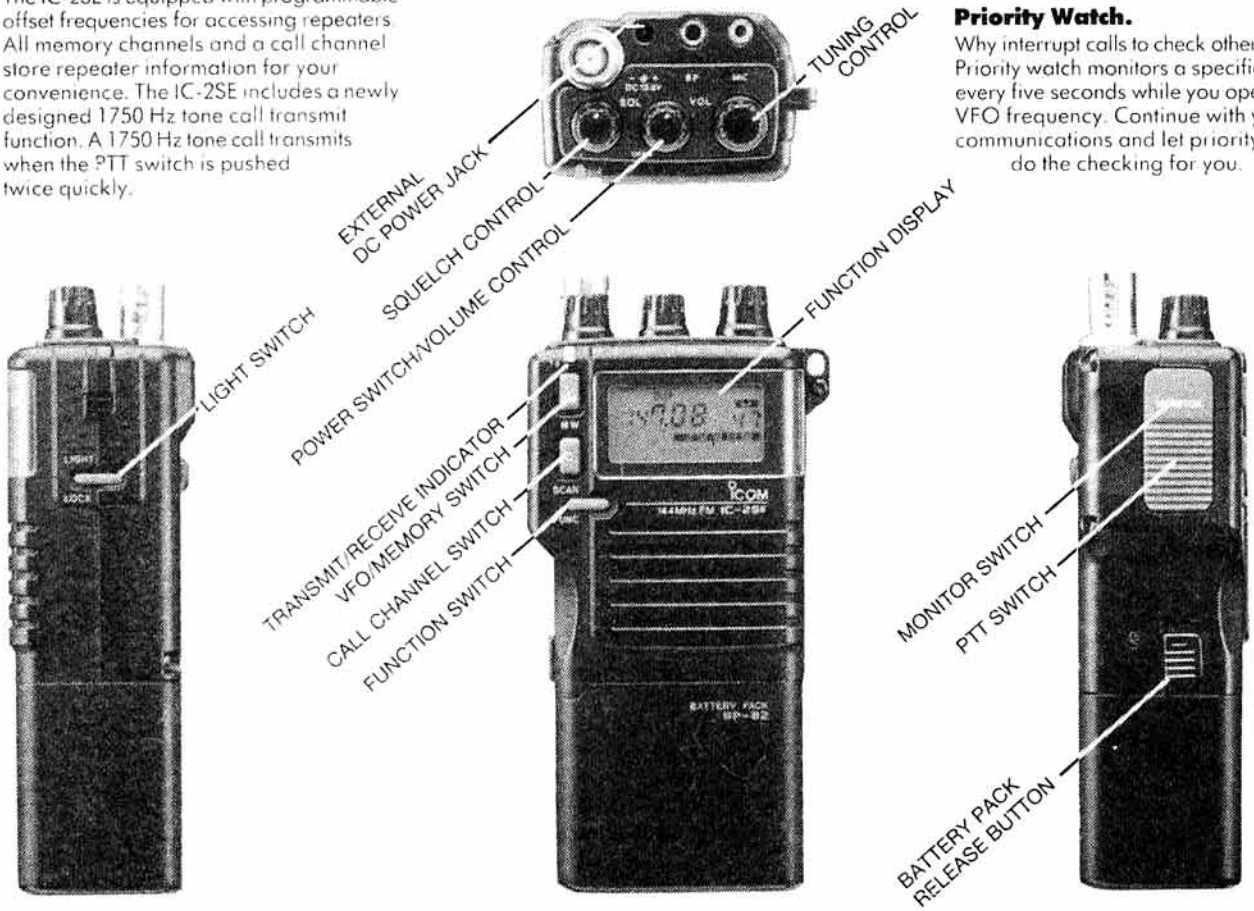
Power Saver for longer operating time.
The power saver ensures lower current flow during standby conditions. Operating times are much longer than with older, more conventional transceivers.

Built-in Clock with timer functions.
The IC-2SE is equipped with an advanced 24-hour system clock with timer function. The transceiver automatically turns on when real time matches a pre-programmed time. This is perfect for scheduling QSO's. Auto power-off timers and other settings can be made in clock mode.

Convenient Scan Functions.
The IC-2SE is equipped with VFO and memory scan.
- **VFO Scan.** VFO Scan repeatedly scans all VFO frequencies. In addition, unnecessary frequencies can be skipped.
- **Memory Scan.** Memory scan repeatedly scans memory channels.

Auto Power Off Timer Function.
If you ever forget to turn the IC-2SE off, don't worry. It will turn itself off. Power-off time can be selected or deactivated using multi-function mode. Preserve battery pack power for the times when you need it most.

Priority Watch.
Why interrupt calls to check other stations? Priority watch monitors a specified station every five seconds while you operate on a VFO frequency. Continue with your communications and let priority watch do the checking for you.



Helpline: Telephone us free-of-charge on **0800 521145**, Mon-Fri 0900-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
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TECHNICAL TOPICS

PAT HAWKER G3VA

PROFESSIONAL-AMATEUR PIONEERS

Six years ago, in describing something of the role of radio amateurs in the second world war ('The Secrets of Wartime Radio' *Amateur Radio* (London), March 1983) I pointed out that the large amateur-radio market in North America led, by the mid-thirties, to some excellent high-performance communications equipment whereas, by comparison, British military communications planning had progressed relatively slowly in the inter-war years, with crude, heavy and far from reliable designs still in use. An exception was the adoption by the RAF of VHF R/T equipment for fighter aircraft following experimental 56MHz demonstrations by George Jessop, G6JP, and Douglas Walters, G5CV, then the radio correspondent of the old *Daily Herald*.

In the 'thirties, many of the leading American firms, such as RCA and General Electric, employed large numbers of engineers who had become interested in amateur radio as youngsters. But in addition, a number of firms were established by enthusiastic amateurs, initially to cater for the amateur market. These included Collins Radio (Arthur Collins, W0CXX), Hallicrafters (Bill Halligan, W9WZE) and the specialist RF power valve firm of Eitel-McCullough Inc 'Eimac' set up in 1934 by Bill Eitel, W6UF and Jack McCullough, W6CHE. They launched the company on a $5000 stake and the belief (or dream) that they could build more powerful and reliable valves, which would operate at higher frequencies than any then available. Although Eimac valves were originally designed for amateur radio transmitters, they were soon taken up by commercial and military designers. Old-timers still remember the 35T triode which with 2kV HT could provide 225 watts (CW) or 120 watts (AM) output and which sold in the USA for about $6, and the powerful 75T (375 watts CW output) for $9. The big boys fitted the 100TH triode (300 watts CW output) or the 152-TL (two 75T triodes in a single envelope) handling 500mA at 3000V for $20.

In 1965 Eimac, with a staff of 1800 at its San Carlos factory, could claim to be 'The World's Largest Manufacturer of Transmitter Valves', and then merged with Varian Associates. As the Varian Eimac Division, the firm remains a major supplier of specialised RF power valves, including the 4CX250B series and the air-cooled 30X800A7 - which can provide 2kW PEP output up to 30MHz, yet is only about 2.5-in high.

Eimac has never forgotten its amateur radio beginnings with many active amateurs on its staff, taking an active role in the early moonbounce experiments, helping to set up Project OSCAR in 1965 and with both Bill Eitel, W6UF and Jack McCullough, W6CHE remaining active amateurs in their retirement.

Sadly I have to report that Bill Eitel died on February 26 at the age of 81 years. His contribution to both amateur and professional communications and broadcasting should not go unnoticed on this side of the Atlantic.

THE KALLI(RO)TRON AND OTHER OSCILLATORS

When at last I was able to present (*TT*, September 1988, pp681-2) a round-up of information on the 'kalli(ro)tron' oscillator, based in part on the original 1920 paper by L B Turner and the variation proposed by E J Cuddy in 1955, I felt that it was time to put this topic to rest for the time being. But it is clear that Ray Howgego, G4DTC, in first raising this topic in *TT*, December 1987, page 916, has succeeded in stirring up a lot of interest in

LINEARITY OF AMPLIFIERS

Several recent items in *TT* have discussed the problem of the unwanted intermodulation products produced by the non-linearity of heavily driven or incorrectly biased valve and solid state power amplifiers. One point that emerged from Table 1 of the December 1988 *TT* (page 960) ("IMD specifications for a selection of transmitting valves used by amateurs on HF/VHF/UHF extracted by W1JR from valve manufacturers' data sheets") is that even such highly-regarded valves as the 4X250/4CX250 series perform poorly if an attempt is made to maximise RF output rather than optimum linearity at reduced output. It should always be recognised that better IMD performance than was indicated in Table 1 can be achieved with reduced drive, with the proviso that the bias and screen voltages are correctly set and regulated for the conditions under which the amplifier is to be operated. There is much to be said for using power valves or semiconductors for the more demanding small-signal applications.

My first encounter with this approach was in 1942 when Dud Charman, G6CJ designed a large number of distribution amplifiers for feeding each of the outputs from rhombics and vee antennas to 8 or 16 of the seventy or so HRO receivers at the 'Country Farmyard' special intercept station, using 807 medium-power transmitting valves as linear small-signal amplifiers. In the crowded, non-channelised HF bands, splatter may not always be readily traced to a specific transmission and/or wrongly attributed to the linearity in the front-end of the receiver. This is not so often the case on VHF where there continue to be complaints of 'dirty', unduly broad signals, particularly during contests.

For many years it has been usual to specify intermodulation distortion (IMD) of SSB transmitters by measuring the third-order product (2f1-f2) of a two-tone signal, either with respect to the level of one of the test tones or relative to peak envelope power. Since the level of each tone is -6dB relative to PEP it is important to appreciate that these two different ways of specifying IMD performance differ by 6dB. For example, -28dB relative to one test tone is equivalent to -34dB relative to PEP. Amateur practice is not consistent, although dB relative to a single tone is the more common.

At one time, a specification of -28dB relative to one tone was regarded as acceptable for commercial SSB transmitters, but for many years the more stringent figure of -42dB relative to PEP (-36dB relative to one tone) has been specified for professional/military SSB transmitters etc. since these are often required in independent sideband (ISB) transmitters. Few commercially-made amateur transmitters come within 10dB of the professional specification. This is why such feedback techniques as those described by Tony Preedy, G3LNP (*TT*, February 1989) could do much to clean up the bands, though it has to be recognised that often the worst splatter is not basically the fault of the amplifier but of the operator shouting into the microphone with the audio gain turned up too far!

Checking with that one time bible of SSB *'Fundamentals of Single Sideband'* (3rd edition, 1960, published by Collins Radio) one finds the following notes on the use of the 4X250B tetrode as a grid-driven or cathode-driven linear power amplifier:

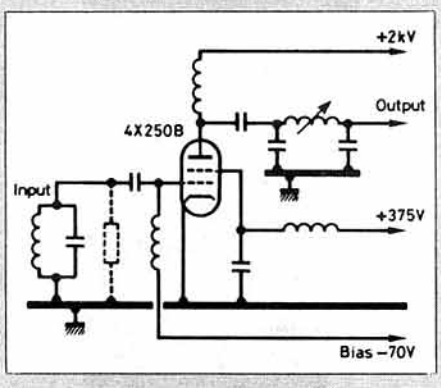

Fig 1. Simplified schematic of basic grid-driven tetrode power amplifier with grid circuit swamping resistor to hold the input impedance constant if the tetrode is driven into the grid current region.
(Fundamentals of SSB)

"Fig 1 is a simplified schematic of a grid-driven tetrode power amplifier. This amplifier, operating Class AB2 produces 250 watts per tube using the 4X250B tetrode. In general, the same design considerations exist for tetrode amplifiers as for triode amplifiers. That is, grid circuit swamping is required to hold the input impedance constant if the tetrode is driven into the grid current region, and neutralization is generally required if the tube is to operate over the entire high-frequency range. However, since the plate-to-grid capacitance is small in the tetrode, neutralization is much simpler. The tetrode amplifier, being a high gain tube requires relatively little driving power and a relatively small grid-swing for operation. This permits the paralleling of tubes with a common input network and a common output network which reduces the number of stages and simplifies tuning. In the tetrode power amplifier, the screen voltage has a very pronounced effect on the dynamic characteristic of the tubes. By lowering the screen voltage, the static current required for optimum linearity is lowered. This permits greater plate RF voltage swing which improves efficiency. The use of lower screen voltage has the adverse effect of increasing the grid drive for class AB2 operation and lowering the power output for class AB1 operation. The tetrode tube can be used in the cathode-driven circuit and can be so used without neutralization in the HF range."

This is, of course, all well-established practice, but one has the feeling that for many present-day amateurs, the fundamentals of good *valve* practice have often been largely forgotten, if ever known. Similarly, there is a tendency to forget that without careful design problems may arise, particularly if simple audio speech processors are used on SSB transmitters not designed to handle the higher duty-cycle and flattened waveforms of heavily processed speech.

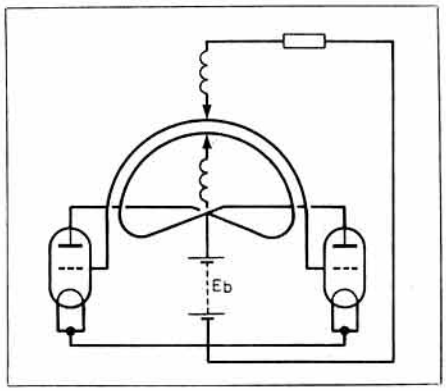

Fig 2. Mesby VHF oscillator of the 1920s.

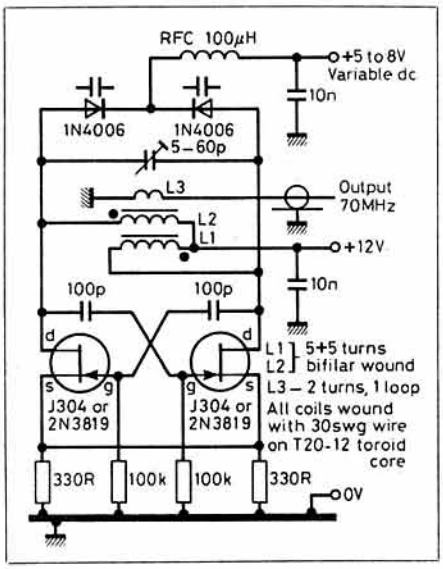

Fig 3. 70MHz kallitron oscillator by G8SEQ. The two source resistors could be replaced by a single resistor selected for optimum results.

push-pull, two-device, oscillators and their origins.

Brian Bower, G3COJ, recalls attending lectures on RF engineering at Cambridge University in 1949-50 given by the self-same L B Turner who, it turns out, was also largely responsible in the mid-1920s for the design of the VLF antenna system for Rugby Radio (GBR, 16kHz) which at the time was the world's most powerful radio transmitter.

K H Green, G1NAK recalls using this form of tuned multivibrator in an attempt to encourage a reluctant 10kHz bar crystal to oscillate; this it did so violently that it self-destructed after about 10 seconds!

J W Noble, G8FEQ consulted the original paper which L B Turner delivered to the Wireless Section of the IEE in November 1919 describing his two-valve circuit which gave very high amplification of audio frequencies and embodied a limiting action for the reduction of static, but remains unconvinced that the modern push-pull 'kallitron' is directly derived from Turner's oscillator as then presented (reproduced in *TT*, September 1988). He draws attention to a form of two-valve oscillator developed by Mesny in the early 1920s from which an output of several watts at 150MHz could be obtained: no mean achievement at that time. G8FEQ writes: "In the early 1920s there was a great deal of interest in the VHF bands despite the poor performance at high frequencies of the components of the day. One of the workers in this field was Mesny. His circuit (**Fig 2**) shows that this is a push-pull oscillator resembling the 'pseudo-kallitron' but with the unusual feature that feed-back is by inductive coupling (as used in the traditional regenerative detector)"

Neither G8FEQ nor I can trace anything further on the work of Mesny, but it is worth pointing out that both the Franklin and Ross-Gunn oscillators of the 1920s (both included in *Theory and Design of Valve Oscillators* by Dr H A Thomas, 1939) use cross-coupled two-device configurations basically akin to the G4DTC form of kallitron oscillator, although in the case of the Franklin the tank circuit is connected to earth rather than between the anodes.

A solid-state kallitron also turns up in *Sprat* (Issue Nr 38) built by John Beech, G8SEQ to provide a test signal source on 70MHz: **Fig 3.** G8SEQ notes that in the form shown it can be continuously tuned, frequency modulated, or scanned by applying a sawtooth waveform to the varicap diodes. It was built using copper PCB pads stuck to a groundplane of plain PCB material, 30mm square, the layout resembling the schematic.

The April 1989 issue of *OT News* (quarterly journal of the Radio Amateur Old-Timer's Association) also recalls that the famous mid-1930s British Political Mission to Tibet, during which Sir Evan Nepean, G5YN operated the first amateur station from Tibet (AC4YN), used a kallitron power oscillator/transmitter built by Lt Sidney Dagg, Royal Corps of Signals. This was intended for use by the Mission on about 10MHz but capable of being tuned to 14MHz: **Fig 4.** *Note:* I would not recommend anyone today to venture on to 14MHz, even from Tibet, with a keyed self-excited power oscilator running at up to about 100 watts input!

However, the final word on this subject surely must go back to G4DTC who launched us into this world of 'smooth running' oscillators. He writes: "I have followed with interest those ever-deepening excavations into the archaeology of the kallirotron oscillator and would thank all concerned with the dig. I also use an identical oscillator to that shown in December 1987 in a band-switched VHF tuner covering 30MHz to 480MHz in ten bands, the balanced outputs feeding an SBL-1 diode mixer for conversion to a 30MHz IF. The 2N5458 FETs were replaced by J310 low-noise UHF FET devices, the 56pF feedback capacitors by 3.3pF, and the variable capacitor reduced to 15 + 15pF. Selected signal-frequency pre-amplifiers can then be placed in front of the mixer to give immediate access to any part of the VHF spectrum. Long term stability of 5kHz per hour at 450MHz is easily achieved and is quite adequate for a general-purpose receiver. If the oscillator is placed in a thermally-insulated diecast box, sudden changes in external temperature are largely ignored.

"While on the subject of oscillator stability, it is worth mentioning the exceptional stability of many of the older mechanically-tuned UHF TV tuners. These were commonly used in British television receivers until the advent of the far less stable varicap diode tuners; they commonly used BF180/BF181 transistors. *Practical Wireless* (March/April 1987) published my 'Blandford' design for a receive converter tuning near DC to 400MHz in a single band. This made use of a mechanically-tuned TV tuner to provide a tunable IF from 464 to 860MHz. Incoming signals were fed to an SBL-1 doubly-balanced mixer with a 464MHz (4 x 116MHz) crystal-controlled local oscillator. Three switched tunable signal pre-amplifiers were placed ahead of the mixer to give a total system noise figure across the spectrum of 3 to 4dB. During the development of this converter (which failed to attract the interest it surely deserved if you will excuse my lack of modesty!) extensive measurements were made on UHF TV tuners. Long term stability was about 2kHz per hour after an initial warm-up drift of about 100kHz in the first few minutes. This is exceptional for a free-running L/C oscillator at 800MHz. External temperature changes accounted for most of the drift: approximately -10kHz/°C, corresponding closely to the calculated drift on a quarter wave copper line due to thermal expansion. To achieve automatic colour locking, varicap tuners soon replaced the inherently-superior mechanically-tuned units. While these are in themselves equally stable, the problem is the supply voltage variations; to achieve a stability equal to that of the mechanical units would require tuning-voltage stabilisation of the order of 1 part in 10^7 or better!

The problem of spurious responses in the various low-cost spectrum analysers using UHF tuners etc, as described recently in *TT*, has in fact been raised by other correspondents and it is hoped to treat this subject separately in *TT* shortly.

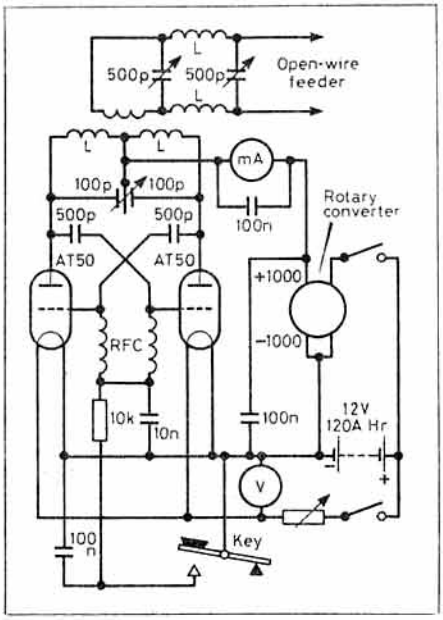

Fig 4. A kallitron power oscillator/transmitter that made history as AC4YN, providing the first amateur contacts with Tibet in the 1930s.

DATA BOOK ERRATUM

T E J Toth, G4ORF has drawn the attention of George Jessop, G6JP to an error on page 139 of G6JP's *Radio Data Reference Book* in the chart showing the characteristic impedance of PCB tracks. While the curves in this chart are drawn correctly, those marked 75 and 35ohms have been transposed, although the intermediate 50ohm curves are correctly designated. A correction sticker is being added to remaining stocks but those with existing copies of the book should note the correction.

NICAD MEMORY — FACT OR FICTION?

Several earlier *TT* items have noted that the common advice to discharge fully nicad batteries before recharging, in order to overcome the so-called condition of nicad 'memory', is not good advice but can shorten the life of these batteries. Deliberately discharging nicad battery packs can, in fact, lead to polarity reversal of one or more cells since it is unlikely that all the cells making up a battery will be in exactly the same state of charge.

What then is the reality of the memory effect so often advanced as the reason to avoid partial recharging? It should be noted that a useful list of facts and fallacies, stemming from an article by J Fielding, ZS5JF (*TT*, May 1988, page 349), strongly rejected the idea that "You should not charge only partially discharged cells as this causes a loss in capacity," giving the reply: "*Not true*. It is not necessary to fully discharge nicad batteries before recharging. In fact, *the opposite* is true. Repeated partial charging gives an increase in the number of charge/discharge cycles compared with fully-discharged cells." But the ZS5JF notes did not refer specifically to nicad memory.

However, an article by Anton Wilson ('Rechargeable Power Supplies, Part 3: The Mystery of Memory' *International Broadcast Engineer*, March 1989, pages 48 & 51) explores this topic in some depth, introduced as follows:

"Battery memory is undoubtedly the most often mentioned and least understood of all nicad battery anomalies. To further this confusion, there are actually two separate and distinct conditions that might be called 'memory'. Most people believe that the so-called memory phenomenon is manifest by a loss of capacity, that a battery so inflicted will run the equipment for only a fraction of the time normally expected. This turns out to be the first point of confusion. In almost all cases memory does *not* involve any significant loss of capacity but rather a voltage depression. Battery engineers use the term 'voltage depression phenomena' to refer to these conditions, avoiding the ambiguous term memory."

Later in the article it is noted: "There are two basic causes of so-called memory. The name memory ironically originates with a very rare phenomenon that is almost never encountered in professional video *(and probably equally seldom in amateur radio — G3VA)*. A fully-charged nicad battery that is only partially discharged before being recharged, and then repetitively cycled to precisely the same point of partial discharge... may exhibit a voltage depression at the memory point if an attempt is made to discharge the battery past the previous point of partial discharge... The most prevalent cause of memory phenomena turns out to be long-term trickle charging... In this case the continuous current can cause a metamorphosis to occur within a fully charged nicad cell... Over a period of time the charged nicad compounds are transformed into a secondary alloy called NI_5CD_{21} which exhibits a lower voltage potential than a normal nicad cell."

IN PRACTICE

In practice, the article explains, the unaffected nicad discharges first, providing the usual initial voltage output. But then the cell begins to use the secondary alloy exhibiting a voltage depression (**Fig 5**). In the case of a battery with a fully charged potential of say 12, 13.2 or 14.4 volts as commonly used for professional portable TV cameras and video recorders, the cumulative voltage depresssion at the point of change to the secondary alloy can amount to a rapid drop of more than one volt, and this may be sufficient to take it below the minimum end-point operating voltage of the equipment, although the battery may still be holding a large part of its total charge. In these circumstances the effective operating period of the battery may be reduced by up to 70% or so of the time per charge that it should power the equipment, even though the total capacity per charging cycle may not have been seriously diminished.

Anton Wilson points out that long-term trickle charging can also result in the appreciably more serious problem of 'accelerated ageing' which can reduce the useful life of a battery, in terms of charge/discharge cycles, to only one-eighth of normal. As noted by AG6K in the December 1988 *TT*, the prime cause of this form of accelerated ageing of sealed nicad cells is the conversion of the water in the liquid electrolyte to hydrogen and oxygen gas when the temperature of the cell rises above about 35°C by overcharging. AG6K suggested that a valid answer to this problem is to use a pulsed constant-voltage charger of the type shown in *TT*, December 1988, Fig 1, page 957, claiming that such a charger when set up correctly is unlikely to result in overheating even if the battery is left on charge for several days. Because of the significant rate of self-discharge of nicad batteries, it is difficult to ensure that a battery is always kept in a fully charged condition over an extended period of time without the use of various fairly complex chargers.

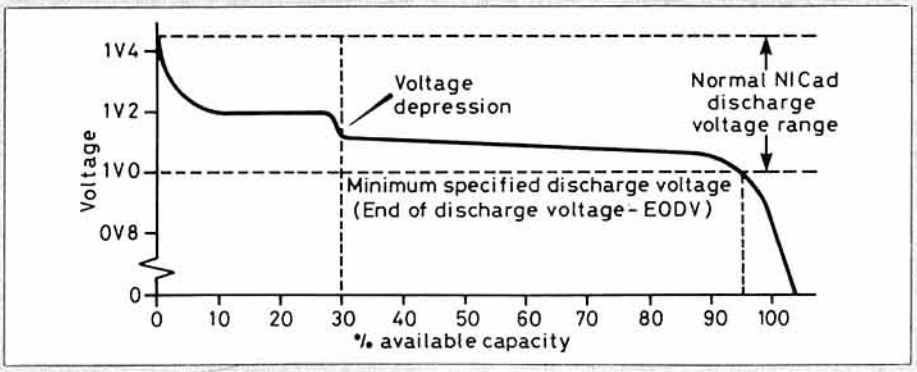

Fig 5. Discharge curve of a nicad cell suffering from a pronounced 'voltage depression' at about one-third discharge.. Most probable cause is overlong trickle charging although the effect is often attributed to the so-called 'memory' of nicad cells.

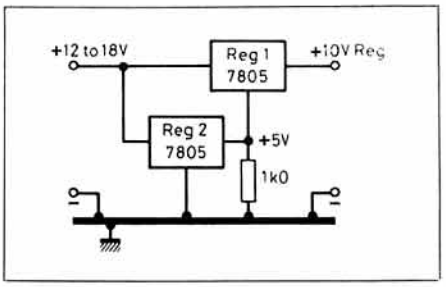

Fig 6. Use of cascaded three-terminal IC voltage regulators (Electronics Australia).

HERE & THERE

Peter O'Connell in the "Circuit & Design Ideas" feature of *Electronics Australia* (December 1988, page 93) shows how cascading two five-volt three-terminal IC regulators (7805) can provide a regulated 10V supply, one of several possible ways of obtaining regulated outputs at voltages different from that of the regulator. For applications requiring heatsinking it is necessary to insulate the top regulator from the heat sink as the common lead no longer connects to earth: **Fig 6.**

The world of hi-fi magazines produces some remarkable prose poems. One wonders how *Rad Com* readers would react to equipment appraisals couched as follows: (This £825 valved audio pre-amplifier) "worked beautifully after as little as 30-minutes warm-up time. And it is a cracker, offering as it does a delightful blend of classic valve virtues with some modern refinements. The sound is warm and rich, without being too romantic or bloated, and it handles wide dynamic swings with absolute grace..." (*Hi-Fi News & Record Review*, April 1989).

The G4DTC hybrid 'ultimate' receiver stimulated enormous interest and Ray Howgego received about 80 requests for PCB layout plans but he has so far not received any comments from anyone who may have completed the receiver. The major problem appears to have been the acquisition of the 623 chip which is made only to "mil-spec" standards and retails at around £13. However, G4DTC points out, it is possible to substitute any of the classic detector circuits, although in this case AM AGC might be a problem. He was impressed to find so many old-timers showing interest in constructional work "after many years of black-box-boredom".

EXPERIMENTAL FET POWER AMPLIFIER

I hope that Peter Haylett, G3IPV will not be offended if I suggest that he is one of those amateurs who like to tread idiosyncratic paths rather than following the crowd. His latest offering is 'an experimental non self destruct power FET RF amplifier' which includes some off-beat features. He introduces his design as follows: "Recent observation of RF amplifiers indicates that RF voltages generated across RF chokes and wire-wound resistors cause unnecessary feedback, not only degrading amplifier performance by producing noise and IMD but also, owing to lack of control of the feedback, capable of resulting in random violent parasitic self-oscillation which can immediately destroy solid-state RF power devices.

"In my experimental unit (**Fig 7**), providing some 30watts CW output on 3.5MHz, feedback is reduced and controlled by the very light coupling of the input circuit to the first stage, using about a

1pF capacitor and resistance-capacitive inter-stage coupling. **Fig 8** shows the difference in feedback arrangements between the conventional RF amplifier circuit and the experimental unit."

G3IPV suggests that his technique overcomes the problems of parasitic and self-oscillation. In front of this unit, he uses a special driver amplifier which remains stable with very light loading. This all seems logical enough though I am not sure that I follow entirely his notes on operation as follows:

"During operation, it was found that an SWR meter did not function correctly. It was thought that this was because an SWR meter may read the correct neutralization point of an amplifier rather than the SWR on the output coaxial cable; the neutralization occurring when the output parameters of an amplifier are varied by an ATU. With my experimental amplifier owing to very low feedback capacitance this would no longer occur. Difficulty was observed in obtaining power to an antenna when using an ATU and field strength meter near the antenna. However, good power output was achieved by connecting the feeder directly to the drain of the Power FET and monitoring the output with an oscilloscope in parallel with the antenna socket. High power output was achieved in this manner even with the antenna off resonance and unmatched."

G3IPV concludes that power FETs are superior in such applications both to valves and to bipolar transistors once the problem of safely soldering them into the circuit has been achieved. I would, however, stress that the unit developed by G3IPV should be considered experimental rather than established practice, as I suspect that not everyone would agree with his explanations.

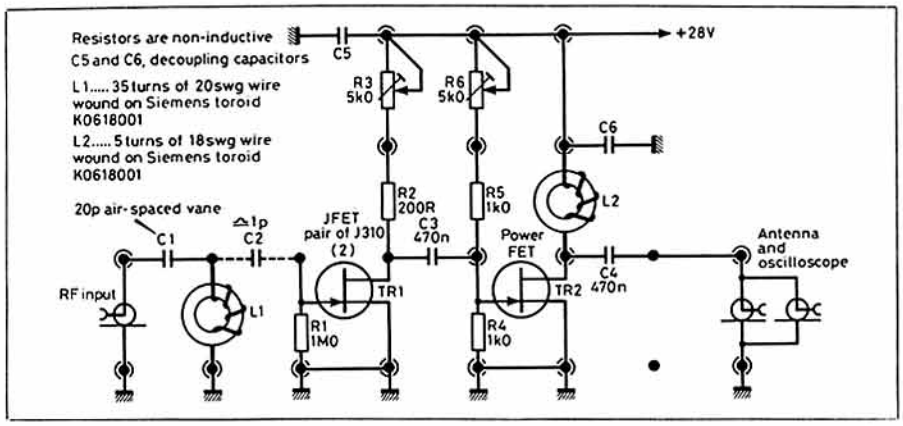

Fig 7. Experimental 3.5MHz FET power amplifier developed by G31PV and intended to minimise the risk of destructive self- or parasitic-oscillation.

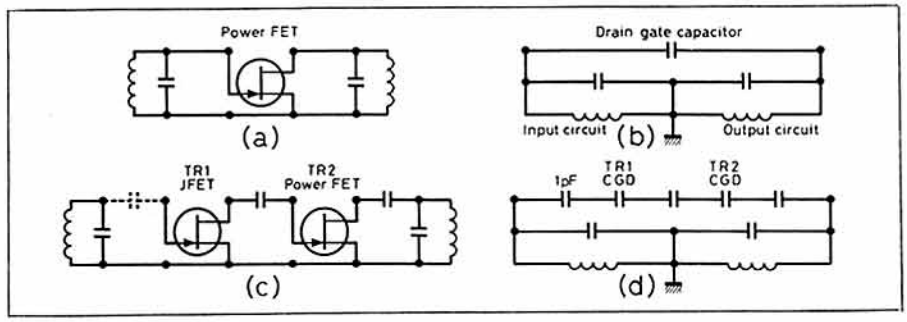

Fig 8. (a) Conventional RF amplifier with uncontrolled feedback; (b) feedback circuit of (a); (c) G3IPV amplifier with 'controlled' feedback; (d) feedback circuit of (c) as suggested by G3IPV.

THE FRINEAR LINEAR

During 1988, the attractions of the relatively low-cost and still readily available European colour-television line-output valves, types PL519/PL509, as RF linear amplifiers were discussed in a number of *TT* items. This has prompted Frits Geerligs, PA0FRI to contribute his design for a single-valve linear suitable for use with QRP transceivers (**Fig 9** and **10**). With about 5 watts input, the amplifier provides an RF output of about 80 watts on 28MHz rising to about 110 watts on 3.5MHz, using a single PL519 that had already seen ten years service in a colour television receiver.

PA0FRI points out: "A new (100%) PL519 is capable of providing more than 200 watts output when used with forced air cooling. As G4DTC stated (*TT*, May 1988) the PL519 seems to be virtually indestructible with its performance limited only by envelope temperature. After ten years television service, cathode emission remains near perfect and the valve is capable of sustaining over 1.1kV on its anode. In my opinion, anode dissipation, with adequate cooling, is of the order of 65 watts. The anode is in fact about the same size as that of the old 814 RF power valve, although, in the case of the PL519, closer to its glass envelope. This is why forced air cooling is needed to get maximum power from this valve.

Using two 400V mains transformers in the PSU, the amplifier can be constructed in a compact enclosure of about 27 x 22 x 9cm, smaller than most solid-state amplifiers of equivalent power."

PA0FRI does not indicate the degree of linearity achievable with the PL519 when output is increased beyond about 100 watts.

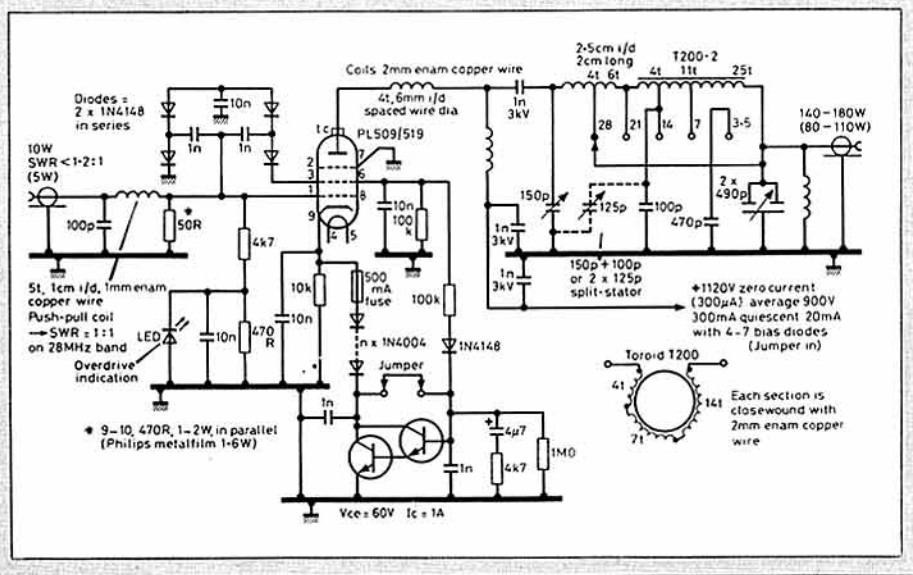

Fig 9. The PA0FRI 'Frinear' power amplifier for use with low-power transceiver or exciter. The maximum output power of 140 to 180 watts requires the use of ducted air cooling but 80-110 watts output is possible without forced-air cooling.

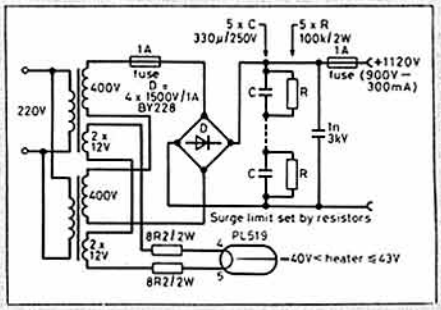

Fig 10. Power supply for the 'Frinear' using two 400V mains transformers.

THE WAY WE LISTEN

Although hand-speed Morse is, and seems certain to remain, the simplest and most effective weak-signal communications mode, it should not be assumed that the way we listen to either CW or speech under noisy conditions is by now fully understood. Samuel Morse, it may be recalled, in the period before he teamed up with Alfred Vail, thought in terms of mechanically recording the incoming signals, not appreciating that the human brain could be 'programmed' to perform instant decoding at realistic speeds. As *TT* has pointed out in the past, it is necessary to consider both receiver and operator as a complete 'system' with a complex man-machine interface.

