Radio Communication

April 1990

IARU Region 1 Conference / Torremolinos, Spain / April 1-6 1990

UK Novice Licence
The Instruction Stage

The TS-950S Reviewed

RSGB NATIONAL CONVENTION
NEC : April 21-22 : Official Guide

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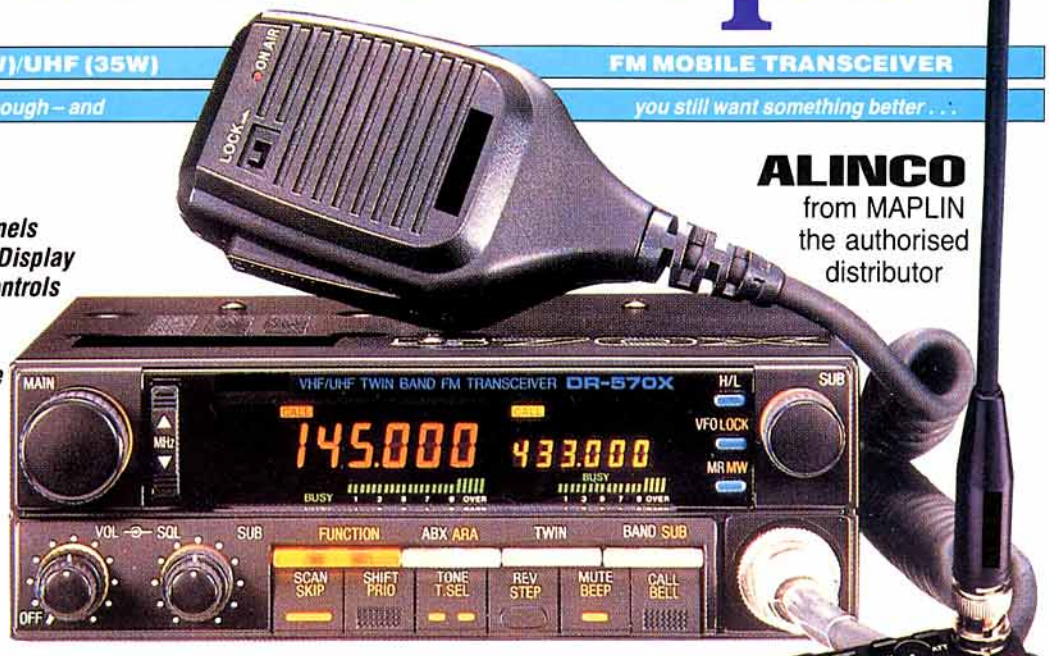

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Radio Communication

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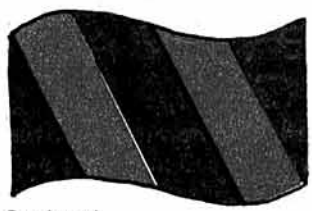

Supplement:
Free NEC show programme

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THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Affiliated club or society/registered group (UK): £25.00 (including *Radio Communication*): **£14.95** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)

Membership application forms available from RSGB HQ

18/24MHz

Since January the Radio Amateur Licensing Unit in Chesterfield has been sending out with Licence Renewal Validation Documents a copy of BR68 — the licence terms and conditions limitation booklet. The booklet has not been updated with respect to the 18/24MHz band. The DTI says that they will produce an updated version of BR68 as soon as possible. In the meantime the information published in the July 1989 *RadCom* on p7 is correct.

QSL Bureau News

The new QSL sub-Manager for the G4PAA - PZZ series is Mr P Colvin, G0BXQ, 46 Beechwood avenue, Woodley, Berks, RG5 3DG.

From 1 May, the outgoing side of the QSL Bureau moves to Potters Bar. More about this next month.

Subscriptions and donations

Each month, some 20 to 30 RSGB members overpay their subscriptions. The Society prepares and posts back a refund cheque. A number of members who receive cheques kindly return them as a donation to the Society's funds. It is intended in future to regard all overpayments of subscriptions as a donation as this will reduce the cost of refunds and subsequent re-processing. All donations will be acknowledged, and if a refund is then requested it will be made.

Slow Morse - GB2CW

Volunteers from all parts of the UK spend many hours each week broadcasting morse practice transmissions from their homes or clubs. This is done for the benefit of other radio amateurs preparing for the 12 wpm morse test. In recognition of the essential role played by these volunteers in helping to maintain the future of our hobby, the RSGB has for many years expressed a wish to the DTI that a special callsign be used for all RSGB morse practice transmissions.

We are pleased to report that the DTI has now agreed that from 1 June all accredited RSGB morse practice transmissions will be made using the callsign GB2CW. This means broadcasts will become easily identified as authentic transmissions properly licensed by the DTI and coordinated by the RSGB.

Up to date schedules of transmissions can be obtained by sending an SAE to the Morse Practice Coordinator at the address shown below. *(Lists also appear in the RSGB Call Book - Ed).* New volunteers are constantly being sought to provide increased VHF coverage at local levels, for morse practice transmissions. For further details, please write to :- Mike Thayne, G3GMS, Morse Practice Coordinator, 14 Tynedale Avenue, Monkseaton, Whitley Bay, Tyne and Wear, NE26 3BA.

NEC 1990 Save 50p

Inside this month's *RadCom* is a free pull-out programme for the RSGB's National Convention and Exhibition at the NEC. Please remember to take this with you to the NEC as it will save you paying 50p for one on the door!

David Gough jnr

Former RSGB News Editor, David Gough, who emigrated to VK last year is now a dad. His wife, Chris, gave birth to a son - James Michael David - in mid February. No doubt all members who knew David will join us in sending congratulations and best wishes.

Mid Glamorgan RLO

A reminder that the RSGB Liaison Officer for Mid Glamorgan is Clive Trotman, GW4YKL, 19 Park View, Dolau, Llanharan, Pontyclun, Mid Glamorgan, CF7 9RZ. Clive was appointed following his predecessor's move out of the area. Members in Mid Glamorgan should contact GW4YKL for information on all aspects of the Society's business.

Callsigns - thanks

In the March 90 *RadCom* we published some of the ideas about UK callsigns in the future, and asked for your comments. As a result, we received many letters expressing different views. While we have not acknowledged every letter individually, a special thank you to those who took the trouble to communicate their views to the Society.

Postal dispute hits RSGB HQ

During March, industrial action at a North London sorting office stopped all mail into and out of RSGB HQ, creating a huge backlog lasting several weeks. Thousands of franked letters and parcels were held up at HQ awaiting collection. Members are asked to be patient whilst the post returns to normal.

Deliberate bad operating

Everyone is aware of football hooligans - they are a tiny minority of people who behave in a completely irresponsible way - sadly perhaps without even realising it. They give football a bad name and colour many people's perception of an otherwise terrific sport.

How sad it is that it only takes a few rotten apples to foul up other people's pleasure. How sad it is that the same is also true in amateur radio. Abuse of the amateur airwaves takes many forms and is not confined to just HF or VHF operation.

The recent DXpedition to Bouvet Island by the 3Y5X team certainly brought out the very worst in a tiny group of HF operators worldwide. The inconsiderate operation by some who were attempting to work a new country was certainly no mitigation for some of the worst demonstrations of intolerance ever heard on the amateur bands.

On the VHF bands deliberate abuse takes other forms. Packet radio has a tiny percentage of messages circulating the mailbox network which by any standards are offensive, abusive, scare-mongering and often totally misleading. Bad language on repeaters and amateurs "winding up" other amateurs is also prevalent on repeaters in or near major cities. Deliberate repeater jamming has been with us for years, as has other forms of abuse.

By and large the handful of radio amateurs who are responsible for all of the above forms of abuse are well-known for their activities. These people must certainly not be encouraged for, whether they realise it or not, they are wrecking our hobby. A hobby which has a high reputation with sound values and a history of outstanding service.

It is a fact in so many walks of life that the rules and regulations regrettably have to cater for the tiny minority of wreckers. They enjoy the freedom to wreck, while the silent majority are restricted because of their antics. What the tiny vocal minority do not realise is that if their activities were recorded and played back at the next ITU World Administrative Radio Conference in 1992 then there would be no better way of discrediting amateur radio and hindering its development. These people are damaging our hobby by their obsessive intolerance of others.

All over the World National Radio Societies, such as the RSGB, are working for their members and for the preservation and enhancement of amateur radio. The RSGB is in the forefront of such work, with the opening up of the 50 MHz band in Western Europe being just one example. The credibility required to achieve results such as this often take years to build up and just a few months to demolish. Certainly the in-fighting and abuse within the hobby itself is seriously tainting the perception of those who grant us our frequency allocations.

Would that the Government could just step in and close down the few stations that give amateur radio a bad name. However, it is not that simple and will never be so as the resources needed to do the job are considerable and very costly. The RSGB is in the process of re-establishing its Amateur Radio Observation Service and setting up new procedures with the DTI/RIS. However, when all is said and done, it will only be the determination and co-operation of the majority of amateurs that will make any voluntary observation scheme work. At present, there seems to be a great reticence amongst amateurs to properly record details of abuse and pass it onto the DTI/RIS via the Society. A system already exists for *well-documented* reports of spectrum abuse to be passed to the DTI/RIS by the Society. Regrettably all too few such reports are ever received. We accept wholeheartedly the fact that amateurs will not come forward if effective action cannot be taken by the Government; it is very much a chicken and egg situation. However, if members are complacent in the face of obvious abuse of our privileges then the Society will be powerless to act; are *you* interested in joining the RSGB's Observation Service?

In the meantime, amateur radio has a code; it is as valid today as it was when it was written by American Paul Segal many decades ago; it appears on this page.

David Evans, G3OUF

The amateur's code

*** The amateur is considerate ..... he never knowingly uses the air in such a way as to lessen the pleasures of others.**

*** The amateur is loyal ..... he offers his loyalty, encouragement and support to his fellow radio amateurs, his local club and to the national society (Radio Society of Great Britain), through which amateur radio is represented.**

*** The amateur is progressive ..... he keeps his station abreast of science. It is well-built and efficient. His operating practice is above reproach.**

*** The amateur is friendly ..... slow and patient sending when requested, friendly advice and counsel for the beginner, kindly assistance, co-operation and consideration for the interests of others; these are the marks of the amateur spirit.**

*** The amateur is balanced ..... radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or community.**

*** The amateur is patriotic.....his knowledge and his station are always ready for the service of his country and community.**

(Of course, read "she" for "he" and "her" for "his", as appropriate)

Project YEAR — Novice Licence Summary

All of the main aspects of Project YEAR and the Novice Licence have been progressing well. This summary is intended to bring members up-to-date.

• **Novice Licence** - the text of the licence is in an advanced state and is likely to be agreed soon. It is essentially that which was published in the Society's July 89 Discussion Document summarised in September 89 *RadCom.*

• **The training course manual**, intended for Novice Licence Instructors, is complete. It may need modification in the light of any final syllabus changes agreed with the DTI.

• Many members have replied to the recent "help postcard" and have volunteered to become **Novice Instructors**. They are being contacted by the Society.

• The Novice Licence **examination** will be put out to tender by the DTI. Naturally the Society intends to put in a bid for this work. In many countries the national societies have a volunteer-based examination system and a large number of RSGB members have volunteered to act as examiners.

• The first RSGB **book** for budding Novices has been written and production is about to commence. Other books in the series are currently being written.

• The script for the **recruitment video** has been written and is being discussed with YTV who have agreed to sponsor its production.Finally, the Society hopes that the Novice Licence will be in place quite soon. This will further stimulate much more activity and further much-needed recruitment into amateur radio to help safeguard its future.

NEWS & REPORTS

IARU Region 1 Conference

This important triennial conference concerning the future development of amateur radio in Region 1 is being held in Torremolinos, Spain from 1 to 6 April. The extent of Region 1 is shown on this month's front cover. 147 delegates are expected from 37 national societies. All aspects of the hobby are being discussed including VHF/UHF, contests, HF and technical standards.

Some notes relating to contests have already appeared in *RadCom*. As regards HF, the RSGB is presenting several papers covering equipment standards, beacon frequency allocations, code of practice for QSL Managers and common licensing.

For equipment standards, we are proposing the introduction of informal specifications for amateur radio equipment, covering harmonics, spurious signals, key clicks, intermodulation products etc. which could be used by reviewers to evaluate commercial gear. It is hoped that manufacturers not meeting the spec would take note of criticisms in equipment reviews and modify their products accordingly.

Another RSGB paper proposes a reform of beacon services. The band 28.2 - 28.3MHz has become increasingly crowded and channel allocation is unplanned and uncoordinated. Also, the FCC have recently permitted novice operation between 28.2 and 28.3MHz. RSGB proposes that a sub-band between 28.175 and 28.200MHz be for officially recognised international beacons sponsored and approved by the national society. Frequencies would be allocated by IARU. A similar sub-band is proposed for 50.020 - 50.075MHz.

The RSGB paper on Common Licensing recognises the difficulty of unifying licence conditions and qualifications in each country and proposes that each country accepts each other's qualifications for the issue of a licence.

A code of practice is proposed for QSL Managers which would make a DX station responsible for ensuring that his manager operates in an ethical and efficient manner.

Several papers cover Olympic recognition for amateur radio and the establishment of Radio Amateur Olympic Games including Amateur Radio Direction Finding Competitions, Home Construction, HF/VHF Contests and High Speed Transmission/Reception.

A paper from Africa presents proposals for the re-establishment of amateur radio into Mozambique and Malawi. Also, training programmes for local amateurs are proposed for Swaziland, Lesotho and Zimbabwe. Each programme would be of five years duration with funding provided by the IARU.

Of great concern to the IARU is the forthcoming World Administrative Radio Conference in 1992. A paper recommends that the IARU set up a permanent Committee to prepare for the WARC in order to ensure that present amateur rights and frequency allocations are defended.

VHF matters under discussion at the Conference include beacons, meteor scatter, sporadic E coordination, and RSGB contributions on 50MHz bandplanning, and 12.5kHz channel spacing.

In addition to those listed above, the RSGB is presenting papers on third party traffic, conference venues, and better behaviour. Other conference papers deal with disaster relief, education, packet radio message content, morse code, developing countries, satellites, and IARU administration.

The RSGB delegation comprises G3GVV, G3HCT, G3WDG, G3ZAY, G3ZNU, G4ASR, G6LX, with G3VZV as an observer for BATC. Also present from the UK will be G3FKM, G3OUF and G7GAL, all of whom are involved with the Conference administration. G3AAJ will attend on behalf of IARU in connection with Satellite activity.

RadCom will bring you a full report on the conference as soon as possible.

G-Plates again

Several members have queried why, after our statement that callsign number plates would not be available, "G1ANT" and "G1LLY" were sold recently for large sums of money. The general DVLC policy remains unaltered but a relatively small number of cherished plates of all kinds are being sold at auction. The Society has written to G1ANT and G1LLY to explain this. In the meantime, we will still have to wait for the general issue of callsign style plates.

End of converted CBs?

The DTI have written to say they intend ceasing issuing authorities for the possession of non-approved CB sets (for conversion to 28MHz) after 31 December 1990. The Society is taking this up with the DTI but in the meantime members are advised to apply for an authority if they have such a rig as it is illegal to possess one without it.

Space Shuttle

Two space shuttle missions this spring will carry amateur radio. SAREX (Shuttle Amateur Radio EXperiment) will be on STS-35 due to fly on 26 April and STS-37 on 4 June. Operators will be Ron Parise, WA4SIR, and Ken Cameron, KB5AWP. Operation is likely to include packet, voice and ATV. NASA gave its approval for SAREX because it would encourage youth interest in science and technology. The bad news, however, is that the transmissions are not likely to be audible in the UK.

Lunar eclipse halts moonbounce tests

The total eclipse of the moon during the evening of 9 February was seen by many people in Britain despite heavy cloud cover. The much heralded visual display - the moon going blood red - failed to materialise and most observers seem to have been disappointed by the event.

However, during the eclipse moonbounce expert Peter Blair, G3LTF, carried out a series of controlled EME tests whilst in QSO with a large number of stations throughout the World.

His results are quite startling. At the start of the test period (1600Z) all signals were stable but varied in strength depending on individual's equipment. At 1625, just as the earth's shadow appeared over the moon, stations in the Western hemisphere exhibited deep and rapid QSB for several minutes then faded out altogether. Within 20 minutes, European and African stations were similarly affected followed by those in the East; the last to disappear being from Japan and Australia. For the next 14 minutes the only signals received were occasional meteor pings from eastern European participants until at 1659 the first faint EME signals from the Eastern USA were heard. As the moon reappeared, signals took on the same rapid fading as at fade-out then became stable once more. By 1730 normal moonbounce communication was restored.

An interesting aspect of these remarkable tests was that just before and just after total eclipse, during the period of rapid fading, signals from the far north and south seemed to be enhanced by some 6dB just for a few minutes. This raises the possibility of north-south EME contacts taking place between stations running much lower power than would normally be needed for moonbounce - provided, of course, they wait for the next lunar eclipse which is expected to be on April 1st 1992.

Morse Test congrats

In last month's *Last Word* we published a letter from Mr McWhinnie, G8PFW/G0MQW, suggesting that with the RSGB Morse Test pass slip should be a letter of congratulation, and a form for applying for a Class A licence. We commented that this was a good idea. In fact, it was such a good idea that we adopted it more than a year ago! Everyone who passes the test is sent a letter offering congratulations and giving advice, and a DTI licence application form is enclosed. Mr McWhinnie seems to have fallen through the net and was unfortunately sent an incomplete package. Apologies to him and a slapped wrist for the editor for not checking his facts properly.

Leonard Cheshire VC Patron of RAIBC

Gp Capt Leonard Cheshire VC, OM, DSO, DFC, has agreed to be the patron of the Radio Amateur Invalid and Blind Club (RAIBC). Gp Capt Cheshire is famous for a distinguished flying career but most of all for his work with the disabled, notably the 250 Cheshire Foundation Homes in 45 countries.

The RAIBC is the main national organisation helping disabled and blind radio amateurs and short wave listeners. Founded in 1954, it has recently gained charity status. Benefits to members include a bi-monthly magazine *Radial*, hf and vhf nets, and help with installation, operation and maintenance of members' stations. Details can be obtained from Margery Hey, 29 Besthorpe Road, Attleborough, Norfolk, NR17 2AN.

One step nearer to 1992

As most of you who work in the electronics industry will be aware, the Radiocommunications Division of the DTI issued a discussion paper towards the end of last year entitled "Electrical Interference: A Consultative Document". It deals with the implementation of the European Community EMC Directive due to come into force in 1992 (for further reading see 'EMC Matters' *RadCom* June / August 1989). Comments on the issues raised in the document were solicited with a deadline of Feb 9th. The RSGB submitted a paper to the DTI in which the specific aspects relating to amateur radio were addressed.

KITS

One of the principal areas of concern centred on equipment which is sold in kit form. The document proposes that "products sold commercially in kit form should have to comply when constructed in accordance with the instructions." The definition of a kit, however, is rather vague. Having sought clarification it was suggested that *all* kits will have to comply, provided the manufacturers' instructions are followed. It is the responsibility of the kit manufacturer to ensure compliance with the Directive. Kits can be defined in various ways.

a) A kit of parts.

b) A PCB and some parts, or

c) Maybe even an article giving PCB layout and lists of components could constitute a kit.

In all cases, full instructions must be provided to ensure compliance. Failure to comply after assembly is the responsibility of the manufacturer, assuming the instructions were adequate.

The RSGB recommends in its response that:

a) Kits in general, and especially those for use within amateur radio, should be exempt from the requirements of the EMC Directive.

b) The published designs and articles should not be required to meet the Directive prior to publication. When the equipment is built and installed in the correct operational environment it will be subject, as with a), to the WT Act 1967. This has always been the accepted case in relation to kits.

RETROSPECTIVE COMPLIANCE?

The document seeks comments on how to deal with products placed on the market before the date of implementation of the Directive. Should they be made to comply, even though they did not have to comply with the Directive when first supplied? There is also the problem of dealing with second-hand equipment; this is not specifically identified in the discussion document. It is presumed that it will be treated similarly. The RSGB firmly believes that retrospective compliance should not be required on equipment sold prior to 1992.

The issue of modification or alteration to hardware or software is mentioned. Any modification which may alter the EMC characteristics, and which is implemented after the Directive comes into force, may require that the modification complies with the requirements of the Directive. The RSGB opposes this as it would restrict the self-training, educational and experimentational aspects which are the corner-stone of amateur radio.

COMMERCIAL EQUIPMENT

The document states that commercially available equipment for the exclusive use of radio amateurs has to meet the requirements of the Directive in full, it being the responsibility of the manufacturer or its agent to ensure compliance. Passive devices such as SWR or power meters do not have to comply, except in cases where their operation in a system may cause interference. The RSGB takes an entirely different view on this subject and proposes that approval of commercial amateur radio equipment be subject to the ITU regulations and the conditions of the UK Amateur Licence in relation to spurious emissions.

HOMEBREW

Homebrew equipment which is built from original thought is exempt from the requirements but must still comply with the WT Act and the terms of the licence. If, however, the equipment is built from an article in a magazine, it may in future be deemed to fall into the category of a kit!

Project YEAR and the basic training concepts of the Novice Licence, at present under consideration by the DTI, could be severely damaged if the stringent proposals relative to kits were to be implemented. Kit manufacturers may not be able to survive the proposed legislation, as testing costs would inevitably be prohibitive, especially for the smaller UK based companies. In practice, the cost of testing a 1 watt 80 metre crystal controlled transmitter could exceed the total value of the company's stock.

FUNDAMENTAL

The fundamental tenet of amateur radio - self training and experimentation - could be restricted by the Directives' proposals on modification. Access to the airwaves through the second-hand equipment market could be profoundly curtailed.

Because the Directive has to be translated into National Legislation, the DTI is seeking the views of all relevant bodies. There inevitably will be a great deal of discussion before anything is finalised. To quote the discussion document "In order to help ensure that the Directive is implemented in a reasonably consistent way throughout the Community, the Department (DTI) intends to initiate discussions with other member states and the Commission, on the detailed interpretation and implementation of the Directive. The Department's present thinking on interpretation of the Directive is subject to change in the light of these discussions."

There is considerable determination amongst the leading National Societies in the EC to fight any legislation which could in any way be detrimental to the well-being of amateur radio and which may impede the education and training of people in electronics and engineering.

Following its written submission on the discussion document, the RSGB intends to hold a meeting with the DTI in which all areas of concern will be debated in full.

If you would like a copy of the full RSGB reply to the DTI Discussion Document, please send a letter enclosing an SAE to EMC Committee member, Hilary Claytonsmith, G4JKS, QTHR.

WAB Contests

The Publicity Officer of the Worked All Britain Awards organisation, John Fitzgerald, G8XTJ, tells us that their contests for 1990 are as follows.

LF Phone, Sat, 1st April, 0900 - 2100z

50MHz mixed mode, Sun, 3rd June, 1500 - 1800z

144MHz phone QRP, Sun, 1st July, 0900 - 1300z

432MHz mixed mode, Sun, 1st July, 1400 - 1700z

144MHz phone QRO, Sun, 16th September, 0900 - 1500z

LF CW, Sun, 4th November, 1400 - 1700z

HF mixed mode, Sat/Sun, 1-2 December, 1200 - 1200z

New contest rules and contest log sheets can be obtained from WAB's new Contest Manager, Gordon Horsfield, G4SKQ, 2 Linden Road, Ecclesfield, Sheffield, S.Yorks, S30 3XL.

Cultural Capital of Europe

Over the Easter weekend 14-16 April, the Scottish Tourist Board (Amateur Radio Expedition) Group will operate GB8CC from the People's Palace in Glasgow to celebrate the city's role as the Cultural Capital of Europe in 1990.

IARU Satellite Coordinator

In the *Satellites* column in February *RadCom*, Ron Broadbent, G3AAJ, was described as "the first IARU Region 1 satellite coordinator". This was not strictly accurate as Dr Andras Gschwindt, HA5WH, has held the IARU Satellite Coordinator post for a number of years. Ron's role is complementary to, and somewhat different from, that of HA5WH. Specifically the appointment was made to extend and improve the liaison between IARU Region 1 and the various AMSAT groups active in the Amateur Satellite Service. Apologies to all concerned for the confusion.

Baffled by solar news?

Listeners to GB2RS who find the solar news hard to digest will find it useful to read the explanatory notes on pages 69/70 of the RSGB's *Call Book* (pp 91/92 in 1990 edition).

European Youth Clubs Day

The Atherton Youth Concern youth club has strong links with the West Manchester Radio Club. They will celebrate European Youth Clubs Day by operating GB2EYC over the weekend 28/29 April. The WMRC is appealing to other radio clubs to form similar links with local youth organisations. The club has run construction classes and given tuition for the Scouts Communicators Badge and the Duke of Edinburgh's Award. Club members have also erected a mast at the youth club and have raised money to buy equipment and help maintain the building. Clubs embarking on similar youth projects may like to contact WMRC Chairman, G4HZJ, who is QTHR.

l to r: George, YO3FU; Sandy, YO3FBK; Mar, YO3CD; Josha, YO5AVN; Vasile, YO3APG, President of FRR. Photo: G3KOX

Romania first hand

Nick Waite, G3KOX, was with an ABC News team in Romania at the end of the revolution. In between his professional duties, he managed to meet a number of amateurs. He says .....

"I arrived in Bucharest in the early hours of Friday 29 December. There were checkpoints but very little sniping. Neville, G3RFS, had given me phone numbers of FOC members so I was soon able to meet Mar, YO3CD, who introduced me to several other YOs and told me how to apply for a licence. On the next business day, 3 January, I phoned Dan, YO3ZA at the PTT. Within 90 minutes he appeared at the hotel, licence in hand! Before the revolution I would have been very lucky to get one in 90 days.

A few days later Mar took me to the headquarters of the Romanian Amateur Radio Federation (FRR) and introduced me to the President and several other members. A bottle of firewater was produced and we compared problems and solved most of them. I was enrolled as an honorary member of the YO DX Club. In spite of a serious lack of radio equipment and components, all the YOs were in great spirits because of the sudden lifting of restrictions. Before the revolution anything more than a 'rubber stamp' QSO could result in the loss of a licence; now they were free to chat. They expected soon to be able to use the WARC bands, maybe even six metres.

Before I left I was able to give the Federation several boxes of surplus books from the RSGB and a good selection of parts from George, G3NOH, transported thanks to my bosses at ABC News."

Arrow Radio held an open day on February 24th and organised a raffle which raised £85 for amateur radio in Romania.

News from the HF Contests Committee

At the January meeting, a number of policy matters were discussed, together with a review of various contest rules. For some time there had been comments from overseas participants of the 7MHz, 21MHz and 21/28MHz events, that the multiplier comprising the UK prefix did not provide sufficient scope. Various alternatives were suggested and the committee adopted a suggestion from G3VDL that the UK County Code should be used. This change will be incorporated in the rules for the 1990 21MHz cw and the 21/28MHz phone events. It will also be used for future LF phone events and the 7MHz cw contest.

The committee also discussed a number of comments from members about the publication of contest dates and the omission of certain events in the monthly Contest Calendar in *Radio Communication*. It seems there have been problems relating to the way the text is prepared for publication. This is being corrected and it is to be hoped that future calendars will include all RSGB events.

Whilst on the subject of contest dates, the committee often receives complaints about the date of a particular HF contest clashing with another event, such as a rally, exhibition, or even some special occasion organized by a club. The Committee is asked to change the contest date to avoid the clash, but, sad to say, this is not usually possible. The dates of contests organized by national societies are agreed with other societies and the IARU several years in advance so as to avoid clashes with similar events. The IARU allocates "slots" to each member society, e.g. 2nd full weekend in March for RSGB Commonwealth etc. Once a date is published, it is a major (and expensive) task to get it changed. All other IARU member societies have to be consulted usually by telephone, telex or FAX and, if a new date can be agreed, which is not always certain, publicity has to be revised and other announcements published.

PARTICIPATION IN RSGB CONTESTS

When visiting clubs to talk on contest matters, HFCC members are often asked what is the point in entering HF contests when they always seem to be won by the same few people. Others, say they do not enter because of the lack of tolerance on the part of some contest operators to those who cannot keep up, or ask for a repeat. While these comments might apply to some of the larger international contests, we hope they are not applicable to RSGB events.

The HFCC run a variety of HF events and we try to cater for every level of skill and in particular to include events, or make provision for the first time entrant. Many newcomers have told us that they would like to be part of a club team in the January AFS contest, but are afraid to enter in case they would not be able to cope. Have heart, there is a section of frequencies reserved for the QRS operator. Even if you can only make 10 or 12 contacts, it still adds to your team score, so have a go and send in a log for checking. Another event for the new contester are the Cumulative contests (also held in January). These friendly short contests are an ideal way to start contesting and we certainly hope you will give them a try.

W1CUT retires from ARRL

Last November Laird Campbell, W1CUT, retired from the staff of the ARRL after more than 35 years of service to Amateur Radio. In his letter to the Directors, ARRL Executive Vice President David Sumner, K1ZZ said, "No one person has contributed to the League in more different ways than Laird." Over the years his jobs included Contest Assistant in the Communications Department, Technical Assistant, Assistant Managing Editor, Managing Editor, Advertising Manager, and Assistant General Manager for Business Operations.

Foxteering in Japan

The first national tournament of "Foxteering" - the Japanese type of ARDF - was held on last November in the western suburbs of Tokyo under the sponsorship of the Japanese Amateur radio League, to whom we are indebted for this information. There had been two national foxteering conventions previously, but they had been sponsored by a voluntary group. The involvement of JARL indicates the increasing popularity of this type of event.

Some 270 entrants gathered from all over the country. Especially noteworthy was that six players from China, nine from Korea and one American radio amateur living in Japan participated at the invitation of JARL, giving the event an international character.

The tournament was conducted more or less in accordance with the ARDF rules adopted by IARU Region I but with some adaptations to cater for local circumstances. Changes include the use of the 144MHz band, except where using 3.5MHz causes no QRM to other band users, and the use of FM as the equipment is so easily available, in Japan. The distance between "foxes" is, in some cases, reduced because there are natural restrictions on getting a ground wide enough to cover those distances provided for in the Region 1 rules. This also prevents compliance with the rule that the same site should not be used twice.

The players from China displayed great ability as expected, winning the first place in the JN and YL categories. The Japanese players, however, showed the results of their training since ARDF was introduced into their country in 1984 by winning the first place in the OM and OT categories.

Catswhisker Award

The Evening Study Association, in conjunction with the North Cheshire Radio Club is putting out regular morse proficiency transmissions. The callsigns G0BAA and G3LEQ are used on 3.600MHz and 144.250MHz on Sundays at 1915 local time. Plain language texts will be transmitted at 30, 26, 22, 18 and 15 words per minute. The Catswhisker Proficiency Award can be obtained by listening to the award transmissions on the second Sunday of each month. More details can be obtained from NCRC Catswhisker, PO Box 3600, Altrincham, Cheshire, WA15 9LU, or by telephoning G3LEQ on 0565 4040.

RAFARS QSL manager QSYs

The RAFARS QSL manager, Ian Wicker, G0HAV, has moved house; his new address is 25 Lee Warner Avenue, Fakenham, Norfolk NR21 8ER. Those wishing to exchange RAFARS. RNARS and RSARS cards may do so via him.

Report of the City and Guilds of London Institute on the May 1989 RAE

(Reproduced by authority of the Institute)

OVERALL RESULTS (UK CANDIDATES)

Exam date	No. of candidates completing exam	Candidates qualifying for RAE certificate	
		Number	%
May 87	3017	1959	64.9
Dec 87	1233	857	69.5
May 88	2453	1550	63.2
Dec 88	1182	835	70.6
May 89	2250	1516	67.4

COMPONENT RESULTS FOR THE MAY 1989 EXAMINATIONS

Paper	Components	No of candidates	Distinction %	Credit %	Pass %	Fail %
01	Licensing conditions, transmitter interference & EMC	2085	8.6	28.4	34.6	28.4
				71.6%		
02	Operating procedures, practices & theory	2196	10.5	33.7	34.8	21.0
				79.0%		

REPORT ON MULTIPLE-CHOICE QUESTION PAPERS

PAPER NO. 765-1-01

Syllabus Topic or Objective	% of items	Comments on performance of candidates
Licensing conditions	33.3	Questions on licensing conditions were generally well answered by most candidates. Changes in the Amateur Licence which came into effect on 1 January 1989 caused a little difficulty and some people did not know that power should now be included in the station log. It was not realised by many candidates that, unless renewed, the licence expires at midnight on the date prior to the anniversary of the date of issue.
Transmitter Interference	33.3	Most candidates understood the precautions to be taken in modulating transmitters and in frequency control to prevent interference and out-of-band operation. However, only 29% of the candidates selected the correct type of capacitor to be used in an oscillator tuned circuit; 36% of candidates thought that an electrolytic type was suitable. The question on a broadband PA stage was very badly answered, most people not appreciating that its main feature is operator convenience and not its ability to suppress harmonic radiation. Another badly answered question was one in which a 22Ω resistor was shown connected in series with the collector of a transistor in an oscillator circuit. 61% of candidates thought this was a collector load rather than a 'stopper' to prevent parasitic oscillations. A question on RF screening also caused difficulty with some candidates who chose ferrite as a material with which to screen unwanted radiation. There were two questions on frequency measurement which were not well answered. One of these related to the choice of frequency measuring device for a transmitter which was not crystal controlled. The other question was about the factors determining the accuracy of a frequency counter. Each of these questions was correctly answered by only 40% of the candidates.
Electromagnetic compatibility	33.3	Questions on EMC were generally well answered by most candidates. In one question about a third of the candidates thought that a commutator motor produced narrow-band interference. A question on a 1:1 balun caused difficulty, 69% of all candidates answering that it provided impedance matching. It is of course used to couple balanced to unbalanced line and hence prevent currents flowing on the outer of the coaxial cable.
General comments		This was the first paper prepared to the revised syllabus and included an additional section on electromagnetic compatibility. A high standard of performance was achieved by many candidates, and there have been improvements in topics which have been weak in previous years. Paper -01 was passed by 71.6% of the candidates.

PAPER NO. 765-1-02

Operating procedures	16.4	All questions on operating procedures and practice were very well answered.
Electrical theory	10.9	Well answered by most candidates, but two questions on basic principles were disappointing. A third of candidates thought that increasing the distance between the plates of a capacitor increased its capacitance. Only 43% of candidates knew that the impedance of a parallel circuit at resonance was a maximum; half of all the other candidates thought it was always zero.
Solid state devices	12.7	Most questions were well answered. The only badly answered question was one which asked about the bias state of a Class C amplifier. Many candidates apparently confused Class C with Class A operation.
Receivers	12.7	Very well answered. Not all candidates realised that in an HF receiver the local oscillator is normally higher than the signal frequency. This is to facilitate easier tracking of the local oscillator and RF tuned circuits.
Transmitters	14.5	Most candidates obtained high scores in this section. The question on the phase-locked loop oscillator was answered well by the more able candidates but caused difficulty with others. Most candidates answered the question incorrectly and quoted the output frequency to as fr/N instead of fr x N.
Propagation and antennas	16.4	Some candidates were unsure as to whether it was the electric or the magnetic component of an electromagnetic wave which was parallel with the direction of polarisation. A question which produced disappointing answers was one about the current distribution in a simple dipole. A quarter of the candidates confused this with the radiation pattern.
Measurements	16.4	The choice and characteristics of instruments (meters) in this section caused difficulty with some candidates in two questions. In a question on testing an audio amplifier, many candidates did not realise that a square wave is an ideal waveform to test the linearity.
General comments		Paper -02 was very well attempted, most candidates being satisfactorily prepared. The areas of weakness ranged from some of the basic principles of electronics to the more practical application of antennas. 79% of all candidates who took Paper -02 were successful. The overall results for the Radio Amateurs' Examination show a significant improvement over last year, indicating that candidates were generally better prepared. This is particularly encouraging considering the papers were prepared to a revised syllabus which included some additional topics.