Listening to and 'decoding' either morse or speech under noisy conditions involves very complex processes in the human brain and auditory system which, in spite of years of research, is by no means yet fully understood. To quote from the book *Correlation Techniques* by F H Lange, admittedly published some 20 years ago: "In spite of the most intensive efforts, the method of operation (of the auditory system) has not yet been completely clarified... Meyer-Eppler has described the problem as the 'Cocktail Party Problem'... If a large number of people are in conversation with one another in one room, it should in general be impossible to carry on a conversation with someone in the immediate vicinity. Nevertheless experience teaches us that this raises no great difficulty, in fact the reverse, if a person has 'tuned in' to the partner and the subject of conversation. This implies, therefore, the existence of a tuning (modulation) mechanism in the human ear, certainly one of another kind than is used in the radio receiver; for, in the radio receiver, the only transmitters which are distinguished from one another clearly are those the frequency ranges of which do not overlap. On the other hand all the conversations which the ear would be capable of separating lie in the same frequency range, roughly between 80 and 6000Hz. The human ear therefore achieves more than all the methods of analysis hitherto known... Classical filter theory with its band-pass and rejection bands break down here."

Professor Lange quoted the physiologist Kraus who in 1953 wrote: "Because of its smallness, the ear presents some of the most disputed problems of human physiology. While the mode of operation of the eye is quite clear and its basic principles have been imitated and evaluated in the photographic camera, the mechanism of hearing is still a matter of dispute. In spite of the small size and complicated structure, the ear compares roughly with a modern radio receiver and, regarded purely technically, is of comparatively simple construction, so that one might hold the view that an accurate examination would immediately expose the purpose and function of each individual constituent part. The opposite is the case and all theories are still full of contradictions."

Correlation techniques and research into directional hearing have led to the recognition of the value of various pseudo-stereo and binaural techniques (see *TT* February 1989, p36) for the reception through interference of speech and (more effectively) narrowband CW signals, though contributing little to intelligence at reasonable signal-to-noise ratios.

It has often been pointed out that the human ear can provide an effective narrow-band filter with a minimum bandwidth of only about 50Hz, a dynamic range of over 100dB and the ability to 'tune' from about 200 to over 100Hz without introducing 'ringing'. Unfortunately, in practice, such ideal characteristics cannot always be achieved. It takes an experienced operator and even then encounters the problem of 'masking'. Even an experienced operator, if confronted with two nearly similar tones, will normally find it impossible to distinguish between them unless they are separated by about 100 to 500Hz or so depending on their position in the audio spectrum.

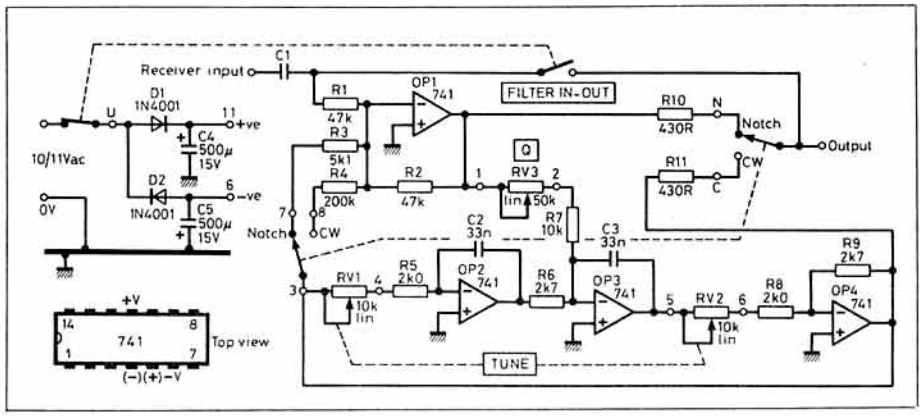

Fig 11. Versatile active analogue AF filter for speech or CW reception as described originally by DJ6HP in 1974 and which continues to represent an effective design. It provides a CW filter tunable over about 450 to 2700Hz with the Q (bandwidth) variable over a range of about 5:1. For speech the filter can be switched to a notch mode. Although modern digital audio filters could provide more precisely shaped tunable filtering, this analogue filter has received many endorsements over the years.

Recent professional interest in reducing the transmission bandwidth of high-quality digital stereo sound has revived interest in this phenomenon of 'masking'.

In 1967, E Zwicker and R Feldtkeller published a study 'Das Ohr als Nachrichten empfaenger' (The ear as a receiver of information) showing that there exist between 30Hz and 20kHz, 24 audio sub-bands within which the most powerful component conceals (masks) adjacent, less powerful components, including noise, making them imperceptible to the ear. The widths of these sub-bands varies from 100Hz in the low-frequency domain up to 2kHz in the high-frequency domain. Applied to hi-fi music this means that while the dominant components have to be transmitted accurately, other components within each of the critical sub-bands may be transmitted digitally with a much lower (less accurate) number of bits, permitting the total bit-rate to be reduced by from three to seven times, thus permitting digital stereo of CD-quality to be transmitted digitally at 256kB/s rather than the 1.4MB/s of CD recordings.

It seems to me that the Zwicker masking

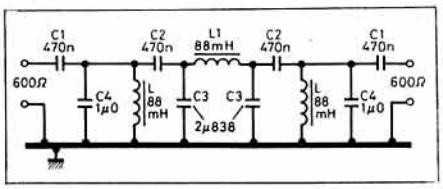

Fig 12. Passive AF filter design by DJ1ZB using standard 88mH toroids and with a centre frequency of about 420Hz and bandwidth of about 80Hz. Note that this design is for 600ohm input/output impedance. (*Sprat* No 58)

phenomenon explains why our ears alone cannot filter out a weak wanted CW signal if there is a more powerful interfering signal *within the same sub-band*, even though in other circumstances our ears have a selectivity of only 50Hz or so. Appreciation of Zwicker masking also encourages the reception of CW signals at relatively low audio frequencies (say 300-500Hz) rather than the usually recommended 700-1000Hz. Interestingly, the same recommendation is made in respect of CW audio filters in the current issue of *Sprat* (Issue No 58 — dated 'Autumn 1989' but presumably the 'Spring' issue). In "The best audio frequency for CW reception" by DJ4SB and DJ1ZB, on the basis of a 1979 German publication, it is suggested that the selectivity (discrimination) of the human ear peaks around 300 to 400Hz being some ten times better at these frequencies than at 1000Hz. The former belief in using the higher frequencies presumably stems from the fact (Fletcher-Munson curves) that the *sensitivity* of the ear is greater at around 1000 to 2000Hz: **Fig 11** and **12** illustrate two filters mentioned in the *Sprat* article.

Meanwhile, the age-old arguments about easing the entry into HF amateur radio by removing the obligatory (ITU Radio Regulations) Morse Test continue on both sides of the Atlantic.

John Rabson, G3PA draws attention to a remarkable example of an unexpected use of CW reported in the Belgian journal *CQ-QSO*, December 1988. His translation is as follows: "It's the end of March 1985. A Belgian family is involved in a road accident. The parents are badly injured, their son is in a coma. The doctors say there is no hope for him.

"The parents refuse to give up hope. For two years they visit their son every day. One day, in desperation, the father, a radio amateur who before the accident was preparing his son for the Morse test, has the idea of sending CW by pressing on his son's arm. To his astonishment, the lad responds. The doctors say 'you're imagining things' they insist death will come within three weeks.

"But three weeks later their son is transferred to a university hospital. There, in front of an audience of doctors and lecturers, he is able to send CQ quite clearly whenever asked... gradually the coma becomes less deep.

"Several months have passed. The boy is able to communicate by signs. He indicates that he is thirsty but doesn't want any of the offered drinks. He seizes his morse key and sends 'grapejuice'.

"This is not a fairy story. The father is Jan, ON1FV of Malines. His son Willem has now left hospital; he can say several words and can even take a few steps." □

AN INTRODUCTION TO SPORADIC E (part 2)

Jim Bacon, BSc, G3YLA.

FROM TROPOSPHERE TO IONOSPHERE

Last month I described some of the possible tropospheric weather factors contained in the current theories on Es. This month I will concentrate upon the effects these weather 'triggers' have on the ionosphere; in particular the E region. I am sure you will already appreciate that the subject of Es is a very complcated one, but I hope you will find the effort to understand the mechanisms at work worthwhile. The goal is to be able to use routinely available weather data to improve your chances of locating that elusive and (possibly) unpredictable Es patch.

WIND SHEAR THEORY OF Es

The wind shear theory was developed during the 1960s [12] and a good description of the processes involved can be found in a book by Rishbeth and Garriott [13] - incidentally, this is the same Owen Garriott that you may have heard a few years ago operating from the space shuttle Columbia. The wind shear theory is probably the keystone of most mid-latitude Es, so it's worth a little time looking at how it works.

The essential physical principle behind the wind shear theory is that a charged particle, moving through a magnetic field, experiences a deflecting force, called a 'Lorentz force'. The magnitude of the force is proportional to the strength of the field, the velocity of the charge and the charge itself - see **Fig 12**. When this principle is applied to E region ionisation being blown along by the neutral (non-ionised) horizontal wind, the resulting motion of the ionisation is at an angle to the wind; that is, it now has a vertical component of motion.

Actually, things are not quite that simple. For example, the Earth's magnetic field is not necessarily horizontal, and there is the question of positive and negative charges being deflected in different directions. The first point about the magnetic field raises interesting questions about the behaviour of the wind shear theory at high geomagnetic latitudes where the magnetic field is nearly vertical. I will return to this in the next section. On the second point, the wind shear theory states that electrons are unaffected by this deflecting force and, furthermore, because of electrostatic forces, they are constrained to move with the positive ions, see [13].

It follows that if the horizontal wind speed varies with height, then so will the magnitude of the deflecting force. The ideal case is shown in [13] and is repeated here as **Fig 13**. It is worth noting that the angle of the deflection is also a function of height, principally determined by the collision rate. In this example a wind reversal is indicated, but this is not always necessary to produce an accumulation of ionisation in a shear region. A decrease in westerly wind with height can also produce a concentration of ionisation [4] — see **Fig 14**.

Because of the variation of the deflection angle with height, the wind shear mechanism also varies with height in the ionosphere. It is sufficient here to say that above about 130km it is mainly meridional (north/south) winds which are effective at redistributing ionisation, whereas between 100 km and 130km both meridional and zonal (east/west) winds can play a part in the redistribution (see **Fig 15**). Lower down in the ionophere, the winds actually carry the ions and electrons along without deflection and this probably plays an important part in the dispersal of existing Es.

The timescale involved in the wind shear method of generating Es (a few minutes) means that it is not possible to form an enhanced layer of ionisation using the normal gaseous ions found at this height. The recombination rate is too high and the ions would not have a lifetime long enough to be moved bodily by the wind to the extent required for deflection to take place. In order to overcome this stumbling-block to the wind shear theory it was proposed that metallic ions must play a large part in Es formation. The reason that this is necessary is because metallic ions have a much longer lifetime (of the order of several hours to a few days) and remain in existence for long enough to be affected by the wind shear. Many studies have now confirmed this [4,5], and the general view is that iron and magnesium are two of the principal contenders. But one question remains; where does this input of metallic ions come from?

METEORS

The connection between meteors, which might provide an input of metallic ions to the lower ionosphere and Es, goes back quite a long way - to the late 1940s, in fact [14]. However, the problems of measurement in this region have produced only a limited amount of data to verify the connection. This is an area which is rife with claim and counter-claim. The fundamental problem of any statistical analysis of Es is that *all* variables must be identified before the correlation becomes meaningful. In this case, the performance of a correlation between, say, meteor rate and Es will depend upon any other possible causal ingredient being constant throughout the trial. This is clearly an impossible constraint.

The paper referred to earlier [14] quotes a lifetime for metallic ions of meteoric origin of between 5 and 20 days in the height interval between 110km-120km, which is typical for Es. The suggested correlation between Es and meteor input is not too good but it comes out in favour of a delay of 1-2 weeks between the meteor input and Es formation.

If the wind shear theory is the answer to much of the mid-latitude Es - and the consensus of opinion says that it is - then metallic ions are also essential to the theory. Measurements of Es layer composition support this, but why should there be a delay of 5-20 days between meteor input and the Es? It has been suggested that the delay is necessary for the metallic ion input from meteors to be brought to the height where the wind shear comes into play.

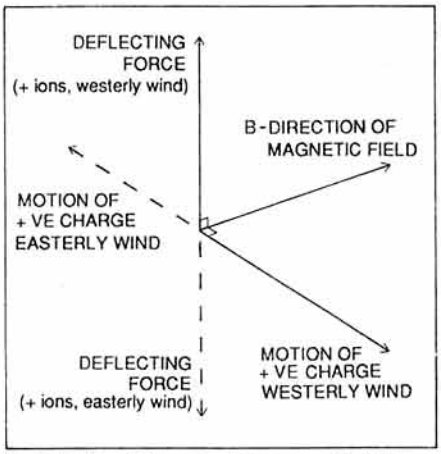

Fig. 12: Motion of charged particle in magnetic field.

Much of the earlier work indicated that the height of maximum ion input was some way below the height of the Es at around 80-95km. However, a recent paper [15] describing the use of an HF meteor radar shows that a peak input occurs around 105km, decaying to half the peak value at 10km above and below this height. This allows direct meteor input to the region of the Es and again raises the question of the reason for a delay. Some of the results presented later in this article will suggest that the link between Es and meteor input is more direct. Indeed, it is very likely that meteor input is the 'fuel' of Es, but the rate at which it is used up (within its 5-20 day lifetime) depends upon other factors.

A useful guide to the seasonal distribution of meteor showers is given in the RSGB handbook [2] (see **Fig 16**). On a daily scale, the time of maximum input of meteors is about 0600 local time when the Earth's rotation is in the same

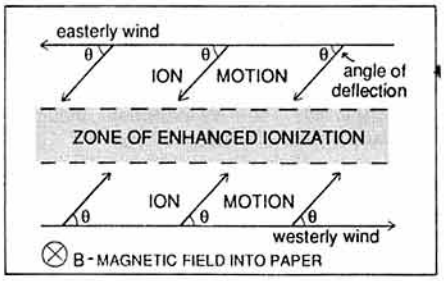

Fig. 13: Principle of 'wind shear' theory taken from [13]. (Ideal case).

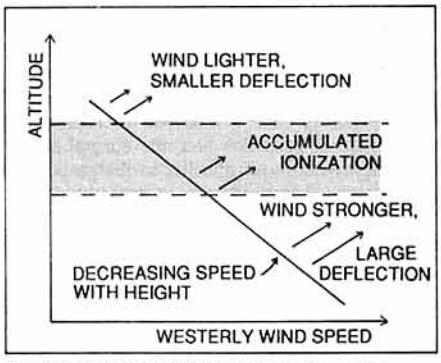

Fig. 14: Ionization density increased by decreasing westerly wind with height.

direction as its orbital motion. The seasonal distribution of meteor activity may be a useful pointer to the optimum periods for Es if the delay between the meteor showers and Es is minimal.

MAGNETIC FIELD

The wind shear theory described earlier refers to the part played by the Earth's magnetic field, and it is clear that variations in the magnetic field will also play an important part in the occurrence of Es. Obviously, the orientation of the field will determine the resultant ion motion due to horizontal winds. Towards higher latitudes the angle of dip of the earth's magnetic field becomes quite large - for example it is 77 degrees at the location of the EISCAT radar in northern Scandinavia - and yet the wind shear theory has still been shown to work [5].

A good measure of the state of the earth's magnetic field is given by the various geomagnetic indices. One is called the 'K index' and ranges between 0 and 9 on a quasi-logarithmic scale. The Earth's magnetic field has normal seasonal and diurnal variations, but the K index is designed to exclude these normal variations and concentrate on the departures from the normal - because of sudden solar activity, for example.

A second index is known as the 'A index' and it varies between 0 and 400. The A index is essentially a measure of the particle output of the sun, which by its subsequent effect on the ionosphere produces a change in the state of the earth' s magnetic field.

Both of these indices can be averaged globally and are then given the suffix 'p' to show that it is a planetary index. The A and K indices are frequently used in Es studies, and you might find the table below useful.

K index	0	1	2	3	4	5	6	7	8
A index	0	3	7	15	27	48	80	140	240

There have been various studies which link the K or A index with Es, but these are not generally conclusive. Results to be presented later show that 'true' mid-latitude Es correlates with a low K or A figure - that is, a relatively undisturbed geomagnetic field. There are exceptions, though, particularly with Es of the auroral type.

AURORA

Results from the EISCAT UHF radar [5] provide evidence of an interesting type of Es — see **Fig 17.** The first thing to notice is the time of the event - late evening - which is relatively uncommon. The familiar wave-like signature of AGW motion is in evidence, but the vertical strip of increased electron density is worth explanation. The paper [5] presents evidence (showing AGW activity in the F region) that the AGW motion was present before the Es occurred. It seems that the Es only formed after the vertically orientated increase in electron density: this is believed to represent precipitation of electrons near the auroral zone which ionise metal atoms attached to dust particles. These metallic ions are then compressed to form an Es layer by the wind shear effect in the normal way.

This type of event is likely to be associated with a high values of geomagnetic index. Note that there need not be an aurora in progress at the time but the high index may be a precursor to one occurring subsequently. The auroral oval where this particle precipitation occurs is itself quite a variable feature. It extends further south and is broader on the night side of the Earth than on the day side. The width and southward extent of the auroral oval are also functions of solar activity. A description of many aspects of auroras can be found in a *QST* article of a few years ago [16]. If the auroral electron precipitation does play a role in Es formation, this will dictate a further period (on a daily scale) when it may be worthwhile searching for Es given the necessary AGW to provide the wind shear. The results section, next month, will consider this further.

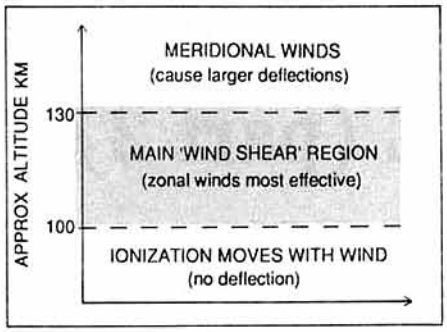

Fig. 15: Variation of 'Wind shear' effect around the E region.

ATMOSPHERIC TIDES

There have been many advances in our knowledge of the structure of Es due to the research work of the EISCAT UHF radar in Scandinavia. It is worth returning to the example shown in Fig 5 (last month), in which it is clear that there are two scales of wave motion present in the Es layer. The short period features between 1615 and 1700 UT are probably the result of gravity wave activity causing a thin layer of intensified ionisation by the wind shear mechanism.

There is also a longer period wave motion present, although only about a quarter of a cycle is visible as a gradual downward slope during the period of the trace. This long-period wave is due to the effect of solar tides in the atmosphere. In fact, the trace shows the response of the E region to the 'solar semi-diurnal tide' which repeats every half-day. Incidentally, this 'tide' is nothing to do with local high water! Anything which varies with the apparent movement of the sun or moon can be called a tide. In this case we are considering solar heating effects which in turn produce a regular (tidal) cycling of temperature and air movement (wind).

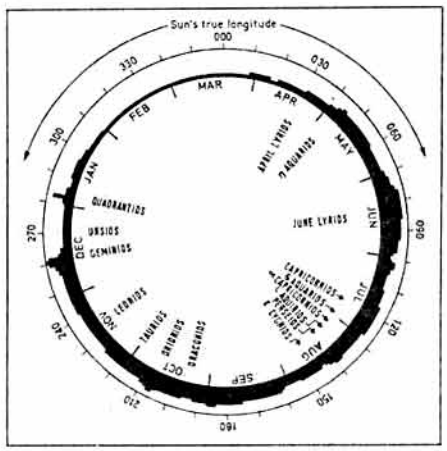

Fig. 16: Meteor distribution.

Atmospheric tides are one of the more complicated areas of atmospheric physics but it's worth thinking about some elements of them [17]. These E-region 'tides' are primarily driven by solar heating of water vapour and ozone in the lower part of the atmosphere. It so happens that the semi-diurnal component is particularly efficient at propagating upwards from its source region, whereas the expected diurnal mode is not. It appears that this contribution may be greater at times of solar cycle minimum and is liable to much variability from season to season (and also on shorter timescales from day to day).

The results of modelling the semi-diurnal tide lead to some interesting conclusions. Amplitudes are greater in summer than in winter and are very dependent upon the mean wind below 100km. In other words, there is no definitive value for the amplitude of these tides. In view of the solar influence there will also be a noticeable difference between different latitudes in a given season.

In the context of Es, the important thing is that these tides produce a wind structure which seems to operate the wind shear mechanism and thence cause conditions favourable for Es. It is not clear whether the tides alone are capable of intensifying the ionisation enough to produce Es without help from other sources. In fact, it seems that the solar semi-diurnal tide may be the 'clock' which determines the times when Es production is possible. The actual occurrence of Es probably depends upon other factors, especially the presence of lower atmospheric triggers to produce gravity waves which 'modulate' the tidal signature in the E-region.

The majority of Es layers do not remain at a fixed height. There appears to be ascending and - to a greater extent - descending Es as shown in Fig 5 and these are called 'sequential Es'. From a selection of EISCAT results and amateur radio reports, it seems that there is some measure of repeatability in the occurrence of sequential Es layers which is largely determined by the phase of the semi-diurnal tide, see **Fig 18.** It is possible that the descending part of the wind shear cycle gathers the available metallic ions and gradually confines them to a progressively thinner region lower down. At some point the ionisation density may be sufficient to produce Es. However, perhaps Es can only be produced in the additional presence of AGW to provide a further wind shear compression of the layer. If Es is independent of AGW then there should be Es each morning and afternoon as the tidal phase reaches the appropriate descending part of its cycle.

A further possibility is that both the rising and descending portion of the tidal cycle can produce Es when it is with in the height band where the wind shear mechanism is most effective. In fact, the rising portion will probably also require the presence of AGW to instigate Es [18].

A remaining question is what happens at the trough of the tidal cycle. The results of ionospheric soundings show that these descending layers often appear to become stationary at some height where they disperse. This height is sometimes referred to as the 'dumping height' [19]. At these lower heights the wind shear mechanism becomes ineffective because of the increased collision rate for ions. In the absence of renewed meteor input, this will gradually deplete the available metallic ions with each descent to the lower levels where collisions occur more frequently. However, if there is no effective wind regime or AGW, the metallic ions will enjoy a longer lifetime in the E

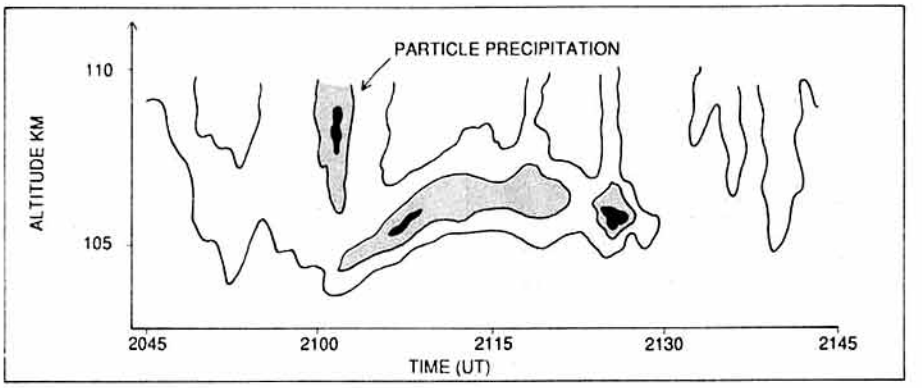

Fig. 17: Sporadic E layer observed by EISCAT UHF radar, [5].

region waiting to be used up. One theory [19] is that this final 'dumping height' depends, in part, upon the conditions in the opposite hemisphere.

In the example shown in Fig 5, it is believed that the ionisation was rapidly dispersed by a sudden change of the horizontal wind which produced an upward motion of the metallic ions. After a while they may be gathered up and brought down again by the next cycle of the tide. Of course, the trigger AGW may have moved out of the field of the radar and the true 'dumping height' may have been somewhat lower elsewhere.

The final debate of this lower portion of the Es height range is what part of this describes the occurrence of FAI - Field-Aligned Irregularities. Many amateurs report FAI as almost a postscript to Es, usually happening an hour or so after the Es has disappeared, although some reports suggest FAI can be independent of previous Es. It is possible that it has something to do with the lower 'dumping height' region of the cycle in Fig. 18 when the ionisation becomes aligned with the magnetic field once the wind shear mechanism ceases to be effective.

A few notes are worth adding to this 'tidal' view of Es. The curve of the favourable wind shear region shown in Fig. 18 is an estimate of the relationship between Es and the daily time of occurrence. The times are not to be taken too literally in view of the great variability of the tides from day to day and season to season. Indeed, data now being analysed will necessitate a 'fine-tuning' in a future article. However, the underlying message is that the double peak to the diurnal occurrence of Es can be explained in terms of the tidal wind regime in the E region. It is actually more correct to think of the tidal effects as being due to a combination of the diurnal (once daily) and the semi-diurnal (twice daily) tides. Because these peak at different times, the combination of the two tides will not be a symmetrical curve as shown in Fig. 18. In fact, the marked asymmetry which actually exists may explain why the corresponding late evening and early morning periods are relatively unproductive.

NEXT MONTH

The next part of this series of articles on Es will deal with the results of radio amateurs' observations during the last few years and, in particular, the detailed reports sent in after the 1988 season Es trial. As you are now aware, there are probably several ingredients to an Es opening and this makes it very difficult to be sure that all the requirements are met on a given day. After looking at satellite pictures, weather charts and past Es openings in next month's part, the final section (part 4) will provide some operating hints and procedures which will bring together all the various components into an easy to use check-list. □

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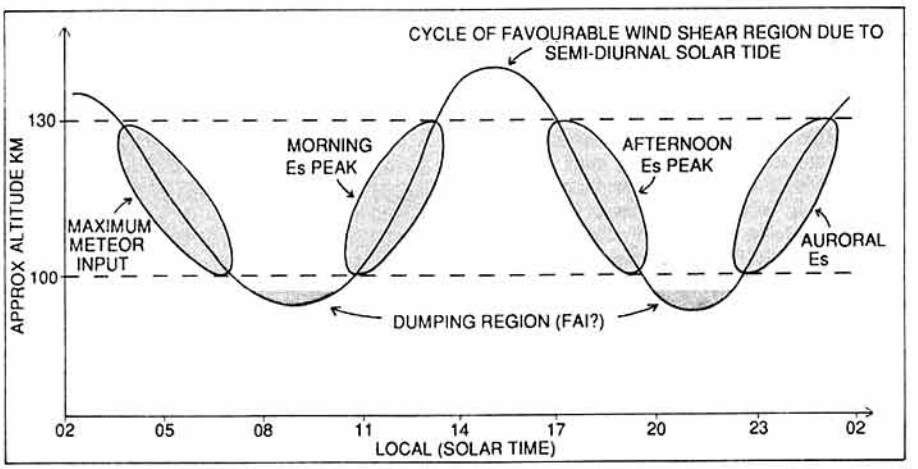


Fig. 18: Tidal influence on Es.

SPORADIC E HOTLINE

You may remember that this time last year Anglia TV weatherman Jim Bacon — who's the part of this fascinating series on sporadic E, ran a little trial in which he invited people to ring a Voicebank number to obtain Es predictions.

Well, because everyone seemed to enjoy the facility and also because Jim would like to have another go, we're doing it again this year. He writes:

"Some of these dates are weekdays, but don't worry too much since quite often the band doesn't really get going until late in the afternoon - say between 1530 and 1830 GMT. Also, it seems that many DX-chasers book days off work at this time, since they're well-known Es dates. The early part of June, in particular, is a strong contender amongst the fraternity which supports meteors as a cause of Es, hence two sets of trial dates are designed to explore this link. The weekend of VHF NFD is there to collect maximum activity and has also provided Es in the past.

"The dates for your diary are:

- *Tuesday 6 June*
- *Wednesday 7 June*
- *Saturday 1 July*
- *Sunday 2 July*
- *Wednesday 12 July*

"The trial, like that of last year, will consist of recorded messages on the RSGB 'Voicebank' to say where the particular Es triggers are located, if any. This will be updated during the day as new information becomes available. I would, of course, appreciate as much information as possible on what happens, but some things are more important than others. I'd very much like to know:

- *times of contact or hearing DX (SWL reports welcome)*
- *beam headings - both stations if possible*
- *signal strengths and characteristics - fading?*
- *any changes to DX or beacons over a period*
- *BOTH locators*

"The information will be available on the following number:

021-400 0977.

So - go to it, work some good DX and help the noble cause of science whilst you're at it. Remember, it could be *YOUR* report that makes the crucial difference. Oh, and don't forget to read Jim's article on possible causes of Es.

PSION MORSE TUTOR

Peter Walton, G4WAL, has found an ingenious way of learning more using a popular pocket organiser.

By now most people will have encountered, even if they do not already own, one of those little grey pocket computers known as the Psion Organiser II personal organiser. Up to now you, for example, may have only afforded it a passing glance, taking the view that here we have just another 'executive toy' in the shape of a bigger and better pocket calculator. If this applies to you, read on, and be prepared to be converted. If, however, you are already a 'Psion person' please excuse the sales pitch but be assured that I have no commercial interest whatsoever in Psion Ltd.

If you have already read the sales literature in Psion's high street outlets you might be forgiven for assuming that they are selling yet another mind-blowing calculator, extolling its virtues as a personal diary, 'phone directory, and perhaps a financial spreadsheet support peripheral. In actual fact the device is a full-blown personal computer with up to 64kbytes of ROM and up to 64k of RAM, a built-in real-time clock and calendar, Eprom based 'data-packs' easy to use basic style programming language (OPL) and it supports a versatile RS232 'Comms Link' the use of which has the potential to open up a multitude of exciting amateur communications ideas.

I have already taken time out to write the morse tutor program published here, and only wish I had the proverbial 48 hours per day to allow me to get started on all of the other 'amateur' software just crying out to be written. For example, how about a portable (hand held) RTTY/Packet terminal, a take-anywhere Locator unit, a Motorway section vs repeaters-available database, an instant logbook (yes, it knows the time and date itself!), etc. So, if the Psion is not an opening for another era of traditional Amateur experimentation and development I don't know what is! Enough - let's return to Earth for now, and consider the project in hand, the morse tutor program...

What does the program do?... Well, on selecting PROGRAM - RUN - MORSE via the Psion's Menu, you will first be asked to select a 'speed' of 6, 10, or 12WPM (these three are fixed, but can be modified within the program). After choosing a speed (and you need only key the numbered key there's no need for shift!), you are then asked for a option between 1 and 7. This option decides, in easy steps, how many of the alphabet/numbers are to be used: 1 = EISHTMO, 2 = AUVNDB ... 5 = numbers. After choosing an option (again there's no need to use shift) there are a couple of seconds' wait while the program picks at random 16 characters from the group you made available.

GENERATING CODE-GROUPS

On pressing the execute key the Psion will then send the group for you to transcribe (the organiser has a built-in 'beep'). On completion of the passage, further pressing of the execute key will reveal the string of characters sent, so that you can check your copy. You are then given the option to repeat, re-set, change speed, or end.

Assuming that you are sold on the project, all that remains is the legwork... entering the listing into the Psion. If you are already a well-established user, you may have the RS232 comms link, in which case it's possible to do the work via the standard keyboard of your PC by creating and transferring files (using your word processor). Otherwise, I'm afraid, it's an evening's work entering a line at a time from the Psion's own keypad. That's how I wrote the original program anyway, so don't be put off!

For the benefit of anyone who has only just acquired a PO (Personal Organiser) and has not yet become fluent with the use of OPL, I'll take you through the detail stage by stage, with apologies if I overstate it all! Before you start the entry instructions, I must make the point that the 'program' is, in effect, a series of 'procedures' which have to be entered individually. The main one called MORSE, and the other very small ones are called DIP, DA, DI and SP. They are only a few lines each. Procedures are called-up from the main program by name and a single colon (eg, DIP:). This should not be confused with the labelling of program sections which use double colons, and enable "goto" to be used (eg, GOTO RAND::).

Having powered-up the PO select main menu option "PROG". Then select program menu option "NEW". Display will now show "NEW A:". At this point key in the word "MORSE" and key the "EXE" key. Display will now show "MORSE:" indicating that it has created a procedure called "MORSE" and is ready for the program to be keyed in. Press "EXE" again to move the cursor onto the next line and then start to enter data from the second line of the listing (the first line is the procedure name!). Ignore "MORSE:" and start with "REM P.Walton 1988.Reqrs to call the following procs". Then key "EXE" for next line - "REM DIP: DA: DI: SP:" followed again by "EXE". Carry on to the end of listing, ie "GOTO RAND::".

Note that use of lower-case letters, symbols and numbers is obtained by use of the "SHIFT" "CAP" "NUM" keys as needed, and errors can by backspaced over by the "DEL" key.

DOUBLE-CHECK

When you have entered the full listing double check your work by use of the cursor arrow keys to run up and down the listing (and double, double check that spaces, colons, etc are exactly as per the listing. Spaces are very important in OPL!). If you are happy with your work, the next stage is to translate, and then save the procedure. Key the "MODE" key, and the display will offer three options: "TRAN SAVE QUIT". Select "TRAN" (translate, which will take a few minutes!), and if you were very good at following instructions the display will show "SAVE A: MORSE" and you need only key "EXE" again to save the procedure and return to the program menu.

However, if you have not been so lucky/skillful the screen may show an error (you may have to look it up), and will ask you to press the space key to put you into the listing at the right place to correct, and try another "TRAN" (clever, eh?). When a good "SAVE" has been made and you are back on the menu screen, you will now have to enter the other four procedures in the same way ("NEW" "DIP" "TRAN" "SAVE" etc) before the program can be used.

On completion of all five successful "SAVES" take the "RUN" option from the program menu, and the PO will display "RUN A:SP" (presuming that "SP" was entered last, as it defaults to the last procedure handled). At this point delete "SP" type in "MORSE" and key "EXE". It remains now to amaze your friends and colleagues, and perhaps even learn some CW along the way!