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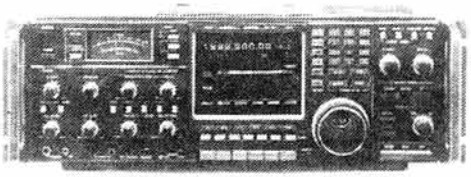

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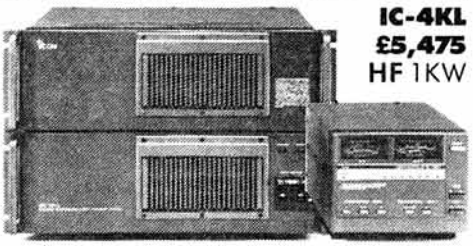

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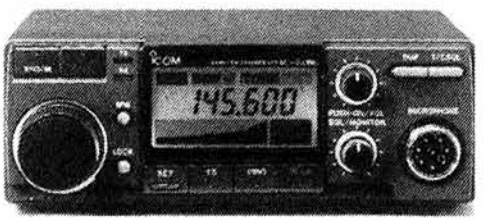

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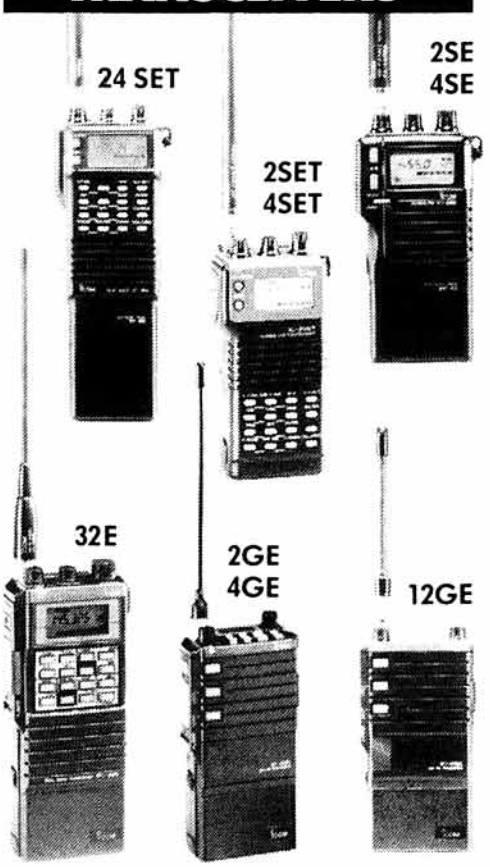

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The TS-440S is probably the most successful HF transceiver ever made by Kenwood, and this is no surprise when you realise that it is virtually a mobile version of the TS-940S. I can't put it better than Geoff Arnold in his review of the TS-440S: "The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

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The New HF-225 Receiver

I am delighted that the HF-225 has been a raging success world wide, and I will just quote a letter received from one of our American customers:—

"I received my Lowe HF-225 about a week ago. Since then I have enjoyed many pleasant hours listening to it. As a past owner of receivers such as the Sony ICF2010 and Grundig Satellit 650 and 500, I must say that none compare to your Lowe HF-225. Without question, for hour after hour listening, nothing compares. I especially like the Genie key pad. Why more receivers do not incorporate such intelligent rergonomics is beyond me. I also thought both the instruction manual and the short wave book were well written, with the shortwave guide particularly enjoyable."

The letter comes from Chris Williams in Massachusets, but is typical of many letters we are receiving from all over the world about the HF-225.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser, which gives a reciprocal mixing performance not far off that of "professional" receivers costing up to ten times the price, and that's not just advertising talk, it is really true. The synthesiser actually tunes in steps of 8Hz, which betters most other receivers and gives a smooth "VFO" feel when tuning. As one user has already commented "If you tuned the HF-225 with your eyes closed, you would believe you had a £5,000 receiver on the table".

The HF-225 has a range of low cost options which extend its appeal; such as a keypad for direct frequency entry, which simply plugs into a rear panel jack; an active whip aerial; a rechargeable battery pack for portable use; and an attractive carrying case which protects the receiver whilst allowing full operational use. The new D-225 detector option is really something special, because it gives true synchronous AM detection for dragging sensible programme quality out of a signal being affected by selective fading distortion. The same option also gives narrow band (communications) FM demodulation.

Every listener these days appreciates a receiver which offers facilities for memorising favourite or regularly used frequencies, and the HF-225 offers 30 memory channels for this purpose. Using the memories has been made particularly versatile, because the operator can review the contents of the memories whilst still listening to the frequency he is using, or alternatively in the "Channel" mode, can tune through the memory channels using the main tuning knob, listening to each frequency as it appears on the display. Just like having a bank of single channel receivers under your control. Terrific for checking HF airband channels for activity.

Unlike most HF receivers on the market, the HF-225 comes complete with all filters fitted for every mode:— 2.2kHz, 4kHz, 7kHz, and 10kHz. There is also a 200Hz audio filter for CW, and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch, but further selection can be made by the user from the front panel and the receiver remembers which filter was last used. True versatility and all built in at no extra cost. When selecting filters in use, the filter bandwidth is shown on the main display.

The display itself is a high contrast liquid crystal type, and shows frequency, filter bandwidth, detector lock (when D-225 is fitted), and whether the receiver is in memory mode. Automatic placing of the decimal point takes place as the receiver is tuned, so there can be no ambiguity in reading.

At the end of the day, what does the HF-225 offer you as a user? I can do no better than quote what was said by Rainer Lichte about the earlier HF-125:—"The HF-125 is a serious piece of equipment; don't be deceived by the unassuming front panel and the lack of spectacular features. The HF-125 will outperform most competitors. If you like an honest approach to receiver design, this is it. British understatement at its best".

The HF-225 is even better.

HF-225 £395 John Wilson

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RADCOM POSTAL SURVEY

How well does the Post Office handle delivery of the magazine?

Aim

The Society has been much concerned for some time over the difficulties experienced by members with the delivery of their copy of *RadCom* each month. Consequently a carefully conceived plan has been put into effect to enable us to determine what problems exist and what are their root causes, and then to address the causes, and eradicate them. This article is to report progress thus far.

Survey

A few months ago we enclosed with *RadCom* a survey containing questions related to its delivery. There was a fine response to this - thank you all. We analysed the results using exactly the same criteria used in the survey carried out 10 years ago. (See *RadCom* November 1980). The results are shown on the map and in **Tables 1 and 2**.

Statistics

Close reading of the map and tables will reveal some interesting anomalies. For instance, Surrey is a poor area for delivery, whilst Northumberland and Armagh are good. Even adjacent counties provide startlingly different results. Small wonder, then, that members frequently report receiving their magazine some time after those they speak to over the air. However, what is also interesting is the relatively small spread between the earliest and the latest counties. A detailed comparison with the 1980 survey is not valid as there have been changes where the magazine is printed and posted, and in the method of sorting. However, it is fair to say that the overall results are very similar, both in mean delivery times and in the apparently random variation from one county to another.

Sorting Office

Concurrent with this analysis, meetings were arranged with the Post Office at Southend sorting office which handles the magazine straight from the printers. The Southend office, which is one of the five largest in the UK, was purpose built a few years ago and is fully automated. The thrust behind this development was the establishment of the Access joint venture in Southend; the mailing for Access alone is of astronomical proportions. The aims of the meeting were to learn how their system works, to describe the problems we were encountering, and to impress upon them the need to improve and to develop an ongoing programme to monitor performance. We found the staff at Southend to be most co-operative. The Regional Manager has been present at most meetings together with two Heads of Department. They clearly wish to have a satisfied customer and have taken, and continue to take, a very positive interest in monitoring progress and seeking improvement.

Presstream

The Royal Mail system we use is called Presstream. It is especially designed to provide a cost effective postal system for large mailings. The *RadCom* monthly mailing of approximately 32,000 copies falls nicely into this category. Presstream efficiency relies upon the ability of clients to post code and batch their mailing. This we do. Those members who live in areas for which no post code has been allocated receive their *RadCom* directly through our HQ Despatch Department.

Procedure

The procedure each month is that the printer prints and collates the

TABLE 1: Delivery league table

	A	B
Hertfordshire	4.45	-1.66
Isle of Wight	4.50	-1.61
Dorset	4.53	-1.58
Hampshire	4.76	-1.35
Wiltshire	4.77	-1.34
Essex	4.79	-1.32
Hereford & Worcs	4.81	-1.30
Cornwall	4.88	-1.23
Avon	4.89	-1.22
Co Armagh	5.00	-1.11
Northumberland	5.00	-1.11
Salop	5.00	-1.11
South Yorkshire	5.00	-1.11
Somerset	5.11	-1.00
West Sussex	5.12	-0.99
South Glamorgan	4.14	-0.97
Buckinghamshire	5.20	-0.91
Cheshire	5.20	-0.91
Greater London	5.21	-0.90
Herefordshire	5.25	-0.86
East Sussex	5.33	-0.78
West Glamorgan	5.33	-0.78
Devon	5.48	-0.63
Cumbria	5.50	-0.61
Lancashire	5.54	-0.57
Gwynedd	5.55	-0.56
Gwent	5.55	-0.56
Cleveland	5.57	-0.54
Durham	5.60	-0.51
Northamptonshire	5.60	-0.51
Tyne & Wear	5.63	-0.48
W Midlands	5.65	-0.46
Suffolk	5.68	-0.43
Tayside	5.75	-0.36
Powys	5.75	-0.36
Strathclyde	5.77	-0.34
Cambridgeshire	5.78	-0.33
Grampian	5.81	-0.30
West Yorkshire	5.88	-0.23
Gloucestershire	5.90	-0.21
Derbyshire	6.00	-0.11
Mid Glamorgan	6.00	-0.11
Merseyside	6.00	-0.11
Borders	6.01	-0.10
Central	6.01	-0.10
Lincolnshire	6.05	-0.06
Nottinghamshire	6.09	-0.02
Bedfordshire	6.12	+0.01
Berkshire	6.15	+0.04
Kent	6.28	+0.17
Warwickshire	6.35	+0.24
Staffordshire	6.46	+0.35
Leicestershire	6.47	+0.36
Co Antrim	6.50	+0.39
Greater Manchester	6.50	+0.39
Norfolk	6.64	+0.53
Dyfed	6.71	+0.60
North Yorkshire	6.75	+0.64
Co Down	7.00	+0.89
Lothian	7.14	+1.03
Humberside	7.21	+1.10
Fife	7.50	+1.39
Clwyd	7.57	+1.46
Oxfordshire	7.58	+1.47
Isle of Man	8.00	+1.89
Scottish Isles	8.60	+2.59
Highland	8.91	+2.80
Surrey	9.28	+3.17
Dumfries/Galloway	10.00	+3.89
Channel Islands	10.50	+4.39
Co Fermanagh	No Data	—
Co Londonderry	No Data	—
Co Tyrone	No Data	—
		(Mean 6.11)

A=Average time taken for delivery from date of posting for each county. Mean time taken for whole country is 6.11 days.

B=Variation from mean in 'A' above for each county. A negative number indicates a faster delivery time, and a positive number indicates a slower delivery time.

magazine, inserts the address label and finally bags the *RadCom* in its plastic wrapper. He advises Southend Royal Mail office that the magazines are ready and over a period of two days the sorting office sends vans to collect the copies as they are completed. With the final delivery the printer gives the Royal Mail a docket which lists the total number of copies. Royal Mail then notify the Society that they have received the total mailing for the month and are introducing it into the Presstream system. All copies of the magazine are posted on the same day. Analysis of the survey indicates that the majority are received within 7 days tailing off to about the 25 of the month.

More statistics

Not strictly part of the survey, but nevertheless relevant to a discussion of the posting of *RadCom*, are the following figures showing the number of magazines which needed replacing by HQ because they were not delivered at all. July 90, August 133, September 294, October 468, November 127, December 123, January 137.

Cost

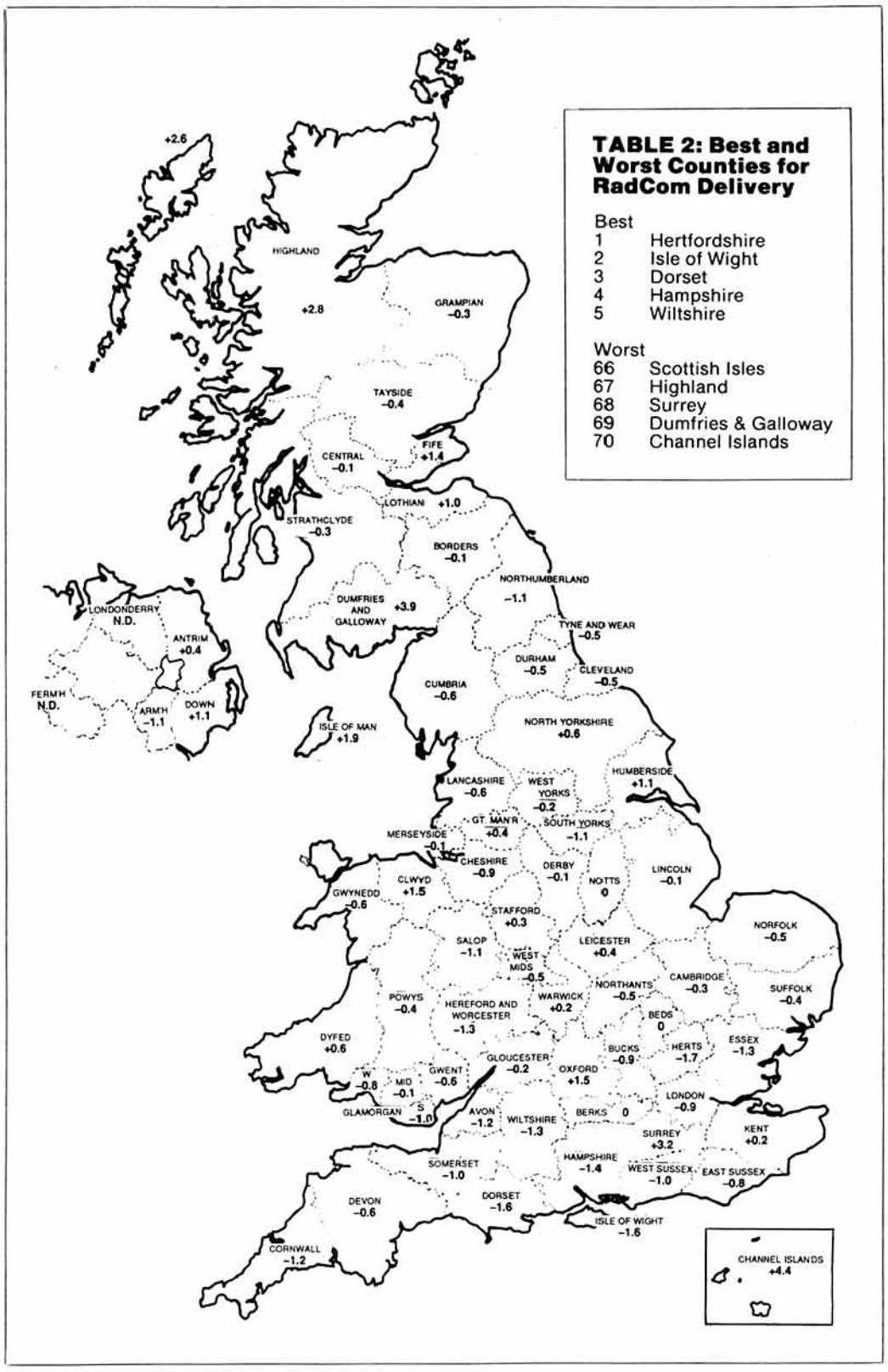
The approximate annual cost of mailing is £10,000. Printing and wrapping costs for *RadCom* is approximately £140,000. This means that the printing and despatching of *RadCom* costs the Society about a quarter of a million pounds each year.

Vital

The Society, of course, regards this as a good investment and important for amateur radio in general and our members in particular. *RadCom* (formerly the *T and R Bulletin* and then the *RSGB Bulletin*) has always been seen as a vital and important part of the Society. A reading of John Clarricoats book *World At Their Fingertips* pages 176-197 shows just what it meant to those who served 50 years ago.

The next stage

It is of the utmost value in our dealings with the Post Office if members who fail to receive their *RadCom* after the end of the third week of the month notify the Society and, if possible, send a written report to their local sorting office. We will record the details on the computer system here and despatch a replacement copy. The local sorting office will send a copy of the complaint through to the Regional Manager and this will eventually find its way through to the Southend sorting office. This greatly assists us in demonstrating to the Post Office the scale of the problem when seeking compensation, and helps them to trace any flaws in the delivery system.



Packing

There are other problems at the packing stage which can also lead to late or non-delivery of *RadCom*. These include faulty collation, unsealed plastic wrappers, and wrappers containing no address label. We believe that most of these can be eradicated over the next few months. The printer is aware of them and we are meeting regularly with him in order to resolve these. Ultimately, we are prepared to renegotiate each bill to reimburse the Society for actual additional costs and loss of goodwill incurred when *RadComs* are undeliverable.

Feedback

It is of immense value to receive feedback from the members. We really do appreciate just how frustrating it is to receive *RadCom* late, especially when this means missing something in the small ads (just the same as the articles advertised in the local paper for under a tenner have always gone when you phone!). The more information you send to us the better we are able to help both the printer and the Post Office identify where the faults lie.

Objective

Obviously, in a mailing of 32,000 plus we have to accept the fact that some copies of the magazine will inevitably go astray. Our objective is to reduce that to the absolute minimum.

The Novice Licence

John Case, GW4HWR, says "The time has come"

For a long time, to many of us, the Novice Licence has been a dream. A dream which at last has become reality. While waiting for the Licence, the Training and Education Advisory Group has spent much of its time preparing a training scheme and some of the details follow.

DO IT, NOT 'SAY IT'!

From the very early days it was decided that instruction for the licence must be a 'hands on exercise'. Learning by doing is the underlying philosophy. From this it follows that instruction must be biased towards the practical, rather than the conventional 'chalk and talk' method. In order to achieve this, the instructor must have a small group of students and for a number of reasons the group size is fixed at four. This may appear to be too small to many of you but if you stay with it for the next few paragraphs, you too will probably think that the number is correct.

KEEPING THE INTEREST

It must be fun!

To avoid losing potential radio amateurs by subjecting them to a daunting long course, the tuition time is fixed at about 30 hours — say 15 weeks at two hours per week. In addition to this, students would be expected to spend a little time on work outside the course. One of the problems of any project which is of short duration, is the need to use the time in the most efficient way.

A student starting on a project which is to last 300 hours can afford to spend a few hours 'feeling the way' but with the Novice Training scheme this is not possible.

Another problem arises because of the practical aspect of the course. Students will need to have access to equipment such as soldering irons and simple tools, test equipment in the form of analogue and digital multimeters, amateur radio transceivers and a number of other associated bits and pieces. During the course there will be some rather dull things to be learnt, for example the Q codes. Even these can be made a bit more interesting as the extract from the relevant section of the course will show. **(Fig 1).**

TIME TABLE

The solution to both of these problems is achieved by means of a well defined training programme, a sample of which (about one third of the total) is shown below **(Fig 2).** Some of the abbreviations in the table may appear a little obscure but are explained in the Training Manual for Instructors. A number of extracts from this book have already been used and many more will follow. For the time being WS 2 indicates that the students will be using a Worksheet — Number 2, while carrying out the particular exercise. There are 30 worksheets in the set and the numbers are frequently referred to throughout the manual.

You will see that the time is about equally divided between demonstration/talking and practical work done by the students as a follow up to the demonstration or talk previously given. The reason for the group size immediately becomes apparent when the rotation of exercises is noted. In this way maximum use of equipment is obtained, but, as all four students are doing different things, the instructor will be very busy looking after only four students! This is even more important as the exercises get more complex. It is important that students should work individually so that there is no question of one working and the other watching.

Fig 1. Making Q-codes interesting

YOUR PROGRAMME PLAN

TABLE 1

	STUDENT A	STUDENT B	STUDENT C	STUDENT D	TIME
Group	Say hello to the group and tell them your name. Use the name you would like them to use when they address you. Tell them about the course and give them a brief outline of the kind of things they will be doing.				10 m
Group	Demonstrate the main controls of a receiver or a transceiver. Demonstrate the use of a soldering iron. Show components and name each. Set up the meter as a voltmeter and give some idea of the way in which the scale is arranged.				20 m 20 m 20 m 20 m
Ind.	Set receiver - 1 Use soldering iron Examine components Set meter	Set meter Set receiver - 1 Use soldering iron Examine components	Examine components Set meter Set receiver - 1 Use soldering iron	Use soldering iron Examine components Set meter Set receiver - 1	20 m 20 m 20 m 20 m
Group	Demonstrate the receiver on 'open bands' and tell them about some of the others. Demonstrate simple soldering exercise - Worksheet 2 Show how to construct a simple log - Worksheet 10 Show how to use Test Set No 1 for voltage measurements - Worksheet 12				20 m 10 m 10 m 10 m
Ind.	Set receiver to band and mode - 2 Soldering WS 2 Build logs WS 10 Measure volts WS 12	Measure volts WS 12 Set receiver to band and mode - 2 Soldering WS 2 Build logs WS 10	Build logs WS 10 Measure volts WS 12 Set receiver to band and mode - 2 Soldering WS 2	Soldering WS 2 Build logs WS 10 Measure volts WS 12 Set receiver to band and mode - 2	30 m 30 m 30 m ALL
Group	Talk about Q codes and other abbreviations Worksheet 5 (H) Talk about procedure - simple QSO - Worksheet 8				
Ind.	Students A & B Simulated QSO WS 8		Set receiver to band and mode - 3	Soldering WS 3	
	Soldering WS 3	Set receiver to band and mode - 3	Students C & D Simulated QSO WS 8		

Ind. = Individual - Students working singly or in pairs.

Fig 2. Part of the training programme

Very occasionally they will work in pairs such as when carrying out simulated contacts. Preferably this will be done by using two telephone handsets in different rooms with a length of bell wire and a battery completing the circuit.

WORKSHEETS

These form a very important part of the training scheme and are included in both the Training Manual for Instructors and one of the books intended for the students — *Amateur Radio for Beginners.* Book 3. To give some idea of the content of the sheets, an index of the complete set is reproduced at the end of this section.

The sheets have three functions: 1. Those marked (C) are intended to guide the students through the various exercises which have been demonstrated by the instructor, and so relieve him of some of the repetitious instructions. 2. Those marked (H) are intended to provide notes on some of the talks, thus alleviating the necessity for student note taking. 3. They provide material for 'home study' of subjects which can only be learnt by usage, not instruction. An example of this is WS 5/6 — Codes and abbreviations.

TEST SET No1

The first mention of this is in WS 2, but it is used on a number of occasions subsequently. It is a very simple exercise designed to give some basic practice in soldering

Putting theory into practice

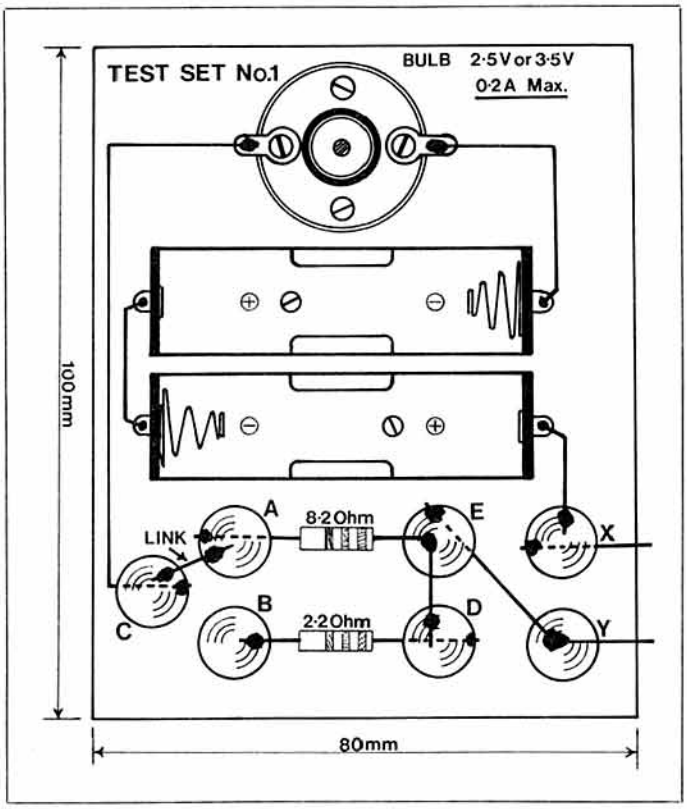


Fig 3. Test set No 1

but it is important to try to make any exercise have some purpose. This is an elementary circuit consisting of two AA cells, a choice of two resistors and a bulb, connected in series. The plan of the set is shown in **Fig 3.**

The base board is a piece of soft wood and the terminals are brass drawing pins. Problems of two wires soldered to one pin, are overcome by trapping some wires under the pins, indicated by dotted lines on the diagram. When the board is complete the students are told to put an AA cell into one of the battery boxes and to touch wires X and Y together. The worksheet asks them to explain their result and to suggest ways of correcting the 'fault'.

WS 3. Contains another soldering exercise and when completed a number of continuity tests are made using Test Set No.1 as the continuity tester. This provides a check that the instructions on the sheet have been correctly followed. WS 4. In this the test set is used to discover some of the effects of increasing voltage, decreasing resistance and shorting out some of the circuit. Although the title of the sheet is 'Discover Ohm's Law', the Law is not mentioned during the exercise, that comes later.

The previous paragraphs may give the impression that the work is concentrated on one subject but if you refer again to the table it will be apparent that the three exercises are well spaced with a variety of other subjects in between. The same test set is used again in WS 12 for practice in measuring voltage and in WS 14 and WS 15 for investigation of current and power. **Fig 4** shows part of WS 12.

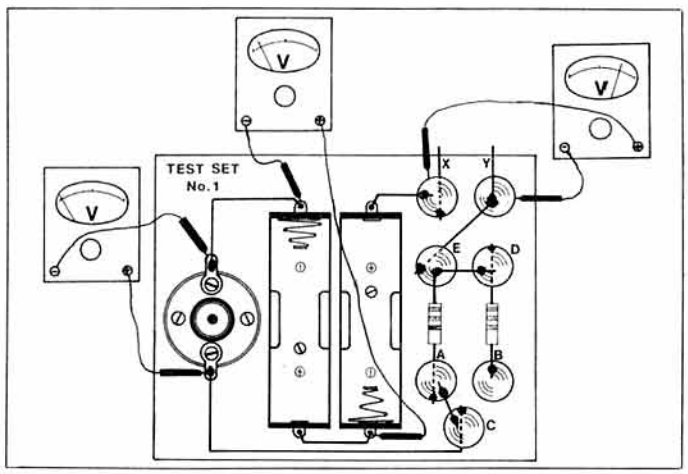


Fig 4. Test set No 1 as used in WS12

INDEX OF WORKSHEETS

The amateur's code.
WS 1. (H) The colour code.
WS 2. (C) First soldering exercise. TEST SET No. 1.
WS 3. (C) Soldering exercise No. 2.
WS 4. (C) Discover OHM's LAW — 1.
WS 5. (H) Codes and abbreviations.
WS 6. (H) and (C) More codes and abbreviations.
WS 7. (C) Audio Frequency Amplifier project.
WS 8. (C) Setting up a contact.
WS 9. (C) Soldering — TEST SET No. 2.
WS 10. (C) and (H) Build a log and design a QSL card.
WS 11. (C) A look at aerials.
WS 12. (C) Putting a multimeter to work.
WS 13. (C) Measuring resistance.
WS 14. (C) Measuring direct current (dc)
WS 15. (C) Power.
WS 16. (H) Propagation.
WS 17. (H) The QSL Bureaux — and other aids for amateurs.
WS 18. (H) AC and frequency.
WS 19. (H) Tuned circuits.
WS 20. (C) Demonstrate Ohm's Law using test set 2.
WS 21. (C) Fit a 13A plug to a piece of three core mains lead.
WS 22. (H) The spectrum.
WS 23. (C) Fit a PL259 plug to co-axial cable.
WS 24. (C) Fit a BNC plug to co-axial cable.
WS 25. (H) Block diagrams — Receiver.
WS 26. (H) Block diagrams — Transmitters.
WS 27. (H) Harmonics.
WS 28. (C) Test Set 2 — with diodes and transistors.
WS 29. (H) Learning the Morse Code. With help from Hilary G4JKS.
WS 30. (H) Getting ready for a CW contact.
(C) indicates the sheets to be used during course work.
(H) indicates those to be used at home.

PROJECTS

There are two of these. The first is an AF amplifier, built from a kit which includes all components and a specially designed PCB with large pads and wide track spacing. Progress to this will not be permitted until the necessary soldering skill has been acquired. For this reason the exercise does not appear in the tables until later.

The second project is an open one and requires each student to build a radio receiver. Any receiver will do but it must work! A crystal set or the medium wave radio described in the pilot edition of *D-i-Y RADIO* are both detailed in the books — *Amateur Radio for Beginners*. Connecting the radio to the audio amplifier produces quite an impressive receiver.

THERE'S MORE

But space is running out. The Training Manual for Instructors gives details and explains how the course assessment is carried out. Satisfactory completion of all parts of the course is an essential requirement and entry to the examination will only be permitted when this has been certified.

SMALLER GROUPS?

Although it has been said that the ideal size for a group is four students, there is no objection to smaller numbers and a 'one to one' ratio will present no problems. The tables in the programme would be followed using only the column headed Student A for one student, columns A and B for two, and A, B and C for three. The instructor would have to stand in for one student when the simulated contacts are being carried out.

INSTRUCTORS

All instructors must be registered and registration is conditional on the availability of certain essential equipment and of suitable premises. This procedure is most important as the instructor will be the person certifying the satisfactory completion of all of the exercises and projects. Certification will be on a form designed specifically for that purpose.

It is intended that short courses (one afternoon or one evening) will be available in strategic parts of the country for those who would like to attend. The object of the courses being to expand the ideas in these notes, to show the models and to answers queries wherever possible.

Finally, to all who have 'stayed the course' to this point — Thank you for your attention. If you are interested or feel there is a need in your area 'test the waters' and watch out in *RadCom* for a call for registration of instructors.

The photograph shows young people working on some of the exercises which have been tried out on students such as those in the picture.

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SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

You may still be wondering about my opening remarks in last month's column. Unfortunately the punch lines in DJ4XN's letter to *CQ DL* had to be edited out - which tended to make what did appear somewhat lacking in an ending!

There still seems to be a lot of misunderstanding about what we are allowed to do on the "WARC" bands. A G0 (who shall remain anonymous to spare his blushes) recently telephoned John, G3HCT, to point out that his article in February *Radcom* on verticals for 18 and 24MHz was a dreadful mistake because we are not allowed to use them and he should have checked with the DTI before publication! John is, of course, chairman of the Society's Licensing Advisory Committee! *(see this month's news pages on confusion about licence conditions - Ed).*

There is also confusion about 10MHz - where we have full facilities as far as the licence goes but where virtually every amateur radio society in the world has agreed that for the time being and in view of our Secondary status we should refrain from using ssb in an attempt to reduce interference to the Primary users. We all know that we are *entitled* to use ssb - but the vast majority prefer to follow the "gentlemen's agreement". Narrow band signals in a band only 50kHz wide leave more room for others too and that seems to be sensible - or is it ?

There is much unhappiness in the USA and Canada about some of the quite dreadful behaviour heard when the Bouvet expedition was on the air. Leader articles in *QST Canada* and *QST* deplore what happened. It seems that the FCC issued citations to 240 people who were operating outside their band allocation and K1ZZ makes the point that the amateur community knows who the guilty parties are and has to make it quite clear to them that deliberate interference and other rules violations simply will not be tolerated. There is *no* justification for deliberate interference *ever* - and if you don't subscribe to that principle then find something else to do. That applies over here as well as in the USA.

DX NEWS

An update on the information given last month about G0GWA and G0KPH with the international expedition to the North Pole. They were due to leave on 5 March from Khatanga and hope to be on the air from the base camp 450kms from the pole with the callsign EK0AB. Another station actually with the cross-country vehicles will be EK0AA. Between 15 and 20 April visitors and press will be present and hopefully there will be three days of amateur operation to commemorate the 45th anniversary of the United Nations.

More callsigns have been allocated to Vietnamese locals - these include XV2AAA, XV2AAB, XV2AAC, XV2AAD, and XV2AYL. QSLs from XW8KPL and XW8KPV are now being accepted for DXCC credit (as are those for XW8CW, XW8DX, and LU6EFL/D2). SP9JLD and others should sign as 9N5CW and 9N5DX from **Nepal** from 10 to 31 May. They hope to cover all bands 1.8 to 28MHz. *QRZ DX* says that Thai club stations may now stay on the air for 24h daily if they wish but that 1.8 and 3.5MHz operation is not allowed yet.

DX News Sheet passes on a rumour that 1S0XV *may* be on the air from a Vietnamese held island in the **Spratly Is** group for two weeks possibly in the middle of this month. The rumour also says that it will be a joint Vietnamese/ Japanese/Russian effort and that they will have a military escort!

HaGal International (from IARC) says that there will again be special activity during the Passover holidays from 0800 11 April to 1200 15 April. This year they will be in connection with a special tree-planting campaign and there will be several special stations on the air from sites where this is happening. The "Green Comm Award" will be awarded to those who work them. More details later.

Latest information on the planned Pacific expedition by OH2BH and others mentioned last month is that they will now operate from **Jarvis Is** from 4 to 18 April and that separate country status is being applied for. From 19 April to 4 May some of the operators plan to spend a week on **Palmyra Is** and a week on **Kingman Reef**. Some of these dates still seem to be in some doubt. VK3OT will be on **Lord Howe Is** as VK9LE from 25 March to 8 April using all bands with cw and ssb. The Kwajalein ARC station is now using the callsign V73AX in place of the rather better known KX6BU.

DL2GAC will be in the Pacific area until 1 May. Look for him on 14.163MHz from 1100 - he may still be operating as YJ0ABS or H44/ DL2GAC. He also uses the IOTA frequencies 14.260, 21.260, and 28.460MHz. K2BK wishes everybody to know that the station signing "K2BK/KH7" was a pirate.

The *Long Island DX Bulletin* says that ZS9A in **Walvis Bay** is to be found on Mondays, Thursdays, and Saturdays from about 1615 near 28.610MHz. Others say he might be on 14.180MHz around 0500, on 28.610 at 1630 and at 1500 in the net on 21.335MHz. DXCC status for Walvis Bay has been approved but cards should not be sent in before June - more information later.

Readers will be pleased to know that the person who was pirating OY7ML's callsign has been caught but sorry to hear that he was the holder of a "G" call located in the south of England. It is sad that anyone in the UK should behave in such a manner. LA7DFA will be JX7DFA from **Jan Mayen Is** from now until the end of July - mostly on cw and suggested frequencies to watch are 3.501, 7.005, 14.010, 21.010, and 28.010MHz.

DJ6SI has listed conditions for those who wish to have QSLs for his various expeditions. They are - (1) after the end of an expedition he will only QSL for a period of seven months, and (2) no QSLs for previous operations will be answered if requested after 30 June 1990. Cards with no postage are answered via the bureaux and the list of priorities for the others is as follows - if sent with (1) more than $2.00, (2) $2.00, (3) two ircs, (4) S1.00, (5) one irc, (6) sase with German stamp.

There is a new station on from **Ivory Coast**. This is TU2UI who will be there for more than a year and who prefers ssb often around 2100 on or near 21.337MHz. K8MM has now moved from his J52US station and is in **Sierra Leone** where he hopes to become 9L1US. He hopes to be on 14, 21, and 28MHz cw and ssb. A French operator is expected to be on the air from **Guinea-Bissau** at any time using the callsign J52NU. SARL has told me that in view of impending political changes **Namibia** will lose its ZS3 prefix. It is not yet known what the replacement will be.