I hope this article will stimulate many people to investigate and explore the vast potential of POs in the field of amateur radio, and look forward to seeing many more uses made of the device/s. □

MORSE TUTOR PROGRAM

```
REM P.Walton 1988
REM DIP: DA: DI: SP:
GLOBAL R$(1),L$(10),R%,X%,
SAV$(16),T%,L%,OP%,SL%
GOTO SET::
SET::
PRINT"SELECT SPEED"
PRINT"1=6 2=10 3=12"
L%=GET
IF L%=85
L%=200
ELSEIF L%=86
L%=100
ELSEIF L%=87
L%=70
```

continued on next column

continued from previous column

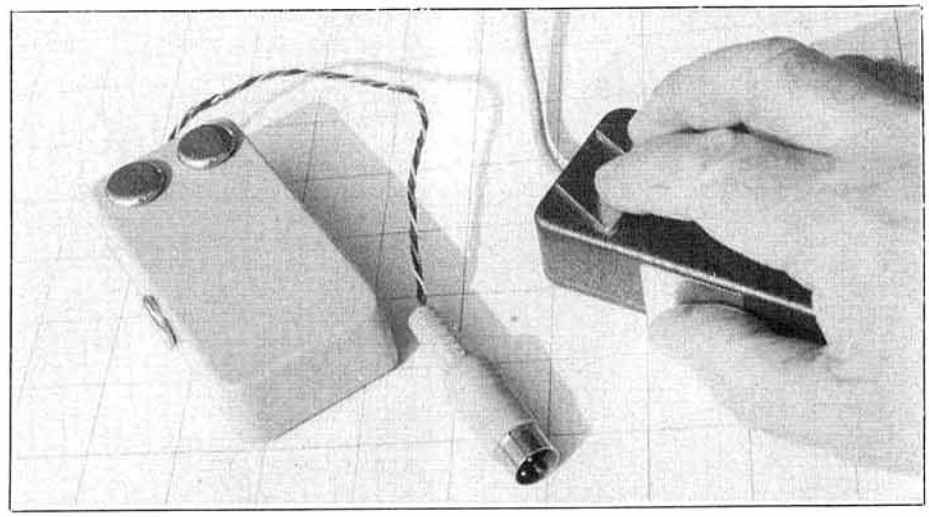
```
ENDIF
T%=80
PRINT"SELECT OPTION"
PRINT"1-2-3-4-5-6-7"
OP%=GET
CLS
PRINT"...WAIT.."
GOTO RAND::
RAND::
IF LEN(SAV$)=16
GOTO FIN::
ENDIF
DIP:
IF OP%=85
GOTO GRP1::
ELSEIF OP%=86
GOTO GRP2::
ELSEIF OP%=87
GOTO GRP3::
ELSEIF OP%=79
GOTO GRP4::
ELSEIF OP%=80
GOTO GRP5::
ELSEIF OP%=81
GOTO ALL::
ELSEIF OP%=73
GOTO ALL::
ENDIF
GRP1::
L$="EISHTMO"
IF R%>7
R%=R%-7
ENDIF
R$=MID$(L$,R%,1)
SAV$=SAV$+R$
GOTO RAND::
GRP2::
L$="AUVNDB"
IF R%>6
R%=R%-6
ENDIF
R$=MID$(L$,R%,1)
SAV$=SAV$+R$
GOTO RAND::
GRP3::
L$="WJCKPG"
IF R%>6
R%=R%-6
ENDIF
R$=MID$(L$,R%,1)
SAV$=SAV$+R$
GOTO RAND::
GRP4::
L$="RLQZFXY"
IF R%>7
R%=R%-7
ENDIF
R$=MID$(L$,R%,1)
SAV$=SAV$+R$
GOTO RAND::
GRP5::
L$="0123456789"
R$=MID$(L$,R%,1)
SAV$=SAV$+R$
GOTO RAND::
FIN::
PRINT"PRESS EX TO SEND"
X%=GET
CLS
X%=0
DO
X%=X%+1
R$=MID$(SAV$,X%,1)
IF R$="A"
DI: :DA: :SP:
ELSEIF R$="B"
DA: :DI: :DI: :DI: :SP:
ELSEIF R$="C"
DA: :DI: :DA: :DI: :SP:
ELSEIF R$="D"
DA: :DI: :DI: :SP:
ELSEIF R$="E"
DI: :SP:
ELSEIF R$="F"
DI: :DI: :DA: :DI: :SP:
ELSEIF R$="G"
DA: :DA: :DI: :SP:
ELSEIF R$="H"
DI: :DI: :DI: :DI: :SP:
ELSEIF R$="I"
DI: :DI: :SP:
ELSEIF R$="J"
DI: :DA: :DA: :DA: :SP:
ELSEIF R$="K"
DA: :DI: :DA: :SP:
ELSEIF R$="L"
DI: :DA: :DI: :DI: :SP:
ELSEIF R$="M"
DA: :DA: :SP:
ELSEIF R$="N"
DA: :DI: :SP:
ELSEIF R$="O"
DA: :DA: :DA: :SP:
ELSEIF R$="P"
DI: :DA: :DA: :DI: :SP:
ELSEIF R$="Q"
DA: :DA: :DI: :DA: :SP:
ELSEIF R$="R"
DI: :DA: :DI: :SP:
ELSEIF R$="S"
DI: :DI: :DI: :SP:
ELSEIF R$="T"
DA: :SP:
ELSEIF R$="U"
DI: :DI: :DA: :SP:
ELSEIF R$="V"
DI: :DI: :DI: :DA: :SP:
ELSEIF R$="W"
DI: :DA: :DA: :SP:
ELSEIF R$="X"
DA: :DI: :DI: :DA: :SP:
ELSEIF R$="Y"
DA: :DI: :DA: :DA: :SP:
ELSEIF R$="Z"
DA: :DA: :DI: :DI: :SP:
ELSEIF R$="1"
DI: :DA: :DA: :DA: :DA: :SP:
ELSEIF R$="2"
DI: :DI: :DA: :DA: :DA: :SP:
ELSEIF R$="3"
DI: :DI: :DI: :DA: :DA: :SP:
ELSEIF R$="4"
DI: :DI: :DI: :DI: :DA: :SP:
ELSEIF R$="5"
DI: :DI: :DI: :DI: :DI: :SP:
ELSEIF R$="6"
DA: :DI: :DI: :DI: :DI: :SP:
ELSEIF R$="7"
DA: :DA: :DI: :DI: :DI: :SP:
ELSEIF R$="8"
DA: :DA: :DA: :DI: :DI: :SP:
ELSEIF R$="9"
DA: :DA: :DA: :DA: :DI: :SP:
ELSEIF R$="0"
DA: :DA: :DA: :DA: :DA: :SP:
ENDIF
IF X%=5
SP: :SP:
ELSEIF X%=10
SP: :SP:
ELSEIF X%=15
SP: :SP:
ENDIF
UNTIL X%=16
PRINT"EXE TO VIEW"
X%=GET
CLS
PRINT SAV$;
PRINT"EXE TO CLEAR"
X%=GET
PRINT"1 RE-SETS 2 ENDS"
PRINT"EXE  REPEATS"
SL%=GET
IF SL%=86
STOP
ELSEIF SL%=85
PRINT"RE-SETTING"
BEEP 800,100
GOTO SET::
ELSEIF SL%<>85
SAV$=""
CLS
PRINT"..WAIT PLEASE.."
GOTO RAND::
ENDIF
STOP
ALL::
IF R%>5
R%=R%-5
ELSEIF R%=1
DIP:
GOTO GRP1::
ELSEIF R%=2
DIP:
GOTO GRP2::
ELSEIF R%=3
DIP:
GOTO GRP3::
ELSEIF R%=4
DIP:
GOTO GRP4::
ELSEIF OP%=81
GOTO RAND::
ELSEIF R%=5
DIP:
GOTO GRP5::
ENDIF
GOTO RAND::

DIP:
R%=INT(RND*10)+1
RETURN

DA:
BEEP L%*3,T%
BEEP L%,0
RETURN

DI:
BEEP L%,T%
BEEP L%,0
RETURN
SP:
BEEP L%*3,0
RETURN
```

A touch-sensitive controller offering a low cost solution to easy operating without to much regard for tradition



An easy touch controller for automatic keyers

By Alan S Chester G3CCB

Touch keyers are not new and some interesting examples have appeared from time to time, but most have retained some features of the traditional paddle as though any radically new departure would be just too much for the user to accept in one package. However, an altogether different approach to automatic keyers was seen a few years ago [1] where a pair of miniature straight keys mounted side by side were operated by the tips of two fingers. The design offered here combines the touch method with the use of the fingers in the manner just described.

PRINCIPLE OF OPERATION

The touch sensitive switch mechanism is provided by two CMOS inverters in cascade which can be triggered by bringing the input terminal from a positive level to ground. Because of the very high input resistance of the device, this function is achieved merely by touching the input terminal with a finger tip having grounded the rest of the hand in some convenient way. The gain of the inverters then produces an adequately fast transition to ground at the output.

The resistance of the hand, from fingertip to palm, varies widely from well under 100k to some Megohms depending on the condition of the skin and the pressure and area of contact. It was the first aim, therefore, to achieve a high and constant sensitivity of operation which was as independent as possible of operator skin characteristics. Sensitivity could be raised by increasing the value of a hold-up resistor at the input but it was found that the very large values required were more economically realised by using a reversed-biassed low-leakage diode in its place.

PRACTICAL ASPECTS

The circuit of the touch controller is given in **Fig 1** where one channel only (dots or dashes) is shown. The CMOS device is a Quad 2-input NOR-gate. A NAND-gate version could just as easily be employed with unused inputs taken to the positive supply line. The more expensive Schmitt trigger equivalents were tried but with no worthwhile improvement in performance.

The leakage current of the diodes available (a few nanoamps) was found to be just about right to give the required degree of sensitivity without the need to look for better devices. A much higher sensitivity would, in fact, have caused the device to trigger on the presence of slight moisture at the controller's input.

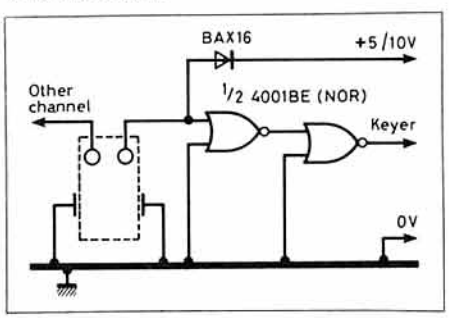


Fig 1: Circuit diagram (one channel).

The layout is not critical except for input wiring between the touch pads and the CMOS gates, which must be kept well clear of other parts. Two controllers were constructed, one in a plastic box with nickel plated blazer buttons as finger pads and a second in a metal case with 'professional' touch plates mounted through insulating bushes. A general impression of the external design may be obtained from the photograph.

KEYER INTERFACE

Most automatic keyers offer two input terminals which are brought to ground to initiate the dot and dash channels respectively and the sink current is usually not more than a milliamp or so, which is within the capacity of the CMOS gates used in the controller. The 5-10V supply needed for the controller is easily provided by the keying unit so that a four-way connector is all that is required to link the two units. The keyer used with the controller at G3CCB was constructed some years ago from an article in *RadCom* [2] and continues to give excellent service.

OPERATION

The controller allows more choice in the manner of operation than most other designs. The preferred way might be to use the first and second fingers of the hand best suited to the operator. The thumb will then rest comfortably on the ground plate on the side of the case. On the question of which way round to wire the dot and dash plates, it might be a good idea to forget the traditional paddle altogether and start afresh. My own choice is dots on the first finger which gives the most rapid movement to the most agile digit and this is the method used in Ref. 1. Experimenters will find that there is far less to this apparent dilemma than may operators would claim but it certainly could be confusing to change sides every week or two!

The controller is particularly suited to iambic keyers since the equivalent of the squeeze action is simply to touch both pads simultaneously. It would be wise to practise with the keyer set to a slow rate at first, aiming for as little finger movement as possible. Full iambic technique can be tried straight away but don't rush things and keep off the air until you are fully confident.

RF BREAKTHROUGH

Automatic keyers using CMOS devices are prone to breakthrough from adjacent transmitters and the touch controller is probably even more vulnerable because of its high input impedance. Even so, the plastic cased version has been used regularly with a variety of QRP transmitters and aerial systems without trouble. The screened case offers better protection where higher powers are used, but some RF filtering might also be required. Clearly, the touch pads themselves cannot be screened but their natural capacitance to the case (around 20pf) will assist in reducing the RF input impedance.

CONCLUSION

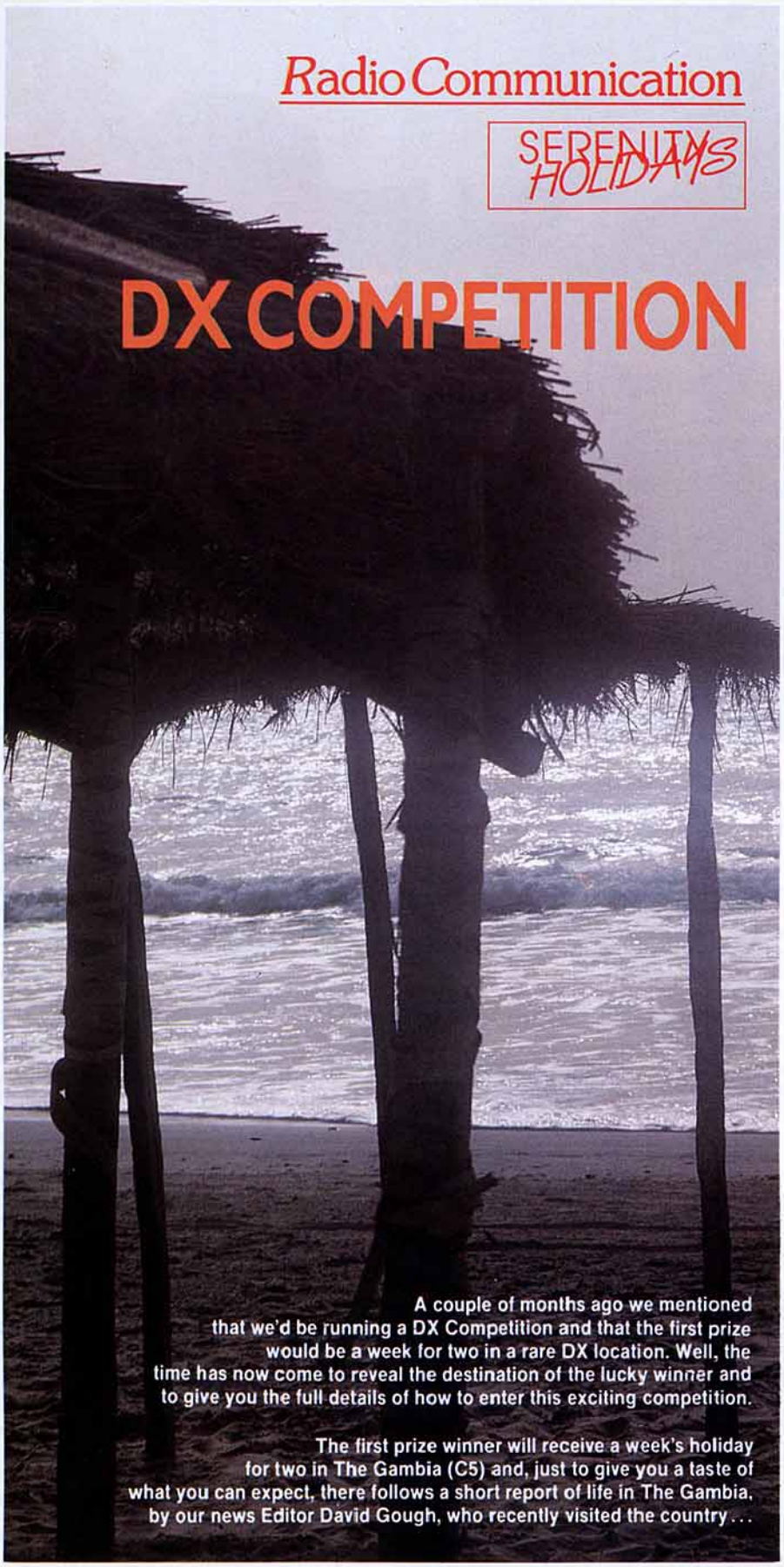
The touch controller described is simple, effective, reliable and cheap. Once mastered, operation is easy and the controller can be used in any number of unusual and difficult situations which would render the normal paddle (or even straight key) awkward to handle.

The external design leaves plenty of scope for the constructor and, for example, a nicely finished bare metal case would obviate the need for grounding plates. A gold plated presentation model would look very nice indeed but, considering the fact that the total cost of electronic parts is under £1, the idea might be regarded as being a 'touch' extravagant! □

REFERENCES

[1] John S Lewis, W5TS, 'The code at your Fingertips' *QST* Nov 1976.

[2] CIB Trusson, G3RVM, 'The ultimate' keyer (Mk2) — with auto intercharacter spacing', *RadCom* Feb 1980.



THE GAMBIA EXPERIENCE

Stepping off the plane five and a half hours from Gatwick, the hot air rushed to meet us with all the warmth of an African handshake. The first stop was at the Health Authority desk but, since two of the three people manning the desk were asleep and the third was deep in conversation with one of the airport officials, we passed through to immigration. No one asked to see my Yellow Fever Vaccination Certificate I'd paid £11.50 for, which made me wonder if all the anguish I'd gone through to have the various jabs was worth it (I don't like them one bit). Of course, it would be very foolish to consider going to a tropical country without taking the necessary medical precautions (Typhoid, Yellow Fever, Cholera and Hepatitis 'A' vaccinations, and the Polio 'sugar-lump'). In addition to the vaccinations, and perhaps more important, is a course of malaria tablets. These should be taken one week before the visit, throughout the visit, and for six weeks afterwards. But, back to the story....

Our luggage was lined up neatly in rows and when all was ready we were allowed to walk up and down the lines to pick up our baggage. A few Dalasi (local currency - about D12 to the £1.00) in the hand of a porter helped to speed things up a bit. We then made a dash to the customs desk - a concrete slab on a few blocks - formed a disorderly queue, had our bags chalked with an 'X' and made our way out of the gate.

Ernie Sumption, C53GS, and his wife Anna were there to meet us with cold drinks - the temperature was around 130°F. Ernie and Anna first came to the Gambia on holiday some four years ago and eventually decided to stay during their last visit 18 months ago.

The next day we visited the guest house where the winner will be staying. Ernie hasn't yet decided on a name for it yet but a firm favourite seems to be 'Bunkoyo' which mean 'white house' in Mandinka - the language of one of the prominent tribes in The Gambia. Although not totally completed when we saw it, Bunkoyo comprises six rooms, two with double beds and the rest with two singles. All the rooms are approx 16' x 12' plus a bathroom with shower, WC and handbasin. There is a large communal lounge with a bar, which opens out onto a patio overlooking Casino Beach. The beach is about 5 minutes stroll from the guesthouse (10 minutes if you take it at Gambian pace!) and is in a very quiet location. The warm Atlantic waves roll gently onto the sand which ranges in colour from white, through red to volcanic black.

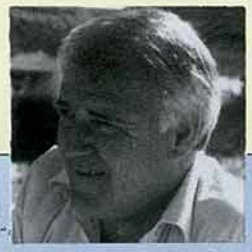
The accommodation is on a half-board basis with a good filling breakfast and dinner in the evening. Snacks and drinks are available throughout the day and are served on the communal patio. All of the rooms have their own small patio area with local-made cane chairs and tables. Three of them catch the morning sun and three catch it in the evening. The communal patio benefits from the sun throughout the rest of the day. Two of the rooms are fitted out for amateur radio use, with each having antenna feeders and additional shelving for the rig. Visiting amateurs have a choice of two valve transceivers for use during their stay (transistor rigs tend to cut-out at these temperatures). Alternatively, it should be possible to take your own rig if you prefer. Naturally, if there are two sets of amateurs visiting at the same time they will have to come to an agreement on

which bands they operate at which times and, in the event of a dispute, Anna is the mediator. There is a three-element tri-bander for 20m, 15m and 10m at the side of the building and an 18AVQ in the centre of the roof. The Gambian Amateur Radio Licence costs approximately £4.00 and Ernie can make the necessary arrangements provided that visitors send a copy of their licence in advance. Alternatively, the licence can be obtained on arrival but, a word of warning, the office is not open at weekends and flights from the UK generally arrive on Friday afternoon.

Just to give you some idea of what can be expected when operating from such a choice DX location, Ernie, C53GS, came third in the African section of the 21MHz CW Contest last November. He achieved 1560 points which, when considering that the electricity didn't come on until well into the contest, is not a bad score. At the end of February, two well known DX enthusiasts - Roger, G3SXW and Nigel, G3TXF - visited Ernie and Anna at their compound in Serekunda, about two or three miles inland from Casino Beach. In one week only they made a grand total of 14,783 CW contacts! Anna told me that the operation was virtually continuous with each taking a few hours sleep in shifts. Such was the dedication of these two DXers that Anna, a trained nurse, had to treat Nigel for swollen legs after sitting down for so long in front of the rig, and Roger, heading for 15,000 contacts, almost had to be dragged away in order to catch his flight home. By a roundabout route, we've managed to extract a promise from the intrepid duo to write up their side of the story for a future issue of *RadCom*. Needless to say, you only have to put out a short CQ call and you're at the fighting end of a pile-up; I was to find that out for myself a few days into the visit.

SO WHAT OF THE GAMBIA ITSELF?

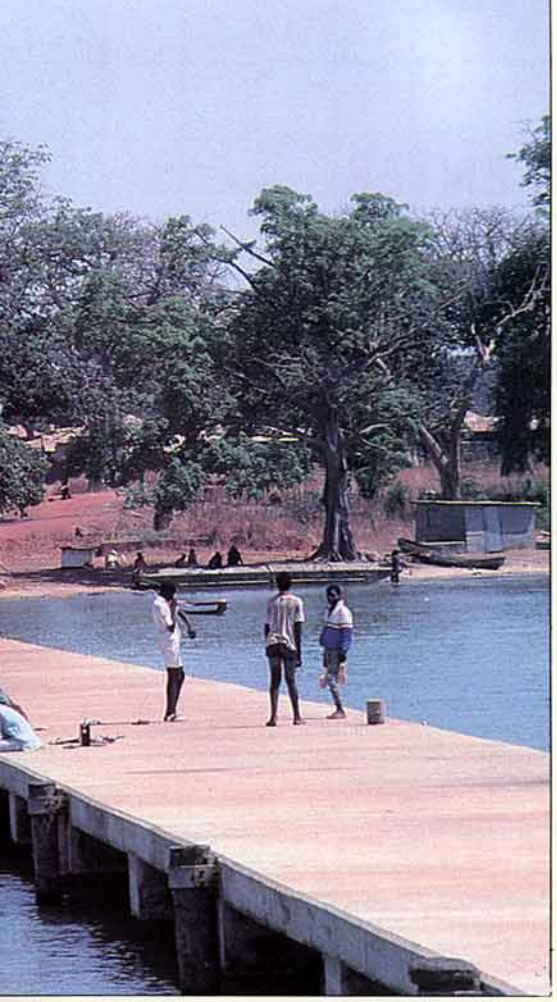
I hope that whoever wins the first prize in this exciting competition will not spend all the time on the air since there is so much to see in this fascinating country. The Gambia is situated on the beautiful West African coast between the Equator and the Tropic of Cancer. It is dominated by the River Gambia and stretches some 200 miles in length with an average width of only 20 miles. It has unsophisticated charm, miles of deserted palm-fringed beaches, spacious tropical gardens, nature reserves, craft markets and interesting excursions. The two excursions we went on were the 'Roots Trip' up river, and the 'African Experience' neither of which should be missed. These excursions can be booked through West Africa Tours. The company is run by an Englishman, Patrick, who hails originally from Essex. He employs 14 local people to act as guides on the tours and as resort representatives for Serenity Holidays. All of the guides wear distinctive red, blue and green 'Gambi-shirts' - the colours of the Gambian flag - and are easily recognised, providing a welcome splash of colour at the airport. Patrick first came to the Gambia over five years ago as a resort manager for another well-known travel company. He set up West Africa Tours two years ago and has never looked back.



Right: Patrick, proprietor of West Africa Tours

THE ROOTS TRIP

The American novelist Alex Haley, author of 'Roots' traced his ancestry to the village of Juffure, about 2-3 hours cruise up river from Banjul, the capital of The Gambia. Before we moored at the neighbouring village of Albreda, a mass of children had gathered on the jetty to meet us. The Gambians are very friendly people and the traditional greeting is to shake hands and say 'Nanga Def'. However, if you don't feel confident enough to try your hand at Mandinka, a simple "Hello, how are you?" will suffice, when shaking hands. One thing you will encounter in the Gambia is begging. Children in particular are in short supply of pens and paper and it's a nice gesture to take a few pens and notepads with you; the odd tee-shirt wouldn't go amiss either. After walking through Albreda, we made our way a few hundred yards to the village of Juffure to be introduced to the tribal elder. It's customary to meet the elder as you enter a village and this wizened old man of around 85-90 years of age sat under a canopy of palm leaves while a book was passed from visitor to visitor. The introduction consisted of writing your name, country of origin, date of your visit, and a comment on your first impressions of the village. After signing the book we all gave some Dalasis towards the upkeep of the village (money given by previous visitors has helped to fund a new school). With the 'formalities' completed, we were taken to meet the claimed 6th-generation descendant of Kunta Kinte, the hero of Alex Haley's novel. This elderly grandmother also sat under a canopy of palm leaves while a framed faded copy of an old British Caledonian in-flight magazine, depicting her with Haley, was passed around as 'proof'. Alex Haley gave money to the village to sink a bore hole and provide its inhabitants with good fresh water.



After spending some time talking to the locals, we meandered down to the jetty and left a hoard of people determined to sell us some of the carvings made in the village. Bartering is a way of life in The Gambia and the prices were literally falling by 50 Dalasis a second as the boat pulled away towards Fort James Island, the next stop on our excursion.

Fort James Island is about half a mile into the river from Albreda and is the place where the slaves, which had been taken from the north bank of the river, were kept in appallingly cramped conditions before being transported to the New World (USA) in the 17th century. Back in the village of Albreda there is a stump of wood which is all that remains of the flagpole nicknamed the 'freedom pole'. It was called this because any slave who escaped from James Island, swam across to Albreda and touched the pole was guaranteed their freedom. It all sounds very romantic but, in truth , it was a cruel game. If a slave did manage to free himself of his chains, make it to the beach before being shot, swim across the crocodile infested river and stagger up the beach to touch the 'freedom pole' he would have been a very lucky man indeed; the chances of survival were virtually nil. Fort James Island has a strange calmness to it, as though it were still breathing a sigh of relief after the abolition of slavery. If you look very carefully around the water's edge you will find brightly coloured beads. These are all that remains of the necklaces worn by the slaves to identify their particular tribes. The beads were torn from their necks when they arrived on the island, stripping them of any remaining dignity which they may have had. If you're tempted, as many are, to take these beads away as some kind of macabre souvenir, please don't; leave them behind as a reminder to future visitors who may have forgotten the brutality of trading in human life.

After leaving Fort James Island there is time to reflect on what you have seen and felt. If you are luckier than we were you may see dolphins playing in the wake of the boat as you return to the creeks near Banjul.

THE AFRICAN EXPERIENCE

The other excursion we went to was the African Experience and it certainly lives up to its name. In three and a half years it has become one of the top tourist attractions in The Gambia, but don't let this put you off. It's nothing like the typical 'let's go native' tour which you get when you go to Spain or other Mediterranean countries. The African Experience is run by Mrs Seka, a petite Yorkshire lady from Hebden Bridge who sounds just like Thora Hird. She is married to a tall Gambian gentleman and has a very good head for business. The cost of this excursion includes a full Gambian-style meal which, if you arrive early enough, you can help prepare on open fires. Visitors are seated in several semi-circular huts around an arena. Over the three or so hours in which you are there you are treated to a wide range of African dances, music and other entertainment, including having a Black Spitting Cobra draped around your neck. You can visit the excellent craft market selling goods at very fair pegged prices (no bartering here) or even visit the 'Maribou' or fortune-teller, who will tell you things about yourself with devastating accuracy!

Banjul is hot and bustling and not really the place to spend too much time except, perhaps, to visit Albert Market. This is a veritable rabbit-warren of stalls selling everything from door hinges to cassette/radios, fabrics to counterfeit Cartier watches, and wallets to exquisite wood-carvings. However, if you do want to buy anything here, make sure you are well versed in the art of bartering. Aim at about a quarter of the stall-holder's first price and slowly work to a compromise. If you still think his final price is too much, don't buy. I found Serekunda Market to be far better. It's not so geared to tourism and caters mainly for the locals. If you visit this market you may be the only whites there and will attract a great deal of attention from these very friendly people. You will still have to barter for whatever you want to buy but you'll get a fair price if you do it right. I bought several cassettes of local Gambian music for about D20 each (less than £2.00!).

After a very full week of seeing the sights during the day and relaxing (?) in front of the HF rig on the fighting end of a pile-up in the evening, it was time to say goodbye. After checking in at the airport we relaxed at Rosie's Bar, just opposite, with a couple of bottles of Julbrew, the local and very excellent beer. Shortly before we were due to board the Novair (ex-Cal Air) wide-bodied DC10 for home, we were required to walk out onto the tarmac and identify our baggage. The bags were then taken to a makeshift desk manned by three smiling customs officials in full regalia.

"Anything to declare?" came the question.

"Like what?" I asked.

"Like guns, bombs or drugs' said the Chief Customs Officer.

I told him we had nothing like that but we did have six bottles of Julbrew.

"OK" he said with a broad grin, and waved us through.

Within an hour we were cruising at an altitude of about 35,000' and on our way home. We left a temperature of 135°F and arrived back at Gatwick to a very cold 46°F.

There is so much more that could be said about The Gambia if there were more space available but, by way of ending this short report, I must stress that even if you aren't lucky enough to win the first prize - and there's no reason why you shouldn't - you should think seriously about taking a holiday here. It's a 'Gambia Experience' you will never forget."

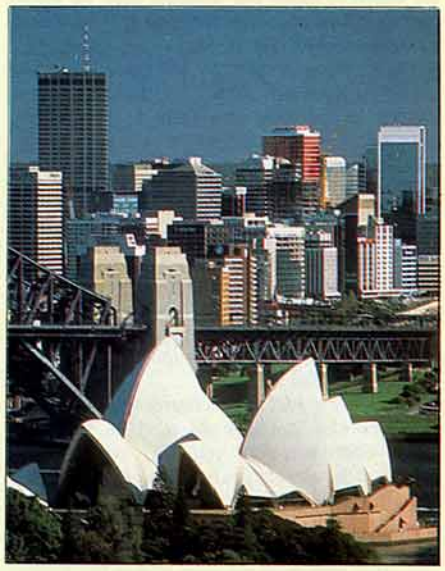
You can obtain a copy of the Serenity Holidays 'Gambia Experience' brochure by writing to them at:
Serenity Holidays Ltd
17 Bell Street
Romsey
Hampshire SO15 8GY

As we said at the start of this report, the first prize is a week's holiday for two in the Gambia, courtesy of Serenity Holidays Ltd. Your prize will also include the use of an amateur radio station and the cost of a visitor's licence. The total package also includes your insurance, flights and transfers to and from Yundum Airport and your half-board accommodation at Ernest and Anna's guest house, near Casino Beach.

DX COMPETITION — HOW TO ENTER

Over the next three months we'll be printing a number of photographs and clues (the first of which are at the bottom of this page) relating to well-known landmarks around the world. All you have to do is identify the precise location of the landmark, write down the ITU prefix associated with the respective country and also its capital city (or main town/village in the case of islands). When you have successfully identified all locations and provided the required information, you must then estimate the total number of International Nautical Miles flown point to point by the shortest direct route (ie, ignoring the normal airline routes and availability of a local airport) if you were to visit each of the locations in the order in which they appear. The start and finish point is at RSGB Headquarters in Potters Bar. This latter part of the competition will be the tie-breaker.

For example — the photograph shows the Sydney Opera House so, if this were the first clue (which it isn't), your answer would be;



Sydney Opera House, Sydney NSW, VK(1) and Canberra. The shortest distance between RSGB HQ and Sydney is 9,166 International Nautical Miles — OK?

By the way, don't forget that you will have to add the distances between each of the locations as they appear, starting and finishing at RSGB HQ, in order to arrive at the total.

The entry form and final clues will be in the August issue of Radio Communication and a small entry voucher will be printed with each of the other sets of clues. These vouchers MUST be attached to the entry form (photocopies of the vouchers or entry form will NOT be accepted). The competition is open to RSGB members only and, in the event of a tie, the entrant with the nearest estimated total International Nautical Miles travelled will be the winner. In the event that no entrant successfully identifies all of the locations or gives all of the required information correctly, the judges will exercise their discretion.

So - it only remains to wish you the best of luck and "GOOD DX".

RULES:

Entries MUST be received at RSGB Headquarters by 5pm on Friday 29 September and the judges decision will be final.

The winner will be notified by post and the first prize of the holiday must be taken during the Winter 1989/90 season on a mutually convenient week for the winner and Serenity Holidays Ltd, excluding Christmas, the New Year and Easter holidays. If the winner would like an additional week at the same accommodation or at another hotel in The Gambia, this can be arranged at extra cost. (It's certainly worth considering this since the air fare forms part of the prize and the cost of an extra week is, therefore, quite reasonable.)

No cash alternative prize will be available.

The winner of the competition may be required to provide a write-up of his/her experiences in the Gambia for possible future publication in *Radio Communication* and should be prepared to allow their name and photograph to be used in conjunction with any publicity resulting from winning the competition, either by the RSGB or Serenity Holidays Ltd.

Immediate family members of Mr & Mrs G E Sumption, or employees of Serenity Holidays and immediate members of their families, or employees of the RSGB, or the Council of the RSGB, and immediate members of their families, will NOT be eligible to enter the competition.

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VOUCHER 1

CLUE 2

NOTHING TO DO WITH FAST FOOD

CLUE 3

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

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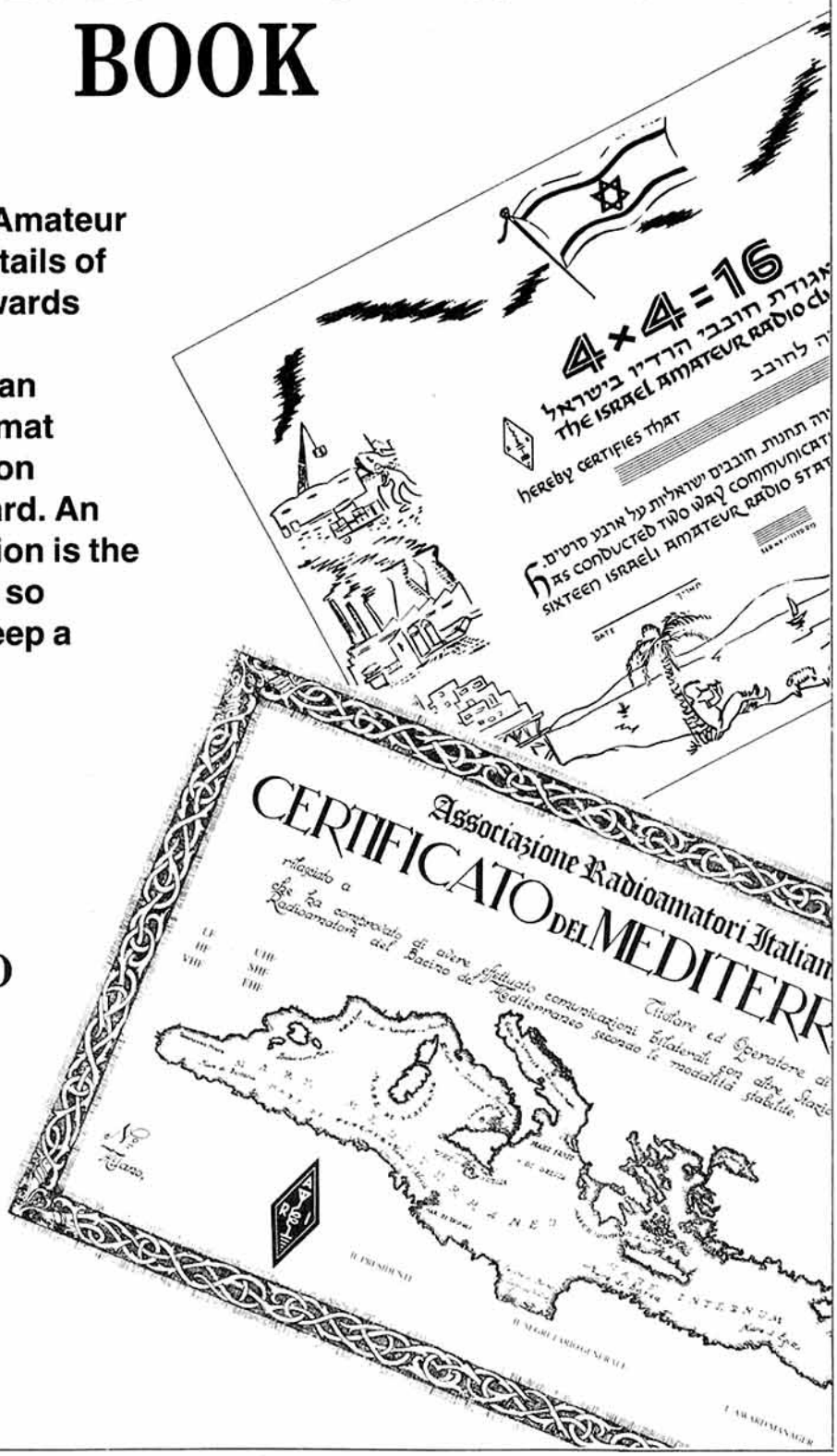

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£7.95

to RSGB members by post

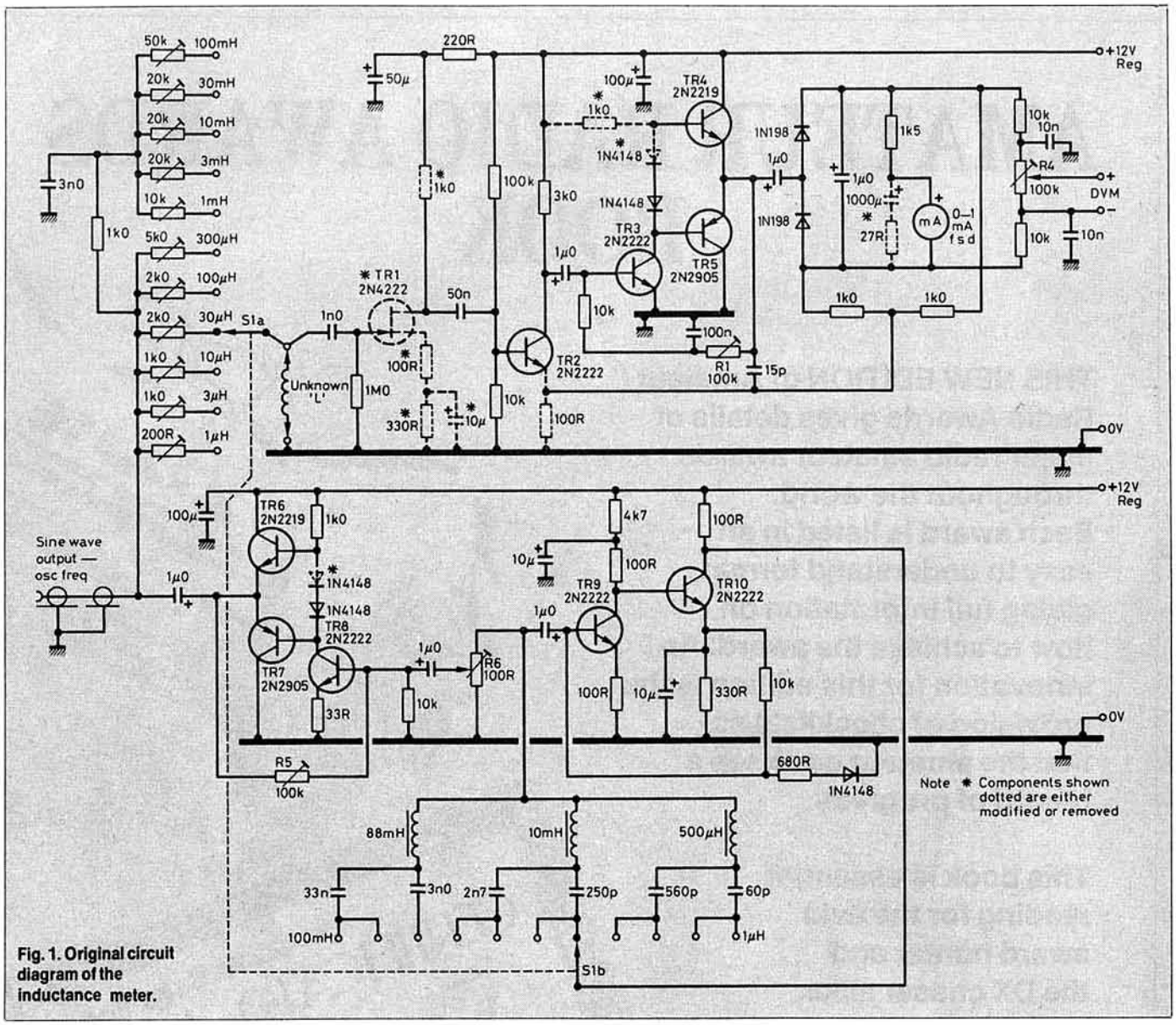


Fig. 1. Original circuit diagram of the inductance meter.