V31KX will be in **Belize** for two years and seems to prefer ssb. He keeps a schedule with his QSL manager KR5N on 18.125MHz at 0130 on Fridays. GM3GDX tells me that Fran, W2BJI - who he talked to when he was J37XC - will be in **Grenada** until 3 April when he goes to St. Kitts as V47KJI until the end of the month. He asks that only those who actually need a QSL to him and if a direct reply is required an s.a.e. and irc should be sent. He likes using 21.280MHz. *QST Canada* reports that stations in Moncton, N.B. may use the XM1 prefix this month to mark the city's Centennial.

The *Lynx DX Bulletin* says that there is a new station on **Macquarie Is**. This is VK0JR and he joins the VK9NS net on 14.222MHz and also appears at week-ends on 14.168MHz around 1000.

1990 28MHz COUNTRIES TABLE

G4MUW	120 (ssb)
GM4OBK	63
G4ZYQ	56
G2AKK	55 (cw)
G4DXW	44
GM4ZIL	43
G4NXG/M	40
G0MXU	16
G0JSM	15

AWARDS

Victory-45 Award

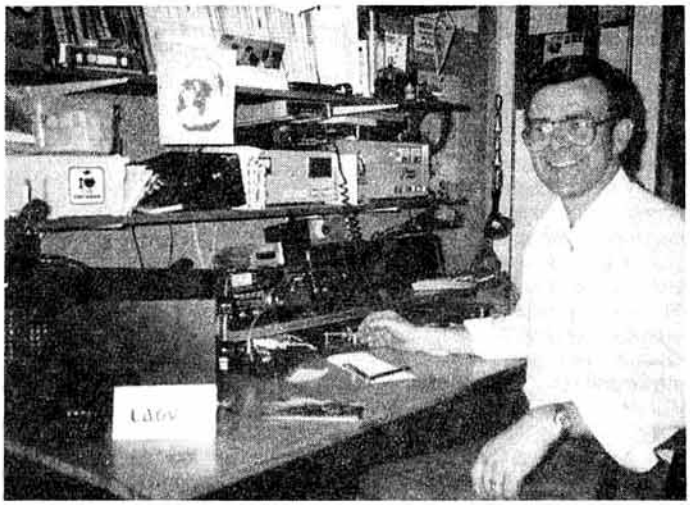
This is to celebrate the 45th anniversary of victory in WW2 in Europe. It is issued for QSOs with Soviet World War II veterans and certain memorial stations and a total of 45 points is needed. Each contact counts one point for Europe, two for Asia, Africa, and N.America, and four for others. European applicants need to have at least 10 QSOs with veterans during the period 1 January to 9 May 1990.In addition they will also be acceptable during the "GC" contest on 15 April and "CQ M" contest on 12-13 May. Most have short callsigns with prefixes in the U1-U0 series. Memorial stations with prefixes EM. EN, EO, ER, and EZ will be on the air from 1 to 9 and on 12-13 May. The award is free and applications should consist of log extracts certified by two amateurs or the RSGB Awards Manager. They go to P.O. Box 88, Moscow, U.S.S.R.

WARC 79 Award

Some details were given last month but I now have them all. You need to have made confirmed contact with at least 79 stations (including one in each call area of Japan) on one or more of the 10, 18, and 24MHz bands between 1 July 1989 and 31 December 1990. Send certified list (including full QSO data), signed by two other amateurs and with 10 ircs to J.A.R.L. Award Desk, 1-14-2 Sugamo, Toshima, Tokyo 170, Japan. Listeners may apply. There is an official application

QTH CORNER

A92BN	YASME Foundation (see A92QL).
A92QL	YASME Foundation, Box 2025, Castro Valley, Cal, 94546, USA.
CY0SAB	VE1CBK, W.E. King, RR 1 Site 35 Box 32, Windsor Junction, NS, B0N 2V0, Canada.
J37XC	(see V47KJI)
P4/N4XCF	PO Box 2209, San Nicholas, Aruba.
P29PL	VK9NS, Box 90, Norfolk Is, 2899 Australia.
SO1MZ	EA2JG, Ave Murrieta 15 13, 48980 Santurce, Vizcaya, Spain.
V47KJI	E. Fran H. Thisse, 164 Washington St, Marlius NY 13104, USA.
VR200PI/JR	KB6ISL, 9605 San Gabriel Av, South Gate, Cal 90280, USA.
VR6JR	G3OKQ, Greenfingers, Oyster Lane, Byfleet, Weybridge, Surrey.
3B8FV	Box 62, Quatre Barnos, Mauritius.
9V1XT	JH0JLP, Shigeo Fujisawa, 10113-10, Akago, Komagane 399-41, Japan.



Erling Johan Wiig, LA6VM, the QSL manager and treasurer of Club Bouvet - 3Y5X. Erling is also QSL Manager for the Peter I Island operation by 3Y1EE and 3Y2GV (photo: LA8CJ).

form obtainable from the same address - sorry, I do not have any of these.

CONTESTS

The Yuri Gagarin Cup Contest

0000 to 2400 8 April

This contest takes place only every third year and covers 3.5 to 28MHz (cw only) and QSOs via satellites (which count as an extra band). QSOs in same continent one point, outside three. Multiplier is sum of ITU zones worked on all bands. Stations may be worked once per band. Send entries by 1 June to GC DX Contest Committee, PO Box 88, Moscow, USSR. I have copies of the rules (sase please).

"CQ M" Contest

2100 12 May to 2100 13 May

1.8 to 28MHz plus satellites (QSOs this way count as an extra band). Single-operator single and multi-band, multi-operator multi-band and listener sections cw and phone. After changing band you must stay there at least 10 minutes. Exchange RS/T plus QSO number (from 001). QSOs with own country count one point, with other countries in same continent two points, and with other continents three. Listeners get one point for logging one side of a QSO, three for both. The multipliers are one for each of the countries in the "R-150-S" list worked on each band. Send logs to CQ-M Contest Committee, P.O.Box 88, Moscow, to arrive by 1 July. Requests for the RSF Awards "R-150-S" "R-100-C" "W-100-U""P-15-R" and "R-6-K" can be claimed when you send in your logs and in this case no QSLs will be needed if the necessary contacts have been made during the contest.

In the **European DX Contest (WAEDC) 1989 SSB** All-Band Section there do not seem to have been any UK entrants. In the Single Band (High-band) category GM3BCL scored 20,554 points, and in the Multi-operator Single-transmitter class GJ0LYP scored 263,040.

In the **1989 IARU HF World Championship** G0/AA6MC scored 84,616 points and GM4OBK 20,200 in the single operator mixed mode section. On cw G3ESF scored 182,942, GM3CFS 127,764, G3TXF 72,964, and GM4ZFE/P 42,416, and GW8GT made 359,840 points in the multi-operator single transmitter category.

PROPAGATION

Smithy's report this month goes as follows :- "February, for some time the favourite to be the peak month of Cycle 22, turned out to be very disappointing. After more than a year in which the average solar flux was above 210 sfu, the monthly figure for February plummeted to around 175 with a lowest daily value of only 138. At the same time the geomagnetic field was rather more unsettled than usual with a few days having an A index below 10. The overall result, therefore, was a spell of rather indifferent conditions on the hf bands - compared, that is, with what might reasonably have been expected at this stage of the cycle.

HF F-LAYER PROPAGATION PREDICTIONS FOR APRIL 1990

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

Time / GMT	28MHz 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 024680246802
** EUROPE								
MOSCOW	....234443..	...24566751.	...477888841	1.2677788973	646665566898	876432234689	7631....1368	43.....3+
MALTA	....345444..	...25677762.	1..588888952	322788888985	876766667899	998543334789	886311112478	++3.....4+
GIBRALTAR	.....22222..	....2454451.	...157777841	1..378888973	653777667898	998754434689	997521112478	++52.....4+
ICELAND	.....	.....1112..	.....233452.	25566751	31.256667886	875654444678	887421112356	554.....23
** ASIA								
OSAKA	...12331....	...144421...	...254333221	...142124452	....1...2673	461	.....13.	.....
HONGKONG	...2456664..	...25666762.	...144347851	1...22125874	2.....2786	475	152	.....2.
BANGKOK	...45677751.	...35667872.	1..124347862	3....1125885	5.....2688	3.....477	155	22
SINGAPORE	...46777751.	..135667873.	1..124347863	3....1125886	5.....2688	2.....477	155	22
NEW DELHI	...46777621.	..1456677431	112223347763	421..1125886	73.....2689	61.....478	3.....157	24
TEHERAN	...56777852.	..2655678741	324422347975	6451..125897	973.....2789	851.....478	62.....156	3.....24
COLOMBO	...56787862.	..1456678841	311113347975	63...1125897	83.....2789	6.....478	4.....156	24
BAHRAIN	..1677888631	1.2655678853	4353223347986	7551..125898	973.....2799	85.....478	62.....156	4.....24
CYPRUS	...578888731	1.1788889853	4348777778986	757755668998	987522335899	9852....2589	862.....367	+3.....35
ADEN	2.1677888853	423655678976	755311247998	9761...25899	984.....2799	861.....478	74.....156	4.....24
** OCEANIA								
SUVA/S	.....11111..	....122232..	...13323552.	...34212573.	..152...262.	...3.....3..	...1.....1..	.....
SUVA/L	6424521..186	55367321.386	2358632126 73	.14851112751	..262...162.	...3.....3..	...1.....1..	.....
WELLINGTON/S	....12221...	...12334321.	...34334553.	..1542125751	..262...265.	...3.....32.	...1.....1..	.....
WELLINGTON/L	54222.....46	664541....67	566751...186	346851...474	.1462....551	..14.....32.	...1.....1..	.....
SYDNEY/S	...3566631..	...56666521.	..1664346641	..1542125763	...21...2773	451	.....13.	.....
SYDNEY/L	21..41....34	3212621...56	4334731111187	212552.11286	...42...1573	...1.....35.	.....2.	.....
PERTH	...577752...	..15876541..	21236434543.	411141125652	5...1...2786	2.....476	154	.....2.
HONOLULU	.....11..	.....1.1331.	....1211451.	...1221145..	..342...23..	..33.....	...1.....	.....
** AFRICA								
SEYCHELLES	2.1666776653	423555677776	755211347999	975...125899	972.....2799	85.....478	72.....156	4.....24
MAURITIUS	311678+88865	533656678987	865322347999	9851...115899	983.....2789	96.....478	73.....157	4.....24
NAIROBI	421677788876	743755578988	976411247999	9972...15899	996.....2689	983.....478	761.....157	43.....24
HARARE	631677++9987	853755578999	986621247999	9985...15899	9972....2699	985.....478	772.....156	44.....24
CAPETOWN	4..588+++988	61.776678999	94.853336999	97.83.114899	9945....1689	8873.....378	674.....156	442.....24
LAGOS	751487+++988	974775558999	997851116999	99882...4899	9986....1689	8873.....378	6751.....156	342.....24
ASCENSION Is	652288777765	874586446887	997773113899	999851..1799	99862....589	8873.....278	6751.....47	342.....4
DAKAR	542278+++986	774486546998	997773212899	999851...699	99862....389	8874.....168	7751.....36	442.....3
LAS PALMAS	1..158888862	321278888984	653688878998	9868876668899	999864334699	9986311.1479	88631....157	++3.....25
** S. AMERICA								
Sth SHETLAND	1....2+++986	3....3668998	621.13336899	853122114789	99742...1568	8974.....246	6751.....13	352.....
FALKLAND Is	4411.4++8986	7633156688898	9976343335799	998742113589	99962....268	8874.....36	6751.....4	442.....2.
R DE JANEIRO	431118876885	663337655797	987654322599	9987521..289	99962.....69	9874.....38	7651.....16	432.....3
BUENOS AIRES	331116888875	653326666787	886644332489	99875111.179	99962.....58	9874.....26	7751.....4	442.....
LIMA	11..22777763	321143665566	654363331148	88765211..27	99862.....5	7874.....3	5751.....	242.....
BOGOTA	1...12666663	21..24654465	653354321137	8765521...17	99863.....5	7874.....2	5751.....	242.....
** N. AMERICA								
BARBADOS	1...26766773	321146644576	654364311168	8876521...48	99862.....17	8874.....4	7751.....2	442.....
JAMAICA	1565653	21..13654455	532133331137	7654421...17	89863.....4	6874.....1	4751.....	.42.....
BERMUDA	3555663	21..14554565	532134321257	7643421...38	99862.....6	7874.....3	5751.....1	242.....
NEW YORK	344542	1....1454564	421.12332256	65322211..37	88752.....5	6874.....2	3651.....	.32.....
MEXICO	244441	1.....354443	321.21232113	55323111...2	58752.....	3774.....	.551.....	.22.....
MONTREAL	233441	1....1344553	42...2232356	64222211.137	78652.....5	6874.....2	3651.....	.32.....
DENVER	1121	12232	21.....22123	43111...12..2	46642.....	2574.....	.351.....	..2.....
LOS ANGELES	.....122.	13331	21.....14212	33111...13..1	25542.....	.474.....	.151.....	..2.....
VANCOUVER	.....	11	1.....1111	221111...21.1	14442....1...	.363.....	..31.....	.....
FAIRBANKS	.....	.....	....1111111.	111121.12211	.2342...21..	..33.....	..11.....	.....

The provisional mean sunspot number for January 1990, issued by the Sunspot Index Data Centre, Brussels, was 179.4. The maximum daily sunspot number was 236 on 20 January, and the minimum was 125 on 9 January. The predicted smoothed sunspot numbers for March, April and May and June were respectively: (classical method) 146, 143, 140 and 136; (SIDC adjusted values) 156, 151, 146 and 140.

The provisional mean sunspot number for February 1990, issued by the Sunspot Index Data Centre, Brussels, was 128.4. The maximum daily sunspot number was 249 on 24 February, and the minimum was 57 on 17 February. The predicted smoothed sunspot numbers for April, May, June and July are respectively: (classical method) 140, 137, 134 and 131; (SIDC adjusted values) 148, 144, 138 and 133.

It will be some time before it becomes clear just how the cycle will now progress. Sudden dips of this sort are not uncommon and do not usually last vey long, and February could still emerge as the peak month in the *smoothed* curve, though this could not be with a smoothed monthly sunspot number as high as the 180 which is the most recent prediction by N.G.D.C. Boulder. Looking back, the highest peaks both in monthly and daily activity were in the first half of 1989 and this, coupled with the steep fall this February, means that the smoothed curve passes through a peak of 213 sfu in June 1989 (month 33) (peak smoothed monthly sunspot number of 158 in July).

Only time will show whether this is the true cycle peak. If so, it was abnormally early, there being no cycles in the reliable record which peaked in less than 39 months, though S.I.D.C Brussels did adopt a September 1989 peak as the basis for their predictions. Perhaps the rapid rise in the first two years which seemed to promise a very high peak has instead given us a lower and earlier one. If so it will still be the second highest on record in terms of 2800MHz solar flux, though just short of Cycle 21 in terms of sunspot numbers.

On the other hand, there have been solar cycles in which the smoothed curve passed through one or more minor peaks before reaching the final summit and there is plenty of time for activity to recover and even to rise above the levels of 1989, resulting in a peak well above that of Cycle 21; though it now seems less likely that the prime position of 19 is at risk. As mentioned last month, even-numbered cycles tend to have prolonged maxima and there remains a good chance that 1990 will prove at least as good as 1989."

BAND REPORTS

The future of this section looks doubtful in view of the large amount of space it occupies - but please keep writing until it stops appearing

This month we have G2s AKH, HKU, GM3CSM, G3s GPE, GVV, LPS, G4s DXW, EHQ, GW4KGR, G4MUW, GM4OBK, G4s NXG/M, SFU, UZN, ZYQ, and G0s BXQ/M, HGA, and JZA to thank for the logs. Stations using cw in italics:

7MHz

0000 *FM/F6HWU, VP2V/W2GUP, 4S7WP.*
0100 *J34P, G3UUV/J6L, 7S7AAA* (Ant).
2000 *G4WYG/ST2*, ZD8BOB.
2100 *JA7ARM*, YI1BGD, *6W1QB.*
2200 *SU1CU.*
2300 A61AC, P43BG.

10MHz

1900 *4K2OIL* (FJL).
2000 *ZS9/DK7PE, 4K4AFM.*
2300 *WF8C/VP9, SM0OIC/YN.*

14MHz

0800 KN0E/KH3, KL7, G0JSM/ZL2/M.
0900 V85GA, VR200PI/YL, VR6YL.
1400 *4K4AFM, 3W3RR.*
1700 AP5HQ, KH6OR, W6-W7.
1800 FH5EH.
1900 *HK0/N8JT, KH6IJ, SO1MZ*, 3W8RR, *8Q7JC.*
2000 A61AC, FJ/K2IBW, *PJ8JT*,VK.

21MHz

1100 *UA0YM.*
1300 A61AD.
1500 *TG0AA, 3C1EA.*
1600 A47RS, *G4WYG/ST2*, ZS3BI.

28MHz

0800 ZL3IX.
0900 HS0B, JT1BS, KG6JJH, KH0AC, XW8KPL, XX9JN, YJs 0AHM, 8M, 1SHD, 3C1EA, 3W8RR.
1000 BV2FA, BV4OB, BYs 4RB, 8AC, RA0AD/JT, V85GA, 5U7NU.
1100 A61AD, P29s CEH, PL, TY0AS, WL7E, ZD7PP, *9J2AL.*
1200 SU1ER, TZ6VV, VQ9LW, 6W7OG.
1300 *A22AA*, C56/G0CBY, P4/N4CXF, *G4WYG/ST2.*
1400 CY0SAB, OD5SK, *TL8PS.*
1500 HK0NZY, *WA0FGV* (S.Dak).
1600 HH2BN, *TG0AA*, N3CRH/TJ, VR6JR.
1700 *A61AC*, FY/N4QDX, S01A, V21/VE3ODC, ZD9BV, 9L1CM.
2100 *CE0FFD.*

Thanks to the following for items extracted: the *Long Island DX Bulletin* (W2IYX), *RSGB DX News Sheet* (G4DYO), the *Ex-G Radio Club magazine* (WA8TGA), the *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), and *DXNL* (DL3RK).

Closing date for June issue is **26 April**.

UHF/VHF

NORMAN FITCH G3FPK
40 Eskdale Gardens, Purley, Surrey CR2 1EZ

The frequent gales and storms in January and February took their toll of antenna installations. Tropo conditions were mediocre for most of the period, 50MHz F-layer propagation was sparse, so there is little exciting news to report. There were several auroral events but activity in them was low.

CHALLENGER UPDATE

Andy Adams, GW0KZG (GNS), has sent the final details of the April itinerary of the RRS 'Challenger' in the North Sea. They plan to sail east from Dundee on 3 April towards Denmark, turning north, via a zig-zag course in the mouth of the Skagerrak, then along the southern Norwegian coast before crossing back towards Peterhead.

What is left of the Derbyshire Hills CG Western Isles expedition site after a force 9 gale which, frustratingly, left the 4x19 2m array undamaged

The next stage will be another zig-zag course between The Orkneys and Shetlands, around the north of the Shetlands across to Norway before a long steam down the North Sea. A port call in Den Helder (JO22) is planned for the 17th. This part of the voyage will be through many 'wet' squares.

The second leg should start on the 18th following the Dutch, Belgian and French coasts, across to the Thames estuary, then zig-zagging along the east coast for a few days. The final stage will be another trip across to Holland then back again to Great Yarmouth by 3 May.

The equipment, QSL route and probable operating times remain as shown on page 22 in the March *VHF/UHF*, so regular monitoring of Andy's preferred frequency of 144.240MHz should prove rewarding.

LUXEMBOURG ACTIVITY

Reg Woolley, GW8VHI/DA4RG, DL8EBW and others plan to operate from CJ square in Luxembourg during Easter, 13-16 April. On 144MHz they aim to operate one station for tropo working and a second for meteor scatter tests. Some microwave activity is possible.

BEACON NEWS

The 50MHz beacon 9H1SIX in Malta was taken off the air. It was due to be relocated on 50.515MHz as soon a new crystal arrived. From Sierra Leone, 9L1US (ex-J52US) was planning to run a 24 hours-a-day beacon on 50.091MHz from a QTH remote from his home station.

Brian Viney, GW4KDP (GDD), has recently returned from Gibraltar and wrote: "The beacons have been vandalized yet again. There is an on-going problem with PMR users who seem to blame the beacons for any problems that occur, and put them out of action by destroying the antenna systems." He reports they were still QRT on 10 February. At a local club meeting, it was suggested they might describe them as 'scientific beacons' in the faint hope that they might then be left alone.

IRISH ACTIVITY

Martin Dale, G6ABU (NOT), says that the Derbyshire Hills Contest Group plans to operate from IO61 square during this year's Perseids meteor shower in August. They completed a very successful expedition there in 1984 and hope to use their original callsign, EI2VPX, again.

Martin reported that the group's 1989 expedition to the Western Isles (IO67) was a disaster. On 10/11 August, force nine severe gales wrecked their tents and stations, although the four 19-element Yagi array survived. A few stations were worked prior to the gales. The logbook was retrieved from a nearby stream, so it should be possible to decipher the callsigns of stations who worked GM4ZAP. Anyone needing a QSL should contact Martin, who is QTHR.

REPEATER NEWS

The Kent Repeater Group has sent its 58th Newsletter which gives details of the status and performance of its seven voice repeaters, GB3s KN (R4), KS (R1), CK (RB0), EK (RB2), NK (RB4), RE (RB11) and SK (RB6). It also operates the packet relay, GB7CK, on 144.650MHz. The Newsletter includes operating notes on the GB3US logic used on KN, KS and RE, and a rather humorous article on EPROMs by G4VSZ. For details of the KRG, contact G0AMZ (QTHR) or telephone 0634 376991.

The Aylesbury Vale Repeater Group controls GB3VA (R4), GB3AV (RB2) and GB3BV (RB1) and has forwarded its 14th Newsletter. This carries comprehensive information on the repeaters, a coverage map for GB3BV and a short article on a TX

ANNUAL VHF/UHF TABLE
January to December 1990

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
G0CUZ	—	—	—	—	53	8	14	1	—	—	76
G4XEN	—	—	—	—	33	6	27	2	1	2	71
G7CLY	—	—	—	—	41	4	—	—	—	—	45
G4OUT	—	—	7	1	28	5	—	—	—	—	41
G6HKM	2	4	—	—	21	7	1	2	—	—	37
GM0GEI	18	15	—	—	—	—	—	—	—	—	33
G3FPK	—	—	—	—	25	4	—	—	—	—	29

British counties are those listed in the January 1990 *RadCom*, but excluding IOS; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI counties. Countries are the usual DXCC ones plus IT9.

shutdown timer by the editor, Mike Marsden, G8BQH. Contact him (QTHR) for details of the AVRG.

John Rhind, G6JR (BKS), is the secretary of the Milton Keynes Repeater Group and sent a copy of its December journal. (He edited this issue but the group seeks a permanent editor.) It contains details of GB3MK on RB0, which is located in Milton Keynes, and a coverage map. There is an interesting article on Electrical Noise in Motor Vehicles, which is to be continued. For information about the MKRG telephone G6JR on Milton Keynes (0908) 604275.

THE TABLES

The first listings in this year's annual table starts in a very modest way this month. The rules are summarized at the foot of the table but if anyone wants a complete set, with a counties and countries list, just send me an SASE.

INTERFERENCE

Each month, more examples of digital RF pollution appear and this time the sufferer is K A Hammersley, G8RRA (WMD). His problem appears to be a Hitachi TV receiver type CPT2178, used by a neighbour across the road, and it provides an S9 signal on about 144.200MHz. There are other noises every 15kHz and the 50MHz band is also affected.

G8RRA contacted Hitachi Sales (UK) Ltd whose Customer Relations Consultant suggested, "...it is possible this is caused by a signal being created within the power supply of the television receiver." He then wrote that they had not received any other complaints and that, "...all our products conform to BEAB standards including radio interference levels."

Has any reader 'in the trade' any advice to offer? One experiment would be to disconnect the TV antenna; if the QRM diminishes, a braid breaker filter at the TV set to stop radiation from the feeder braiding could be tried. These are available from RSGB Sales and are regularly advertised.

Andy Newell, G7CFX (HPH) is suffering terrible QRM from a local 'Spectrum Plus 2' computer system. He has disconnected all the peripherals to no avail. He tried contacting Amstrad for help, but concluded that the switchboard operator has instructions not to put through any calls about interference problems.

Other Spectrum series models seem less troublesome according to Andy, so have other readers had problems with the Plus 2? They are quite popular and are used in amateur stations during operating periods, so let us know if there are any simple means of reducing the racket - apart from switching it off!

SOFTWARE

Several readers have written about contest scoring programs incorporating duplicate checking. Jim Dunnett, G4RGA (SOM), sent me a copy of his dupe-check routine, HASHQSOC, which he claims is the fastest method outside machine code. It does not save the actual calls and QSO numbers, but can easily be adapted to do so by dimensioning extra string arrays.

I ran HASHQSOC on my PCW8512 and it works very fast on normal calls, but as Jim warned, it threw out 'special' calls, such as GB99ZZ, and reciprocal ones like F/G3FPK. However, the F/ or /P parts could be stripped off before processing in the latter case.

Andrew Talbot, G4JNT (HPH), has written a comprehensive suite of programs incorporating all you need to log, check and print a contest entry. He is selling these so send him an SASE (QTHR) for details of this and other software. If you are looking for log book software, John Hedges, G7ANQ (WKS), recommends 'Log Book' from MTS - see the Classified Ads section.

Nigel Wilson, G4VVZ (NOT), has also produced some up-market software and kindly sent me a set of programs for contest scoring which include full dupe-checking. He overcame the rather slow operation of disc sequential files by using the 'Jetsam' keyed files facility available in the 'Mallard' Basic CP/M language used by the Amstrad PCWs.

This software has been used to score all the contest logs for the Derbyshire Hills Contest Group since autumn, 1987, Nigel says he will produce "...a tidied up version with manual, but without some of the frills." He has offered to copy it for others who send him a formatted CF-2 disc and sufficient return postage; he is QTHR.

I have a number of amateur radio programs written for the Amstrad PCW8000 series computers, but please do not send disks with requests to "...copy all your amateur radio software." Send an SASE first for the latest PROGLIST, pick what you need, then send your formatted disk(s) and I will copy.

METEOR SCATTER

The main meteor stream in April is the Lyrids which should peak on the 22nd. The highly elliptical, 415 years period, orbit is inclined at 79.8 degrees to the ecliptic plane, so this stream suffers minimal perturbations by the planets of the solar system. The stream velocity at atmospheric encounter is a high value of 48.8 kilometres per second. Its parent comet is Thatcher 1862 I.

The British Meteor Society's Radiant Catalogue records a variable ZHR - Zenith Hourly Rate - for this stream, with 113 observed in 1982 and 30 in 1984. Strong peaks of activity could occur in any year, but these are quite unpredictable. The best times for the usual, four directions are;- NE/SW around 0200 and 0930; E/W around 0400; NW/SE around 2300 and 0700; N/S around 0000 and 0800. The shower is above the mid-UK horizon between 1830, through midnight, to 1400.

The next useful stream is the Eta Aquarids which has a period of 11.18 years and an orbit inclination of 83 degrees. The velocity is 66.8km/s and its parent comet is the famous Halley. The ZHR is quoted as 50, but in 1980, 110 was observed. This stream is above our horizon between 0200 and 1300 and the best times are;- NE/SW around 0600; E/W around 0800; NW/SE around 0930 and N/S around 0500 and 1100. 3-5 May is the active period for the Eta Aquarids.

Commenting on the difference between the recorded visual and radio maxima, Robert Mackenzie, the director of the BMS, writes: "The Quadrantids are a very good example because the maximum is of such short, sharp duration. There is a time difference of about four hours between the radio and visual maxima. Radio systems are capable of detecting much fainter meteors (meteoroids of lower mass) than visual observers can see. The Earth is actually encountering a great number of low mass meteoroids at a different time to those of somewhat higher mass. Thus the time of maximum depends on the observing techniques used."

He goes on to explain that, as a result of various dispersive effects - pressure of sunlight, the solar wind, etc. - the meteoroids are really 'sorted' into their orbits according to their mass. In practice, this means we often get the best reflections from a large number of low mass meteoroids, which may not even be visible in a telescope, rather than from fewer, larger mass ones which produce spectacular 'shooting stars'.

Meteor streams are a fascinating branch of astronomy and anyone already familiar with amateur radio satellites should have little difficulty dealing with their much larger orbits. I have learned a great deal from the publications of the BMS and can recommend membership to keen MS addicts. For full details, send an SASE or IRC to Robert A Mackenzie at 26 Adrian Street, Dover, Kent, CT17 9AT.

Back to computer software, and Roger Blackwell, G4PMK (YSW), has written a complete suite of programs for PC-compatible machines, primarily aimed at the amateur astronomer which he calls ASTER. It includes a meteor shower predictor and comes complete with a manual on either a 3.5" 720k or 5.25" 360k disk. Send him an SASE for details and cost. He is QTHR.

50MHz

Speculation continues on whether Sunspot Cycle 22 has peaked, and if not, when it might happen. The January report from Ray Cracknell, G2AHU (HWR), includes data from Boulder, USA, reporting the mean sunspot numbers as 166.1 and 179.4 for December and January respectively. The corresponding adjusted mean 2.8GHz solar flux figures at Ottawa, Canada, were 206.3 and 203.4.

January revealed: "There were several mild auroral openings and a higher incidence of Sporadic-E than previously reported in mid-winter. Having complained during the previous two winters of under exploitation of winter Es, this may not indicate a real increase."

Summarizing results from Britain, Ray reports: "The excellent transatlantic conditions experienced during December tailed off during the first week of January and, except for a long opening to eastern and central North America on the 27th, signals only appeared spasmodically for short periods in localised areas. Otherwise DX contacts were confined to Central America, Ecuador and the north of South America, and the west coastal regions of Africa."

Costas Fimerellis's, SV1DN, report from Greece includes the comment: "The TEP season may be said to have started on 28 January when there was pronounced evening type, pure TE, up to 62MHz. A feature of cycle 22 has

been the lack of typical pure TE type evening signals; i.e. with rapid flutter similar to auroral signals, and so far, relatively few openings on 144MHz."

On 13 March 1989, G4GLT and KA1MFA made an authenticated auroral Es QSO at 2234UTC. This is being claimed as a first between Europe and America, and the greatest distance worked from Britain via this mode. Ray would like to know if there are any prior claims. I do not know of any, but it was just before I started writing *VHF/UHF* and no readers' letters for that period were passed to me.

Now some items from the Ted Collins, G4UPS (DVN), news pages starting with possible operation from Robinson Crusoe Island, Juan Fernadez (FF06), by the CE0ZZZ expedition around the end of March/beginning of April period and using 100W and a 5-element Yagi.

The first of the new Belgian permits - they have had the band before, of course - was issued to ON4PS on 8 February and Pierre's first QSO was with PA3EUI. There are no antenna or time restrictions. The first of the new Swiss permits were received by husband and wife team HB9CRQ and HB9XAJ on 7 February, but like the Belgians, they had the band in the late 1940s and 1950s.

Marc Schiltz, LX1SI, told Ted that the first Luxembourg permits were expected to be issued before 15 March. The probable conditions are 100W ERP, SSB and CW only, 50.100-50.200MHz with no antenna or time restrictions. Y33UL reports that "...talks regarding 6m are going well..." and Matt reckons it won't be too long before some GDR amateurs are on the band.

Clive Penna, GM3POI/P (IO88), will be QRV from Deerness (OKE) from 10-19 April; QSL via G3POI. Trevor Day, G3ZYY (CNL) plans operation from Gibraltar in the last week of June and first week of July using the call ZB2HN; a modified IC-211 and amplifier will be taken. QSLs should go to 46 Beatrice Avenue, Saltash, Cornwall, PL12 4NG.

An unusual one to listen for is ZS9H from Walvis Bay. He is George Hart, the captain of a fishing boat, and plans some /MM operation on the band. QSL via PO Box 1018, Walvis Bay 9190, Republic of South Africa. G4UPS has been asked to act as TR8CA's QSL manager for G stations. Alain has provided Ted with 40 blank cards, so if you need a Gabon QSL, contact him at 27 Parklands, Hemyock, Devon, EX15 3RY.

On 20 February, KP2A worked Kim, JA8JRC/6W1 (IK14), who said to QSL via JA8KJH. He is thought to be someone working in Dakar. Tony Selmes, G4KLF/MM, has received his Oman call A45ZN. Future /MM operation will be under his South African call, ZS1D/MM and he hopes to apply for a 50MHz experimental permit in due course.

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	144MHz	430MHz	1.3GHz	Total
G3IMV	206	427	125	51	809
GJ4ICD	344	263	119	59	785
G4IJE	307	338	5	2	642
G0DAZ	137	316	122	39	614
G4RGK	69	302	140	52	563
G6HKM	190	217	109	46	562
G4KUX	—	384	120	—	504
G4TIF	172	204	111	—	487
G4XEN	66	294	114	5	479
G6HCV	243	231	—	—	474
G1KDF	139	180	102	37	458
G6DER	43	183	114	82	422
G8LHT	113	185	93	14	405
G0CUZ	—	330	73	—	403
G4MUT	98	153	94	34	379
G4RRA	—	280	80	—	360
G1LSB	44	172	143	—	359
G4VXE	147	162	42	4	355
G0EVT	88	209	57	—	354
G4SSO	—	256	98	—	354
G4PIQ	—	261	87	—	348
G4SWX	—	347	—	—	347
G1SWH	143	149	53	—	345
GM4YXI	—	340	—	—	340
G4DHF	—	325	—	—	325
GJ6TMM	109	151	52	—	312
G8ATK	—	143	94	52	289
G0GMB	—	187	99	—	286
G1GEY	—	170	92	22	284
G0JHC	232	48	—	—	280
G8PYP	118	105	31	—	254
G6STI	—	152	69	24	245
G4YTL	—	245	—	—	245
G3FPK	—	241	—	—	241
G0LFF	83	153	—	—	236
GM4CXP	—	198	31	—	229
GW4FRX	—	228	—	—	228
G1SMD	115	106	—	—	221
G4DOL	—	216	—	—	216
GM0GEI	177	—	—	—	177
G8XTJ	44	120	—	—	164
G0HVQ	87	71	—	—	158
G1DOX	54	73	16	8	151
G6MEN	67	54	27	3	151
G4XBF	—	150	—	—	150
G4TGK	—	137	—	—	137
GW4VVX	—	115	—	—	115
G1CEI	11	77	18	—	106
GM0GDL	—	83	22	—	105
G6UWO	—	41	44	18	103
G7CLY	—	100	2	—	102
G1WPF	—	101	—	—	101
G6ODT	—	21	47	—	68
G0HDZ	—	64	—	—	64
GM1BVT	41	21	—	—	62
GM1ZVJ	6	48	—	—	54

No satellite, repeater or packet radio QSOs.

Pitcairn Island has always been a much sought after country on the HF bands and now Jim Russell, G3OKQ, has arrived on the island where his call is VR6JR; QSL via his home call. He has been using the special anniversary call VR200JR and the QSL manager for that is KB6ISL. Jim is using a TS-680S and 3-element Yagi, but an amplifier and 6-element Yagi are due to leave Auckland by sea on 4 April.

Tom Freidrich, ZS3AT, has completed his tour in Namibia and returned to Germany. Roy Handley, G3GJQ/5N0, is back in the UK and will not be returning to Nigeria. His QSL address is 16 Ybryn, Glan Conway, Colwyn Bay, Clwyd, LL28 5NJ. Steve McDaniel, KG4SM, will be leaving Guantanamo Bay this summer and will answer QSLs direct or via the bureau. Anyone working him just prior to departure should send their card to WF0G.

From Bill Tynan's, W3XO (Texas), 'The World above 50MHz' column in the March issue of QST, I see that KL7IKV reckons no Europeans have been worked from Alaska. WA1OUB, well known to UK operators, has received a reception report from a Soviet SWL in NO66 who heard Bob at 1416UTC on 7 June 1987. His report was RST559 and it was almost certainly Es propagation over 8,800km.