W6HPH Inductance Meter Revisited

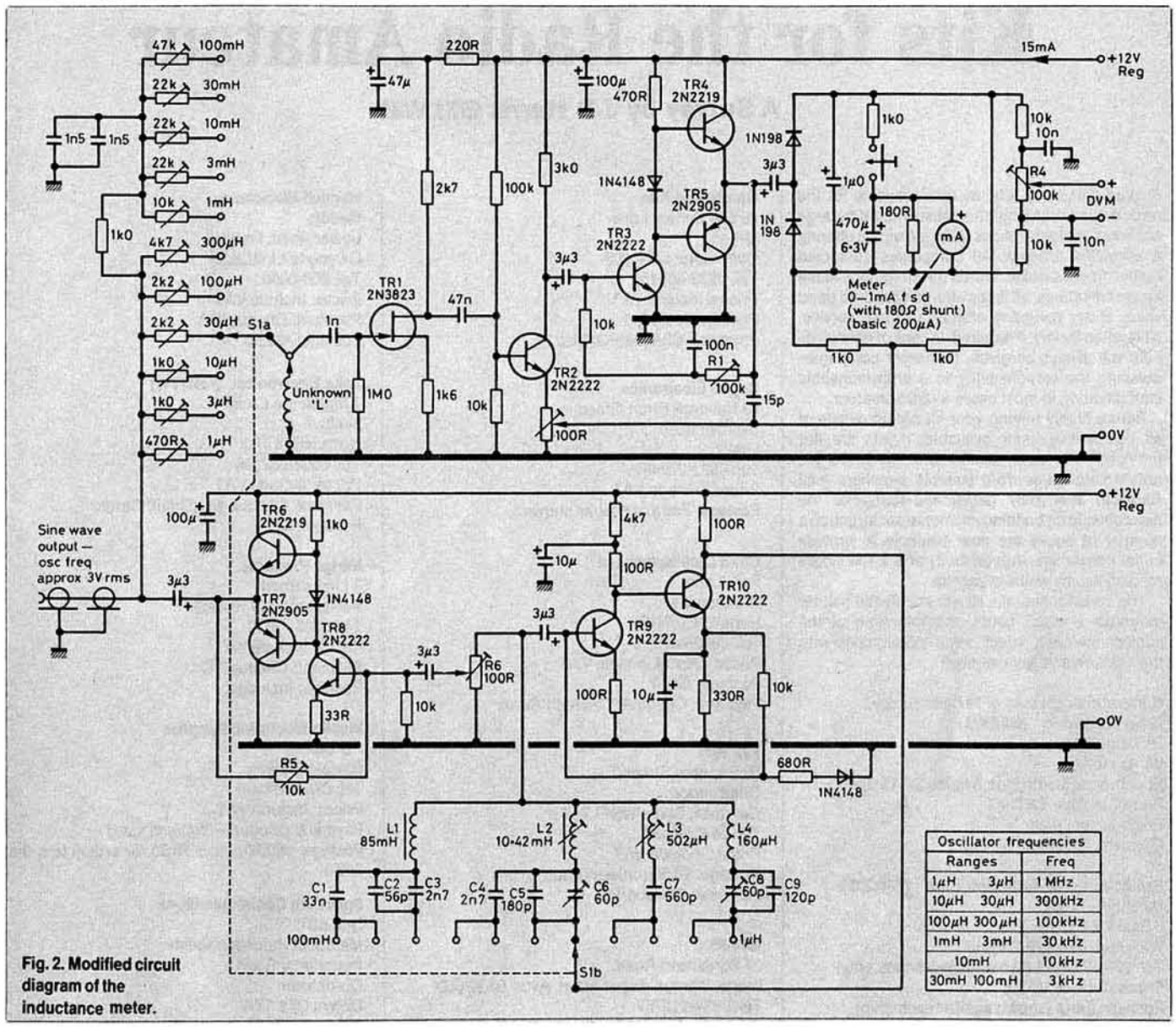
Ray Morris, G3FDG, offers advice on building an updated and improved version of this useful test instrument.

Following an article in *RadCom* Dec 84, which featured an inductance meter designed by W6HPH, two identical samples of the inductance meter were constructed and set up following the details given in the article. This follow-up article describes how satisfactory results could not be achieved with the circuit as published, and provides suggested modifications for the successful completion of an extremely useful project.

(a) In the initial stage the amplifier circuit comprising Tr1, 2, 3, 4 & 5 was assembled and tested. Two problems were evident when a sine wave signal was fed to the input of Tr1, namely severe waveform distortion and thermal runaway of the Tr4 and 5, which drive the meter circuit.

The latter problem was cured by removing one of the 1N914 diodes between the bases of Tr4 (2N2219) and Tr5 (2N2905) and replacing this with a wire link, also the 1k0 resistor from the 12 volt rail to the base of Tr4 was changed to 470 ohms. In practice the equivalent 1N4148 diode was used in place of the 1N914 type.

A small refinement was also included at this stage by changing the 100ohm fixed resistor in the



Oscillator frequencies	
Ranges	Freq
1µH 3µH	1 MHz
10µH 30µH	300kHz
100µH 300µH	100kHz
1mH 3mH	30 kHz
10mH	10 kHz
30mH 100mH	3 kHz

Fig. 2. Modified circuit diagram of the inductance meter.

emitter of Tr2 (2N2222) to a 100ohm preset, so that the feedback can be adjusted to set the overall amplifier gain.

SETTING UP PROCEDURE

Turn the Inductance range switch to the OFF position to disconnect the amplifier input from the range of preset pots selected by switch Sla, the input will still be connected to the unknown 'L' terminals. Check the DC voltage at the emitters of Tr4 & 5 relative to ground, this should be exactly half of the supply rail voltage — if not, then set to this value by adjusting of R1 (100k preset).

To set the overall gain of the meter amplifier circuit, apply a 300mV signal at 100kHz to the 'L' terminals and adjust the 100ohm preset in the emitter of Tr2 (2N2222) to obtain a meter reading of 300 (or 3 depending on the scale marking). With the signal still applied, connect a digital voltmeter to the DVM output terminals, and set the 100k preset (R4) so that the DVM reads 0.300 volts. Reduce the input signal to 100mV; the analogue and digital motors should now read 100 and 0.100 respectively.

(b) RF oscillator and output amplifier (Tr6, 7, 8, 9 & 10). It was found that the oscillator alone worked very well and gave a good sine wave across R6 (100 ohm preset) except that the voltage level at 900kHz was very low compared with that on the other ranges. A thermal runaway problem was again evident at the output amplifier Tr6 (2N2219) and Tr7 (2N2905) and this was rectified by the removal of one 1N914 diode at the bases of Tr6 & 7 and replacing it with a wire link. Once again, in practice the equivalent 1N4148 diode was used in place of the 1N914 type.

After setting the emitter potential of Tr6 & 7 (2N2219 & 2N2905) to half the supply rail voltage by means of R5 (100k preset), the amplifier output levels of five out of the six frequencies used in the design were checked and found to be approximately 2.0 volts rms. At the sixth frequency (900kHz) the amplifier output level dropped to just 1.1 volts rms.

A satisfactory solution to this problem was found by setting up an additional tuned circuit in association with the selector switch Slb. As indicated in the diagram, an inductor L4 of 160µH is resonated by a 120pF fixed capacitor and a 60pF parallel trimmer. On setting up, the output of the amplifier was 3.0 volts rms at 1.0MHz for the 1.0µm and 3µH inductance ranges.

(c) An additional change to the meter drive circuit was also included for operational convenience. In the original design the pointer of the meter remained permanently beyond full scale deflection when the inductance under test was removed. A push button switch has been included in series with the meter circuit, but the damping capacitor (1000µF) remains across the meter movement. A 470µF capacitor is also satisfactory at this point.

(d) At the time of construction, the specified 2N4222 Fet was not available so a 2N3823 type was substituted with a consequent change in the drain and source resistor values.

When these modifications were completed, it was a relatively simple matter to calibrate the full scale deflection of each range using the appropriate preset potentiometer. Two samples of the modified Inductance Meter have been completed which include the modifications proposed here and they were found to perform identically. □

Kits for the Radio Amateur

A Survey by J D Harris G3LWM

A large number of kits are now available for the radio amateur ranging from those offered by large commercial organisations to the individual offering a specialist product. All companies contacted replied in great detail. Within the limitations of the kit specifications, all items offered appeared good value. Every company offered a repair, service, calibration facility, if required. In case of difficulties help will always be given, the larger companies detailing the responsibility to a knowledgeable staff member, in most cases a radio amateur.

Before finally buying your kit obtain details of all competitive items available. If kits are not provided with case, connectors, hardware etc obtain catalogues from suitable suppliers (see *RadCom* July 1987 pages 488-489). For the newcomer to kit building and home construction a number of books are now available to provide initial knowledge (Appendix 1) and a few hours reading will be well worthwhile.

The construction of a kit will enable the builder to obtain a much better understanding of the subject involved, inject some individuality into their station and save money!!

Name and Addresses of firms in survey.

Dave Aizlewood (G4AWZ)
36 King Street
Wincanton
Scunthorpe, South Humberside DN15 9TP
Prices: Include VAT
Postage: Included
Payment: Cheque/PO

British Amateur Television Club (G8KZG)
(Members only)
6 East View Close
Wargrave Berks RG10 8BJ
Tel: 073 522 3121 (evenings/weekends only)
Prices: Include VAT
Postage: Extra (shown against each item)
Payment: Cheque/PO

John Beech (G8SEQ)
124 Belgrave Road
Wyken, Coventry CV2 5BH
Tel: 0203-617367
Prices: Include VAT
Postage: Included
Payment: Cheque/PO

Cambridge QRP Components (G4KJJ)
30 Rookery Close, St Ives, Huntingdon
Cambs PE17 4FX
Tel: 0480-68330
Prices: Include VAT
Postage: Add £0.35 to orders under £10.00
Payment: Cheque/PO

CPL Electronics
8 Southdean Close
Hemlington, Middlesbrough
Tel: 0642-591157
Prices: Do not include VAT
Postage: £0.70
Payment: Cheque/PO

Cambridge Kits
45 Old School Lane
Milton
Cambridge CB4 4BS
Tel: 0233-860150
Prices: Include VAT
Postage: Included
Payment: Cheque/PO/Giro

Capco Electronics
63 Hallcroft Birch Green
Skelmersdale
Lancs
Tel: 0695-27948
Prices: Include VAT
Postage: Extra at cost as shown

Cirkit Distribution Ltd
Park Lane
Broxbourne
Herts EN10 7NQ
Tel: 0992-444111
Prices: Do not include VAT
Postage: £0.70
Payment: Cheque/PO/Credit Cards

FJP Kits
63 Princess Street
Chadsmoor
Cannock, Staffs WS11 2JT
Tel: 05435-6487
Prices: Include VAT
Postage: £0.50 (unless stated)
Payment: Cheque/PO

G4TJB
24 Portishead Road
Worle, Weston-Super-Mare, Avon BS22 0UX
Tel: 0934-512757
Prices: Include VAT
Payment: Cheque/PO
Postage: Included

CM Howes Communications
Eydon
Daventry
Northants NN11 6PT
Tel: 0327-60178
Prices: Include VAT
Payment: Cheque/PO/Credit Cards
Postage: +£0.90 to be added to order cost

Harlech Electronics
Noddfa
Lower Road, Harlech
Gwynedd LL46 2UB
Tel: 000-0000
Prices: Include VAT
Payment: Cheque/PO
Postage: +£1.50

Lake Electronics (G4DVW)
7 Middleton Close
Nuthall
Notts NG16 1BX
Tel: 0602-382509
Prices: Include VAT
Payment: Cheque/PO/Credit Cards
Postage: £2.00

Kanga Products
3 Limes Road
Folkestone, CT19 4AU
Tel: 0303-76171
Prices: Include VAT
Payment: Cheque/PO
Postage: Included

Maplin Electronic Supplies
PO Box 3
Rayleigh, Essex
Tel: 0702-554155
Prices: Include VAT
Payment: Cheque/PO/Credit Card
Postage: +£0.50 also + £0.50 for orders less than £4.50

Spectrum Communications
Unit 6B
Marabout Industrial Estate
Poundbury Road
Dorchester
Dorset DT1 1YA
Tel: 0305-62250
Prices: Include VAT
Payment: Cheque/PO/Credit Cards

Wood and Douglas
Unit 12-13
Youngs Industrial Estate
Aldermaston
Reading, Berks RG7 4PQ
Tel: 07356-71444
Prices: Include VAT
Payment: Cheque/PO/Credit Cards
Postage: +£1.00

APPENDIX 1

Suggested Reading: Title	Part No/Author Publisher	Supplier	
Constructors Guide*	XH79L-Maplin	Maplin Electronics	£0.25
Practical Electronics Handback	WG01B-Ian Sinclair	Maplin Electronics	£5.95
Introducing Amateur Electronics	WG44X-Ian Sinclair	Maplin Electronics	£4.95
Beginners Guide to Building Electronic Projects	RF09K-RA Penfold	Maplin Electronics	£1.95
How to get your Electronic Projects Working	WA53H-RA Penfold	Maplin Electronics	£1.95
Radio Communications Handbook	RSGB	RSGB Publications	£9.41
Test Equipment for the Radio Amateur	RSGB	RSBG Publications	£7.13
Radio Amateurs Handbook	ARRL	RSGB Publications	£19.03

* This is sent Free of Charge with all kits purchased from Maplin Electronics

COMPANY	CONVERTERS	TRANSVERTERS	PREAMPS	PREAMPS + PA	PA's	ATU	TEST EQUIPMENT	OTHER	NOTES
Dave Aizlewood (G4AWZ) (F)								Famous 'Oner' Sprat. pcb for Unichip kit	
British Amateur Television Club (G8KZG) (F)								Special kits for all aspects of amateur TV	Members of BATV only.
John Beech (G8SEQ) (F)	50MHz	50MHz						QRP TX/RX; 3-band QRP TX/RX 50MHz TX 10MHz QRP TX/RX	PCB's available as separate items. All kits supplied with knobs, sockets and box.
Cambridge QRP Components (F)						Random wire ATU	SWR bridge	Audio amp morse osc 160/80m RX; OXO TX/FOX TX; VFO	Kits include all basic components, *exclude* box knobs, air spaced capacitors, crystals and PCB. Range of QRP components.
CPL Electronics (F)	50MHz	50MHz 28/144 IF				Low pwr ATU/ SWR bridge	Wobbulator, two-tone osc, C meter, Dip osc, UHF prescaler	Bug key, morse trainer auto notch filter	Kits from magazine articles. All parts supplied. PCB's available as separate item. Reprints & articles available.
Cambridge Kits	50-70MHz (10MHz IF) LF converter. 100-600 kHz (3.5 or 4.1 IF)					100kHz-30MHz low power	Noise bridge, MSF clock, two-tone osc. Sound meter, Audio osc, Xtal calibrator	Speech compressor Tunable notch filter 60kHz RX	All parts supplied, coils prewound.
Capco Electronics (F)						Paris for ATUS and aerials. High voltage Caps. Roller coaster coils. Aerial kits			
Cirkit Distribution (£1.30)	50MHz multiband Converter (10m, 6m, 4m) 2m-10m 70cm-2m, 70cm-10m, 80m conv for RC14, 23cm to 2m or 10m	50MHz/28MHz 70MHz/28MHz	Wideband 14-70MHz 28/50/70MHz 2m-70cms 1.5-30MHz (Diode switched)	2m	4m/6m (20W) 1.8-30MHz 3W PEP	1.8-30MHz 20W 1.8-30MHz (parts for ATU)	SWR meter, FET dip osc Wavemeter, Deviation Meter, Xtal calibrator DVM. Logic probe	Complete DSB. RC14, 20m DC RX. RX/TX, PLL VFO. CMOS keyer Speech processor	Wide range of components. Some kits complete. Others require additional hardware. Repair/service available. Retail outlets.
FJP Kits & Components (F)	50MHz VLF conv 'Woodstock' SW converter	Meon 28/144 50MHz	2m masthead		QQV03-20A 50MHz/144MHz		Xtal tester. UHF prescaler. Capacitance meter. 2-tone osc. LCR Bridge.	Active aerial, Nicad charger	Repair calibration service available mail order only.
G4TJB (F)			2m	2m	6m VMOS amp			5-20A PSU low pass filter. High pass filter morse practice osc	Mail order and rallies Calibration/Repair available
CM Howes Communications (F)		2m-20m 2m-80m				Low power (30W) 1.8-30MHz	Crystal calibrator	Low power TX s 20-160m DC RX 20m-160m. 'S' meter/dual bandwidth Filter. CW side-tone unit TRF RX	Mail order & retail stockists.
Harlech Electronics (F)								DC/RX. CW tcvr 160-80, preselector. 7A PSU	Specialist in kits related to 'Sprat' QRP items.
Kanga Products (F)							Master kit Frequency counter	160m SSB tcvr single band RX. VFO FT707/160 add on unit 'Sudden' dc RX (G3RJV)	Kits contain 'harder to get bits'. Other parts clearly indicated and can be purchased if required.
Lake Electronics (F)								CW TX/RX for 80m 3-band RX 80/40/20m	Complete kits including *all hardware*. Instruction manual and PCBs can be supplied as separate items.
Maplin Electronics (F)					1kw linear Heathkit	Active aerial 600kHz-30MHz ATU	Crystal calibrator freq counter. PSU. Heathkit dip osc. Noise bridge	QRP HW9 TX/RX General coverage RX 80m dc RX	Many other test equipment and non-related amateur radio kits. (6 retail outlets) Other Heathkit items.
Spectrum Electronics (F)	2/4/6/10/20m	2/4/6m	2/4/6/10/20m	2/4/6/10m	2/4/6/10m			IF and HF kits. RX for 20/ 80m + SSB RX 50MHz TX/RX	Conversion for various CB equipment for use on 10m. Many varieties of kits available.
Wood & Douglas (F)	4/6m			70cm/2m	70cm/2/4/6m	70cm/2m		FM TV (24cms) modules Toneburst, CW filter Complete 70cm/2m RX/TX	Kits require additional hardware. Some is available. Other components also available.

F = free catalogue £1.60 etc = cost of catalogue

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Just take a look at some of the outstanding features it offers.
Since its debut at the Leicester Exhibition there has been so much interest in the FT470 that we expect the demand to be high for some time, however this was bound to be inevitable since Yaesu have created yet another winner!
A word of caution, beware of FT470 lookalikes. The FT728 is a Japanese domestic model and may not meet the up to date technical requirements for the UK Market.

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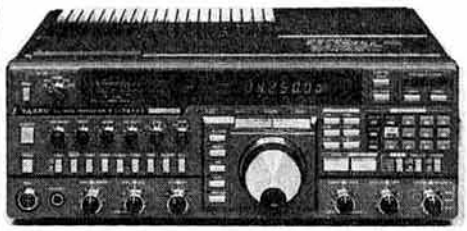
NEW IMPROVED FT767GX



(only available from authorised dealers)

Yaesu have upgraded this popular HF and VF/UHF base station transceiver. The improved version is now available with enhanced synthesiser performance and VFO tuning rate. Read Chris Lorek's review in "Ham Radio Today".

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For existing owners of the FT767GX who purchased their sets through Yaesu's official UK distribution network, Yaesu are offering an upgraded local unit for a nominal charge. Please contact us for details.

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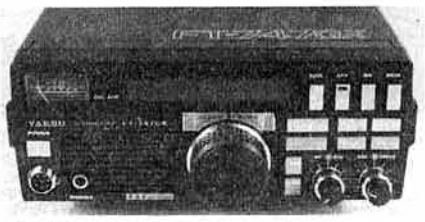

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FT4700RH

YSK4700 Remote Kit	£24.95
FTS8 CTCSS unit	£60.83
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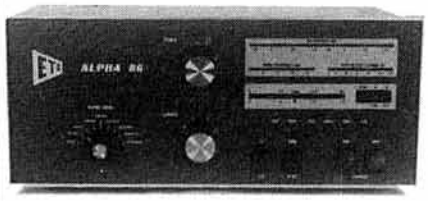

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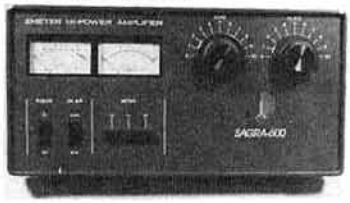

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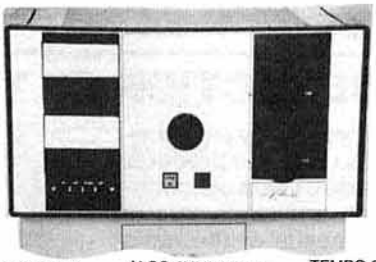

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80-10M HF LINEAR
3kW PEP RF INPUT
100W DRIVE
1 x 3CX1200A TRADE
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ALSO AVAILABLE
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MAX INPUT 2kW
25W DRIVE TYPICAL
1x3CX800A7
£1322.50
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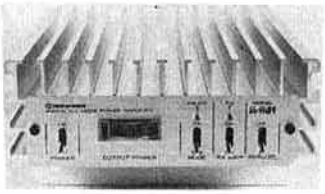

HL100B/10 10m 10W in 100W out PEP **£179.00**
HL100B/20 20m 10W in 100W out PEP.....**£179.00**
HL100B/80 80m 10W in 100W out PEP.....**£179.00**
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HL30U 70cms 2W in 30W out GaAs FET Preamp....**£135.00**
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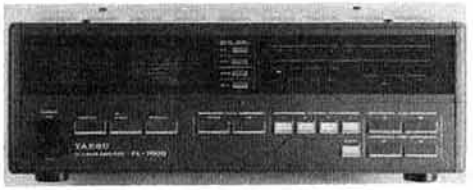

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160-10M HF LINEAR 500W PEP RF OUTPUT 100W DRIVE
FOR FT757GX, FT747GX, FT767GX
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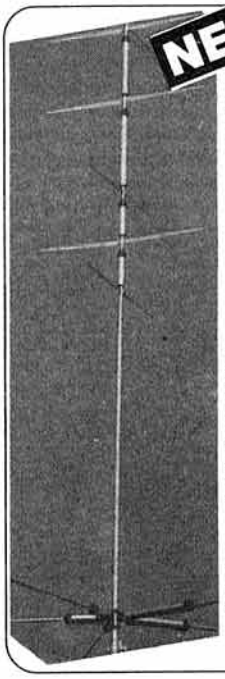

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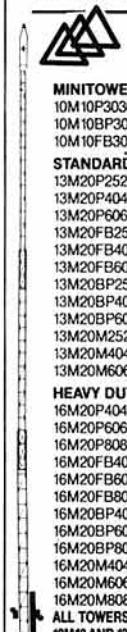

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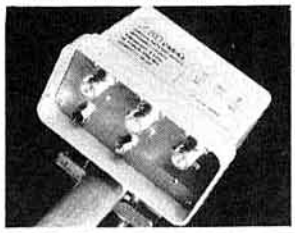
Bearcat 175 XLT	£169.99
AOR 2002	£487
Cobra SR925 Base RX	£149



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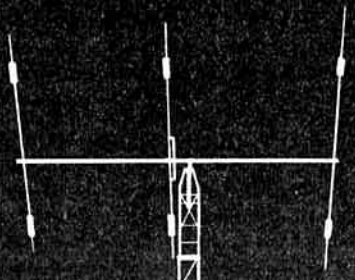

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	* 4 + Tube	8.15	24.0
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16M20	2	7.8	12.0
	3	8.0	18.0
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Extended Height: Ground level to centre of Array.

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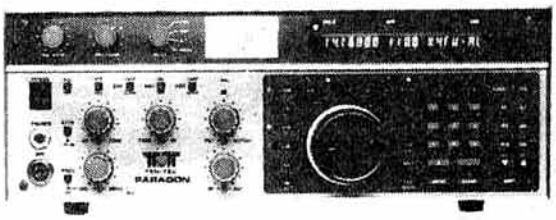

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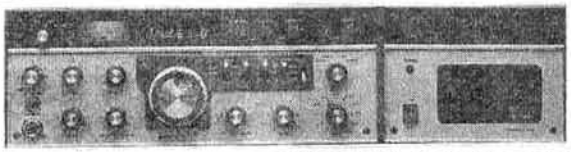

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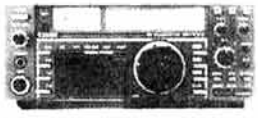

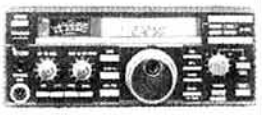

Icom have now introduced the new IC725 as an economy version. Available from stock at only £749.00

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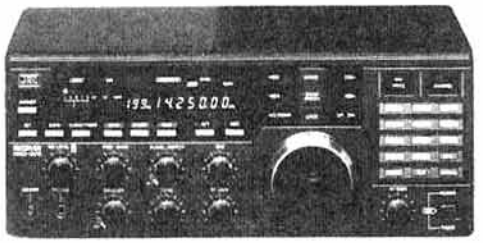

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CONTEST NEWS

RULES

HF-DF CONTEST

South Manchester Date: 11th June 1989. *Map No.* 118, 1:50000 series Stoke-On-Trent. *Assembly* 1300 BST for start at 1320 BST. *Location:* Barley House Farm, Biddulph, Stoke-On-Trent, NGR 906605.

Competitors requiring teas should notify Chris Wells, 31 Madison Ave, Cheadle Hulme, Cheshire. Tel 061-485-1707 by 4th June 1989.

ALL ASIAN CONTEST 1989

0000 17 June — 2400 18 June (Phone)
0000 26 August — 2400 27 August (CW)

All non-WARC bands 1.8 to 28MHz. Single-operator single and multi-band and multi-operator multi-band. Exchange RS/T plus two figures indicating the operator's age (ladies send "00"!). QSOs on 1.8MHz count three points, on 3.5MHz two, and on other bands one point. The multiplier is the number of *different Asian prefixes* worked on each band (following WPX ruloc). Logo must reach JARL All Asia Contest, PO Box 377, Tokyo Central, by July 30th (phone) September (CW). I can supply copies of rules (sae please).

VENEZUELAN INDEPENDENCE DAY CONTEST

0000 1 July — 2400 2 July (Phone)
0000 29 July — 2400 30 July (CW)

Work the world on 3.5 to 28MHz. Single operator, single and multi-band, and multi-operator single and multi-transmitter. Exchange RS/T plus serial QSO number (from 001). QSOs with own country count one point, with other countries in the same continent three, and with others five. The multiplier is one for each YV call area worked on each band and one for each country (including own) worked on each band. Besides the plaque given to the winner in each class, all who score more than 10% of the winner's score will receive a certificate. Mailing deadline is 30 September for phone and 30 October for cw. I can supply photocopies of rules if required.

432MHz-47GHz UHF/SHF & SWL CONTEST RULES

1400GMT 7 October — 1400GMT 8 October 1989

The general rules published in "Contest News", *RadCom* January 1989 will apply. There will be three sections, section S for single operator stations, section M for multi-operator stations, and section L for listeners. Individual band tables and an overall table will be published. Scoring will be at 1 point per kilometre. Crossband contacts involving bands above 2GHz will count for half points. Entries will be forwarded for the concurrent IARU contest.

All entries and check logs to: VHF Contests Committee, c/o D J C Bushell G4WAD, Tanglewood, Bridge Street, Lower Moor, Pershore, Worcs.

70MHz TROPHY & SWL CONTEST RULES

0900-1600GMT 17 September 1989

The general rules published in the "Contest News", *RadCom January 1989* will apply. There will be three sections, section F for Single Operator Fixed stations, section O for other stations, and section L for listeners. County and Country multipliers will be used in accordance with general rule 14.

The station with the highest overall score will receive the VHF Manager's Trophy.

All entries and check logs to: VHF Contests Committee, c/o A J Collett, G4NBS, 10 Quince Road, The Limes, Hardwick, Cambridge, CB3 7XJ.

CONTEST LOG SHEETS

Both HF and VHF logsheets are available from Headquarters in packs of 100. Prices (including p&p) are £3.29p for members and £3.87p for non-members. When ordering, please specify the type of log sheet required.

144MHz TROPHY AND SWL CONTEST

1400GMT 2 September — 1400GMT 3 September 1989

The general rules published in the "Contest News", *RadCom* January 1989, will opply. There will be three sections, section S for single operator stations, section M for Multi-operator stations, and section L for listeners. The Thorogood trophy will be awarded to the winner of the single operator section, and the Mitchell-Milling Trophy to the leading Multi-operator entrant. Certificates will be awarded to the leading stations in each RSGB zone, and entrants should include their zonal code (see p 63, January 1989 RadCom) on the cover sheet. If you wish to enter the concurrent IARU contest, please complete an extra cover sheet (427-86), and score contacts using both the radial ring system and 1 point/km.

All entries and check logs to: VHF Contests Committee, c/o D A Yorke, G4JLG, 40 Edge Fold Road, Worsley, Manchester, M28 4OF.

SEANET 89 CONTESTS

0000 15 July — 2400 16 July (CW)
0000 19 August — 2400 20 August (Phone)
Rules available later

RESULTS

432MHz FIXED STATION, AFFILIATED SOCIETIES, AND SWL CONTEST RESULTS

This event proved popular with entrants, and although conditions were not spectacular, there was enough activity from Europe to give many stations in the South some good continental DX, with DL6WU (JN49HT) consistently appearing in the best DX claims. Propogation in other directions seemed to be very limited this year, and the number of QSOs was well down as a result.

The new FM section was poorly supported. If you are interested in 432MHz FM, why not try the low power contest in August? More entries are needed if this section is to continue. It was pleasing to see 3 entries for the listener section after the poor showing in the December 144MHz AFS event.

There were few complaints of poor signal quality, and not much comment about the length of the event. Lack of stations to certificate work seemed to be the comment made by the majority.

Congratulations go to all the zonal certificate winners, highlighted by asterisks in the tables. Particular mention must be made of the overall winners: G8TFI in the Multi Op section, G4FRE in the Single Op All Mode section, Martlesham DX and Contest Group in the Affiliated Societies section, G4APA in the FM section, and BRS31976 as the leading listener.

G3XDY

432 MHz AFS RESULTS

Pos	Affiliated Society	Points	Callsigns			Zone
1	Martlesham DX & CG	1662	G4FRE	G4PIQ	G3ZNU	C*
2	Sheppey Western CG	1367	G8TFI	G0DAZ	G4BVY	B*
3	Five Bells Group	1362	G8ZHP	G4NPH		B
4	Chesham & D ARS	924	G6KZP	G1RDX	G1WPF	D*
5	Farnborough & D RS "A"	907	G8HHI	G8ATK	G0GCI	D
6	Harwell ARS	898	G3NNG	G4HLX	G0GLB	D
7	South Manchester RC "A"	717	G4JLG	G3ZDM	G4NTY	A*
8	Sutton & Cheam RS	664	G4OWM	G3OLX	G4KWB	C
9	North Wakefield RC	506	G4NOK			A
10	Cambridge & DARS	408	G4NBS			B
11	Reigate ATS	272	G8JXV	G3YSX	G1WIS	C
12	Newport ARS	210	GW1NRS	GW6ZUQ		E*
13	Maidenhead & D ARC	208	G3WQG	G8XYN	G4GGV	D
14	Edenbridge ARS	148	G7AVG	G8PPQ	G6IUS	C
15	Clifton ARS	102	G3JJZ			C
16	Great Lumley ARS	98	G6GLR			A
17	South Manchester RC "B"	41	G8APB	G4MYB		A
18	Farnborough & D RS "B"	14	G0HNA			D

MULTI OPERATOR FIXED STATION SECTION

Pos	Call	Score	QSOs	Loc	Zone	Best DX	km
1	G8TFI	1012	142	81UQ	D*	DF8WU/P	660
2	G8ZHP	954	125	92TR	B*	DL6WU	703
3	G6KZP	535	109	91RP	D	G14OPH	461
4	G4NOK	506	80	93FR	A*	PE1ALA	443
5	G4NPH	408	72	02BI	B	DL6WU	657
6	G40WM	328	94	91WI	C*	—	—
7	G30LX	218	84	91VH	C	G4JLG	287
8	G4KWB	118	50	91VH	C	G0DAZ	288
9	GW1NRS	112	24	81MO	B*	G4RKV	289
10	G1WPF	101	38	91RP	D	PE1JVH	381
11	G6GLR	98	21	94FT	A	G8HHI	392

SINGLE OPERATOR FIXED STATION — FM ONLY SECTION

Pos	Call	Score	QSOs	Loc	Zone	Best DX	km
1	G4APA	21	9	83TD	A	G1GEY	206

SINGLE OPERATOR FIXED STATION — ALL MODE SECTION

Pos	Call	Score	QSOs	Loc	Zone	Best DX	km
1	G4FRE	850	108	01PX	C*	DL6WU	567
2	G4PIQ	714	100	01MU	C	DL6WU	578
3	G3NNG	683	116	91EP	D*	DD9KG	614
4	G8HHI	622	120	91OH	D	DD9KG	555
5	G4RKV	516	71	01OI	C	DL6WU	551
6	G6HKM	508	90	01FT	C	DL6WU	615
7	G4NBS	408	73	02AF	B*	DG9YN	570
8	G1GEY	374	39	94FW	A*	G4RFR	463
9	G1KDF	357	51	83NN		G4RKV	369
10	G4JLG	332	56	83TM	A	G4RFR	307
11	G8MNY	303	85	91XI	C	G4KUX	380
12	G1RDX	288	64	91RQ	D	PE1JVH	381
13	G3ZDM	239	44	83UK	A	G4RKV	331
14	G6CSY	235	51	01BJ	C	DK3FB	522
15	G0DAZ	216	43	82VF	B	PE1EWR	404
16	G8ATK	198	65	910F	C	PE1JVH	422
17	G1HLT	185	40	93KD	B	G4RKV	269
18	G3XWZ	164	43	93JD	B	G4FUF	280
19	G4NTY	146	32	83TM	A	G1HWY	324
20	G4BVY	139	25	82TD	B	PA3DIJ	583
21	G6YLW	126	31	01HI	C	G4NOK	301
22	G4HLX	125	29	91FP	D	G4ERG	242
23	G3YSX	109	39	91WF	C	G1LSB	177
24	G8JXV	108	39	91VE	C	G4JLG	298
25	G3JJZ	102	40	01AJ	C	GW1NRS	209
26=	GW6ZUQ	98	25	81PP	E*	G4FRE	277
26=	G3ZNU	98	19	020D	C	DL1EBR	339
28	G31LO	94	20	81VQ	D	G4RKV	239
29=	G3WQG	90	39	91PO	D	G4NOK	236
29=	G0GLB	90	29	91IQ	D	G4ERG	233
31	G0GCI	87	36	91OF	C	GJ4TAW/P	242
32	G8XYN	69	29	910M	D	G8SDS/P	154
33	G8DXC	64	17	02DL		G8TFI	197
34	G6YLJ	60	32	91TP	C	G4NOK	245
35	G8PPQ	59	21	01BF	C	G8TFI	174
36	G1WIS	55	23	91WG	C	G8ZHP	163
37	G7AVG	54	25	91XD	C	G8ZHP	177
38	G4GGV	49	23	91PM	D	G4FRE	146
39	G8APB	38	13	83WD	B	G6KZP	198
40	G61US	35	11	01CD	C	G8TFI	183
41	G0HNA	14	8	91PG	D	G8TFI	119
42	GW1ATZ	9	5	83LE		G8IZR	—
43	G4MYB	3	3	83TJ	A	G4JLG	13

LISTENERS SECTION

Pos	Call	Score	QSOs	Loc	Best DX	km
1	BRS31976	99	31	01HO	GW6TEO	391
2	BRS52543	72	19	83LT	G4RFR	345
3	BRS28198	46	10	93FR	G4NOK	330

Checklogs gratefully acknowledged from : PE1EWR, G0GGG/P, G4BZP/P
Disqualified: G8SDS/P, General Rules 5 & 6.

VHF LISTENERS CHAMPIONSHIP 1988

The 1988 championship was a closely fought battle between Bob Treacher BRS32525, and Mick Toms BRS31976, with both taking part in a wide range of events on the 70, 144, and 432MHz bands last year. Last year's runner up, Norman Henbrey, BRS28198, only took part in one event this year. The stations who took part are in fact exactly the same as in 1987, so it would be nice to see some additional names in the 1989 championship.

Congratulations go to Bob Treacher, who will receive the Hansen Trophy. Thanks go to the loyal band of listeners that support VHF contests. *G3XDY*

Posn	Station	Mar 144/432	Apr 144	May 432	VHF NFD	Jul 144LP	Jul 432LP	Sep 144	Sep 70	Total
1	BRS32525	1247	54	1000	—	1000	1000	1000	1000	6301
2	BRS31976	2000	1000	744	704	—	—	589	549	5586
3	BRS52543	—	—	—	1241	—	—	—	—	1241
4	BRS25429	—	—	—	—	—	—	770	—	770
5	BRS28198	—	488	—	—	—	—	—	—	488

CONTESTS CALENDAR

RSGB HF CONTESTS

4 May	28MHz Cumulative CW/SSB (Mar89)
12 May	28MHz Cumulative CW/SSB (Mar89)
20 May	County Roundup SSB (Mar89) SWL (Apr89)
21 May	County Roundup CW (Mar89) SWL (Apr89)
3,4 Jun	NFD/Region 1 CW Field Day (Feb89)
24,25 Jun	Summer 1·8MHz (May89)
8,9 Jul	SWL (May89)
16 Jul	Low Power Field Day (May89)
6 Aug	Ropoco 2 (Jun89)
2,3 Sep	SSB Field Day (Jul89)
8 Oct	21/28MHz Phone (Jul89)
9 Oct	28MHz Cumulative
15 Oct	21MHz CW
17 Oct	28MHz Cumulative
25 Oct	28MHz Cumulative
2 Nov	28MHz Cumulative
10 Nov	28MHz Cumulative
11 Nov	Club Calls Contest 'CCC' — all modes & SWL (Sep89)
18,19 Nov	Second 1·8 MHz CW (Sep89)

RSGB VHF CONTESTS

6,7 May	432MHz-24GHz Trophy Contests & SWL (Mar89)
13 May	24GHz Cumulative (Mar89)
14 May	10GHz Cumulative (Mar89)
27,28 May	144MHz & SWL (Mar89)
18 Jun	50MHz Trophy & SWL (Mar89)
24,25 Jun	10GHz Cumulative (Mar89)
1,2 Jul	VHF NFD (Apr89)
8 Jul	24GHz Cumulative (Mar89)
16 Jul	10GHz Cumulative (Mar89)
5 Aug	144MHz Low Power & SWL (May89)
6 Aug	432MHz Low Power & SWL (Apr89)
13 Aug	10GHz Cumulative (Mar89)
2,3 Sep	144MHz Trophy/IARU VHF & SWL
9 Sep	24GHz Cumulative (Mar89)
10 Sep	10GHz Cumulative
17 Sep	70MHz Trophy & SWL
7,8 Oct	432MHz-24GHz/IARU UHF/SHF
13 Oct	432MHz Cumulative
21 Oct	1·3/2·3GHz Cumulative
29 Oct	432MHz Cumulative
4,5 Nov	144MHz CW
6 Nov	1·3/2·3GHz Cumulative
14 Nov	432MHz Cumulative
22 Nov	1·3/2·3GHz Cumulative
30 Nov	432MHz Cumulative
3 Dec	144MHz Fixed & AFS & SWL
8 Dec	1·3/2·3GHz Cumulative
9 Dec	50MHz CW
10 Dec	70MHz CW

OTHER CONTESTS

17,18 Jun	All Asian Contest (June89)
1,2 Jul	Venzuelan Independence Day Contest (Jun89)
15,16 Jul	Seanet 89 Contest (CW) Jun89)
29,30 Jul	Venzuelan Independence Day Contest (Jun89)
19,20 Aug	Seanet 89 Contest (Phone) (June89)
26,27 Aug	All Asian Contest (Jun89)

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

VHF NFD 1988 RESULTS — AMENDMENT

Following an appeal to Council, the 144MHz entry from G0FBB/P has been reinstated in VHF NFD 1988. G0FBB/P is now placed 19th on 144MHz with 3668 points, and all stations shown in positions 19 and beyond move down one place. In the overall table, the Windmill Contest Group moves up from position 19 to position 11 with 1680 points, and groups in positions 11 to 18 inclusive move down one place.

G3XDY

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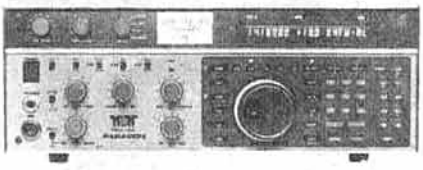

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FT 790R	YAESU
FT 690R	YAESU
FT 290R	YAESU
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System Operators

An eventful month on the packet scene started with the SysOp (System Operator) meeting on 2 April. The meeting was held at Surrey University and had the largest group of SysOps ever in attendance. The highlight of the day was a tour of the UOSAT satellite ground station with a very informative guide giving a detailed explanation of all that one could see. Unfortunately the meeting was not as constructive as they have been in the past, with only one real proposal being adopted. This was to implement the change of bulletin routing from @GB to @GBR as of 1 May.

Many other subjects with very varied titles were discussed, from 'New user education' to 'Developing fresh services using the file facility' but no firm proposals were either made or adopted. The next meeting date was set for 23 July to be held in Shrewsbury.

During the month various updates were circulated for Mailbox software. As reported last month G4YFB sent out version 2.07 which solved a few bugs. I can report that the latest version 2.1 is being tested and will have been issued by the time you read this. WORLI issued version 10.1, and 10.2 is expected any day. As you can see, to report anything of these new releases is becoming very difficult, as a report is being written a new version arrives, making it out of date before publication. For this reason the promised report of WORLI has been held over until next month to include the very latest changes. This month I have included a report on new Mailbox software by AA4RE, it is currently being used by two stations GB7LIV and GB7ZZZ to who I am thankful for the report.

AA4BE mailbox software report

This package is a relative newcomer to the UK Mailbox scene, currently run by only two GB7 mailboxes, namely GB7LIV and GB7ZZZ. It is a multi-user, multi-port mailbox system which needs only one copy running in the computer. The command set it uses is very similar to WORLI (NE for expert and RH for verbose read), supporting hierarchical forwarding and message ID (MID).

The screen is split into two sections, one for monitor, the other for connect and local. However it is not possible to expand either of these windows to full screen with a single key press, but either section can be redirected (not simultaneously) to disk or printer. The forward file has an advantage of stipulating not only times but days as well, giving the opportunity to stop forwarding during peak times at weekends.

As the system runs in host mode along with multi-user software by WA8DED, a suitable TNC is required. For best results even a DRSI board. The system has a few minor bugs which future versions will, hopefully, cure, but as it stands I am very happy with the software and have no intentions at this time to return to MBL.
Thanks are due to Nigel Mundy, G1TDM @ GB7ZZZ for this info.

Software releases

Software releases on the Net/Rom front included the latest version from John Weisman, G8BPQ. This version 3.16C is the latest in a long list of releases (each one to remove yet another bug) and seems to be the best yet (no crash for five days). However, it seems that the faster the computer is then the slower the software runs - especially when used concurrently with G4YFB's mailbox software. With all of these problems taken into account it is still worth the effort to implement this software as the facilities it offers are second to none.

The latter part of the month saw the VHF/UHF Convention at Sandown Park. Being marched around in the crush during the morning, I was surprised how little of the event was attuned to data communications, although later in the day there was a lecture with information from Eastnet. The latest news I have is that Eastnet (which it is hoped will link Ipswich, Cambridge, Huntingdon and hopefully into Lincolnshire with 9600baud links on 23cm) is still not on the air. The reasons I have been given are all due to equipment problems.

The latest licence information received shows that the DTI has 61 amateur packet repeaters being dealt with, all at various stages, with 9 or 10 nearing completion. All of the 430MHz applications are at present with the MoD (Ministry of Defence - the Primary User) for clearance. When these do eventually get released it should take some of the strain off 144.650MHz.

VHF/UHF frequency usage

This month I have published a new list of Packet Radio Frequencies, (see below) which is intended to replace the list found on page 94 of the new CallBook. I hope that you will find this of use as it sets out the frequencies which we have been allocated, showing which are for Mailbox use and which are for *all* data modes.

It should be said that the 2m frequency set aside for Mailboxes (144.650MHz) is for *user* access, all station-to-station activity should be conducted on the frequencies set aside for 'All Data Modes'. With the amount of nodes now appearing around the country on 144.675MHz this should be even easier. It should also be said that Mailboxes are stations which have been allocated a GB7 callsign; personal message facilities do not fall into this category.

Packet radio for the blind

A report from Angus McKenzie, MBE, G3OSS, shows that packet radio for the blind is a workable mode. Angus is using a Eureka A4 computer with a Kam TNC. The Eureka A4 is a small portable computer designed for use by the blind. Its keyboard is designed for Braille input and its output is via a built-in speech synthesiser. Although this system is fairly slow (because it tries to pronounce everything it sees) it still makes a very workable system. The only problems encountered so far are the quantity of commands that Angus has had to learn for the TNC. For the near future Angus has said that once he has mastered the system, he will make available an alphabetical list of commands on tape for other blind users. If you know of a blind amateur with a Eureka A4 who may wish to get onto Packet, Angus is willing to pass on all he has learnt. He will answer all letters sent in on tape. Angus is QTHR.

Band	IARU Allocation	UK use	
1.81MHz	None	None	
3.5MHz	3.590 - 3.600	As IARU plus 3.605 (Mailbox)	
7MHz	None	No formal stations.	
10MHz	None	No formal stations.	
14MHz	14.089 - 14.099	As IARU plus 14.103 (Mailbox)	
21MHz	21.100 - 21.120	Mailboxes on 21.103, 21.107	
28MHz	28.120 - 28.150	Mailboxes on 28.123, 28.127 29.250 (AFSK)	
50MHz	None	50.63 50.65 50.67 50.69 50.71 50.73 50.75	 Most mailboxes Some mailboxes 9600Bd
70MHz	None	70.3250 70.4875	Informal packet Formal nodes
144MHz	144.625 - 144.675	144.625 144.650 144.675	All data modes AX25 mailboxes All data modes
430MHz	430.600 - 430.800	Not used owing to UK licence restrictions.	
	433.625 - 433.775	432.625 432.650 432.675 433.625 433.650 433.675 433.700 - 433.775	9600Bd links 1200Bd links User access and links TCP/IP and 'real time' traffic User access only User access only Not used owing to Raynet allocation
	438.025 - 438.175	Not used owing to ATV activity.	
1.3GHz	1240.000 - 1241.000 1298.000 - 1300.000	1240.15, 1240.30, 1240.45, 1240.60, 1240.75MHz (150kHz b/w) 1299.000MHz (25kHz b/w) 1299.425, 1299.575, 1299.725MHz (150kHz b/w)	
2.3GHz	2355.000 - 2365.000	2310.1, 2310.3MHz (200kHz b/w) 2355.1, 2355.3MHz (200kHz b/w) 2364.0MHz (1MHz b/w)	
	2392.000 - 2400.000		
10GHz	No recommendation	10,006 - 10,026MHz, 10,150 - 10,170MHz.	

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The levels of packet

Having recently been in discussion with a small group of local users, I mentioned a Level 4 connect. By the look of the blank faces I realised that I had got too technical, and therefore this month I will try to explain the Levels of AX.25.
This system permits computers of all types to communicate with each other provided that they follow the rules of the model.

The model consists of a seven layer hierarchy, the lowest being level one, and the highest being level seven with each layer being able to communicate with the levels directly above and below. This allows all compatible items to be interchanged.

To explain this further, let us liken packet to a hi-fi system. Such a system working in this hierarchy would consist of the stylus, turntable, amplifier and speakers - with the stylus being level one and the speakers at level seven; provided each component has been standardised, they can then be swopped at will.

Packet operators have an interest in OSI-RM because it provides a model for the development of amateur packet radio protocols. If all the amateurs who are developing software adhere to the model, they can then be sure that their work will be compatible with other programme developers. The standard or protocol is called CCITT X.25 and is the basis of the amateur protocol AX.25 (CCITT is the International Telegraph and Telephone Consultative Committee).
Starting with the lowest level, the seven layers of OSI-RM are:
1) Physical layer
2) Link layer
3) Network layer
4) Transport layer
5) Session layer
6) Presentation layer
7) Application layer

At the moment the lower four levels are the most significant - with the Physical and Link layers already working, and the Network and Transport layers (although working) still being perfected.

Level 1 - Physical Layer
This level is concerned with the moving of data mechanically and electrically from one device to another. This is normally the RS232 connection (Serial port) which runs from computer to TNC.

Level 2 - Link Layer
This level has the task of arranging data bits into frames and providing the error-free transfer over a communications link. Address information is added to each frame to aid in the transfer from source to destination. The code is checked at destination with the code sent from the source station. If the two do not match it is rejected. The protocol for this transfer is known as High-level Data Link Control procedure (HDLC).

Level 3 - Network Layer
This third level is concerned with the routing through a network of links. This is made possible by adding routing information to each frame. Once the path is established, each subsequent packet in the same transfer does not require all of the networking information.

Level 4 - Transport Layer
The sole purpose of this layer is to maintain a connection that is transparent to both source and destination stations, assuring all the time that the data received is complete, and in the same order that it was sent.

Level 5 - Session Layer
This layer provides for the synchronisation of the flow of data.

Level 6 - Presentation Layer
This level plays the part of translator, providing the interpretation standard of exchanged data between source and destination. Used when both stations use different ways to represent the data.

Level 7 - Application Layer
This the highest level of OSI-RM; it provides the interface between the lower levels and the program running on the computer at the destination station. You may have seen some Mailboxes with an OS facility for the user to run an application.

Beginners

To help with the introduction into Data Communications I feel it is time to print a glossary of terms used. Over the next few months I hope to cover all of the terms in general use.

Part 1 A - C

Acknowledgement timer - the AX.25 timer that causes your TNC to check that the far station's TNC is still connected to yours when a packet has not been acknowledged before the timer expires; also called the T1 timer.
Address - the identification of a packet source or destination.
Address field - the field in an AX.25 frame containing the call signs of the source and destination of the frame and, optionally, the callsigns of up to eight digipeaters.
Amateur X.25 (AX.25) - the link-layer packet radio protocol based on the CCITT packet switching protocol.
Asynchronous - a data transmission timing technique that adds extra information to indicate the beginning and end of each transmitted character.
Audio frequency shift keying (AFSK) - a method of transmitting digital information by switching between two audio tones fed to the transmitter microphone input.
Autobaud - the ability of a communications device to adapt automatically to the terminal baud rate.
Backbone - the link of mailboxes in the National Trunking System that transfer mail automatically from one end of the country to the other.
Backbone frequency - the operating frequency of the backbone network.
Balanced Link Access Procedure - the CCITT X.25 link-layer protocol that was the model for AX.25.
Baud (Bd) - a unit of signalling speed equal to the number of discrete conditions or events per second.
BBS - abbreviation for bulletin-board system.
Beacon - a TNC function that allows a station to send an unconnected packet, usually with station information, at regular intervals.
Bit (binary digit) - a signal that is either on or off representing either one or zero: bits are combined to represent alphanumeric and control characters for data communications.
Bit rate - the speed at which the information is transferred, sometimes known as baud rate or data rate.
Buffer - a portion of computer memory allocated for the temporary store of information being received or transmitted.
Byte - a group of bits, usually eight in number.
Checksum - the sum in hexadecimal of the bits stored on ROM in the TNC; it should be equal to the stated checksum in the TNC manual.
Clone - a device that duplicates a known device by a branded company.
Collision - a condition that occurs when two or more packets are transmitted at the same time from different stations. In the event of a collision neither packet will reach its destination.
Command mode (cmd) - the TNC operating mode that awaits a command input from the user.
Connect - to establish a communications link (connection) between two packet radio stations.
Control field - the field in an AX.25 frame that indicates the frame type.
CSMA - abbreviation for Carrier Sense Multiple Access; a channel access scheme in which packet radio stations listen on a channel for the presence of a carrier before transmitting.
(Part 2 D - L next month).

DataSpace '89

Perhaps the first thing I should do this month is to mention the AMSAT-UK Colloquium which is being held in connection with the RSGB Data Symposium, the International Satellite Meeting, and the Satellites in Education Day. The dates are 27-31 July 1989 and the place is the University of Surrey, Guildford. If you have not already sent for an Application Form for attendance at any of the day sessions please do so *now*. RSGB and AMSAT-UK both have forms for all of the events; see p12 of April *RadCom* for further details and also note that bookings made after 1 July attract a surcharge.

I would also ask Traders and Clubs who wish to put up a display or stand in the large foyer of the University Lecture Halls to contact me at once as space is now at a premium.

OSCAR 10

As I mentioned in my very first column in mid-1988, Murphy's Law is very active as far as anyone giving advance information about Amateur Satellites is concerned. Such a case in point was our old friend OSCAR 10. In last months issue I said that command stations had requested that the satellite should not be used for two months due to Eclipse's, FM'ing etc.

And then on 1 May OSCAR 10 was again being heard loud and clear, although with some FM'ing still being evident during part of the pass. Command stations then suggested that the satellite could be used at all times when it was *not* FM'ing. On 2 May I spent a couple of hours listening to the bird and found that signals were very strong on the down link, but still with some FM'ing - so it looks as if the ol' gal is still going strong! Given a bit of sunlight *(since when did it cloud over in space..! Ed)* to get the solar cells producing a few more milli-amps, we could be in for a good OSCAR 10 summer. However, please do heed the official request not to use OSCAR 10 when you hear the 145.810MHz beacon 'warbling'.

This topic brings us nicely to the first part of the mini tutorial series.

FM'ing

I do not expect that you will see this phrase in any technical handbook as it is a term used mainly by radio amateurs to describe a constant carrier (CW) signal which is anything but stable

and is normally caused by an unsmoothed power supply. In the distant past amateur CW operators had to constantly adjust the receiver with the left thumb, while writing out the message with the right hand, such was the extent of the warble on some gear. This also applies in some measure to the signals being re-transmitted by a satellite transponder.

If the solar cells (the only power source on OSCAR 10) are exposed to little or no sunlight then the B+ line of the electronics will be fluctuating which will cause the stability of the devices to degrade, result - warble ie FM'ing.

You will remember that the OSCAR 10 satellite has virtually no battery power system that's any use at the moment — we suspect that the batteries are open circuit. Please, therefore, only use OSCAR 10 on a steady T9 note.

Another word used by satellite folk is the Oscalator, which is a device for calculating the whereabouts of most amateur satellites and costs pennies instead of hundreds of pounds. (ie, you don't need a computer to find a satellite). I say this in the hope of enlightening those readers who write to me with the request that they have now acquired a computer and would I tell them how to use it as they want to go "on the satellite". You only need the AMSAT-UK Orbital Calendar and a set of Oscalators to find out where all amateur satellites are for any day of the week.

OSCAR 13

This satellite continues to give much pleasure to a lot of people. Although I hear moans about it not being very loud, this is mainly due to the attitude of the spacecraft at the time it passes your area of the world. There is a term we use called the Squint Angle, which is the angle at which the antennas of the spacecraft are aligned towards earth. It would be of advantage for satellite OSCAR 13 users to learn a little more about this, if only to enhance transmission and reception under trying conditions. I will elaborate on that subject at a later date, but for now it can be assumed that the lower numbers (degrees) of Squint Angle zero to about 15 will give good results at this time.

Those who use OSCAR 13 will have by now found out the Schedule of operations was changed on 3rd May and are as follows:

MA 003 - MA 160 Mode B
MA 160 - MA 200 Mode I
MA 200 - MA 240 Mode B
MA 240 MA 003 Mode OFF

Mode S Beacon will be active on 2400.661MHz from MA 210 - 222 on every orbit. The exact ALONG/ ALAT on 29th April was 211.8/+3.3 with a drift of 0.016/-0.061 degrees per day.

These will be in operation, given no mishap, until 14 June. No schedule after 14 June is available. Listen to Amsat-UK Nets on Sundays. 3780MHz at 1015

OSCAR 10 and 13 Operation Schedule charts cannot conveniently be included in this column every month. These can be obtained for the courtesy of a stamped addressed envelope via the address above.

Microsats

As reported previously, we will soon have another eight satellites up there, with a launch date around October 1989. Launch slip two of the chain will be our own UOSAT D and E. One other will be Brazilsat Operation DOVE, which I had some words to say about last year in these columns. It is only at this late date that notice is being taken about the implications of propaganda being uploaded into amateur radio frequencies via this satellite. I, from a personal point of view am neither convinced that the idea nor the system are a plus for Amateur Radio.

FO-12

During the last month this satellite had to be shut down once again because of battery degrade. I suspect that it gets a lot of usage over the Pacific area, but certainly not so over Europe. By the time you read this hopefully we may have a more stable situation, even if for only a few days per week. JARL seem to be putting out a regular schedule, and trying to please as many of the world as possible. I get a fax from JARL nearly every week and will keep everyone informed via the Nets. The new JAS-1B is now due for launch early in 1990, and I am informed that it will (has) a bigger and better battery and solar cell unit. This is the prime problem with JAS-1A.

Software

By the time you read this Satscan Two, Version 2.8 for the IBM from AMSAT-UK will be up and running with all the bugs ironed out (fingers crossed). We have taken a lot of time to get it right, and the program really is the only one you will require to do all your satellite work if you use a IBM. I hasten to add that our friends in AMSAT-NA (Bob McGweir) have also produced an updated bug-free issue of Quiktrack, which does a very similar job. We swap programs between both organisations, which means that you can order the USA software from me as well. A stamped and self-addressed envelope to me gets you the gen, yesterday. Please note that postage stamps purchased in overseas countries and stuck onto SASEs are not acceptable by the British Post Office for carriage of mail from the UK. It really is surprising the number of radio amateurs who believe their stamps to be legal in other overseas areas. Please use IRCs obtainable from your own Post Offices.

One last item, which I sincerely hope is not true, is a rumour that SPACCO in Pakistan have designed and applied for permission to fly an amateur satellite, educational (?) type, from the International Frequency Allocation Board of the ITU. Frequencies given to IARU were 435.480 to 435.420MHz Uplink for a 145.090 to 145.110MHz Downlink. As this is right outside the IARU recommended Amateur Space Allocation I hope they will think this through and ask for some advice before building the satellite. The furore and hassle caused will not only waste their time but a lot of others as well. More as it happens.

Once again, let me implore officials of high order to *ask* if you are doing the right thing to the rest of the amateur world when you designate a couple of frequencies for your pet satellite design. We did set up an alert system a few years ago, and agreed it again at the RSGB International Satellite Meeting in 1988. Does any national radio society take any notice of frequencies being suggested by satellite builders in their area? Perhaps you do not think it is *your* job?

I notice that the RSGB have obtained permission for an Aeronautical Mobile operation to take place on 9 May. Good luck to the operators. If the experiment goes off OK it will be a plus for UK amateurs and, who knows, we may still get permission to fly the Amsat-UK Transponder on a manned balloon before long. We asked permission nearly two years ago so, of course, it's early days yet!

MIR

As we go to press the crew of MIR have been removed from the spacecraft. You cannot work U2MIR again until at least August or September this year. The crew landed in good shape on 27 April at 0230 UTC. Thank you for giving a lot of people a few hours of your time from up aloft.

OSAR NEWS is available on annual donation to AMSAT UK. Apply via G3AAj (address above).

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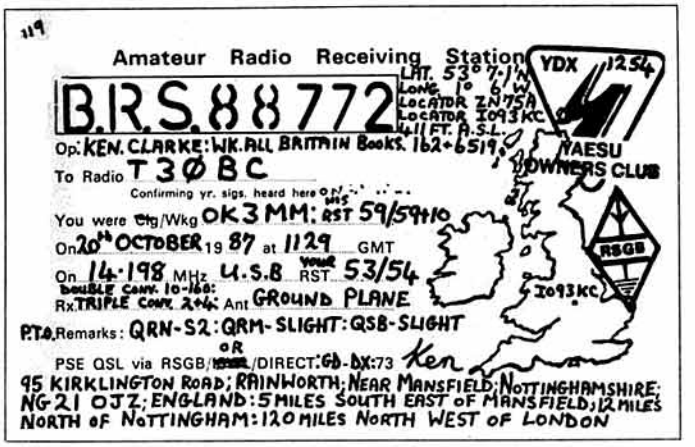
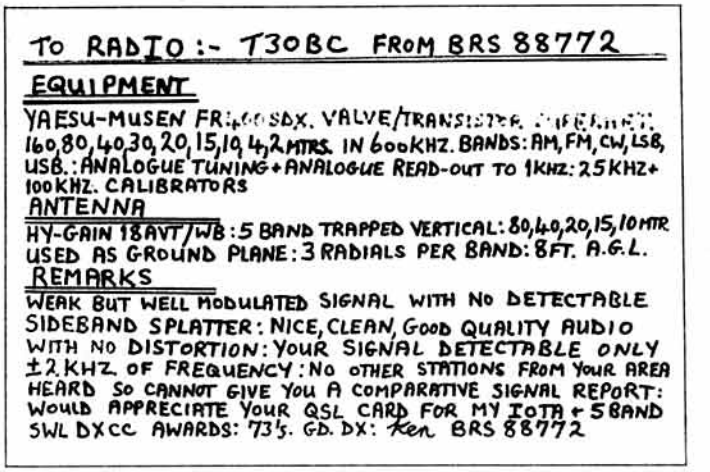
QSL card competition results

My February column drew attention to a competition to find the best prepared Listener Report. I am pleased to say that the response was good, with many entries received. The entries showed that there is a large gulf between the reports which are sent, with some very good, and some bordering on the abysmal. In some cases it was quite clear that the advice given in the column on many occasions about providing a useful and well-prepared report went unheeded. It appears that some listeners are only willing to prepare a very basic report and still expect to get a QSL card in return. Some will never learn!

Now on to the better things which the competition brought. The winner was **Ken Clarke BRS88722**. His card is shown here and as you can see it was packed with useful information and was the most informative of those submitted. Indeed, G4XPE and G0HXO sent copies of cards they had received from Ken, suggesting that they were the best SWL cards ever received, giving a substantial amount of information about the quality of signal, interference, etc. Second place went to Yvonne Blain BRS91397, and once again, all the basic information was provided, with details of more than one QSO made by the station being noted, including stations which had been calling in but not heard. The judges were particularly impressed with this and if the report had been for a DX QSO rather than a 'local' 3.5MHz contact, the judges felt that this might well have been the winning entry. Third, was Mick Toms BRS31976, who submitted a computer generated report for a 144MHz meteor scatter logging between a G and a UA3. The judges felt this was something different and showed some dedication on the part of the listener. It was felt that the report would be most useful to the VHF operator as it gave the beam heading (important in MS operation) and had an interesting addition by suggesting to the receiving amateur that if he preferred, signing the report and returning it would be adequate confirmation. All three should have already heard from "C"ontact Cards about their prizes.

There were several entries that can count themselves unlucky not to have been placed. These were Robert Small BRS8841, who provided a worthwhile report of an





The winning QSL card, submitted by Ken Clarke BRS 88772.

African/American QSO on 24MHz; Colin Watson BRS46598 whose type written report to C6ANX listed a number of stations worked; and Chris Inwood BRS88955, who the judges felt dwelt too much on the local weather, but did report on a USA/South American contact.

Unfortunately some of the other cards received were not worth the card they were written on — indeed, one even failed to provide any callsigns of stations being worked! The judges felt that some would have been committed to the bin, certainly not enhancing the SWL's reputation. The biggest fault was not reporting on more than one QSO made by the station reported on, and failing to remark on propagation conditions. Another point for all listeners to note is to keep your reports simple and understandable. One report we received referred to 'C, D and K Negative' — whatever that means, and another provided a SINPFEMO report to an amateur on 21MHz. The judges had never heard of this code, but wondered whether the SWL had confused the Broadcast Band reporting system of "SINPO". However this should NOT be used when reporting to amateurs — RS (on SSB) and RST (on CW) being used.

So there you have it, the number of entries justified the competition, and I hope that the three winners enjoy their prizes.

White Rose LF contest results

The results of the last WRARS LF Contest are now to hand and once again the event was won by an overseas station — ONL3647, coming in first by over 6,000 points, with David Whitaker in second spot. There were 13 SSB entries in all.

The star band for the event was 7MHz, with 90 countries heard including FO5FO in French Polynesia. The change in the sun spot cycle had a drastic effect on 1.8MHz, and only six entrants took time out to monitor the band. 3.5MHz was disappointing in comparison to recent years, but signals from the States were particularly strong around midnight. In the CW section, three entries were received with Don Piccirillo BRS52868 winning with 11,000 points.

The society is still looking for a society to sponsor this event for the future, so if *your* club is interested, please contact G3ZGA at 146 Street Lane, Leeds LS8 2AD.

LF Challenge results

This year's Challenge was not well supported with only six entries being received together with three check logs. Not surprising perhaps in view of the fact that conditions were probably the poorest since I first started running the Challenge.

However, it was good to see first time logs from G6RJZ and BRS90528. Comments were mixed: Martin Parry, BRS52543, found it hard going on 3.5 and 1.8MHz, but 7MHz was good with lots of DX to be heard.

However he missed the VK9ZW and VK9ZM expeditions; whilst Arthur Miller BRS88969 had dental problems for most of January and so could not burn the midnight oil as much as he would have liked. Here are the results.

Station	Countries	Total Points
1. BRS52543	209	421
2. BRS8841	199	377
3. BRS88969	151	275
4. BRS25209	134	230
5. G6RJZ	69	101
6. BRS90528	45	56

Check logs from BRS25429, BRS32525 and BRS62088

I trust that next January's Challenge will be blessed with both better conditions and more entrants. In view of the low number of listeners entering this year, there will be no Trophy for this year's winner.

More on Delta loops and a VE's ideas on SWL reports

Bob VE7BS wrote with regard to the Delta Loop piece in the February column which I expanded upon last month. Bob used to be BSWL 545 before the War and now considers he does more listening than transmitting.

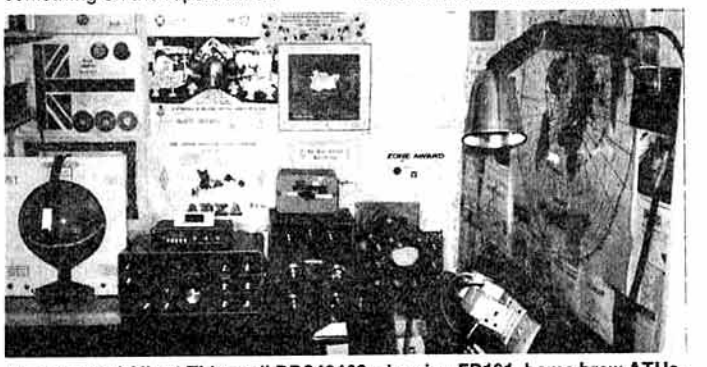
Bob reiterated the view that to get the best DX from your loop, the feed point ought to be in the bottom corner (or for the purist, a quarter wave down from the apex, which is normally somewhat above one bottom corner) the loop is vertically polarised, so even if it is very close to the ground it responds to lower angle signals. If fed in the middle at the bottom, the loop is horizontally polarised and the most effective part of the antenna is relatively close to the ground. This results in it responding to very high angles of arrival. Fed at the apex, it is horizontally polarised too, but at least the radiating centre of the antenna is fairly high, so the arrival angles are not so high. Bob refers to a classic article on loops by G3AQC in the May 1974 *RadCom*, which he felt would be an interesting read for anyone thinking of erecting a delta loop.

Moving to SWL reports, Bob thought that there should be something on the report which showed that the SWL did actually hear the signal of the station being reported on. He feels very uneasy when he receives a listener report from an SWL in, say, Hong Kong reporting a QSO with a station in his own country. I know many G's feel the same way, Bob, and have sent me evidence! Some have even said they will not QSL unless the report details QSOs made with stations outside of the SWL's country. This is fair enough, but such 'rules' would not be necessary if the listener reported on three or four QSOs made by the station or repeated some personal comment about the QSO on his card.

Useful test equipment

Every SWL shack ought to have a range of good test equipment to facilitate basic measurement of electrical currents and voltages. Just like the tools which I looked at last month, you get what you pay for. If you are a dab hand with a soldering iron and at construction, you will save money by buying in kit form, otherwise, you will have to pay more for the equivalent ir. a finished form.

First item on your list should be a volt/ohmmeter which will form the backbone of your test equipment. This is a handy device which will measure AC and DC voltages, direct current and resistance.



The shack of Albert Tideswell BRS48462, showing FR101, home brew ATUs. home brew oscilloscope, FL3 Filter, and antenna switching unit.

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

Secondly, you should look for an RF signal generator covering 200kz to 30MHz. It is best to look for these at Club surplus sales or rallies.

A signal generator is useful for aligning receivers. Other test equipment which could be useful are a noise bridge, an attenuator, and a mega (which will tell you if you have any water in your coax).

HAB news

Various information has dropped through my letterbox following my mention of the HAB Award scheme.

Firstly, I must correct two small mistakes. The Contest Manager is G6TNW. Apologies to G6TNV! Also the 144MHz contest date has been changed to avoid clashing with the Society's 50MHz and SWL Trophy. Unfortunately, GW6JNE failed to give me the new date, so watch Contest News for up-to-date details.

On the Awards front, H Falkinder, T Edwards, G Ridgeway, Chris Gibbs and E Brown have, between them, cornered the market in newly issued certificates. These five SWLs currently seem the most active on the HAB scene. Although having said that, there are quite a few listeners who have recently purchased HAB Record Books.

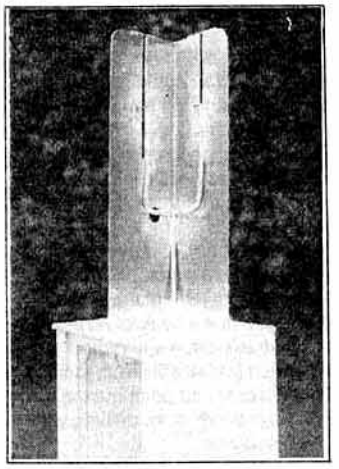
ILA news

GW4OXB sent the latest copy of *'Just Listening'*, the quarterly journal of the International Listeners' Association. The Association still appears to be thriving, and their magazine has interesting features about 'My Rarest QSL Card' and facsimile transmissions.

However, the most informative item in the newsletter detailed two exclusive Spectrum programs. The first gives bearing and distance of the DX you hear. Needing only the latitude and longitude of the station heard. Secondly, there is a 'callsign and QSL checker' which will list over 2,000 callsigns or prefixes to tell you if you have a duplicate — sounds ideal if you are a contester or prefix hunter. There are also a number of members sundries, including a prefix list, club badges, QSL cards and log sheets. Membership is only £1.50 this year, so write for a membership form to: 1 Jersey Street, Hafod, Swansea, SA1 2HF.

Finale

There you have this month's SWL offering. For the latest in SWL activities and DX news, turn to my 'Spectrum Analysis' piece at the front of the magazine. Please note that copy for the August issue should reach me no later than Monday 19 June.



The GB3WWH beacon

The 2.3GHz beacon, GB3WWH, has been in operation for about six months now. At the Sandown Convention I had a visit from its builder. David Mann, G8ADM, who left a couple of photographs with me. The two views show what a high standard of construction has been applied.

The first view is an overall one of the beacon in its weatherproof housing and mounting; the first point to note is that the antenna is mounted directly on this housing and fed with a very short length of semi-rigid coax to minimise feeder loss.

From the bottom of the photo, the first module is the switching power supply and smoothing unit. Immediately above is the keyer unit, closely followed by a Microwave Modules MMS348 UHF source which has a nominal output of 500mW. A hybrid block amplifier comes next closely followed by two cascaded multiplier/fillers to the final frequency. The second photograph is a closeup of the antenna — a pair of centr-fed slots arranged at right angles to one another and fed by a coaxial splitter.

Remember that this beacon is somewhat unusual in using amplitude (on/off) keying to conserve power because it runs off batteries which are charged at intervals from a diesel generator.

Any reception reports would be welcomed either by David or the beacon keeper, G3RHI (both QTHR).

Sandown Convention

This year I was actually able to attend the Convention for a change and experience the crowds at first hand! The ground floor 'trade' show and stalls were crowded out during the little time I had to look around. Even the RSGB Committee and Affiliated Societies stands seemed to be very busy too – and I can confirm that the Microwave Committee stand was exceptionally well attended! However, in 'chairing' all three microwave lectures I must admit to being a little disappointed at attendance for these.

The theme of this year's lectures was user-group orientated, in that one of the lectures was predictive of the coming use of bands not so far used and the others related directly to the experiences of two different microwave user groups: ATV and Packet links. The first was entitled "The potential of the mm bands" by Barry Chambers, G8AGN, which used 24GHz as a model for predicting the likely path performance from humidity measurements and extended this to the higher bands (47GHz and above) by taking into account the additional losses due to water (rain), water vapour and oxygen. Included in the lecture write-up is a BASIC program which will calculate and predict the probable performance of simple, very low-powered amateur equipment in the millimetre bands. Standby to benefit from some of the proposed (commercial) uses of such frequencies, mentioned before as having appeared in the form of a consultative Government Green Paper.

The second paper of the afternoon was a joint effort by Mike Sanders, G8LES (RadCom TV columnist) and Garry Shipton, G6CRJ, on "Microwave ATV". Both keen members of BATC and the Home Counties TV Group, they talked and demonstrated alternately on various aspects of their experiences with 1.3GHz TV, with special reference to "their" ATV repeater GB3HV (High Wycombe) and the problems they had experienced with the high powered Heathrow airport radar. There had also been a spurious (sound carrier harmonic) mixing product in the narrowband sub-band at 1296MHz which had to be 'nulled' out rather than filtered out. One of their next projects may be to link their repeater to others in order to extend the range and coverage. They also outlined the possible problems which they saw with the nomination of packet link frequencies between 1240 and 1241MHz. Rest assured - we'll do our best to avoid any such problems, although with cross-polarisation, directive antennas and careful choice of 're-use' distances and directions, not many problems are anticipated.

The final lecture of the afternoon was given by Philip Howarth, G3YAC, on the "Microwave aspects of Packet Links". This outlined the exploratory work which had been carried out by his group, "Eastnet" in East Anglia. Path investigations were undertaken following computer predictions of likely path losses on paths of known profile; these were largely borne-out by practical measurement. The next difficulty was in identifying suitable transmitters and receivers, without resorting to very expensive black boxes. I know that a review was carried out by members of the Packet Working Group and should be available from G3XDV (at RSGB HQ) for any groups contemplating 1.3GHz links for packet 'trunking'. There had been some problems with the G4DDK oscillator source and amplifier boards but they now appear to have been resolved; the suggested modulator circuit, published here some time ago appears to be unsuitable for more than voice bandwidths, producing more phase modulation than frequency modulation at the higher bandwidths needed for high speed packet use. No doubt we will be treated to some minor modifications as a result! There also appeared to be some problems with local oscillator drive in the receiver (Cirkit) adopted by the group. I must report that lower than expected output from the G4DDK001 board is usually due either to low crystal activity or incorrect construction; output is definitely down with some 'amateur' standard crystals.