Next to individual reports. Darrell Moody, G0HVQ (GLR), reports the band having been very quiet since the first week of January with only weak signals from VE1YX heard on 12 January. In a short aurora on 4 February, he heard GM0GEI and GM3WOJ, who was working LAs, between 1750 and 1815.

Neil Carr's, G0JHC (LNH) previous report was not printed, but he recorded the last F-layer signals on 4 January to W8. In his 20 February letter, he records auroras on 20, 21, 24, 29 and 30 January and 1, 2, 4, 15, 16, 18 and 19 February. The best day was 1 February when OZ4VV on CW was a new country. FY7THF was S9 on 7 and 8 February with no other activity. 9L1SL peaked RST579 on the 11th and was worked at 1224; another new one.

Ian Galpin, G1SMD (DOR), uses an FT-690R at 10W to a dipole antenna and caught the winter Es opening on 15 January. Between 1902 and 2108 he contacted OH1YP (KP10), SM6s KJX, PU and ESG (JO67), SM0CHH (JO89), OZ7DX (JO66) and LA9BM (JP40). He mentions a local VHF DX net on 145.275MHz FM which has been going for four years. Participants include G0HKT, G1DWQ, G6CGQ, G6MXL, G7AZP, G7CYO, G7DKE, G7DLH, G7DMD and G8PYP.

The January report from John Heys, G3BDQ (SXE), was also omitted last month. He now has all the QSLs for WAC. In the Es event on 15 January, OZ4VV (JO46) was his first OZ. Mike Wills, G3OIL (WLT), sent a photocopy of his QSL from KJ6WO/DU3 (PK04) for their SSB QSO on 14 October 1989 at 0917UTC. Gordon wrote: "To the best of my knowledge, this was the first G/DU contact." The following day he worked G3KOX, G4CCZ, G4AHN, G3ZYY and G3POI.

Roger Horne, G4HBA (YSW), mentions several auroras in January, most only producing GM contacts, but on 1 February, he worked OY9JD for country number 51. Es openings on 14 and 15 January brought a string of OZs. He has calculated solar flux averages for last year and found that February and June gave the highest values. The average for January to June was 220 and for the second half of the year, 213.

G4UPS worked VE1 and W1 on 27 January, 1317-1341, but nothing heard after 1405. On the 29th, Ted heard ZD8VHF via TEP from 1100, later changing to pure 599, then back to TEP again by 1159. At 1135 he worked TU4DH (IJ77). 1 February brought QSOs with VE1, W1, W2, VE3KKL (FN25), W4WHK (EM90) and WB8VHF (EM79), 1622-1a47.

OZ and SMs were heard on the 4th from 1053; FY7THF was copied at S5 around lunch time for ten minutes on the 6th and 7th; ZS3E worked at 1630 on the 8th with ZS9A heard. On the 11th, 9L1SL reported working CT, F, G, GI, GM, OZ, SV and KP4BZ. Via aurora on the 15th Ted worked GM3WOJ (IO77) at 1810, heard GM0GEI at 1900 and worked GM4DGT (IO86) at 2032; no Gs were heard. On the 18th, he had a back scatter QSO with GI8YDZ at 1140.

Ela Martyr, G6HKM (ESX), got off to a reasonable start on New Year's Day with W1DR (FM17), WA4LDU (EM93), WA4PGM (FM07) and KP4BZ (FK78). YV5ZZ (FK70) was new on the 4th and assorted Ws were also contacted in FN20, 31 and 42.

Geoff Brown, GJ4ICD, reports the TEP season back on 3 February; while trying to work an OE at 1500, he was called by ZS6XJ. Other ZSs were worked later and ZS3VHF was audible till 1900, but no other activity. At 1818 he made the first

GJ/OE contact with OE6AHD. On the 4th, more OE QSOs plus some PAs and Geoff claims a GJ - and British Isles? - first with 9L1SL at 1633.

On the 8th at 2320 an MS QSO with HB9CRQ (JN47) was his 80th country. The paths from Jersey to OZ, HB9 and OE via MS seem very consistent. On the 21st at 1330, TR8CA was copied; he is running a beacon on 50.091MHz - pity it's the same as 9L1US's though. A CQ DX call at 1412 on the 22nd was answered by ON4PS; hardly DX but another GJ first.

On the 23rd, the 9L1US beacon was copied at 1120 and ZD8VHF at 1145. 9L1US was S9+ at 0945 on the 25th and there were lots of Fs at 180 degrees on back scatter. At 1022, Geoff worked SV1OE and at 1105, TR8CA. At 1130 the TR8 and 9L beacons were both S4 with warbles and echoes apparent. He wishes the OE, HB9 and OZ operators would not sit on 50.110MHz all the time and suggests they might monitor "...the good old VHF net on 14.345MHz" more often.

Keith Boleat, GJ6TMM, only lists QSOs with SM7FJE (JO65) on 16 January and OY6FRA (IP62) at 1735 on the 17th for this year. Steve Jones, GM0GEI (HLD) reports an auroral QSO with GJ4ICD at 1745 on 4 February for his 50th country.

GW4KDP reports that the only Gibraltarians active on the band at the moment are ZB0E and ZB2BL. The B licences, with the zero number, have nearly gone through the alphabet so he concludes that the hobby is in a fairly healthy state on The Rock.

Paul Baker, GW6VZW (GWT), wonders if anyone is QRV from Fermanagh and Tyrone? He caught the Es event on 15 January and worked six SMs and three OZs between 2010 and 2045. Next day, between 1525 and 1715, another Es spell brought a couple of SMs and four OZs, two of whom, OZ1CFT and OZ1CSI (JO75) were on Bornholm Island. His antenna was subsequently damaged in the January gales but he has since fixed it with two degrees of elevation and new coaxial feeder. He is now getting excellent reports in inter-G working.

Finally, don't forget to monitor 50.105 and 50.110MHz, the frequencies allocated to the North Pole 90 expedition. The callsigns are GB4MSS/UA0 for the base camp and GB4ICE/UA0 for the forward base.

70MHz

The January issue of QSB, G4WND's excellent newsletter includes the usual 'Who's on Where?' feature. The main articles are on Pye Westminster modifications, the second part of G3NAQ's Auroral Propagation treatise and the second part of G1GVA's 70/50MHz transverting piece.

Ian Cornes, G4OUT (SFD) operated in the Cumulative session on 11 February and found six counties for the annual table, to add to the one worked in January; conditions were very flat. GJ6TMM, GJ1TJP and GJ0FTZ hope to be QRV soon using Pye Europas running five watts.

Hugh Cummings, GM0HSC (SCD), writes that the Young Amateurs' Group in Scotland were donated about 30 Pye Cambridges by Terry Darke, GM3VQJ, which members have been busy repairing and converting for the band. Hugh and GMs 0MUI, 0MUJ, 0MUO, 0LKS and 7BPA are already operating on 70.260MHz AM, while others are awaiting crystals.

144MHz

Colin Morris, G0CUZ (WMD), reckons that the Quadrantids shower was a 'wash out' this year, but on 10 January he worked LA5SAA/P (JO39) by MS for square number 330. The only other MS completion was with SM6DWF in 20 minutes on the 28th. The best of the auroras was on 1 February when he worked various GMs between 1730 and 1850. Colin heard of an Es opening on 20 or 21 January in which DLs worked into the Rome area around 1030.

During January, G4OUT worked 28 counties, the majority on the 21st when your scribe was busy editing the March *VHF/UHF*! Dave Dibley, G4RGK (BKS), also mentions the non-appearance of the Quadrantids.

John Regnault, G4SWX (SFK), took part in the single operator section of the DARC Winter VHF Contest on 4-6 January and was the outright winner, his 283 QSOs being worth 111,788 points. Andy Cook, G4PIQ (ESX) amassed 46,591 points which earned him 10th place out of 58 entrants.

John Palfrey, G4XEN (NHM), seems to have missed the auroras and, like the rest of us, is utterly fed up with all the gales we have been having. He complains of difficulty arranging MS skeds on the 20m VHF net, especially at weekends, when everyone seems to be fixing up EME skeds. He suggests the EME operators might like to consider shifting down the band a little, maybe to 14.325MHz?

G6HKM reckons that January was a disaster compared with last year. On the 9th Ela worked EI3GE and on the 20th, EI3FW, both in Wicklow. On the 13th, best DX was DA4JA (JO41) and on the 20th, GI0GDP, G0EHV and F6BTX (JO10). The tower has been in a safe horizontal position much of the time, but was put up on 18 February to work GI4SAM

John Hill, G7CLY (HBS), got off to a good start this year and worked into Cornwall, G1KTZ, for the first time on 14 January. Storm damage on the 26th altered his 16-element Yagi to a fourteen and a half element version but he was able to work EI2GK and EI3GE with it.

430MHz

G4RGK's EME array was badly damaged in the January storms but on 20 February, Dave wrote;"...it's all repaired now, ready for the next storm!" G4XEN reports conditions "...pretty abysmal..." in the contest on 4 February. Best DX was PA3DZZ at 399km, but it was so poor that John didn't stay till the end. G6HKM worked F6BTX (JO10) on 20 January, but missed the contest due to a sore throat, hence the low score in the table.

DEADLINES

No 1.3GHz news so that's all for this month. The deadline for June is 21 April and for July, 26 May. Let's hope we have come to the end of the destructive gales and floods and that there is some reasonable tropo to report next month.

SWL

BOB TREACHER BRS 32525
93 Elibank Road, Eltham, London SE9 1QJ

We have some rave reviews of the HF bands this month. Many reports remark on how good the DX bands had been in both January and February. Some listeners therefore had new Pacific countries to report on HF, while LF had provided much in the way of Middle and Far Eastern DX.

Stations had been heard from Micronesia and the Marshall Islands using new V63 and V73 prefixes, and there had been continuing activity from Thailand in the guise of XW8KPL.

Conditions on the "New" bands had also been good, with SM0OIG/YN heard on 30 metres. On 17, RW9FW, UL7JC and ZL3GN were heard, while 12 metres had provided interesting loggings in the shape of 9H3DX, ES7JW, JA3NUT, CO6CG and UA9MGO/UA9K. It seems that more and more Russian stations are being heard on both 12 and 17 metres.

14MHz conditions had been good, with many IOTA Islands being logged by contributors, including AL7LJ (Attu Is), W7KT (Veshon Is) and A43DX/A (Mahood Is). 3W3RR also figures in a few logs, as did VK0CH on Mawson Base, Antarctica. 7S8BBB was a Swedish station active from Antarctica, while 4K2OIL and 4K2OT were heard giving away contacts with Franz Josef Land. CE0OGZ and VP2V/KG6WI were heard on CW, while 6Y5/OE2CHN was heard on SSB. Away from IOTA, TI2LAK/HP4, YI1BGD, XT2KG and 9Q5TE were noted.

21MHz might even have overshadowed 14MHz for DX, with some Pacific and Far East exotica noted. Some of the best callsigns were YJ1SHD (Shepherd Is), ZM7VS (Chatham Is), 3D2AG, 7J1AGW, V63AD, H44SH, YJ0AHM, 4K4BAN (AS42), DX8I and DL5UF/H44.

Not to be outdone, 28MHz was also in good shape. 9M8PV was heard (I could do with that one!), together with ZS9/DK7PE (Walvis Bay), A43XA, W3JNO/C6, VQ9LW, TR8GG, HS1BV, HS0B, VS6BI, A47RS, A92QL, J20TW, TU2QQ, ZW8KPL, V63AO, A22AP, 4S7EP, ZF2KE and G4WYG/ST2.

Turning to the LF bands, 7MHz had been the "ace in the pack" with very much DX being heard. In fact several listeners are saying that this could be the best year yet for DXing on the band. Several listeners already have scores in the 140's and it is only February — at the time of writing. David Whitaker provided the best 7MHz list which included J88AB, TZ6PS, VP2EXX, TJ1BW, 9Q5PL, PY0FF, P43BG, FT5XA (at 1807), ZD8BOB and WL7E.

On 3.5MHz, A61AC had been quite active. Other DX mentioned included G3UUV/J6L, N2KK/6, J73BS, TL8WD (at 1730), PY0FF, YC5ODQ, 3W3RR, JD1AMA, 9X5NH, NL7E and DU9RG, who Albert Tideswell BRS48462 remarked was 5x9 for about 15 minutes around 2200 on 10 February.

The CQWW 160 Contest produced some good conditions with 5H3TW a good 5x6 signal around 2220 on the Saturday evening. This was country number 133 for David Whitaker. He heard 43 countries in the contest, including VP9, OY, 4X4, YV and HK. Others worth mentioning were RH7W/RA3PF, UG6GAW, UL7TDU and UM8MHW.

QSL RETURNS

A number of listeners mention receiving interesting HF QSL cards. Robert Small A8841 was pleased with VP8BXK (South Orkney), ZK2VB, VP5VAD, ZS1IS (Walvis Bay), 5J0DX (Gorgona Is), CW0L (Lobos Is), A35SK, YJ1TRS, CY0DXX (Sable Is), YI0SW (after an eighteen month wait for a direct return), AL7LJ (Attu Is — the last island in the Aleutian Chain), and AJ0C/KL7 (Adak Is).

Brad Bradbury BRS1066 mentions an eyeball QSO with Stan Porter ORS45992 who is now living in CT1, but was back home in the UK for a few weeks early in the New Year. QSL returns included KD6TB/DU2, VK9YA, plus a crop of Russian oblasts to make 165/181 confirmed/heard. David Whitaker mentioned CN0A and HV3SJ on 1.8MHz for numbers 121 and 122 confirmed.

VHF NEWS

The only real news to fit this heading this time around came

from Mick Toms BRS31976, who bemoaned a poor Quadrantids meteor shower in January. The peak was around 0500 on the 3rd which he (and I) missed. However, he did hear good reflections from HG5DXC, SM2EKM, LZ2UU and EA3DXU all on CW, and RB5LL (new country) and YU3DX on SSB. On the tropo front, Mick had caught occasional short openings with stations in JO30, JO31, JO40, JN48 and IN88 being heard. Looking back a shade, Mick also thought the Geminids meteor shower in December was poor. Only DK9LY was heard on CW, while SSB accounted for OE5OLO, DL3RBH, IK0BZY and IW8BZM.

On the QSL front, Mick is chasing hard for the next Squares Award and cards from IW5BPE (JN52), IC8EGJ (JN70), 14TDK (JN54), IOUZF (JN63), SM0UOG (JO89) HG2RG (JN87) and HG5CW/7 (JN97) will all help.

DX NEWS

With the CQWPX contest just passed as you receive this issue, there will no doubt have been many exotic prefixes and expeditions which I will try to cover in next month's SWL-SA. One which would have been heard was the trip by WB2DND to operate as A61AD. Remember also that the ST0 trip might be active at about this time — a rare one this. Several other juicy ones for listeners to watch for in April are HR/F2JD, JX7DFA by LA7DFA, V47KJI and V21AJI by W2BJI. And remember, ZS8MI (Marion Is) is scheduled to go QRT this month.

To celebrate an Anniversary in San Marino T70A/10 will be active on 21/22 April. If listeners hear 10 T7 stations between 15 April this year and 14 April next, you can claim the ARRSM "10th Anniversary Award". You can count the same station on different bands to make up the ten loggings — should be easy enough. Claims should go to ARRSM, Box 77, San Marino 47031, with the $10 fee.

Now, something different for UK listeners to listen out for. Two UK operators, G0GWA and G0KPH have been invited to participate in a multi-national expedition to the North Pole using "off-road" vehicles. Most of the radio operating will take place from a base camp at a site 450kms from the Pole using the callsign EK0AB. A station with the cross-country vehicles will sign EK0AA. Between 15-20 April, overseas visitors and the Press will be flown to the North Pole and there will, hopefully, be a period of radio operation to commemorate the 45th Anniversary of UNO. QSLs will be via G4PKT. Exact frequencies were not known at the time of compiling this piece.

According to DX News Sheet, it seems that there might be some problems with direct QSL cards sent to the Soviet Union being "tampered with." If listeners decide to QSL direct to Russian operators, they might do well to heed this advice:

a) Do not put callsigns on the outside of envelopes;
b) Do not mail SAEs to the USSR — they are a waste of time since the envelopes are not of standard USSR size. They therefore attract attention;
c) It might be better to mail your QSL in an "international airmail envelope which protects your mail. Conceal IRCs/dollar bills between the QSL and another piece of paper;
d) If possible, seal the envelope with Scotch tape;
e) Avoid "flashy" stamps;
f) Do not send IRCs to PO Box 88 — they do not reach their intended destination!

There is likely to be a USSR callbook available later in the year. More details when I get them.

DXNS also carried the news in February that David Whitaker BRS25429 Heard All Continents on 40m SSB in 5 minutes. Can anyone better that?

1990 HF TABLE

Let me first acknowledge the 1989 entry of 734 by G1EMD. I hope this year's table will be better supported. Here is the first listing:

STATION	DXCC	28	21	14	7	3.5	1.8	TOTAL
BRS 25429	199	107	126	124	144	83	47	631
BRS52543	125	43	37	45	102	70	24	321
BRS1066	100	54	48	64	61	41	35	303
BRS25209	—	46	40	50	91	42	21	290
G1VDW	40	13	8	28	1	8	—	58
BRS32525	12	12	—	—	—	—	—	12

FINALE

There you have the latest HF and VHF news from listeners and for listeners around the country. If you have any news to offer for this column, please ensure that it is received here by Monday 26 April.