Apologies

OOPS! There appears to have been a mix-up concerning the date of first 10GHz Cumulative Contest. The date was originally set for 16 April, acting on the misinformation that the Sandown Convention was on 9 April. Then somehow the date was passed around as 9 April with the Convention on 16 April! I know that there were stations out on both dates and I guess the solution (subject to Contests Committee approval) will be to accept entries from stations operating on either date. More news later.

EMC MATTERS

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

Towards 1992

The EEC EMC Directive will come into force in January 1992, its main aim being to create a cleaner electromagnetic environment. It will also allow a common European standard of immunity to be applied to all electrical equipment, enabling easier trading across barriers.

British manufacturers have already felt the impact of this Directive as they now prepare to verify that their products conform to the proposed standards. Some large companies have their own in-house test facilities, but the majority are going to have to use independent test houses to ensure that their products are within the RFI levels enforced by the Directive. There are already a number of established test houses in this country, with a few providing consultancy services as well as having a variety of test facilities. Some of these are capable of measuring and detecting emissions up to 70GHz and also generating electromagnetic fields up to 26.5GHz.

In future, all electronic equipment *should* be more capable of co-existing compatibly; whether in fact this turns out to be the case, we will have to wait and see.

If you are interested in reading more about the Directive, a copy entitled 'Council Directive on the Approximation of the Laws of the Member States Relating to Electromagnetic Compatibility' (Ref No. OJC322 (2.12.87 page 4-10), plus amendment OJC81/11 (1.4.89) can be obtained from Official Publications Department, Alan Armstrong Ltd, 2 Arkwright Road, Reading, RG2 0SQ, price £4.50.

Canadian success story

The Committee was interested to receive a letter via the Editor from Raymond Perrin, VE3FN, the Director of the CRRL in Ontario, in which he tells of a case where a Radio Amateur was "sued by a neighbour in civil court for being a nuisance. The suit was launched because some of her appliances malfunctioned when the Amateur operated his transmitter. She refused to permit further efforts to suppress them and she was initially successful in obtaining an injunction forcing him to cease operation."

Mr Perrin was called as an expert witness for the defence and testified that "the Amateur was *not* causing interference." He was supported by all the technical experts including the witness for the Federal Department of Communications. The provincial Ontario Court of Appeal struck down the ruling and ordered that the neighbour must allow her equipment to be suppressed. Mr Perrin also made some interesting points in his letter:

a.) "that a transmitter can only cause interference to an out-of-band receiver if it is doing something wrong."

b.) "that a transmitter can never cause interference to any device which is not designed to be a radio receiver."

c.) "Technically, the interference is caused by the malfunctioning device. The mere fact that turning off the transmitter causes the problem to go away, in no way suggests that the transmitter is actually 'causing interference'. After all, the problem also disappears if the susceptible device is shut down!"

In support of his case that the amateur was not causing interference, he used the following analogy, "Say your house is built with a deficient roof which has a hole in it. So when it rains, you get wet. What is causing you to get wet? Is it the rain? Or is it the hole in the roof? Take away the rain and you don't get wet. But I submit the problem is the hole in the roof and it should be fixed." He ends his letter, "In my view, the interference problem is the biggest single threat to the continued existence of Amateur Radio. It is a world-wide problem. We must get along with our neighbours. We are on a collision course. Something has to be done."

The social scene

Over the years it has become obvious to the EMC Committee that the majority of EMC cases can be basically put down to existing social problems. Being tolerant of each other's foibles seems to be difficult - becoming angry and aggressive seems easy. The following advice results from experience in cases where things have gone wrong. In all this we are of course assuming that your station is clean.

1) Don't use the word interference to your neighbour, use breakthrough. It's a much less emotive word.

2) Don't throw 'your rights as a DTI licence holder' at him. He also has a right to watch his TV.

3) Don't tell him his equipment is faulty. This won't go down well, especially if he's paid a lot for it. Explain that it is a lack of immunity, design faults, etc. Mention 1992.

4) Don't blind him with science or try to 'pull rank'. Sympathise but...

5) Don't immediately assume your transmissions are the cause of his problems and offer to stay off the air. If you do, you are admitting guilt.

6) Don't buy or fit filters to his equipment. You could loan him some to try and tell him where and how to fit them.

7) Don't ever open up or adjust his equipment, as any problems which may arise in the future could be laid at your door.

8) Do advise him to contact the dealer, manufacturer, BT, etc. Most are only too aware of the problems.

9) Do give him a copy of *How to improve television and radio reception* (obtainable from main Post Offices) and point out the *correct* procedure for dealing with EMC problems.

10) Do make sure that all *your* electronic equipment lives compatibly together. Use your clean electromagnetic environment as an example for demonstration purposes.

Intruder watch

A member has brought to our attention a problem which he has been experiencing with a neighbour who has installed a certain type of commercial automatic approach/intruder lamp. This type of lamp contains a passive infra-red detector which acts as the sensor but unfortunately the sensor is also prone to spurious switching by low level RF in the 2m band. The manufacturer is aware of the problem but has no plans at present to introduce extra immunity to the product. It doesn't take too much imagination to work out the problems which follow. Very quickly a technical malfunction (after all it is not a radio device) becomes a social problem for the member. Unfortunately, at the moment, there is no current EMC legislation covering infra-red type sensors. However, after Jan 1992 when the EEC EMC Directive is in force, the manufacturer will be responsible for ensuring compliance with both radiated emissions and immunity from RF fields.

On the receiving end

As with most aspects of life there are two sides to an EMC problem - generation and reception - and at one time or another most amateurs have been on both sides. There is no doubt that TVI, BCI and AFI are most serious in the overall amateur radio context, but interference to the amateur bands by domestic and industrial equipment can also be very frustrating. Interference of this type is often difficult to rectify at source, because it may be generated quite a long way away (possibly hundreds of yards) and even if it can be traced, the perpetrator may not be interested in doing anything about it because it does not interfere with TV or radio broadcasting. With long range interference of this type, the well known dodges of improved antenna siting, using the optimum polarisation (usually horizontal) etc, may be of only limited effect, and noise limiters and blankers only work on certain types of interference. If this stage is reached with an intractable HF interference problem, do not despair, there is a way out.

In principle, any signal can be cancelled by adding to it a signal of identical amplitude but opposite phase. In fact, the adjustment of these two conditions has to be exact for a deep null to be achieved and this means that it is usually possible to null out interference while leaving a wanted signal almost unaffected.

Experimenting with cancellation techniques has an interest all of its own, and success is likely to be more a matter of basic understanding of the principles involved, coupled to ingenuity and patience, rather than abstruse maths and expensive high technology - the sort of activity where the amateur really excels.

Anyone interested is advised to refer to related articles, such as those in *RadCom*, October 1982 entitled 'An Experimental adjustable null receiving antenna for 14 and 21 MHz and *QST* Oct 1982 entitled 'Electrical Antenna Null Steering'. There is also a reference to a simple (but reputedly hard to adjust) circuit known as the 'Jones Noise-Blanking Circuit' in *Amateur Radio Techniques*, page 249, Sixth Edition.

Down the line

If you are experiencing problems with telephone interference, British Telecom have a Consumer Service Department in your local area.

On no account must the apparatus be opened up and modified by anyone but an authorised BT engineer.

Off the rails

If any reader has experience in dealing with interference from light railways and electrified lines, to TVs, videos and amateur radio equipment, please drop a line to the column.

As the 'EMC Column' is published bi-monthly, its next appearance will be in the August issue of *RadCom*, which gives you plenty of time to get your letters in!

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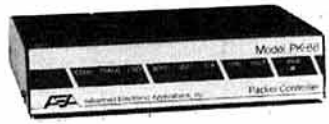

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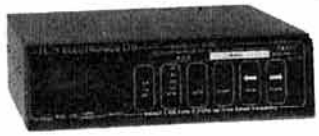

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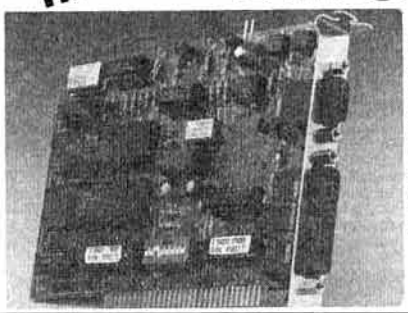

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● YAESU FRG7700 0-30MHz comms RX, FRT7700 ATU, Dressler ARA30 active ant, Comax CD660 decoder, CW/RTTY/ASCII/TOR/AMTOR, HK708 morse key, EG100 B/W monitor, books: £425 ono. Will not separate, buyer collects. (Wokingham) 0734 787350.

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● YAESU FRG9600 VHF/UHF. Unmoded, good cond: £400 ono. Canon Typemate 10 portable typewriter. 1.5k memory plus backup, LCD, full WP, 4 languages, plus calculator mode. As new: £200 ono. Racal RA1792, maintenance manual plus operators manual, unused: £70 ono. John. 0480 56096 after 6.30pm.

● SILENT key sale, late G2KA. FT901DM 6-band plus 10MHz FM Curtiss keyer, mic, twin paddle: £450. FC901: £80. SP901: £35. KW Ezematch: £35. All VGC. Buyer to inspect/collect. Enquiries to G2ACZ QTHR. (Lincs) 0521 73233.

● NATIONAL NC200 HF TX/RX 80-10m, SSB/CW with Homebrew PSU: £60. CR100 RX, tatty, OK for spares etc: £25. Fidelity 10m FM set, fitted noise squelch: £25. Westrex RTTY PSU: £6. GW4GCB. (Colwyn Bay) 0492 531760.

● AMT2 AMTOR/RTTY/ASCII/CW plus 2 Vic 20's plus AMT2 firmware, monitor and cables. A complete system. Boxed: £225. G4BIM. 0844 237093.

● ST5C PSU cvtr deleted, Homebrew Amtor used with ST5, Xitex morse tcvr, 2m 8/8 and 4m ants, Advance digital 10V meter, BC221E PSU, CT471A electronic voltmeter, other items, list supplied. SAE appreciated. G4DEL QTHR. (Hornchurch,Essex) 04024 51410.

● EDDYSTONE 1830/1 marine and gen.cov rcvr. 120kHz-31MHz. GWO: £350. Also AR88 not working: £30. 0707 320271.

● YAESU FT101 Mk2, recently renewed PA and driver valves: £250. G4MGL. (Farnborough) 0252 546966.

● SHARP MZ80K computer with CP/M and 80col screen, twin disks and 1/0 box with RS232 card. Lots of original software plus manuals: £250. Epson MX80F/T printer with MZ80K interface and Sharp ROMS: £100. MZ80K 1/0 box with disk card: £30. RTTY terminal unit plus programmable serial interface. ASCII and RTTY, all speeds: £75. Accept: £400 the lot. G3YPP QTHR. 0462 815533 eve.

● TWIN paddle key G4ZPY brass. Looks v.nice. 5mths old. Never used: £40. XY plotter professional machine with suction plate. VGC: £25. G3UGL QTHR. 0234 750050.

● PSU's several 40 plus Amps 12V S/M: £59. 13.8 40A linear: £95. 10FM Midland 4001 c/w mobile bracket: £35. Motion Electronics TV sound monitor, covers VHF,UHF AM/FM in teak box c/w inst: £25. All inc.post. 0245 324555.

● YAESU FT790R 70cm multimode with nicads, chrgr and case: £270. Microwave Modules 432MHz 30W linear: £100. Trio TR2200GX 2m FM: £40. Welz SP420 swr/pwr meter: £50. MET 432-17T: £30. G8PEB QTHR. 051-428 4899 w/e

● HY-GAIN V converted to 10m by Spectrum Comm. B300P Zetagi all-band 400W HF amp: £135. G0GQN QTHR. 0772 423741.

● DRAKE TR7, PS7, RV7. Offers. Datong RF Clipper: £20. 4x new boxed Toshiba 6JS6C: £10 each. GW3ARS QTHR.

● KENWOOD VFO120 mint. Unused: £50. Transformer 2000-0-2000 at 316mA Class A. Exc: £25. Andrews Helix new HTJ450, air-spaced LDF450, 34m: £70. 14.5m: £30. 8.5m: £18. 6.5m: £14. H100 15m: £8. Multibeam MBM46: £12. G4MAW QTHR. 0803 555488.

● HY-GAIN tri-band beam TH3JN. 5yrs old, one owner with BN86 balun and inst: £100. No offers. As aerial is covered in grease, buyer must inspect and collect. Dave, G3MWV not QTHR. (Cromer, Norfolk) 0263 512872.

● BC221 with AC PSU and full charts: £45. G8PP. (Essex) 04023 42555.

● TRIO TS430S plus PS30 and SPC300ATU. Rig includes all filters, FM board, user and service manuals. Just serviced by Lowe Electronics. Genuine reason for sale: £800. I will pay postage. Jon Carp GM8XFT. D Watch Eng, RAF Saxa Vord, Haroldswick, Unst, Shetland, ZE2 9TJ. 095781 555 x212. Leave message if I am not there.

● TS515 carefully used. 80-10m non WARC. Boxed with mic, spares, manual: £195. FT480R 2m all-mode. Unmarked cond, scanning mic, mobile bracket. Boxed with manual: £275. LM7 frequency meter. Charts. Offers. G3MP QTHR. (Nottingham) 0602 602634.

● HEATHKIT HW9 QRP tcvr 8-bands. Mint cond, fully aligned and tested: £160. Matching ATU and swr bridge also available: £210 all three. Also R5223, complete but not working, would swap for R1155 in similar cond. G6GTC QTHR. 01-302 0059.

● FT290R with Mutek F/E. New nicads, chrgr, softcase, manual, 30W Microwave Module 144/30L. All VGC: £275 ono. G1GSM QTHR. 061-449 9176.

● FT77 8-band 100W tcvr fitted FM and marker board, c/w mic, h/book and matching FP707 spkr/PSU. Both units mint cond, and v.little used: £550. G3TKN. 0705 265101.

● FT200 with PSU in splendid cond with spare valves: £180. Prefer buyer collects. GW3SSJ QTHR. 087487 259.

● TS780 VHF/UHF all-mode tcvr. Mint, boxed, manual. No scratches or marks. Hardly used: £700 ono. Howard, G0HZH QTHR. 0394 460474.

● COLLINS 51JY 5C RX with 3 mechanical filters. Siemens 5C RX. OZ8RO. Vejdammen 5, DK-2840 Holte, Denmark.

● 10M FM tran/cvr plus 30W Liner amp: £45. Hugh. (Northumberland) 0668 6228.

● RESCUE from chainsaw required. 2 unique 50yr old rot and shake free round hardwood poles, 27ft long, tapering 6-4in. Ideal for woodturners or carvers or wire antenna supports, otherwise superior firewood. Available collection. G0HTR. (Warwickshire) 0827 898024.

● FDK750E 2m 25W/FM with matching FDK430 expander, making rig dual-bander 2/70 10W on 70: £195. Would sell expander separately. Fits most FDK inc 750A multi: £80. Bearcat desk scanner. Marine 2m/70cm etc. Mem, 12V/240V: £75. G0ANX QTHR. (Oxon) 0235 87498 not mornings.

● FT290R, nicads, chrgr, case, rubber duck, DC lead, box, manual. Exc.cond. Little used on TX: £250 or exch 2m FM mobile 25W plus WID extended RX to 170MHz. eg IC28E. Must be VGC, cash adj. E/W. G0GMV. (Halifax) 0422 244046.

● YAESU FT221R, fitted Mutek F/E, manual: £260. G4YZS. (Markfield,Leics) 0530 243469.

● AOR 800E handheld scanner with circuit diagram: £165. TR7800 2m FM 25W with mobile mount and service manual: £150. Standard C146A 2m FM handheld S20,S22,R5,R6 with leather carry case: £65. Sony Profeel colour monitor KX20PSI: £200. Sanyo green screen monitor: £35. JVC VHS portable video recorder, C format HRC3EK with batts and chrgr: £125. Prism modem 1000: £40. Prism V23 acoustic modem: £40. Fivemere 1223: £35. Interlekt Portman auto answer modem V21/V23: £50. Pace Linnet PC card modem Hayes V21/V23: £75. Xebex PC hard disk controller card: £25. NEC D3126 2 OMB 3.5in hard disk drive: £100. BBC Micro viewdata software on ROM: £10. Centronics 7394B RS232 80col printer: £75. Offers welcome. Tony Cox, G8TEE, not QTHR. 0276 79308 anytime.

● TS440S tcvr, internal auto ant tuner, 1.8kHz SSB and 500Hz CW filter options. Unmarked and fully functional cond: £975. FT290R 2m unmodified tcvr, HD, nicads, chrgr, helical ant and carrying case. Like new: £250. G3XHX QTHR. John. (Liskeard) 0579 43749.

● TS930S with built-in ATU, VGC: £1200. G4GOX QTHR. 0924 401238.

● TEN-TEC Paragon fitted with 1.8 and .5 filters. FM board. Desk mic. Showroom cond. Genuine reason for sale: £1650 ovno. Save £400 on this superb tcvr. K. Baker QTHR. 021-459 7041 after 6.30pm.

● KW monitorcope. Kenpro KP60 RF speech processor. Welz swr/pwr meter SP200. 1.8-160MHz 1kW. Offers. G2DRT. 0494 814240.

● YAESU FP757GX switch mode PSU, 2mths old. Mint cond. New rig forces sale: £50. GM4OSS QTHR. (Ayrshire) 0560 83800.

● CUSHCRAFT boomer 214B, as new, 14ele 2m yagi: £35. G4DFI QTHR. 01-303 6470.

● KENWOOD TS140S 8mths old. Approx 6hrs use. Plus AT230 and MC50 mic. All as new and boxed. Any test: £900 ono. G0AWE QTHR. 0609 774984.

● ALINCO handheld ALM203E. Amp ELH24B. Ant hot rod HR1. Spkr/mic EMS20. Cvtr DC/DC EDH25. All as new and boxed: £290 ono. G1HDX. (Lincs) 0205 355960.

● 10M multimode AM/FM SSB plus M/M 28/144 tvtr: £120 ono. G0IIY not QTHR. (Lowestoft) 0502 518694.

● FR100B RX 160-10m AM/SSB/CW/FM, FL200 TX 80-10m, AM/CW/SSB: £199. LCL29FM with repeater shift: £35. 20W PA: £15. 2m Jaybeam 4ele quad: £20. 18ele parabeam 70cm: £20. TET 3-band HF vert. 10-15-20: £25. Howes 80 RX built, boxed: £20. 1:1 HF balun in plastic sleeve: £10. Pye U470 rack-mounted RX/TX RB14: £50. Pye N15 UHF Westminster RO-2-4-8-10 SU20,SU18 toneburst, preamp, scans. G4MTG. 021-430 6764.

● MICROWAVE Modules 30W 2m linear plus preamp. MML144/30LS VGC: £40. Also 2m 10ele Jaybeam, good cond: £15. G0DZU QTHR. 0794 884286.

● TVTR, allows 20m operation with 2m tcvr Howes HC220 professionally built in diecast box with LED pwr meter. Exc.working order: £50. Also MM 144MHz cvtr 10m IF: £14. G0DZU QTHR. 0794 884286.

● MITSUBISHI Galant 2000GLS 4-door saloon auto C-reg. Low mileage, power steering, diamond pack, electric windows, sunroof, cruise control, central locking. Towbar fitted but unused. Extremely reliable, one owner. Luxury car in showroom cond. Bereavement forces sale: £4995. (Aberdeen) 0224 743039.

● TELEREADER, CD660, comm decoder, CW/RTTY/BAUDOT, ASCII/TOR/AMTOR. Absolutely as new in appearance and performance. With inst. Nearly half price: £100. Midland mobile CB rig, professionally converted to 10FM. Nice appearance. GWO: £45. Spectrum plus 48k computer with Datacorder, PSU and inst.book. With a host of amateur radio software and 10 games. Immac: £80. Prefer buyer to inspect and collect but will post at buyers expense if req'd after cheque clearance. No offers. (Leeds) 0532 609456.

● KENWOOD TS520SE 160W HF tcvr. MC35S noise cancelling mic, h/book, leads, spare 6146's: £350ono. KW Ezematch HFATU: £60ono. Datong FL1 audio filter: £25 ono. ITT2300/5 teleprinter, modern style, w/pedestal, spare terminal unit/PSU, VGC: £25 bargain. Possibly deliver. G4ODX not QTHR. 0293 512924.

● QTH exc VHF/HF location, Dunstable. 3 beds, fitted kitchen, oven and hob. Pleasant outlook at rear. Garage. Within commuting distance of London, Offers in the region of £78,000. G4UPB QTHR.

● TS830S, 270Hz filter, exc cond: £625. Deluxe memory keyer, ARRL h/book, batt/mains. All options, c/w electronic paddle, stainless steel base and WPM meter: £85. PR 7MHz traps: £5. SEM lambic keyer: £25. All carr.extra. G3RB QTHR. (Tyneside) 091-253 0504.

● COLLINS KWM380 HF tcvr gen.cov. Continuous tuning. No PA adjustments to make. CW filter, w/shop manual, mic, remote frequency entry keyboard kit: £1700ovno. Consider PX 28/50MHz dual-bander or small 12V HF rig. BNOS 12/12 PSU: £80. G4FEQ QTHR. 0977 55286.

● TRIO TR9130 2m multimode tcvr, boxed: £300. Kenwood PS30 PSU 20A 12V: £75. Tonna 144MHz crossed 9ele ant plus rotator and UR67 only: £25 to someone who will dismantle and collect. G4CXJ QTHR.

● TS120V HF tcvr with PS20 PSU, h/book, boxed: £310. Trio TR2600E 2m handheld tcvr, nicad pack, chrgr, battery pack, mic, case, full scanning, 10mem, h/book boxed: £160. Terminal unit, JP Electronics: £15. M40FM xtals, conversion, inst 10m/FM: £25. G1UGA. 0733 230088.

● 6M RN electronics tvtr 2m IF 25W output. Only 6mths old. 20 countries worked, c/w h/book circuit diag: £120 ovno. 12ele ZL'Sp for 2m: £15. 2m SEM BF981 preamp: £10. Buyer to collect or arrange carr. G1HMN QTHR. 0483 233991.

● CANON camcorder, ideal ATV type VME1. Orig.box, good cond, many extras: £460. G4MBZ QTHR. 0252 837581 eve.

● KENWOOD service manual for TH41 Han 70cm Handie. Not photocopy, orig. multicolour from Japan plus spare nicad battery. Both: £20. G4MBZ QTHR. 0252 837581 eve.

● YAESU technical manual for FT209R. Handie orig. document: £10. G4MBZ QTHR. 0252 837581 eve.

● TELEREADER, CRW685E. Keyboard, built-in screen, Brother printer M1009. CW/BAUDOT/RTTY/ASCII. Novex amber monitor screen 12in. All in mint cond: £500. SX400. Scanner 26/520MHz: £300. Jaybeam 12XY 70cm: £15. 19ele tonna 70cm: £10. Coax LDF 4/50. 27m: £40. 25m: £37. Pioneer open reel tape deck, nearest: £100. Telescope 6in reflector by AE Luton. 4mm,9mm,25mm and 2X Barlow. Eyepieces. 1/4 wave optics. Very heavy duty tripod stand, equatorial mounting. 1st class instrument: £300 ono. Jim G4OYU. 0452 812216 or 0242 33218.

● SILENT key Icom IC251E 2m multimode c/w SM5 desk mic: £400 ovno. Exc.cond. Icom IC290H 2m multimode mobile 25W: £375. PNP RTTY/CW modem: £30. Oric computer: £15. G1EAM QTHR. (Surrey,S.London) 01-643 7826.

● FT290 multimode portable with high capacity nicads and usual accs. Exc.cond with orig.box. AR2001 scanner still in orig.box with accs. Full cover 25-550MHz inc military air band. Superb set: £250 each. G0JBC QTHR. (Halifax) 0422 59680.

● EDDYSTONE EA12: £180. KW Viceroy Mk4: £80. GM3UCI QTHR. 0555 70914.

● QTH nr Eastbourne, extremely well-built 3 bed detached house, integral garage, double glazing, gas CH, loft/cavity insulation, good decorative order, delightful gardens, elevated position, 2m/70cm colinear: £174,950 inc carpets/curtains. Further details G4OHB QTHR. 021-449 3530.

● TET beam HB33SP 3ele tribander: £100. G4KTY. (Burnham,Bucks) 0628 665536.

● ICOM IC251 multimode 2m basestation with scanning facility c/w Jaybeam C5/2m colinear ant and 5/8 magmount whip. Seldom used. Exc.cond: £320 ono. G4FVR QTHR. 0723 365043.

● SILENT key sale. Trio R2000 comm rcvr: £395 ono. Yaesu 9600 60 950MHz scanner AM/FM/SSB: £350 ono. Arthur, G4KIQ QTHR. (Essex) 0375 678833.

● QUAD 2ele 10-15-20m only used 2m. Sell or exch 2m linear 70cm gear or WHY. MT PSU approx 1kV at 1A with bais and grid supplies, variable. Offers or exch WHY? Dave, G4WBB QTHR. 0742 465145.

● KENWOOD TS680S c/w CW narrow xtal filter MC43S mic: £875. Slow scan digital pattern gen with PSU: £20. Trio R600 rcvr: £195. G3OIC 05648 26124.

● TECHNICAL software TX3 for Spectrum 3 disk, adaptor, TIF1 interface. RTTY/CW/ASCII transceive. Harldy used: £50 pp. Electroniques 1.6MHz IF amp module Mk3 xtal filter for SSB: £13 pp. Full data for both inc. Arthur, G0EBV QTHR. 091-388 6057.

● 10M multimode tcvr USB/LSB/FM/AM converted from 120ch Lafayette 1200FM. Gives complete coverage of 10m band, no gaps, GWO: £90. Also Hi-mound HK703 straight morse key: £15. G0DZU QTHR. 0794 884286.

● 4CX 1000A valves tested and guaranteed GWO: £50 each. G0HLA QTHR. 0794 884286.

● BNOS PSU type 12/12A: £85 ono. Drae VHF wavemeter: £15 ono. G0IXA QTHR. (Doncaster) 0302 876154.

● SCOPE Hameg HM207/3 single beam 8MHz bandwidth c/w manual: £75. Trio extension spkr: £25. Tronix-1 13.8V 7A PSU: £20. Datong VLF cvtr 0/500kHz, in 28/28.5MHz out: £25. All items post extra. G3RDG QTHR. 01-455 8831.

● FREQUENCY counter Black Star meteor 600 5-600MHz c/w manual and PSU: £100. KW107 Supermatch modified to cover 160: £80. Tech 22D audio generator: £15. Swr/pwr meter 3.5-150MHz: £12. All post extra. G3RDG QTHR. 01-455 8831.

● FAX1 weather facsimile demodulator decodes facsimile, weather pictures, RTTY and Navtex. Also PK232 7-mode data terminal unit. Decodes AMTOR/Packet/RTTY/CW/ASCII, facsimile and Navtex: £225. Each post paid. G3RDG QTHR. 01-455 8831.

● HEATHERLITE 2m Explorer amp 4CX250B valve, boxed: £350. Mike G1UAX. (Herts) 07072 65025.

● ICOM 210 2m TX/RX 0.5W-10W 13.5V or mains operation PLL sync tuning, tone burst. VGC c/w Icom mic PSU and inst book: £95. SAE for full details. GM4FSB QTHR. 0382 543069.

● YAESU FT726R owners: my 50MHz unit is for sale owing to changed interests. Unit is boxed with inst. Can be seen working perfectly. Get onto 6 now while the sunspots last!: £210 ono. John G4XEN QTHR. (Wellingborough) 0933 677573.

● FT290R with Mutek F/E plus nicads, chrgr, flexi and telescopic whips, carrying case and strap, manual. Alinco ELH230 linear: £280 the lot. G6JUI QTHR. (Reading) 0734 507137.

● REALISTIC scanner PROO2001: £90. Halbar weather satellite rcvr digitizer, BBC: £80. Sony WA8000 9-band stereo casset-corder: £50. 0903 724805.

● ICOM R71E: £600. Icom R7000: £700. Both hardly used. Lowe SRX30D: £100. Prefer buyers collect. Cash only please. W.E.Gates, 16 Highmill Dr, Scarborough, YO12 6RN. 0723 365093.

● KW 202/204 combination with matching spkr features Q multiplier, narrow xtal filters Vox semi Break in CW c/w manuals, spare valves, good reliable performance with exc RX. Good cond:: £195 ono. Alan, G0KMC QTHR. (Aylesbury) 0296 29342 eve-w/e.

● IC735, PS55, as new: £850. IC Micro 2E, new: £185. 240/115V taped 1kVA autoxfmr: £10. Various meters, enquire. G3TTC. New QTH. (Warwick) 0926 490897.

● TS930S, SP930 auto tuner, extra filters MC60. As new: £1250 or exch mint Collins S line Johnson KW-Match-Box: £200. Munro G3GBB. 0284 753049 day 037983 657 eve.

● YAESU 70cm module for 726R multibander. Cond as new. Offers. G3BJD QTHR. 0946 810047.

● IC25E FM 5/25W mobile bracket, manual, box. VGC: £140 ono. TR2400 H/H 1.5W chrgr, manual. VGC: £95 ono. G4MWP QTHR. 0203 462035.

● DRAKE TR4 tcvr c/w AC3 mains PSU, RV4 remote VFO: £300. KW E-Zee Match: £40. Heathkit HM11 reflected pwr meter: £30. GI3TNK QTHR. 0232 659919.

● SUPERB Kenwood Trio HF station inc remote VFO, linear amp, PSU. All units mint, boxed, literature. Offers around £850. Send for photo and full details. Also 80m QRP rig: £25. G4MWN. 0664 64678.

● YAESU FRG7700, FRT7700, FRV7700 c/w all manuals. Mint cond: £275 ovno. Prefer buyer collects. G1YLH. 0709 543477.

● YAESU FT208 2m handheld. Also FT708 70cm handheld Both have spkr/mic and NC8 PSU/chrgr: £150 each ono. Microline 80dot matrix printer with Centronics parallel interface: £50 plus carr. G1BWW. (Beds) 0462 711722 answerphone.

● 50MEGS complete station FT620B, 4ele yagi, Kenpro KR600 rotator: £350. G4MHS QTHR. 0303 50652.

● YAESU HF tcvr FT301D 1.8-30MHz, all transistorised, 100W output on SSB and CW, 50W on RTTY, 25W on AM. Digital readout, FP301 mains PSU with spkr, 12V lead, all filters and xtals, inst and packaging: £390. G4IRD (Northampton) 0604 44341.

● FACSIMILE machine. Plessey KD111 combined TX/RX. Transmitted document is auto fed into a spinning lamp sender. The rcvr produces good images from an electrostatic melted powder process. Mains powered. Offers around £50. Steve G8HQY. (Birmingham) 021-422 3067.

● SCANNER H/H PRO38 same as BC50 10ch 4m/2m/70cm, boxed: £60. 6F33, new: £8. 6LQ6, new: £4. Solid state mains linear, good for 10m. Zetagi B132 1-20W SSB in 200W PEP out, used with FT7: £85. G0FJY QTHR. 0903 40072 eve.

● KENWOOD 440S with auto ATU. 6mths old. Inc mobile HF ant for 80/40/20/15/10 bands. Reason for sale, never any time to operate: £975. G0FGP.

● 512K of extra RAM for your Apricot computer, easy to fit: £80. Also Microwave Modules advanced morse trainer with synthesised speech response: £90 or will swap one of items for a packet TNC. Phill. 0978 352086.

● YAESU FRDX400 matching FLDX400, all filters, 2 options fitted, comes with SP400 spkr, mic, tcvr leads. Orig.boxes and manuals, Exc.cond: £350. G4NQQ QTHR. (Somerset) 0458 42111 day 0458 45179 eve.

● PRINTER Amstrad DMP1: £100 ono. GM0AAX QTHR. 0563 21997.

● SCOPE Marconi TF2201 dual trace DC-30MHz, 0.05-50V/cm, 50NS-500MS/cm with slideback voltage and time scales. Complete set of manuals. Only: £50 for quick sale. Mark Lee, G6FKN QTHR. 01-876 4379 eve.

● TOSHIBA dot matrix displays TLC314 AK c/w makers technical data sheets. These are 128dots square, 4 new and one used. For price and info. G4RQN. 0553 675676 after 8pm.

● DRAKE L7 linear: £1100. Drake MN2700 ATU: £480. Bird 43 Thruline with leather case and 8ele: £450. Hygain Explorer 3ele wideband beam: £325. Yaesu FL2100Z HF linear: £475. Trio TW4000A dual-band tcvr: £375. All mint. 0247 455162.

● 23CM PA 2x 3CX100A5. Professional brass metal work, QST design: £60. Single 2C39BA 23cm PA VHF h/book design modified plate line. Working: £25. Blowers 7in 1/100th HP 110/230V: £12. 4.5in 110/230V: £8. Both suit 4CX250B PA. G4MAW QTHR. 0803 555488.

● FT200 tcvr: £150. Liner 2 144MHz: £40. RA17L: £85. 62set immac: £65. 22set: £50. 19sets, MkII Canadian, plus PSU: £45. American: £40. Mk3 British, Variom and leads: £60. C12 plus PSU, ATU and leads: £65. 18set: £40. Dave. 01-641 8008 eve.

● AN ideal South Coast DX location. Reduced in price for early sale. Completely refurbished spacious bungalow situated near cliff top at Barton-on-Sea, Hants. 3 double beds, one with en suite bathroom. Second bathroom, fully fitted kitchen, large utility room, gas fired CH. Garage and gardeners cloakroom with WC and wash hand basin. Matured gardens and grounds with greenhouse and summerhouse. G3FYS QTHR. 0425 479226.

● BASIC television by Grobb. Outline of Wireless, Stranger. Elements Radio Engineering, Peel. Radio Upkeep and Repairs, Witts. TVRX Servicing, Spreadbury. Wireless Transmission for Amateurs, Camm. Wireless Servicing Manual, Cocking. RSGB Handbook. Case 4G spare valves WS19/22. G3KTH QTHR. (Droitwich) 0905 774624.

● KW2000B with mains PSU and Shure 202 mic. VGC: £250. Trio R1000: £200. AR88LF: £65. CR100: £50. EC10 late Mk1: £50. PCR2

mains: £30. Codar AT5 with HB PSU: £20. Labgear TV pattern gen: £15. G3ZZP QTHR. 0482 851275.

● VIC20 computer 11k, data recorder, well built RTTY/CW modems with RTTY/CW and RX4 programs, and other software: £60. GW4WJO QTHR. 0407 2330.

● FT209R for sale. 2m FM handheld, keyboard, nicad chrgr, FBA5, helical. Good cond: £160 ono or swap for HF equip. LA2035 Daiwa linear 30W: £35. Good cond. David GM7AHC. (Airdrie) 0236 51774 after 5pm not Sundays.

● WESTERN alumast 30ft in 3 lightweight sections: £100. 70cm 8 over 8 slot fed yagi: £10. Realistic PRO2003 scanner 68-136MHz, 138-174MHz,, 410-512MHz AM/FM. As new, boxed: £125. Prefer buyers collect. G4KEL QTHR. 01-330 0695.

● YAESU FT77 HF tcvr with FC700 ATU and FP700 PSU. Exc.cond. Rarely used. Manuals, mic and key: £550. GW0BTJ QTHR. 06462 3922.

● FT902DM, FTV fitted 2m/70cm FC902 CW filter fitted, 300Hz plus h/books and mic. 1st class cond: £850. G4DDA QTHR. 0803 525364.

● REALISTIC DX302 gen.cov rcvr. Exc.cond. Boxed with manual: £110 ono. Pat G0LBZ. (Oxford) 0865 776748.

● P40 Strumech tiltover tower with braking winches, AR22R rotator, control box, 30m cable: £350. Buyer dismantles and arranges carr. TS700 144MHz all-mode tcvr: £300. Linear: £30. 8/8 slot ant: £50. 5ele yagi 2m: £20. G3WMO QTHR. (N.London) 01-363 5814.

● PROPERTY of the late G3UWD. Heathkit SB230 linear amp: £325. 45ft 3-section lattice tower c/w ladder, 2ele tri-band hygain hyquad, CDR HAM-M rotator: £150. or will split. Keith, G3LOC QTHR. 0733 74159 or Frank G0CFD QTHR. 0778 423433.

● 2M, FM TR7850. 5W/45W, 15mem, 5 or 25kHz steps, mobile mount and manual. VGC: £129 ono. Richard. G6OIH. (Kettering) 0536 514997 eve.

● ICR70 multimode comm RX. 0.1-30MHz. A highly rated rcvr in mint cond: £195. Richard G6OIH. (Kettering) 0536 514997 eve.

● IC740 HF all-band tcvr inc int 15A PSU. FM unit. Exc.cond: £550. David. 0778 425367.

● YAESU FT708R 70cm handheld tcvr. Immac.cond plus chrgr. All orig.packing: £145. Also Solartron laboratory standard PSU. 10A stable output 1-30V in switchable 0.1V steps. Fan cooled plus safety cutout: £50. Buyer to collect PSU. Dennis G1NEO. (Nottingham) 0602 622651.

● COLLINS KWM2A RE HF tcvr with 516F2 PSU: £475. 312B5 VFO/spkr/wattmeter/station control unit: £200. Traps for 3ele tribander. Offers. GI4GNZ QTHR. 0266 880740 eve.

● ANDREWS 7/8in foam coax, 30m: £40. 26m: £35. 15m: £20. 7/8in air spaced coax with 7/8in EIA connectors, 25m: £50. G4DZU not QTHR. 0532 525552.

● FT101ZD Mk3 FM fan, CW/narrow filter, manuals, YD148 dynamic desk mic, YH55 comm phones, FTV901R matching 3-band tvtr, SP901 matching comm spkr, FC902 matching 10-band ATU, all exc.cond. Prefer buyer inspects: £800 ono complete station. G4YGF QTHR. 091-417 3483 after 8pm.

● FT980 gen.cov HF tcvr, c/w mic, phones, box, manuals and morse key: £750. FT73R 70cm handheld, c/w base, chrgr, tone board, spkr/mic, DC-DC adaptor box, manual: £180. IC03N 70cm handheld, c/w BC35 base chrgr, spare batt pack: £145. CWR610E morse code and RTTY decoder, c/w amber monitor: £140. Model PK232 packet radio TNC: £170. Kantronics KPC2 packet radio TNC: £100. Datong D70 morse tutor: £30. Datong DF1 Doppler radio direction finding system, c/w 4 mag mounts and whips for 2m: £150. Tom G0JSV. 01-582 7444 eve-w/e.

● AMSTRAD CPC6128 colour monitor, Scarab, RTTY, DRIogo, Masterfile etc etc: £200. Amstrad DMP2000 printer plus leads: £150. £325 together. Gone packet. Brother thermal printer: £60 plus ribbons for normal paper. Norman G4SFO QTHR. (Rugby) 0788 810344 eve.

● ALTRON 4-section 60ft tiltover tower with post. Good cond: £350. Icom IC251E 2m base, mint: £375. MM 100W 2m amp. 10W input, mint: £100. Will p/x good 2m handheld any item. (Lancs) 0254 831751.

● MAST 24ft 3-sections 15in triangular base. 9in triangular top. Lattice work, sand blasted and metal repainted. Insulators and metal pilings. Reason for sale, planning permission refused: £120. G0GZS. (Upminster) 04022 28896 eve.

● NEVADA TM1000. Uniace 100 10/FM. ICV12 12ch handheld. CP163 100W HF broadband linear. Kenwood TV502 tvtr. Tokyo 2m/30W linear. Icom 240G 144/148 auto toneburst, scanning, lockout etc. Sony analogue gen.cov rcvr. Haggle with G4REZ QTHR. 0734 311852.

● PALM4 70cm handheld: £85. Microwave Modules MML144/30LS linear 30W, preamp: £80. Mutek BBBA500u wideband preamp for scanners: £20. Discone: £10. TR2200G 2m portable 12ch auto toneburst: £95. AR2001 scanner 25-550MHz: £225. El colour TVs 22in, remote: £35. 01-840 6468.

● ICOM IC210 2m FM basestation tcvr c/w inbuilt mains PSU. Exc.cond, little use. C/w accs and h/book: £150. 0322 53953.

● SONY AN1 active ant for HF amateur and SW broadcast bands. Almost new: £35. G3UFQ QTHR. 0564 777802.

● FREE-standing lattice tower 33ft: £80. MM144/430R tvtr: £100. Icom 260E 2m multimode, faunit. Xtalled on RB14. BNC socket fitted. VGC: £60 ono. Hughie, GM0HSC QTHR. 041-649 5371.

● RANK Xerox 400 telecopier: £20. Creed 444R/P, only 230hrs use, paper winder, large ST6 TV: £80. 2m 10XY needs attention: £20. AR245A 5W 2m handheld, spkr/mic, chrgr, helical, 100mW PA transistor fitted: £80. Buyers collect. G3TGF QTHR. 0435 830484.

● S36A Hallicrafters RX 28-143MHz. Exc mech cond with manual and some spare valves: £75 ono. G3GIQ QTHR.

● FT290R, nicads, chrgr, c/case. mobile mic: £220. Dataflex Stradcom modem V21/V22 internal PC: £90. FT790: £230. Torch 280 card BBC less ROMS: £35. Major M588 AM/FM/SSB OK10m: £75. Tandy M4 disk IF less FDC: £10. G3TYR QTHR. 0483 39877.

● TRIO TS520 tcvr. Good cond used here for RX only: £320. Kantronics KAM TNC with CWID: £190. Memotech MTX512 computer with monitor and program for KAM: £90. Sinclair microdrive, brand new: £20. Buyer collects larger items. G1MIL QTHR. (Crewe) 0270 585092.

● MOSLEY ant elan 10m and 15m 3ele: £80. Welz swr/pwr meter SP400 130-500MHz: £40. G4UJV QTHR. (Newmarket) 0638 720422.

● GOULD Advance OS4000 digital storage scope plus OS4001 output unit, new manual and probe, would prefer to swap for TX/RX or anything interesting. Don Ward, (Bradford) 0274 567570.

● TRIO TS520. Unfitted CW filter. MFJ ATU. Ten-Tec dummy load. H/book and circuits. Shure mic. All boxed in orig.packing. No offers, will split: £425. Carr.extra. Dean G0JQR. (Northumbria) 0670 819297 after 4.30pm or w/e.

● SURPLUS to requirements. Trio 2m FM tcvr TR7800. Never used. Still in orig.packing: £200. Icom 144MHz 10W booster ICML1. Qty 2. Never used: £25 the pair. Microwave Modules RTTY tcvr MM4000 c/w RCA keyboard: £175. Sinclair QL computer with full software and Microvitec cub colour monitor, manuals. Hardly used: £250. Ascot 25635 eve.

● ICOM 251E Mutek: £450 ovno. Heathkit HX1681 100W CW transmitter, 5-bands, with Heathkit HR1680 SSB, CW rcvr and matching PS23 PSU. Plus all manuals. Exc.cond: £320 ovno. MML110S amp/preamp: £105. BNOS 12A PSU: £60. 0964 613928.

● G6TPQ offers instant RTTY. Microwave Modules MM4001 RTTY tcvr with dedicated keyboard. Baud rates to 1200. All shifts: £120. G6TPQ QTHR. 061-633 3895.

● KOKUSAI 70cm FM mobile, 10W output, 6ch readout, RB4 fitted and tone burst. A small compact radio c/w spkr/mic, mobile mount and h/book: £100. (Medway) 0634 827602.

● 60FT Westower, c/w base frame and rotator top section. Ham.M rotator and Hygain Thunderbird 3ele beam, tribander. Offers around: £500 or will exch for HF tcvr WHY? You arrange transport. QTHR. 0229 873781 day 0229 32164 eve.

● PC/XT clone. 640k RAM, 360Kb floppy, 322Mb Winchester, V20 10MHz CPU, CGA/Hercules graphics, amber monitor, printer lead. 50 backup disks, sturdy metal case, no RFI emissions. Less than 12mths old: £700 ono. G4BLT QTHR. (Wakefield) 0924 255515.

● KENPRO KR400RC rotator. Compass indicator. Bottom mast clamp, never used: £140. Tech GDO 0.44-280MHz. Good cond. orig.packing: £15. Both cash only. G8BBZ. (Herts) 0442 69544.

● YAESU FT73R 70cm handy with new nic 1s, chrgr, soft case, h/book and w/shop manual. Choice of 2: £190 each or: £370 pair. G4JQP. 0749 840468.

● YAESU FT101 c/w service manual and spare valves. VGC: £300. G0IPD QTHR. 0784 251310.

● COMPLETE TS940 system, mic, spkr and PSU. In-built auto ATU. The lot! Offers over £1650 to G4DAX QTHR before 30th. 0947 86333.

● COUNTANT PSU, 2 outputs at up to 7.5A, 5-30V. Very smooth, suit computer or radio equip: £70. Tandy 1000 computer, PC clone, c/w CM11 colour monitor, dot matrix printer, mouse, lots of disks. 2x 5.25 floppy drives and room for hard disk. Box and manuals: £700. Meteor 600 freq.counter: £85. Tom G0JSV. 01-582 7444 eve-w/e.

WANTED

● ST. JOHN Ambulance urgently need Clark or hi-lo pump-up mast for mobile medical unit at reasonable cost - funds limited! M.Newbold, c/ Ltd, 79 Miles Rd, Mitcham, CR4 3YL.

● MECHANICAL bug required preferably Lionel or Vibroplex. G3AAQ QTHR. 0788 860444.

● ARGONAUG wanted or other QRP rig. Also 50MCS TX/RX gear. G2CYN. 0234 711538 w/e.

● FOR white stick operator. IC240. Must be in exc.cond. Cash waiting. Please reply to RF Gardner, Hon.Treasurer, S.Bristol ARC. 0272 775638 anytime.

● SONY ICF6800 rcvr. (nr. Skegness) 0754 74341.

● ORIGINAL manuals for army surplus comm equip. Also Type R box and 24V vibrator for Larkspur equip. G4WWX QTHR.

● KW 107, KW 109. ATU's YC601 digital display, YO100 monitor scope. All must be in GWO. Cash waiting for best units. Phil G0JSP (ex G6DBO) QTHR under G6DBO. 0932 762065 day 0784 456169 eve.

● CODAR AT5 inc manual and DC PSU. G4BMH. Kettering (0536) 712273.

● AOR 2002 scanner or similar with 900MHz coverage. Also Trio SP230 spkr and MC50 or MC60 mic. Paul, G0GQV QTHR. (Norwich) 0603 39925 eve.

● 3ELE minibeam. Altron AQ6/20 or similar type or size. Frank, G4KVV QTHR. (Peacehaven) 0273 581107.

● SPEED-X bug key, prefer model 500, but any Speed-X semi-auto speed key wanted. Also Autoplex bug. British made c1932, all brass construction. G3TSS QTHR. (Corbridge) 043471 3125.

● CIRCUIT diagram for Microwave Modules standard 144/28 2m cvtr and info on AR88 BFO mods. Will pay expenses. G7ANV QTHR. 066570 381.

● EXCH Sinclair QL computer 128k, 1985, plus serial thermal DM printer c/w all doc's and 10 cartridges for any RX, Eddystone, DX100, R107, WHY? GWO please. Glenn Grayland, G8ZEB not QTHR. 39 Dollar St, Cirencester, GL7 2AS. 0285 657668.

● 2M FM car mobile rig. G4ERS. 0708 763551/45733.

● MUTEK GFBA144E/ATCS500 required urgently for school moon bounce project. Also MMC144/28HP cvtr, CX600 coax relays. Will pay good price and carr. G4JBH QTHR. 0935 23873.

● SATELLITE board for Yaesu 726R. Also any info re software for Amiga computer and associated radio uses. Icom R71E HF rcvr in top quality cond. required. 0702 711181.

● ARGONAUT wanted or other QRP rig. Also 50MCS TX/RX gear. G2CYN. 0234 711538 w/e.

● SUITCASE radio B2 and A Mk3 wanted. Also any clandestine type radios, manuals in any cond. for spares or restoration. (For small collection). G4OFO. 01-949 2317.

● EARLY wireless/crystal sets, horn speakers, valves, old books, catalogues, bound volumes Wireless World wanted. Also interested in American Comm. RX's. Jim Taylor, G4ERU, 5 Luther Road, Winton, Bournemouth. 0202 510400.

● HELP wanted! Can anyone tell me how to progress the Yaesu FT767GX for the computer-aided tuning system using an Amstrad PC1640. Many thanks. GW8ZCV QTHR.

● TECHNICAL manuals for Racal RA66 panoramic adaptor, RA180 RF amp/mixer, Krohn-Hite 4100 osc, Eddystone EP15 panoramic adaptor, Extel-Transtel AH11R teleprinter, Collins R648/ARR41 HF RX, Redifon TT20 teleprinter terminal unit. J.Graham. (Oxford) 0865 515143.

● CHEAP and cheerful HF SSB/CW rig, model immaterial, wanted to set up project YEAR station at Queensmead School. Details to Don Lamb QTHR. 01-845 6266.

● WANTED, wanted. Ten-Tec Argonaut 515 or 509. Must be good cond, good home assured. Bob G0FTO. G-QRP 3785. (Bolton) 0204 657410 eve.

● SHACK clearout? QSL cards prior to 1970 wanted for reference collection. Can collect or refund postage. G4UZN QTHR. 0532 693892.

● YAESU FTV901R tvtr main frame. Plus 4m,6m modules. Tim G0AUI. (Haywards Heath) 0444 458390 eve.

● WANTED QSL's from the following G-stations, who requested them from me, which I duly sent and have received no return, in some cases for over 3yrs: G0AZR, G0CZQ, GM0DZE, GW0GRJ, G0ICC, G3IIY, G4PPL, G4WLB, GW8WJ. You all still seem to be QRV in the 1989 call-book, so come on chaps, how about it please? I look forward to hearing from you. Phil G0DZA.

● SMOOTHING choke and output transformer for AR88D. Also transistors 2SA70 or equiv. AF118 and circit dgm for Nat.Panasonic 10-trans 3-band radio model R307. GW3VFZ QTHR. 0248 362893.

● TO: borrow, buy or photocopy a copy of Ham Radio Nov 1988 for articles by W6VEH and KF7M. All, or any, letters answered. John, GM8MLH QTHR.

● T1154L and R1155N TX/RX's required for replica WW2 installations. Also seeking ground PSU 114, or Rotorys with chrgr 115. Loop aerials, ammeters and visual indicators type 1. Collection arranged, any item. G0HTR QTHR. 0827 898024.

● FT767GX plus all options 70cm/2m/6m/HF. Also upgraded unit on latest models. Must be mint. Howard, G0HZH QTHR. 0394 460474.

● GERMAN WW2 ex-service equip in GWO or not for museum purposes only. Also WS No.11 and WS No.1. OZ8RO. Vejdammen 5, DK-2840 Holte, Denmark.

● ST.JOHN Ambulance urgently need Clark or Hi-lo pump-up mast for mobile unit. Can you help? Must be reasonable cost. Mike Newbold, G1MJN. 01-640 6011 day 01-543 5489 eve.

● PHONE-patch circuit or unit urgently required for medical unit. All costs refunded. Newbold. 01-640 6011 day or 01-543 5489 eve.

● MORSE key, GPO type 56. Please write with cond and price. Dave Johnson NF5B. 15514 Ensenada, Houston, Texas 77083, USA.

● OLIVETTI formatted 5.25in floppy disks type CP/M R2.2 BIOS V3B. Large quantity required. For Olivetti ETV 300 disk drive and ET225 typewriter. Unit purchased for disabled operator, but disks prove too expensive in commercial supplies. Can anyone help? Ken G4IZW not QTHR. (Hexham) 0660 20636.

● TRIO AT230 ATU. Peter, G3WBI not QTHR. 0282 601237.

● AP1086 (RAF stores Ref nos) sections 10A to 110Z. Also air publications relating to radio, radar equip. Also would purchase current types of Magnetrons, Klystrons, T/R cells, and special types of EEV valves. M. Gee 17 Foxley Close, Mountford Est, Ferncliff Rd, Hackney, London, E8 2JN. 01-254 9083 or 01-790 2846.

● VALVES for my B2,7Q7,7R7,EL32 and 6L6G, especially 7Q7 and 7R7, very rare. G0FQX QTHR. 0908 667250.

● HELP required to resolve two problems with the KW 1000 linear amp. All expenses recompensed. G4MBT QTHR. 0642 485355.

● WANTED for new club. Yaesu FT200, preferably or FLDX400, FT101. Must be in GWO and clean cond. Up to £200 available. ATU and keyer also required. G0FUS QTHR. 0703 620176.

● YO901 monitor scope for 101ZD req'd. Also SP901P spkr, FTV901R transvert, FV901DM and Panoramic adaptor, also called band scope. All must be mint and perfect WO. G0FSC or G0JAU QTHR. (Banbury) 0295 50169.

● SMALL metal bending machine of the type once commonly sold for making chassis, but seem to have disappeared along with the valve. Also looking for a small guillotine. Please have a look in your shed. John G8BXH. 01-428 0974.

● SOLID state Hitachi or Hameg scope. Cash waiting for good item. G3NXD QTHR. 0562 850570.

● CHEAP tcvr, faulty, damaged FT707, FT7, TS130 etc. G3NXD QTHR. 0562 850570.

● MANUAL or circuit details GEC Worcester Dymar type RC620. G3AJT QTHR. (Romsey) 0794 512557.

● YAESU FV102DM ext VFO for FT102. Top price paid for one in mint cond with cables and h/book. G0IWD QTHR. 0543 252556.

● HF linear, must be in 1st class cond. Spot cash, fair price paid. G3HEE QTHR. (Stamford) 0780 55001.

● FDK International Corporaton Japan 2m all-mode multi 750XL TR/RX. Wish to purchase copy of CCT or manual. Likewise for Pye RX Seafarer model 1112. (Newcastle) 091-268 4085.

● TRIO TR2300GX in good cond. Icom IC202S 2m SSB portable or similar HF RX 9R59DS,

HW717 or similar. Consider faulty RX swr/pwr meter suitable for 2m. T.Brady, 120 Baltimore Rd, Gt. Barr, Birmingham, B42 1QL.

● DG5 digital display unit for Kenwood TS520S. G3HLG QTHR. 0636 892384.

● RADIO Engineers H/book by F.E.Terman, published by McGraw Hill. Top price paid for a clean hardback copy. Needed for experimental work. G4OTY QTHR. 02216 6476.

● HQ1 quad ant or similar. Also SEM Tranzmatch with Easitune. G0HHH QTHR. 0562 67026 anytime.

● HELP. To ex-users of Trio TS430S, TS930S, TS440S and TS940S circa 1984. Please contact me if you had problems. Particularly intermittent faults affecting receiving, and suspect sets of solenoids and dry joints. I am taking legal advice. Your info would help a fellow amateur with a TS430S serial 4100402, independently assessed as faulty due to a batch of duff solenoids. All enquiries answered. Morris, 14 Penrhyn St, Port Talbot, W.Glam, SA13 1LU.

● KENWOOD/Trio 930/940 up to £750 available. Must be in perfect working cond. Tony G7EEE. 7 Ashfields, Loughton, Essex. 01-502 1934 day 01-508 6865 fax. 01-508 8355 eve.

● REQUIRED. Woden or Parmeko HT transformer 425V 150mA, not WD. Also needed Eddystone HFC on brown ceramic conical former, and British 7-pin valve holder, 3-hole mounting. Bernard Litherland, G4IMT QTHR. 0225 891254.

● R1475 with mains PSU, not Homebrew PSU. Welz AC38M and SP15M. All to be working and good/exc appearance. Write with realistic cond and price required. All letters answered. Dick Fixter, G0DIC, 18 Linley Dr, Boston, Lincs, PE21 7EJ.

● FM7 adaptor module for FRG7, originally obtainable from Timestep Electronics. Together with installation details if poss. Also full cir.diag of FRG7 required. G3XCD QTHR. 051-638 6342.

● INVERTER transformer for EMI 101 scope or scrap scope for breaking. GW4WWE QTHR. 0792 884895.

● CLARK military 40ft pneumatic mast. Icom 2KL, 2KLPS, AT500. Reg. (Findon) 09061 2404.

● EC958. Wanted Eddystone EC958, scrap or parts also required. Also wanted, parts or incomplete valve Eddystones, anything. Nick. 01-852 4065 and leave message.

● HELP. I need info on mods to convert Yaesu 227R to 25kHz spacing. G0BUR QTHR. 0268 770843.

● TRIO 130S with matching ATU in VGC. Good price paid. GW4WJO QTHR. 0407 2330.

● 10M multimode. Anything considered. Angela G0FXZ. (Yorks) 0924 451537.

● LOAN of h/book or cir.diag for either Marconi RC625 (HB) or for Ultra Valiant (LB). Sets for use by ATC cadets. G3MBQ QTHR. 0625 873708 eve-w/e.

● COLLINS 180S1 ATU. GI4GNZ QTHR. 0266 880740 eve.

● RECRUITING a total of 24 would-be club members (all licensed British Radio Amateurs) to share in the enjoyment as well as the running costs of a radio amateur exotic tropical island beach villa. QTH c/w HF station to be shared at the rate of 2/52 per member annually. For postal details. 0908 668169.

● WIRELESS set No 21. Any good units for W/S No 52 and ATU for TX No 12. Morriss, G4GEN QTHR. 082571 2205.

● URGENT, test gear failure. At least 2 preferably 6 8MFD 600VW block paper caps 1.6x2.6x4.5in long, excl tags, max size. Also 4 0.01uf or 0.025uf 2.5kVW visconol caps 2inx0.7in dia. Would consider modern equiv. G8YBF QTHR. Or leave message 061-477 5303.

● H/BOOK for Yaesu Musen rcvr FRG7. G3VAQ QTHR. 05436 5804.

● KENWOOD ATU AT230 MC60A mic, SM220 monitor. G0IPD QTHR. 0784 251310.

Helplines' is designed to help put people in touch with each other. If you have a problem, it's more than likely there's someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell the rest of us. 'Helpline' is there to help you and to give you the opportunity of helping others. Write to us marking your envelope "Helplines - News Bulletin" and we'll do what we can to get the message out.

TS-515 HANDBOOK REQUIRED

G3WOV needs to carry out some repairs to a Trio TS-515 transceiver but he doesn't have the handbook and circuit diagram. If you can help him obtain a copy of each he will be pleased to refund any expenses. Please write to:

Mr G MacNaught, G3WOV, Starrnet æ TV Maintenance Centre, 4 Signal Group, BFPO 23.

RADIO ENGINEERING HANDBOOK WANTED

The Welding Institute would like to purchase a copy of 'Radio Engineering Handbook' by K Henney. The book is now out of print but was very well known some years ago. If you have a copy which you are willing to part with, please contact:

Ms Sharon Penfold, The Welding Institute, Abington, Cambridge. tel: 0223 891162 ext.2308

AUTO BADGE

Stanley, G3PXJ has written to ask if anyone can help him make a metal or plastic 'RSGB - G3PXJ' badge to fit on the front of his Vauxhall Estate. He would be pleased to pay all costs involved for a first class job. Please contact him at:

43 Appien Close, Kings Heath, Birmingham B14 6DS

FRENCH MEDALS

'World News Brief' in the March issue of *RadCom* carried an item on the World Amateur Radio Medal which is available from France. Unfortunately, nobody told us that the price quoted was for a minimum quantity of 25 off. Several members have already written to France to obtain one of the medals and have found the 'one off' price to be approx 180Fr. In order to benefit from the quantity discount we suggest that several of you consolidate your orders. Perhaps there are some other members of your local club who are also interested in obtaining one or two of these medals.

REMEMBER BILLY ANDREWS?

The Brunel Technical College's Department of Aerospace & Communications Engineering Amateur Radio Club (pause for breath..!) has recently revived its old club callsign, G5FS. It's been over 20 years since the callsign was active in the amateur bands and the first contact after it was re-issued was with Ken Harvey, G5KT, who is currently writing a history of G5FS.

The original holder of G5FS was Professor 'Billy' Andrews, a First World War RFC Pilot who was the first airman to communicate by radio from behind German lines. Billy also conducted many experiments at 50MHz during the early 1930s but, unfortunately, his reports and details of his experiments were lost during the blitz. Anyone who remembers the original G5FS and can shed any light on his experimental work is asked to contact the club at Ashley Down, Bristol BS7 9BU.

The club is active in the 80m, 40m and 20m bands (CW only, at present) between 10am and 12 noon on Wednesdays, and between 12 noon and 1pm on Thursdays.

STOLEN EQUIPMENT

We were very sorry to hear that John Moss, G0KTW, had three pieces of equipment stolen from his home during the Easter holiday. The details are as follows;

Yaesu FT767GX - Serial No. 030466
Yaesu FT290R - Serial No. 11040992
Icom IC02 - Serial No. 118141

Anyone who is offered this equipment or can help in any way with its recovery, is asked to contact the Stokesley Police. Tel: 0642 710222.

STOLEN EQUIPMENT 2

Jim Hicks, G4XRU, from Brighton, has also had some equipment stolen.

It is a Standard C500 Dual-band Handie with a CNB111 battery pack. The serial number is - E010554. There were no accessories or manual with the rig when it was taken. Any information should be directed to Jim on 0273 608331 or to the Brighton Police.

MAXI-Q COILS

Dave Porter, G4OYX, has written to say that Maxi-Q Coils are no longer in production. Until recently, Dave was using the company in Clacton-on-Sea as a supplier of wound RF components, tuning inductors and RF chokes etc and found them to be very reliable. Now that the company has written to him to say that the coils are no longer available, Dave is forced to find another source of RF chokes for transmitting purposes such as 2.5mH @ 250mA and 2.5mH @ 100mA, similar to those produced by Maxi-Q. The construction of the chokes was four wave-wound sections on perspex or tufnol centre with 18swg lead-out wires. The Maxi-Q types were not wax covered but replacements may be.

If you know of a good source of these components, please contact Dave at:
8 Stanton Drive
Ludlow
Shropshire SY8 2PH
Tel: 0584-3828.

PCB DETAILS WANTED

Bert McCann, G3AZI, would like anyone who has information, such as a cct diagram, component layout or external connections for a plug-in PCB, to contact him. The board is a Punch/Reader Interface Card No.801511 Revision 3, which is made in Scotland by GB Techniques Ltd.

Bert can be contacted at:
105 Todd Lane North
Lostock Hall
Preston Lancs PR5 5UP.

GOING QRP-ish

Andy Henderson, G4MBT, would appreciate any information on modifications to his KW1000 linear to enable him to reduce its output by half. Anyone who has any knowledge of this equipment and who feel they can help is asked to contact Andy on 0642-485355 or write to him, QTHR.

MISSING QSL CARDS WANTED

John Bolton, G4XPP, made 100 contacts during the VE-Day celebrations in 1985. He received all but nine of the QSL cards via the bureau. The missing cards are from the following stations and, if they are still available, he'd very much like to receive them either direct or via the bureau; GB0HFC, GB4HMS, GV0DAY, GV0ISO, GV2DX, GV4LIB, GV4OPE, GV4OVE, GV4VED.

John's address is;
10 Bowness Road
Conniston Park Estate
Timperley
Cheshire WA15 7YA

ROBOT ANSWERS

Dean Allison, G0JQR, writes in answer to GM0ATQ's request, last month, for information on the IY4M robot beacon. He states, "...The beacon operates on 28.195MHz and the callsign is sent every 111 seconds. After this time you have up to 30 seconds in which to contact the robot. Regular CW should be used and the robot will only answer to the call 'VVV K'. If it answers '??' you have a contact. By sending 'INFO K' the robot will give your keying speed and info. 'QSA K' will ask the robot for a signal report. It will respond with 'RR' followed by a number of dashes or other characters for about 5 seconds, finally, it will give an S-report. Sending 'MSG1 K' to 'MSG4 K' will give other procedures which can be used. The main problem which most people seem to encounter is that of accessing the robot and again, this can only be done by sending 'VVV K'. I hope this has been of some help."

So - there you have it. Give it a try.

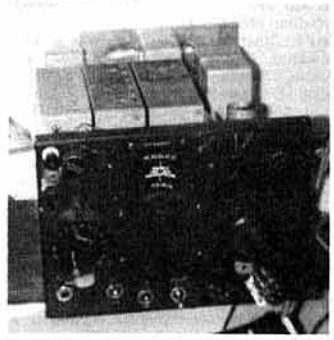
DOWN TO EARTH

Ben Follows, G4FJU, is looking for a source of earthing rods, preferably of the type used by the Electricity Board which are about 4" in length. Apparently, these have a cap on the top and are hammered in. The cap is then removed and the next one connected and further hammered home. He adds "...please don't suggest the use of 15mm water pipe because we have stony ground and these would just bend. Also, there isn't enough room to dig a 6" hole or bury an old water cylinder".

Basically, he needs four 4" rods (or similar total length) and will refund the postage to anyone who can suggest a source of these. In addition to the earthing rods, Ben also needs a couple of alluminium or steel tubes with an inside diameter of 2' and a length of about 4". He has some 11" hardwood poles which he wishes to join in order to make a 33" mast.

If you can help please contact Ben at:
1 Avon Road
Rivers Estate
Bloxwich Walsall WS3 1PA

WHAT IS IT?



Austin Spencer, G3PMO, would like some help in identifying the receiver in the photo (above). He's not sure of the type number and thinks it may be a 'Bendix' made in the USA. If anyone has a circuit diagram or knows where Austin can get hold of one, that would also be a great help. Austin can be contacted by writing to him at:
297 Liverpool New Road,
Walmer Bridge, Preston PR4 5QD.

TS520 TUNING KNOB WANTED

G0JQR asks, "Does anyone have a tuning knob for the TS520? The one I'm looking for is the standard grey/silver type which does not have the winding handle. I'd like it to be in excellent condition and am willing to pay cash or exchange for a TS520 600Hz CW filter."

Dean can be contacted at:
3 West Terrace
Stakeford
Choppington
Northumbria
Tel: 0670-819297.

SPECIAL EVENT OPERATORS WANTED

Anyone interested in helping to run a special event station in Warwickshire, GB2NTE (National Trust England), over the weekend of 29-30 July is asked to contact John Harvey, G4IVJ, on 021-477 7447, as soon as possible.

SWAP SHOP

And finally, thanks to all those who fell for our April Fool item in the April issue and wrote in. The item was from a fictitious lady, Avril Fowler (April Fool), in N London who wanted to swap an anorak for an FT290. One person who did send in a serious swap item was Stan, G4COY. Stan has a pair of 6SJ6Cs which he would like to swap for a pair of 6146Bs. He has changed his rig and wants a pair in good working order. Can anyone help? Telephone 051-260 9192 if you can.

CLUB NEWS

DEADLINE – Items for inclusion in the AUGUST issue must be sent to HQ marked "Club News – DIARY" to be received by Tuesday 20 June 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 – 7, DF briefing; 21, Longleat planning.
▶ Bristol ARC – 1, VHF night on the air.
▶ Bristol RSGB Group – 11, 1st mobile picnic at Ashton Court; 19, talk "The Industrial Uses of Linear Accelerators" by John Thomas; 25, 32nd Longleat Rally.
▶ North Bristol ARC – 17, Special event stations GB0SRS and GB2LOF.
▶ South Bristol ARC – 7, Film and Slide 'Bring & Show' evening; 14, microwave activity on Dundry Hill; 21, Longleat briefing; 25, Longleat Rally; 28, VHF NFD briefing.
▶ Thornbury & DARC – 7, Foxhunt; 21, project evening.

BEDFORDSHIRE
▶ Bedford & DARS – 6, talk "Council Antenna Planning" by Mr Edgley; 20, visit to DTI monitoring station at Baldock. Leave Bedford 1900GMT.
▶ Dunstable Downs RC – 4, "Description" by Phil, G8XTW; 18, DF/Treasure Hunt.
▶ Shefford & DARS – 1, mobile DF hunt; 3/4, HF NFD at Toplers Hill; 8, EGM + demonstration "Uses of the Oscilloscope" by G4LOO, G6TQT & G6RCT; 15, visit to Sundon Electricity sub-station; 22, field day planning; 29, pedestrian DF hunt.

BERKSHIRE
▶ Reading ARC – 8, VHF NFD planning; 22, talk "Raynet" by Graham, G1CSF.

BUCKINGHAMSHIRE
▶ Aylesbury Vale RS – *NEW SECRETARY* Martyn Baker, G0GMB, tel: 0908 260088 (9am-5pm).

CLEVELAND
▶ Stockton & DARG – *NEWS SECRETARY* Florence Nichol, G0CVD, tel: 0642-550659. Meetings: Wednesdays, 7.30pm, Billingham Community Centre.

CLWYD
▶ Conwy Valley ARC – 1, AGM.
▶ Delyn RC – 6, visit to Marcher Sound studios; 20, visit by RIS officers, opportunity to have equipment checked.

DERBYSHIRE
▶ Buxton RAs – Secretary: Derek, G4IHO, *NEW TELEPHONE NUMBER* 0298-5506.

▶ Derby & DARS – 7, junk sale; 21, barbecue at Drum Hill, Little Eaton; 28, night on the air.

DEVON
▶ Exeter ARS – 12, annual junk sale.
▶ Torbay ARS – *NEW SECRETARY* W F Hipwell, G3HTX.

DORSET
▶ Flight Refuelling ARS – 11, talk "Alternative Electronics" by Gerry, G2KV; 18, talk "Measuring Voltage Without a Voltmeter" by Steve, G1ZVC; 25, pre-VHF NFD primer, John G0API.

Co.DURHAM
▶ Houghton-le-Spring ARC – Now meets on Thursdays at 8pm in Fencehouses Comrades Club, Eastfield House, behind Station Avenue North, Fencehouses, Houghton-le-Spring. Details Foster, G0ABF tel: 091-584 4673.

ESSEX
▶ Braintree & DARS – 5, construction evening "HF single-band TX" by G3PEN; 19, operating club station.
▶ Chelmsford ARS – 6, constructors' competition.
▶ Loughton & DARS – 2, talk "The Birth of a Multi-band Receiver" by Jack, G3OPA.

GLOUCESTERSHIRE
▶ Gloucester ARS – 3/4, NFD at Gordon League Rugby Ground; 7, NFD administration and post-mortem.

GREATER LONDON
▶ Acton, Brentford & Chiswick ARC – 20, discussion "Station Accessories".
▶ Wimbledon & DARS – 9, talk "Microwaves" by Dennis, G8CUX and Ian, G8KQW; 30, talk "HF Antennas and Feeder Systems" by Louis Varney, G5RV.

GREATER MANCHESTER
▶ Eccles & DARS – 6, demonstration "The Hall Effect in Semiconductors" by G7CNP.
▶ South Manchester RC – 2, "Technical Topics" your questions answered; 16, talk "Analogue Simulation" by G8UQC; 23, mid-summer DF and barbecue starting at 7.30pm at St.Joseph's Scout HQ, Springfield Road, Sale; 30, VHF NFD preparations.
▶ Stockport RS – 14, NFD post-mortem plus talk "Folded Dipoles and Monopoles" by G0HAL; 28, talk "Networking Computers" by Steve Taylor.

GWENT
▶ Ebbw Vale CARS – *NEW* mets Mondays (during school term) 7pm at EV College of Further Education. Regular CW classes. New members & SWL welcome. Club station. Details GW1IKN tel: 0495 370286.

GWYNEDD
▶ Dragon ARC – 5, talk on Aerials "Let us get them up for the DX" by Bert, GW3YNM; 19, talk "Security in the Home and Shack" by John, GW3VVC.

HAMPSHIRE
▶ Basingstoke ARC – 5, VHF NFD planning; 19, talk "RX front ends" by Grant, G8UBN at Fort Hill School.
▶ Fareham & DARC – 7, night on the air; 14, talk "Communications in the Lifeboat Service" by Colin, G4YCG; 21, night on the air; 28, talk "Simple HF wire antennas – part 2" by Ron, G3XPH.
▶ Farnborough & DARS – 28, VHF NFD preview and planning.
▶ Horndean & DARS – 8, talk "Deliver your own DX QSL cards" by G4PAY.
▶ Itchen Valley ARC – 9, talk "From Pencil to Pixel" by G6OLK.
▶ Three Counties ARC – 7, talk "400 Watts and coasts along" by G0DZU; 21, talk "3cm Microwaves" by G4EML; 24, Summer Barbecue.
▶ Winchester ARC – 16, talk "Testing equipment with a spectrum analyser.

HEREFORD & WORCESTER
▶ Bromsgrove & DARC – *NEW SECRETARY* Mr. Trevor Harper, G0KIN tel: Bromsgrove 33173. Continues to meet on Fridays at Avoncroft Arts Centre; own shack.
▶ Vale of Evesham ARC – 1, illustrated talk "South America" by Hal, N3CTX; 11, family 2m treasure hunt, meet 3pm outside Evesham Post Office.

HERTFORDSHIRE
▶ Cheshunt & DARC – 3/4, NFD and Barbecue at Cheshunt Sailing Base; 14, open air meeting at Baas Hill Common; 28, talk "Weather Satellites" by Stan, G4OAV.
▶ Verulam ARC – 27, talk "Raynet" by G4KUJ.
▶ Welwyn-Hatfield ARC – 5, barbecue and radio controlled model display.

KENT
▶ Edenbridge ARS – 7, net night; 14, field day equipment check; 25, pedestrian foxhunt, Ide Hill; 28, shack visit.
▶ Maidstone (YMCA) ARS – 2, post rally meeting; 9, RAE and CW tuition; 16, AGM at 8.15pm; 30, question time – meet your new committee.
▶ Medway ARTS – *NEW VENUE* Tuesdays, 7.30pm at 5th Medway Scout Headquarters, Roseberry Avenue, Beresford Avenue, Rochester. Details G4VRI, QTHR.
▶ SE Kent (YMCA) ARC – 24/25, Waldershaw Vintage Weekend, special event station GB2WVW.
▶ West Kent ARS – *NEW SECRETARY* Marrie Wiseman, G0LAS, tel: 0732-833122. Meetings: 1st and 3rd Fridays (except August) at Tunbridge Wells Adult Ed Centre, Quarry Street Annexe, Tunbridge Wells.

LANCASHIRE
▶ Central Lancs ARC – 3, NFD at QTH of G1AHM.
▶ Fylde ARS – 8, field day inquest; 22, visit to British Nuclear Fules at Salwick, 7.30pm, advise secretary 7 days prior.
▶ Southport & DARC – 19, talk "First Aid for the Radio Amateur" by Henry, G1GAH.

▶ Thornton Cleveleys ARS – 5, demonstration "Packet Radio" by Ray, G4YVQ; 12, talk by Mick, G4EZM; 19, talk "Inductors – winding your own" by Jack, G4BFH.

LEICESTERSHIRE
▶ Leicester RS – 5, quarterly progress meeting; 12, HF/VHF activity night; 19, HF NFD post mortem; 26, VHF NFD final arrangements.

LOTHIAN
▶ Lothians RS – 14, AGM; 28, barbecue.

MERSEYSIDE
▶ Kirkby ARS – *NEW* meets Wednesdays 7.30pm at Kirkby Sports Centre, 17 Valley Road, Westvale, Kirkby. Activities include Morse code tuition, electronic construction, computers and on air nights.

▶ Liverpool & DARS – 6, talk "Magnetic Loop" by George, G6VS; 13, activity, construction, night on the air; 20, VHF NFD preparations; 27, surplus equipment sale.

NORTHERN IRELAND
▶ Armagh & Dungannon District ARC – *NEW SECRETARY* All correspondence now to Tom Hall, GI6UMR, 1 Hamiltons Bawn Road, Armagh BT60 1DL.

NORFOLK
▶ Norfolk ARC – *NEW SECRETARY* Steve Sewell, G4VCE, tel: 0508-78258. 7, inter-club quiz v Leiston ARC; 21, talk "Domestic satellite TV" by Gordon, G3PXT; 28, talk "Practical Antennas" by Ron, G3KBR of Bandedge.

NORTHAMPTONSHIRE
▶ Northampton RC – 3, (proposed) Founders' Day; 15, mobile DF hunt.

SHROPSHIRE
▶ Salop ARS – 8, inter-club quiz v Powys ARS.
▶ Telford & DARS – 7, G3ZME on the air; 14, repeater feasibility study meeting; 21, simple scope measurements; 28, summer barbecue.

SOMERSET
▶ Yeovil ARC – 8, talk "Robots" by G5JJ; 15, talk "Aerial directivity" by G3MYM; 22, talk "Skywave Absorption" by G3MYM.

SOUTH GLAMORGAN
▶ British Telecom (S.Wales District) ARS – 14, talk "Television Outside Broadcasting" by John Blackmore of BT's TVOB Unit.

SOUTH YORKSHIRE
▶ Barnsley & DARC – 5, surplus equipment sale; 19, night on the air or video show.

STAFFORDSHIRE
▶ Stafford & DARS – 13, night on the air; 20, quiz "Name that Object"; 27, equipment construction.

SUFFOLK
▶ Ipswich RC – 14, description of club project by G0JWQ; 28, treasure hunt.
▶ Felixstowe & DARS – 12, quiz, v Leiston RC (home leg).

SURREY
▶ Coulsdon ATS – 12, 2m fox hunt; 16, quiz v Sutton & Cheam RS (away leg).
▶ Dorking & DRS – 27, VHF NFD briefing.
▶ Reigate ATS – 20, surplus equipment sale.
▶ Surrey Radio Contact Club – *NEW SECRETARY* Bernard, G8TB, tel: 01-660 7517.
▶ Sutton & Cheam RS – 14, visit to Mercury Communications Satellite Earth Station, Tackley, nr Oxford; 16, inter-club quiz v Coulsdon ATS (home leg).

WARWICKSHIRE
▶ Rugby ATS – 13, VHF NFD preparation; 20, 2nd DF hunt (new rules, see G8TWH); 27, talk "Top band DFing" by Geoff Foster (provisional).
▶ Stratford-upon-Avon & DARC – *NEW SECRETARY* Alan Beasley, G0CXJ, 2 Ilmington Road, Blackwell, Shipston on Stour, Warks. CV36 4PE. 12, 2m fox hunt; 23, mid-summer barbecue at Ilmington Manor; 26, talk "Worked All Britain" by Bob, G4NEE.

WEST MIDLANDS
▶ Coventry ARS – 2, portable night on the air; 9, night on the air & morse tuition; 16, canal trip; 23, night on the air & morse tuition; 30, 2m DF contest.
▶ Stourbridge ARS – *NEW SECRETARY* Clive Williamson, G4IEB, tel: Stourbridge 392006. 5, night on the air; 19, treasure hunt.
▶ Walsall ARC & Walsall Raynet – 14, talk by Midland Amateur Repeater Group at Forest Community School, Hawbush Road, Leamore, Walsall.

WEST YORKSHIRE
▶ Denby Dale ARS – 7, talk "Alarming" by G0ISX.
▶ Halifax & DARS – 20, visit to HMS Ceres, Yeadon.
▶ Keighley ARS – 27, illustrated talk "Wildlife on the Falklands" by G0FRQ.
▶ Northern Heights AR&ES *NEW NAME* – 7, VHF NFD planning; 21, live demonstration of satellite TV by Dave, G6BIU.
▶ Spen Valley ARS – *NEW SECRETARY* J R Wilde, G0FOI tel: 0274-875038. 1, bowling at Mirfield Park at 7pm; 15, construction contest.
▶ Todmorden & DARS – 5, talk "Simple Electronics for Simple Folk" by G4HYY.

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 JUNE
▶ British Telecom ARS Rally – BT HQ.

Coryton, Cardiff. Opens 10.30am, traders, bring & buy, refreshments and bar. £1 admission (half-price children/OAPs). Ample parking and easy access 100 yards from M4 junc 32. Details Martyn Jenkins, tel: 0222 379634 (office).
▶ Spalding & DARS Mobile Rally - Springfields Arena, Spalding. Usual traders, free entry to gardens. Talk-in on S22 and 70cm. Details T Kettlewell, G4TWR.

11 JUNE

▶ Elvaston Castle Mobile Rally - Elvaston Country Park near Derby. In excess of 120 trade stands, bring & buy, flea market, craft marquee, full on-site catering, children's entertainment, arena attractions. House and gardens for family. Car parking 50p (levied by Elvaston Castle). Details John G4PZY tel: 0332 767994. Trade Peter G3WFU tel: 0332 700265 evenings.
▶ 29th RNARS Mobile Rally - HMS Mercury, Petersfield, Hants. Opens 10am, trade stands, special interest, repeater group and local club stands, bring & buy stall, local radio (County Sound) stand, craft exhibition, many other attractions for adults and children. Talk-in on 2m and 70cm. Details Cliff, G4UJR tel: 0703 557469.
▶ Norfolk Raynet Rally - Barford Village Hall (7 miles E of Norwich, NGR: TG 113 078). Opens 10.30am, trade stands, car-boot sale, refreshments etc. Details Tim, G4CTT.
▶ Mid-Lanark ARS Open Day - Community Education Centre, Newarthill, by Motherwell. Usual traders, bring & buy stall, demonstrations of packet radio, RTTY and QRP, lectures, presentation of EHI Trophy, refreshment facilities. Talk-in on S22. Venue is situated on A723, 1.5 miles south of M8/A73 interchange. Details David, GM1SSA tel: Holytown 732403.

18 JUNE

▶ Denby Dale ARS Rally - Honley High School, off the A616 south of Huddersfield, W.Yorks. Details Gerald Edinburgh, G3SDY tel: 0484 602905.
▶ Newbury Radio Boot Sale and Rally - Acland Hall, Cold Ash, Newbury, Berks. 10am to 3pm, admission free. Talk-in with GB4NBS. Details and advance bookings from Mike, G3VOW tel:0635 43048.

25 JUNE

▶ 32nd Longleat Mobile Rally - Longleat Park, nr. Warminster, Wilts. RSGB stand, large bring & buy, extensive trade display, specialist clubs and societies, beer tent, several food stands, family entertainment. On-site camping available for weekend. Details Shaun, G8VPG tel: 0225-873098.

2 JULY

▶ Newport ARS Grand surplus equipment and junk sale - Brynglas House, Newport, Gwent. 11am (10.30am for disabled visitors), surplus equipment and junk stalls, auction, refreshments. Talk-in on S22 by GW1NRS. Details from Newport ARS, PO Box 33, Newport, Gwent.

9 JULY

▶ Worcester & DARC Droitwich Strawberry Rally - High School, Droitwich. Trade stands, bring and buy, family entertainment and strawberry fields (weather permitting). Free admission and car parking. Details Derek Batchelor tel: 0905 641733.

15 JULY

▶ Cornish RAC Rally - Richard Lander School, Truro. Trade stands, bring and buy, computer display and demo, refreshment, free car parking, attractions for XYLs and children. Details Rolf Little tel: 0872 72554.

16 JULY

▶ Sussex Amateur Radio & Computer Fair - Brighton Racecourse, Sussex. 10.30am. Usual trade stands and large bring and buy, refreshments, easy access and free parking. Details Bob, G1IOS tel: 0798 43841.
▶ Pontefract Racecourse Rally & Fair - All the usual attractions plus boating, fishing, adventure play ground, pitch and putt. Details Colin G0AAO tel: 0977 43101.

23 JULY

▶ Anglian Mobile Rally - Highwoods Sports & Leisure Centre, Severalls Lane, Colchester. Details Jeremy, G0KEH tel: 0206-384829 (evenings/weekends).
▶ McMichael '89 Rally - Haymill Centre, Burnham, Slough. 10.30am (10.15 disabled visitors), radio controlled cars, ATV group, packet station, HF station, GB4MR, car boot sale,CAMRA bar, refreshments. Admission £1 and £5 for car boot area for car and driver for the day. Details Bob, G0BTY tel: 0494-29868.

28/29/30 JULY

▶ DATASPACE '89 (incorporating the 4th AMSAT-UK Colloquium and the 2nd RSGB Data Symposium) - University of Surrey, Guildford. Details Ron Broadbent, G3AAJ tel: 01-989 6741.

30 JULY

▶ Rugby ATS Amateur Radio Car Boot Sale - Lodge farm, Walcote, nr Lutterworth, Leics, about 2 miles east from junction 20 of the M1. 10am, admission 50p for non stall holders, pitches available for £5 the whole day. Talk-in on S22. Details from Kevin, G8TWH tel: 0203 441590.
▶ Scarborough ARS Rally - The Spa, Scarborough. 11am, trade stands, bring and buy, refreshments and bar. Talk-in on S22. Details Ian, G4UQP tel: 0723-376847.
▶ Hilderstone Radio Rally - Hilderstone College, St.Peters, Broadstairs, Kent. Details Ron, G3TAJ tel: 0304 812723.

6 AUGUST

▶ RSGB NATIONAL MOBILE RALLY - Woburn Abbey, Bedfordshire. Details Norman Miller, G3MVV tel: 0277 225563 daytime.

13 AUGUST

▶ Flight Refuelling Hamfest '89 - Flight Refuelling Sports Ground, Wimborne, Dorset. 10am. Radio & Electronics trade stands, craft and gift fair. Family entertainment and field displays. Free parking. Details John G0API tel: 0202 691649 or Rob G6DUN tel: 0202 479038.
▶ Derby Radio Rally - Lower Bemrose School, St.Albans Road, Derby. Usual attractions, including monster junk sale. Details Martin, G3SZJ tel: 0332 556875.

20 AUGUST

▶ Red Rose Summer Rally - Bolton Sports & Exhibition Centre. Details Dave, G1IOO tel: 0204 24104 evenings.

27 AUGUST

▶ Torbay Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ, 2 Orchard Grove, Brixham, Devon. TQ5 9RH.
▶ Galashiels & DARS Open Day - Focus Centre, Galashiels. Details John, GM0AMB.
▶ BARTG Rally - Sandown Park Racecourse, Esher, Surrey. 1030-1700. 1 adults; 50p OAP/children. Talk-in S22 and SU22 by G4ATG. Details Peter, G8VXY tel: 021-453 2676.

28 AUGUST

▶ Huntingdonshire ARS JUNK 89 - The Medway Centre, Coneygeare Road, Huntingdon, Cambs. 1030-1700. Talk-in S22 and OV, (433.125, RB5). Details Chris, G1YVS tel: 0487 839212

3 SEPTEMBER

▶ 22nd Preston ARS Rally - University of Lancaster. Details Godfrey, G3DWQ tel: 0772 53810.
▶ Telford Amateur Radio Rally - Telford Exhibition Centre. Details Martyn, G3UKV tel: 0952 255416.

10 SEPTEMBER

▶ Lincoln Hamfest '89 - Lincolnshire Showground, 4 miles north of Lincoln on A15. Details John G8VGF tel: 0522-25760.
▶ Vange ARS Rally - Nicholas School, Basildon. Details G4NVT tel: 0268-43025 or Mrs Thompson tel: 0268 552606.
▶ 6th National Amateur Car Boot Sale - The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade, Beds. Details Tony G0COQ tel: 0582 508259 (24hrs). Permission to 'fly-in' tel: Northill 288.

16 SEPTEMBER

▶ Scottish National Convention - Fife Sports Institute. Details John, GM4ALA tel: 0592 742763.
▶ Wight Wireless Rally - Wireless Museum, Arreton Manor, nr Newport, IOW. Details Douglas, G3KPO tel: 0983 67665.

GB CALLS

The list below shows ALL special event stations licensed for operation during this month (as at press date). It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days.

1 JUNE

GB0CDN - NEEDLES BATTERY, I-o-W. SZ 295 849
GB0CDV - COASTAL DEFENCE V, PORTSMOUTH. SZ 631 993
GB0CDZ - COASTAL DEFENCE STATION Z, RYDE, I-o-W
GB0MGS - MARSTON GREEN, BIRMINGHAM
GB0RRA - RED ROSE AWARD, LEIGH, LANCS
GB0RRR - RED ROSE RALLY, HINDLEY, WIGAN
GB0SCS - SECOND CADOXTON SCOUTS, CADOXTON, NEATH
GB0SPC - ST PAUL CHURCH, BEDFORD
GB1CDV - COASTAL DEFENCE V, SPIT BANK FORT. SZ 636 972
GB1CDX - COASTAL DEFENCE X, FRESHWATER, I-o-W. SZ 339 879
GB2CDY - COASTAL DEFENCE, YARMOUTH CASTLE, I-o-W. SZ 355 897
GB2JLS - JOSEPH LECKIE SCHOOL, W.MIDLANDS
GB2OTR - OLD TIME RALLY, COLCHESTER. TL 915 273
GB2QS - WEST BROMWICH
GB2RRM - ROLLS-ROYCE MOTORS, CREWE
GB2SF - SCALBY FAIR, NORTH YORKS.
GB2WWB - WALSALL, WEST MIDLANDS

GB4BCO - BLACK COUNTRY OLYMPICS, WEST BROMWICH, W.MIDLANDS
GB4CS - CLACKMANNAN SCOUTS, FISHCROSS, CLACKMANNANSHIRE
GB4DLC - BLANTYRE, STRATHCLYDE
GB4MCF - MEIR COMMUNITY FESTIVAL, STOKE-ON-TRENT, STAFFS.
GB4RE - CLARO BARRACKS, RIPON, NORTH YORKS
GB4RRA - RED ROSE AWARD, BOLTON
GB4RRS - RED ROSE SILVER, ASTLEY, TYLDESLEY, LANCS.
GB5BN - BEN NEVIS OBSERVATORY. NN 155 701
GB6CDY - COASTAL DEFENCE Y, YARMOUTH CASTLE, I-o-W. SZ 354 898
GB6RRA - RED ROSE AWARD, HINDLEY, WIGAN
GB6RRG - RED ROSE GOLD, ASHTON IN MAKERFIELD, WIGAN, LANCS.
GB8RRS - RED ROSE SILVER, BOLTON, LANCS.

2 JUNE

GB0CDD - COASTAL DEFENCE D, YARMOUTH, I-o-W. SZ 338 899
GB0GHG - GLASGOW HIGHLAND GAMES, SCOTLAND
GB1PHS - PAMBER HEATH SCOUTS, TADLEY, HANTS. SU 597 625
GB8FC - SCIENCE MUSEUM, WROUGHTON AIRFIELD, SWINDON

3 JUNE

GB0BLR - BRENTWOOD LEUKEMIA RESEARCH, BRENTWOOD, ESSEX
GB2RAF - RAF HENLOW, BEDFORDSHIRE. SG 16 6DN
9GB2WW - KIMBOLTON AIRFIELD CAMBS.
GB5DC - FERRING, COLCHESTER, ESSEX
GB5PF - PARTICK FAIR. NS 665 555

4 JUNE

GB0CDX - COASTAL DEFENCE X, FRESHWATER, I-o-W. SZ 339 879
GB2WST - WHITWORTH SCOUT TROOP, WHITWORTH, ROCHDALE, LANCS.

5 JUNE

GB0CDS - COASTAL DEFENCE SOUTHWICK, PORTSMOUTH, HANTS. SU 628 069
GB1CDS - COASTAL DEFENCE SOUTHWICK, PORTSMOUTH, HANTS. SU 628 069
GB2CAW - COCKERSAND ABBEY WEEKEND, COCKERHAM, LANCASTER
GB4CHF - CHURCHILL HOBBIES FESTIVAL, CHURCHILL, AVON

6 JUNE

GB4RE - RIPON ACF ROYAL ENGINEERS, NORTH YORKSHIRE

7 JUNE

GB2EGS - EAST GOSCOTE SCOUTS, LEICESTER

8 JUNE

GB0CCC - CARLETON, PONTEFRACT
GB2SPC - ST PAULS CUBS, RAMSBOTTOM, BURY, LANCS.
GB8XXV - 25TH ANNIVERSARY BRISTOL ARC, ST.GEORGE, BRISTOL

9 JUNE

GB0RAF - RAF STAFFORD
GB0SD - SMILEY DAY, ASTLEY PARK, CHORLEY, LANCS.
GB0TPR - THREE PEAKS YACHT RACE, BARMOUTH, GWYNEDD
GB2SMF - ST MICHAELS FAIR, MERRY HILL, WOLVERHAMPTON

10 JUNE

GB0SIE - SCOTTISH ISLANDS EXPEDITION, RONA
GB2HCW - CARNIVAL WEEK, HUNTINGDON, CAMBS.
GB2HCW - CARNIVAL WEEK, HUNTINGDON, CAMBS.
GB2HLF - YEOVIL DISTRICT HOSPITAL, RECKLEFORD, SOMERSET
GB2HSF - HOWLEY GRANGE FETE, LAPAL, HALESOWEN, W.MIDLANDS
GB2RSF - RISLEY SCHOOL FETE, RISLEY, DERBYS.
GB2SIE - SCOTTISH ISLANDS EXPEDITION, FLADDA
GB4BBS - BOY'S BRIGADE SHEFFIELD, S.YORKS
GB4PCD - PENMAENAWR CARNIVAL DAY. SH 725 768
GB4RIE - RAASAY ISLAND EXPEDITION, KYLE OF LOCHLASH
GB4SIE - SCOTTISH ISLAND EXPEDITION, SCALPAY ISLAND
GB5CI - CROWLIN ISLAND
GB8IHE - INNER HEBRIDES EXPEDITION, RAASAY, KYLE OF LOCHALSH
GB8SD - SCOTTISH AIR SHOW, PRESTWICK AIRPORT

11 JUNE

GB2MMR - MERCURY MOBILE RALLY, HMS MERCURY, PETERSFIELD, HANTS.
GB4RAF - RAF COSFORD, WOLVERHAMPTON, W.MIDLANDS

12 JUNE

GB2WAB - WORKED ALL BRITAIN. SD 339 451

14 JUNE

GB0ROD - ROLLERSTON-ON-DOVE,

BURTON-ON-TRENT
GB1CDJ - COASTAL DEFENCE J, ROUND TOWER PORTSMOUTH. SZ 631 993
GB1CDQ - COASTAL DEFENCE Q, SQUARE TOWER PORTSMOUTH. SZ 631 993
GB1CDS - COASTAL DEFENCE S, PORTSDOWN HILL, HANTS
GB1CDW - COASTAL DEFENCE W, PORTSDOWN HILL
GB2HC - HARROGATE COLLEGE, N.YORKS

15 JUNE
GB2MSG - TEESIDE INTERNATIONAL AIRPORT, DARLINGTON, CO.DURHAM
GB4PCS - PERRY COMMON SCHOOL, BIRMINGHAM

16 JUNE
GB0DJS - DINGLEWELL JUNIOR SHCOOL, HUCCLECOTE, GLOS.
GB0KHS - KINGS HIGH SCHOOL, WARWICK
GB0MEN - MENCAP, TITCHFIELD, HANTS.
GB0RAF - RAF CONINGSBY, LINCOLN
GB1MEN - MENCAP, TITCHFIELD, HANTS.
GB2FD - FIRE DAY, OXHEY PARK, BUSHEY, WATFORD
GB4LMR - LONGLEAT RALLY, LONGLEAT PARK, WARMINSTER, WILTS.
GB4NED - EATON VALE, NORWICH, NORFOLK

17 JUNE
GB0BB - BERKSHIRE BREWERY, READING, BERKS.
GB0CLM - CARDIFF LORD MAYOR, CARDIFF
GB0MPS - MARLBROOK PRIMARY SCHOOL, HEREFORD
GB0SRS - SHIELD ROAD SCHOOL, NORTHVILLE FILTON, BRISTOL
GB1SSR - STOURPORT SCOUT RADIO, BIRCH BANK, WOLVERLEY, WORCS.
GB2GF - GREENWICH FESTIVAL, PLUMSTEAD COMMON, LONDON SE18. TQ447 777
GB2KIN - RAF KINLOS, FORRES, MORRAYSHIRE
GB2MHF - ST JAMES CHURCH, BIRKDALE, SOUTHPORT, MERSEYSIDE
GB2MSF - MEADOWS SCHOOL FETE, WOOBURN GREEN, BUCKS. SU 914 885
GB4AST - 4TH AYLESBURY SCOUTS, BEDGROVE, AYLESBURY. SP 839 126
GB4EKG - ESSEX KITE GROUP, GT. WALTHAM, ESSEX
GB4GPT - GEC-PLESSEY TELECOMMS, BEESTON, NOTTINGHAM. SK 535 355
GB4RAF - RAF HALTON, AYLESBURY, BUCKS.
GB4SSR - STOURPORT SCOUT RADIO, WOLVERLEY, WORCS.
GB4SYT - HILLSBOROUGH, SHEFFIELD 6

18 JUNE
GB2CDU - COASTAL DEFENCE, BEMBRIDGE FORT, I-o-W. SZ 627 860
GB4CAF - CAMBOIS ANTENNA FARM, CAMBOIS BLYTH, NORTHUMBERLAND
GB4HSF - HARTSDOWN SUMMER FAYRE, MARGATE, KENT
GB4NBS - NEWBURY BOOT SALE, COLD ASH, BERKS.

19 JUNE
GB0UOD - OXFORD UNIVERSITY OPEN DAYS, CLARENDON LAB.
GB1CCS - CHESHIRE COUNTY SHOW, TATTON PARK, KNUTSFORD, CHESHIRE
GB2MAM - MOSQUITO AIRCRAFT MUSEUM, SALISBURY HALL, LONDON COLNEY, HERTS.
GB2RFA - REMPLOY 14TH ANNIVERSARY, BIRKENHEAD, MERSEY

20 JUNE
GB0TST - TIPTREE, COLCHESTER, ESSEX
GB5MTY - MILDMAY 21ST YEAR, MILDMAY JUNIOR SCHOOL, CHELMSFORD, ESSEX

22 JUNE
GB2SSF - SANDWELL SPORTS FESTIVAL, WEST BROMWICH, W.MIDLANDS
GB4SCC - SUTTON COLDFIELD CARNIVAL, SUTTON PARK. I092BO

23 JUNE
GB0RHF - RAUCEBY HOSPITAL FETE, NORTH RAUCEBY, LINCS.
GB2ALD - ARMY CAMPING GROUNDS, CHURCH CROOKHAM, HAMTS.
GB2RB - BURNS HOUSE MUSEUM, MAUCHLIN, AYRSHIRE
GB2RBC - ROYAL BALMORAL CASTLE, GRATHIE, BY BALLATER, ABERDEENSHIRE
GB8FC - SCIENCE MUSEUM, WROUGHTON AIRFIELD, SWINDON

24 JUNE
GB0DFS - DERBYSHIRE FIRE SERVICE, MARKEATON PARK, DERBY. SK 338 373
GB0KCF - KINGSTON BAGPUIZE WITH SOUTHMOOR, ABINGDON, OXON. 405 983
GB1BHR - BEAVERS HAPPY RADIO, IRCHESTER COUNTRY PARK, NORTHANTS.
GB2LDP - LOWER DARWEN PRIMARY SCHOOL, BLACKBURN
GB2LHS - LOCHINVAR HOUSE SCHOOL, POTTERS BAR, HERTS.
GB2WMP - WEST MIDLANDS POLICE, EDGBASTON, BIRMINGHAM
GB4AIR - AIR FAIR, ST NICHOLAS & ST MARY SCHOOL, SHOREHAM-BY-SEA
GB4GGA - GIRL GUIDES ASSOCIATION, OLD ARLEY, NUNEATON, WARKS.
GB4SSH - STEWARDS SCHOOL, HARLOW, ESSEX

25 JUNE
GB4HAF - HIGH ASH FAIR, GREAT BRICKHILL, MILTON KEYNES
GB5LW - LONDON WING-AIR TRAINING CORP., KINGS ROAD, CHELSEA, LONDON

26 JUNE
GB0NMS - NORTHEASE MANOR SHCOOL, LEWES. E.SUSSEX
GB4CHA - CASTLE HIGH SCHOOL, DEAL, KENT

29 JUNE
GB1CDX - COASTAL DEFENCE X, GOLDEN HILL FORT, I-o-W. SZ 339 879
GB2BSF - BICNACRE SCHOOL FETE, CHELMSFORD, ESSEX
GB2GLO - GLOSSOP TOWN CARNIVAL
GB6CDY - COASTAL DEFENCE Y, YARMOUTH CASTLE, I-o-W. SZ 354 898

30 JUNE
GB0BCS - BROCKWORTH COMP. SCHOOL, GLOUCESTER
GB0CDJ - COASTAL DEFENCE J, OLD PORTSMOUTH, HANTS.
GB0RAF - RAF STAXTON WOLD, SCARBOROUGH, NORTH YORKS.
GB0SSF - STANCHESTER SCHOOL FETE, STOKE-SUB-HAMDON, SOMERSET
GB4TSR - TRAINING SHIP RESOLUTE, NEWPORT DOCK, GWENT

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GB0CDD - COASTAL DEFENCE D, YARMOUTH, I-o-W. SZ 338 899
GB0CDZ - COASTAL DEFENCE Z, RYDE, I-o-W
GB0FLA - FLANNAN ISLANDS. 725 469
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GB2SSM - SAVACENTRE SPORTS MARATHON, WEST BROMWICH, W.MIDLANDS
GB2WHF - WHITTINGHAM HOSPITAL FETE, GODSNARGH, PRESTON, LANCS.
GB4BHP - BRERETON HEATH PARK, CONGLETON, CHESHIRE. SJ 795 653
GB4BPM - BROMLEY PEAGENT OF MOTORING, NORMAN PARK, BROMLEY, KENT
GB4FG - FERRIBY GALA, N.HUMBERSIDE
GB4HSG - HILTON SCOUT GROUP, DERBYSHIRE
GB4JUL - MENWITH HILL STATION, HARROGATE. N.YORKS.

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INDEX TO ADVERTISERS

the last ...

MORE OLDER RIG INFO PLEASE

Why are there no articles in *RadCom* on the upkeep of older HF rigs? There must be many amateurs, including myself, who cannot or will not spend many hundreds of pounds on a new rig, and so use an older cheaper rig. Some articles on general upkeep including mods and tips on alignment and servicing would be very popular. There are many FT101s, TS520s and the like. I run an FTDX400.

Surely help of this sort would also benefit those newcomers to ham radio who have some knowledge of electronics and encourage DIY. *P Mann, G4IVF*

(If we can persuade members who have successfully modified some of these older rigs to send 'am in, we'll be happy to publish them - Ed)

ALTERNATIVES TO HOMEBREW?

Over the last months I have noticed in *RadCom* and other amateur radio magazines letters on the virtues of homebrewing. Yet again in the April edition of our house organ we have G3XJS clambering on to the bandwagon with his/her "Build - or be deprived" letter.

When will these constructors learn that not all of us, seemingly second class Radio Amateurs, are able to build our own. Speaking for myself I have two right hands and they are equipped with eight thumbs and two big toes. If you haven't worked it out I'm a southpaw and have a disability of my left arm making any form of DIY difficult.

Surely homebrewing is not the only interpretation of *self education* in radio. The learning of a new mode could start a list that would fill this letter page. I live deep in the concrete canyons of Central London. I feel my self education is well taken care of trying to get a signal in and out of my station without upsetting my neighbours.

I am happy for G3XJS and the other soldering iron wielders to enjoy their self education without inflicting mine on them. So a little reciprocation rather than deprecation would be nice.

D Pye, G1UCT

EASY INTRO TO HOMEBREW

May I add to the G4LXN controversy. I thought I was adept at stirring up the mire but I raise my hat to the master! Beginner or experienced, our homebrews usually consist of amplifiers, small signal or power, oscillators and multiplicative mixers, with filters of one kind or another between them. Logically, then, if I, beginner or experienced, can design an amplifier and determine its input/output impedance at least close enough to cut and try, do likewise for a multiplicative mixer and then scale filters that terminate at these input/output impedances in theory I, beginner or experienced can make practically anything.

You would think that articles explaining how to do this would be often seen in *RadCom* wouldn't you? Now tell me where in *RadCom*, *Short Wave Magazine*, *Ham Radio Today* or any other source that I can get the knowledge to do this *from scratch*, not copying anyone else's design. I'll wager you will have to search long and hard! In fact, I don't think you will find it at all! Even Technical Topics usually assumes the reader can do the above already in order to make use of the discussed topics.

Home construction articles are fine, but to encourage homebrew one must be told how to homebrew ...and it's not the same thing is it? *S Dyke, G3ROZ*

(Articles and a book are in the pipeline - hang on! - Ed)

CONTEST DEBATE HOTS UP

I fear that the letter from Mr G. Martin Russell entitled "WHAT IS THE POINT" ('The Last Word' May 1989) is written in so emotional a style, and contains so many factual errors that a newcomer to the hobby reading about contests for the first time might well be given a totally wrong impression. I therefore feel obliged to take issue over the matter.

On studying the letter I begin to wonder whether Mr Russell has ever really listened to a CQWW DX Contest. Anyone who had would know that the contest exchange is the CQ Zone, not a serial number. Also, it is a single-mode event, having separate weekends for SSB and CW. If Mr Russell did find the CW segment of every band to be obliterated by QRM during the SSB weekend, it was most certainly not due to stations participating in the contest! As for 'every possible frequency being wiped out' I would point out that the WARC bands (10, 18 and 24MHz) are totally contest-free. A newcomer to the hobby might not be aware that Raynet provide *local* communications during emergencies and do not (nor indeed would be able to) use the DX bands for this purpose, or that any sinking sailor with radio equipment would use an International Distress frequency for his SOS call in order to maximise his chances of rescue by a nearby ship. Mr Russell's remarks on these matters could be seriously misleading.

I wish that instead of standing on the side of the pool complaining about being splashed, he would come in and learn to swim. A great many 'ordinary weekend Radio Amateurs' do just that and can be heard in pretty well every event, giving welcome contacts to those who are taking it seriously. In the last RSGB 21/28MHz Phone contest, over 700 UK stations made QSOs with overseas entrants. The point which has been so sadly missed by Mr Russell and by many others of his viewpoint, is that *contests can be fun*, and a great many more people enjoy them than we would be led to believe. Let's face it, there isn't that much difference between swapping contest numbers and swapping name and QTH. It's all communicating, and is that not the name of the game?

There is one point, however, on which I agree with Mr Russell: "the time has come to say 'Pack it in, Guys'." Let us act like responsible Radio Amateurs, show a little consideration for and toleration of the interests of others, and stop all this bickering. The contesting fraternity has taken steps to try and avoid causing inconvenience to other band users. Within IARU Region 1, recent years have seen the introduction of 'Contest Segments' on 3.5 and 14MHz (the RSGB HF Contests Committee has introduced similar segments for its events on the other bands as well); there has been agreement to reduce the length of most 48 or 36 hour contests to 24 hours or less, and multi-mode events are discouraged. There now remain eight World-Wide events of major significance (WAE, CQWW DX, WPX and ARRL DX) each with Phone and CW weekends. Surely to use only 16 out of the possible 365 days of the year is not being unreasonable.

We all have exactly the same *right* (or perhaps privelege would be a better term, since we are licensed by the government) to use any of our frequencies at any time, but we should endeavour to see that we do not exercise our right unreasonably to the detriment of others. Neither should we attempt to force our wishes upon others. Then perhaps we can *all* get the most out of our hobby and live in peace with our fellow-Amateurs.

Steve Knowles, G3UFY

In answer to Mr Burbank's article in April *RadCom*. During my 20 years on the bands I have had a great deal of experience in self training and building antennas etc, but I don't work contests. As regards better operating through contest working. It does not take much skill to shout 5 and 9 all over the band.

All the experience gained by contest operators has not taught the said gentlemen how to read an S meter. I have written on previous occasions to the magazine asking someone to answer one question for me (no-one has). Perhaps Mr Burbanks can! What chance has the little man with his 50 watts and dipole got against the Big Boys with their linears and multi-element beams at 60 and 100 feet? And don't reply 'operating skill'.

All these contests take place at the weekends. This is the only time that the vast majority of radio hams get time to operate, only to find that they are shouted down by 'parrots'.

M McIntyre, GI3YDH

G0CAK (Last Word, May) is missing the point, as I'm afraid do many anti contesters. The problem is not contests, but band occupancy. On 20m you can easily have 6 stations working at the rate of 180 QSOs per hour each, or a total of 1080 QSOs per hour. Assume that instead of contest QSOs, they are chat type and each lasts 5 minutes. This means that we have 90 QSOs happening simultaneously, and at 3kHz per QSO, this is 270kHz of Band. 20m isn't wide enough! So if all the people who come on for contests came on to chat, the QRM would be far worse than when there's a contest. The fact that they come on at all shows that they're keen on contests, so it can't be a minority interest.][The main problem is the big US contests, such as WPX, CQ WW and ARRL DX. These contests attract thousands of entrants, so again, it's hardly a minority interest. Anyway there's always CW when a phone contest is on, and vice versa!

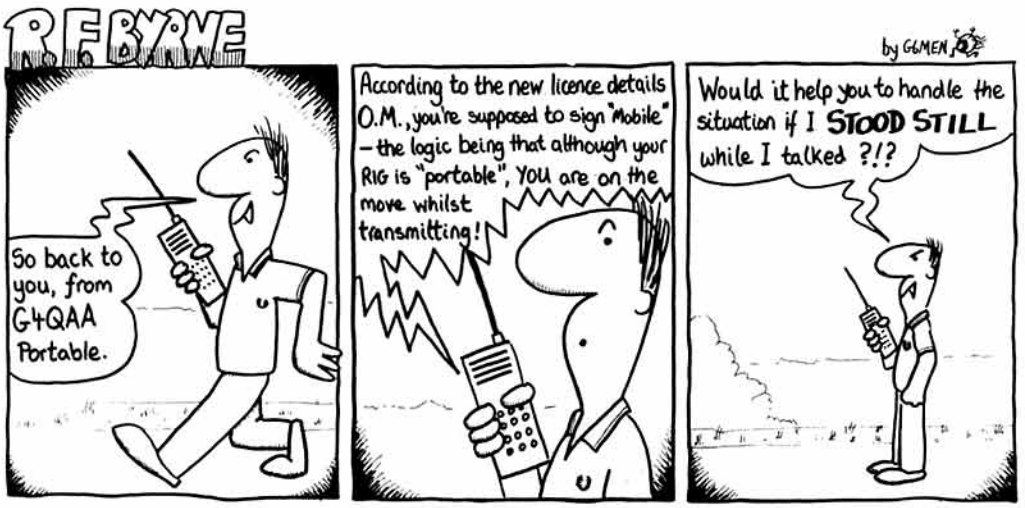
PE Chadwick, G3RZP

PACKET ERRORS

The point about suffix [R] is that the software distinguishes between 'System' and 'Non-System' files and COMMS.COM is a 'System' file which will not be found by the 'PIP' copying utility unless it is identified as a 'System' file.

A problem I found with COMMS.COM is that a Control Character $0C (Control-L) is treated as a CLS (Clear Screen) command. To prevent this happening with off air packets $0C (Decimal 12) should be added to the FILTER default characters in the PK232.

P T Gaskin, G8AYY



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They said I couldn't work DX with just 100 watts. Especially with a radio that has less than 1000 switches on the front panel.

But the truth is, I'm working lots of DX, more than some of these blockbuster types, thanks to my Yaesu FT-747GX.

You see, my no-nonsense FT-747GX was designed with me in mind, so I can hop around the band fast to nail those DX stations. While the other hams are warming up their amplifiers, I'm working the new country!

My FT-747GX has a super receiver, with a directly-driven mixer for great overload protection. And, Yaesu included the CW filter in the purchase price (I used the money I saved on postage for the QSL cards!).

And my FT-747GX is loaded with other features. The receiver works from 100kHz straight through 30MHz, and it's a fantastic shortwave broadcast receiver. I can use all twenty memories for that alone! Plus it's got dual VFOs. A noise blanker. Split frequency operation for the pile-ups. And scanning up the band helps me check out openings as they happen.

I just put in the optional crystal oven, and next month I'm going to pick up the FM board.

And with the money I saved when I bought my FT-747GX, I got a second ten-metre antenna for satellite work on the high end of the band. I use my personal computer to tell me what satellites are going by, and the computer even sets the frequencies on the radio for me.

Now my friends are getting FT-747GX rigs, too. I knew they'd figure out my secret weapon sooner or later. But now I'm setting the pace!

Thanks, Yaesu. You've made a rig that makes sense, at a price I can afford."

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