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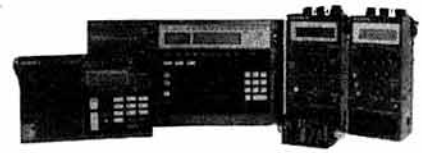
SONY RECEIVERS



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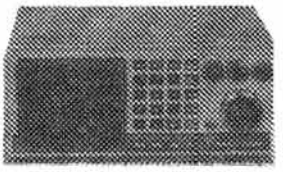

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TECHNICAL TOPICS

PAT HAWKER G3VA

STEERABLE 7MHz DX ANTENNA

Tony Preedy, G3LNP notes that anybody who still has an unguyed 18-metre tower supporting an HF rotary beam (and a garden that can accommodate a circular radius of some 4.6m) still standing after the winter's persistent gales can easily provide themselves with an effective steerable 7MHz DX antenna: see **Figs 1 and 2.**

He writes: 'A figure-of-eight horizontal radiation pattern with a theoretical gain of about 5.5dB over a quarter-wave (monopole) radiator is achieved by driving two vertical wires in antiphase. The central metal tower does not greatly influence the radiation pattern since the net current induced from the two wires is theoretically zero. Similarly the horizontal feed sections are dimensioned such that they have no net radiation perpendicular

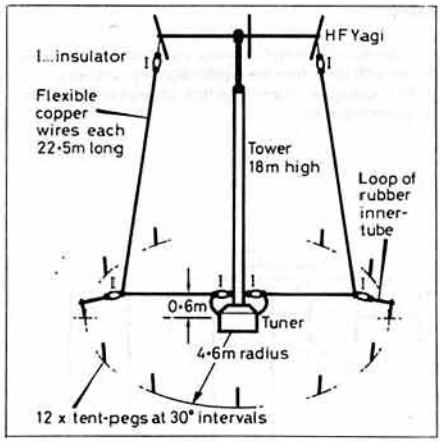


Fig 1. Construction details of G3LNP's steerable 7MHz DX antenna providing roughly 5dB bi-directional (figure-of-eight) gain and good low-angle characteristics with some 30dB rejection of signals from the sides.

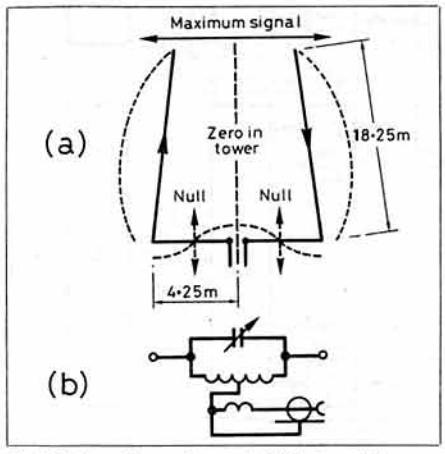


Fig 2(a) Dimensions and current distribution of the G3LNP antenna for optimum directional performance. (b) Tuner as built in waterproof plastic carton. Coil 26 turns, 16 swg, 5cm diameter, 15cm long. Link 3 turns insulated wire. High-voltage 50pF variable capacitor.

to their axis. Radiation is therefore only end-fire and at low angles of elevation.

'The method of driving the wires in antiphase by using a balanced ATU as shown eliminates any need for a counterpoise or ground radials. The tuner, assembled in a plastic ice-cream carton, was adjusted for minimum VSWR at the centre of the band only.

'Construction is straightforward, as illustrated, but unfortunately rotating the beam is a three-stage operation which involves first unhooking the ground attachments, rotating the HF Yagi and then re-attaching the wires to the appropriate pair of tent pegs.

"Performance has been impressive in spite of poor local ground conductivity. DX stations were typically 3 'S-points' stronger compared with a horizontal dipole; Western European stations about 5 'S-points' weaker; side rejection at least 30dB."

A GERMAN CHIREIX-MESNY UHF ANTENNA

Walter Farrar, G3ESP who, in the immediate post-war period, had the interesting task of evaluating and compiling detailed reports on German military radio equipment, writes: "I spotted your *TT*, February 1990 reference to the Chireix-Mesny array of half-wave dipoles and your comment that such an array might have application as a fixed beam on VHF/UHF.

"Well, Hitler's army had a portable station called the SEG2T (Sender-Emphaenger-Geraet 2T), alternatively designated DMG2T (Dezimeter-Geraet 2T) which worked on about 60cm (500MHz) using such an antenna, but with only two squares instead of the four illustrated in *TT* in each element. The transmitter output was 40-60 milliwatts on speech or MCW (A2A), using an Acorn-type valve (DS310) as power oscillator. The receiver was a super-regen.

"The electronics were in a case 340 by 210 by 210mm. The PSU case (same size) was fastened below it and held a 2V accumulator and two 180V (tapped) dry batteries. Together these weighed 26kg and were mounted on a tripod weighing 7.7kg. The station was completed by an accessories and spares case weighing 13kg. In transit, the radio and battery box went on the soldier's back, the tripod was shoulder-slung like a rifle and the spares box was carried by hand. With a total weight of some 47kg it represented a staggering load for any soldier!

"My notes state: 'Radiation from the aerial is highly directional. Therefore equipment must be adjusted for optimum working. There must be no intervening objects between the two stations.'

SOLDERING TO IRON & STEEL

For those prepared to handle (carefully) chemicals which are hazardous to touch and breathe, Roger Del Nero, WA2HNQ (QST August 1989, p39) reports successfully soldering to stainless steel, iron, cast-iron, brass, copper and other metals by using homemade acidic soldering flux. This he made from the following ingredients: 37g of zinc choloride, 23g of glacial acetic acid and 40g of hydrochloric acid. He points out that these quantities make a considerable amount of flux and can be scaled down in proportion as required. Acidic flux should not be used for normal wiring of components to printed circuit boards etc. The zinc chloride can be made by dissolving zinc in hydrochloride acid until the solution is saturated; the remaining ingredients are then added carefully. AK7M, the editor of QST's Hinks & Kinks adds a warning that readers unsure of their ability to handle dangerous chemicals should purchase ready-to-use zinc-chloride instead of attempting to blend their own. He notes that preformulated acidic fluxes are hazardous and should be used carefully.

Incidentally solder, with its lead content, should not be used where there is any risk of particles being ingested. A very graphic example of its danger can be found in the recent final solving of the mystery that for long surrounded the loss of the 129 crewmen and officers of Sir John Franklin's 1845-48 expedition in search of a north-west passage around the northern coast of Canada. Some years ago analysis of recovered bones suggested that these contained toxic levels of lead that adversely affected the health, judgement and ultimate survival of the members of the expedition. It has recently been reported (Nature, 25 January 1990) that further investigations has shown that it is virtually certain that food preserved in soldered tins was the source of the high lead levels.

THE NEI CLANDESTINE TRANSMITTERS AND RECEIVERS

Dick Rollema, PA0SE (*Electron*, February 1990 describes a series of 'NEI' (Netherlands East Indies) transmitters and receivers developed in Australia from 1943-45 by the Netherlands Forces Intelligence Service for clandestine operations in and around the Netherlands East Indies (now Indonesia etc). He gives the circuit diagram of the four-valve "straight" (1-v-2) receiver (NEI-II and NEI-III) which used four 6J7-G glass-octal valves (use of a single type of valve much eases the spares situation). The NEI-II receiver covered 3-6, 6-12 and 12-30MHz in three, switched wavebands with the 6.3V, 0.3A heaters wired in series-parallel, drawing a hefty 0.6A from the 12V 25Ah lead-acid battery in its wooden container box. The 30-watt NEI-II transmitter used the popular 6V6G crystal oscillator and 807 power amplifier combination. The later 50W NEI-III set was powered from 12V with the aid of a rotary converter and comprised a 6G6G CO/6G6G doubler/tripler/807 PA. With crystals between 4-5MHz, the output could be from 4-15MHz. The receiver for the NEI-III was basically similar to the NEI-II but covered 2-17MHz in four bands.

I suspect that the equipments were primarily intended for ship-borne operations, possibly akin to those mounted by the British SBS (Special Boat Service) and the 'private navies' of SIS/SOE. I recall one Special Communications operator who claimed that, when he was invited to go on a short trip round the harbour in one of the converted French fishing boats based in the Helston Estuary in Cornwall, he found that he had been 'shanghaied' for an operational trip to Brittany to pick up agents and mail! The MI-6 'private navy' carried Mark III (6V6-807) transmitters and the ubiquitous HRO receivers to keep in touch with Whaddon.

LINEAR UHF TRANSCEIVER WITH CARTESIAN-LOOP FEEDBACK

Some ten years ago I first mentioned in *TT* the work of Dr V Petrovic at Bath (later Bristol) University in developing what he originally termed a polar-loop feedback technique that enables a high-efficiency Class C HF power amplifier to function as a highly-linear amplifier.

TT (June 1985) was able to report on this project in some detail, including spectrum analysis curves, of the remarkable results Dr Petrovic had been able to achieve using this special form of negative feedback (now usually termed cartesian feedback). He had shown that the technique could reduce the near-in spurious noise and unwanted carrier to around -60dB compared to the 25-30dB down on peak tones of a two-tone test for typical (good) amateur equipment and around 40dB for high-grade professional communications equipment.

That *TT* report was based on a paper by V Petrovic and A H Brown in *IEE Conference Publication No 245*, 1985, pp81-85. This describes

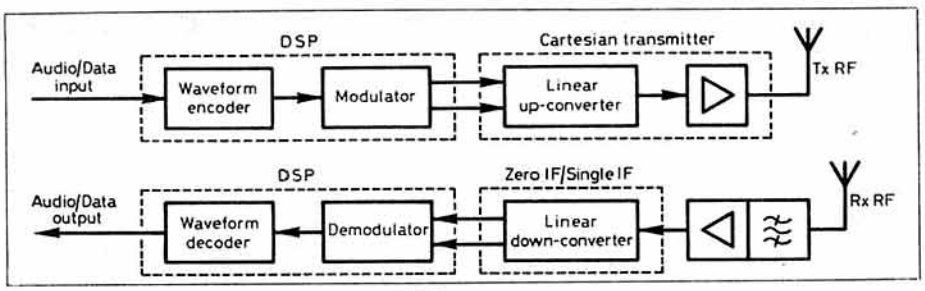
in outline a 1.6 to 30MHz, 100W PEP transmitter in which the feedback reduces the third-order products by a massive 37dB, resulting in products on two-tone test 67dB below the tones and with image sidebands suppressed by 68dB. It was noted that the paper claimed that the correct use of cartesian feedback not only improves the spectral purity but also results in: (1) lower output noise, achieved by reducing the overall gain of the transmitter; (2) improved efficiency, obtained by operating the solid-state PA with reduced bias and using an unregulated power supply; and (3) simplified design of the PA, since neither its linearity nor frequency response needs to be exceptionally good.

I wrote then: "Basically, this cartesian loop transmitter employs phasing-type SSB generation (Weaver third-method) to which the modulation information obtained by synchronous demodulation of a sample of the output signal is fed back in quadrature form. In other words, audio signals at 90° to each other are recovered and used as negative feedback. Since the bandwidth of the AF signals is much narrower than with RF negative feedback, as used on some SSB transmitter, much larger amounts of feedback can be applied.

"The problem of obtaining AF signals over the range 300 to 3000Hz in accurate quadrature by means of phase-shift networks is well known and has been the reason why relatively few phasing-type SSB transmitters are used, particularly where they need to operate over a wide temperature range. The vast majority of amateurs continue to use filter-type SSB generation despite the attractions of third-method and polyphase networks. The novel feature of this latest transmitter is to use a combination of third-method SSB generation with filter-type demodulation to supply the quadrature feedback, using 10.7MHz SSB crystal filters."

With so many advantages, it may seem surprising that this feedback technique has not rapidly established a role in both professional and amateur communications but there are clearly problems not mentioned in the published papers. I seem to recall that Plessey were involved in the Bristol work but am not sure whether any commercial product has yet appeared. However the 5th International Conference on Mobile Radio & Personal Communications at Coventry, December 1989 included a paper "Direct Conversion Linear Transceiver Design" by A Bateman, D Haines and R Wilkinson of Bristol University (*IEE Conference Publication No 315*, pp53-56) in which Cartesian feedback is used in a low-power 900MHz transceiver of high-linearity: **Fig 3.** In this paper, the authors conclude: "The application of Cartesian feedback for transmitter linearisation (**Fig 4**) coupled with recent advances in A/D (analogue-to-digital) converter technology are undoubtedly the two most significant factors which have made the implemention of a universal (linear) low-cost transceiver architecture possible. The performance of a Cartesian-linearised transmitter is impressive, with markedly better linearity achieved even with a Class C power stage than with a conventional well-designed Class A configuration. With the PA stage designed using efficient Class C modules, the added benefits of smaller heat sink and low cost (standard FM modules can be used) come for free. Transmitters have been designed at VHF and UHF (900MHz) with no difficulty, and with standard 'off the shelf' components, giving the performance indicated in the paper. Linearisation of Class C devices at 1.7GHz is currently underway at Bristol."

This transmitter and receiver system is based on the Weaver *'third method'* system together with a direct-conversion receiver with audio digital-signal-processing to provide what amounts to a flexible reconfigurable radio capable of operating with both analogue and digital signal formats



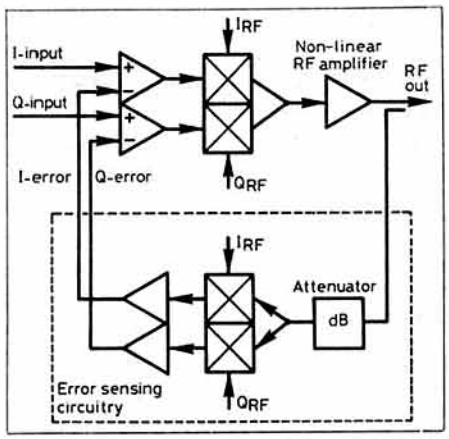
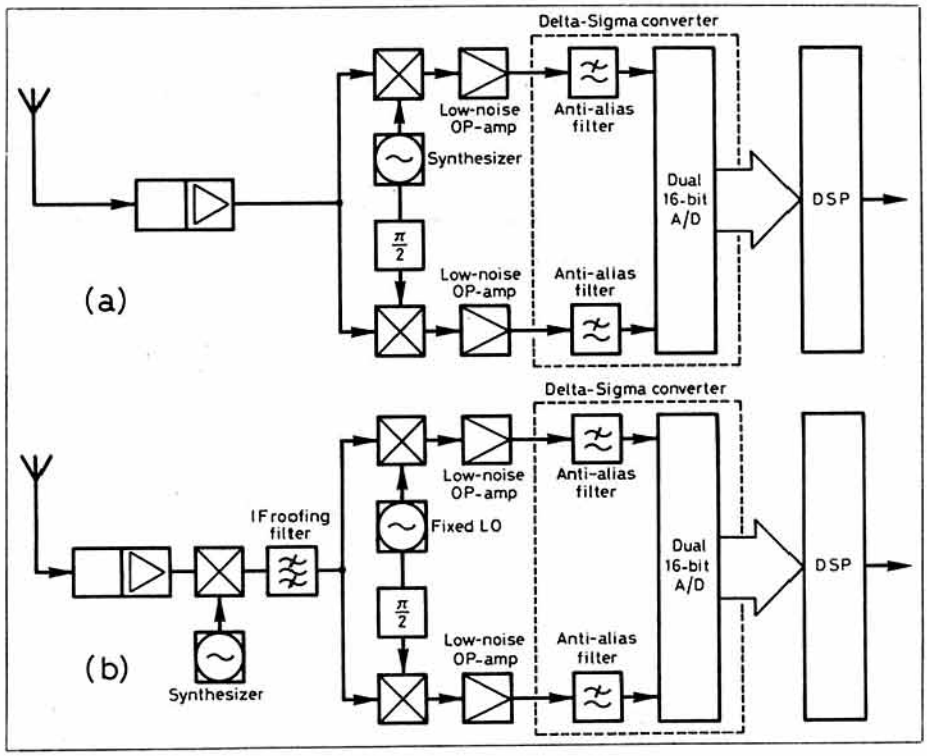


Fig 3. The linear transceiver architecture proposed by the Bristol University team.

Fig 4. Cartesian feedback transmitter linearisation outline.

Fig 5. Direct-conversion receiver configurations suitable for use with post-detector digital-signal-processing (DSP) filtering. (a) Zero-IF system. (b) Single-IF (Super-DC-gainer) system.



regardless of their amplitude and phase characteristics. In practice, the design of the receiver section is claimed to have proved more difficult than the transmitter, requiring wide dynamic range and good sensitivity. In practice, the Bristol receiver uses the *'super-DC-gainer'* technique described in *TT* August 1987, pp581-2) in which a superhet-type frequency-changer section is placed in front of a fixed-tuned DC receiver to give a 'single-IF' rather than a *"zero-IF"* configuration: **Fig 5.** The major breakthrough in favour of direct-conversion (or either type) is given as the current availability of wide-dynamic-range A/D converter ICs: "Devices with 18-bit resolution can be obtained allowing digitalisation of both I & Q channels in a single device which also incorporates anti-alias filtering. Provided the front-end circuitry of the receiver can be made sufficiently linear, adjacent channel selectivity in excess of 80dB can be achieved using digital filtering techniques alone... We are not far from the ultimate goal of single-chip transmitter and receiver realisation of a linear transceiver, with several companies pursuing design programmes in this area."

Clearly, this provides yet another example of where and how professional communications is tending to diverge away from the type of standard practices used in amateur equipment. Perhaps this item may encourage somebody to look into the possibility of adapting Cartesian feedback and digital signal processing to a practical design. However it may not be easy. The Bristol team writes: "The transmitter and receiver system is based on the Weaver frequency-translation technique (ie the 1956 paper "Third Method of generation and detection of SSB, *Proc IRE*, December 1956, but with many practical designs in past issues of *Rad Com*). This method was chosen for the property that the image products fall in the user's own channel, thus greatly

reducing the gain and phase-matching requirements of the quadrature processing paths. The transmitter design includes RF amplifier linearisation by means of Cartesian closed-loop feedback. Problems that have plagued this method in the past have been largely solved... virtually any modulation format can be handled using this technique with no requirement for constant envelope." I have yet to come across a fully-described practical circuit for a Cartesian loop PA (using either analogue or digital techniques) at HF, VHF or UHF — nor any account of what have been "the problems that have plagued this method."

BEWARE OF COSTLY DUST

The drilling of chassis and panels and similar workshop operations can produce metallic and graphite or carbonized dust particles that can subsequently result in equipment faults. Even ordinary building dust is recognised as producing major problems when installing mechanical/electronic equipment such as videotape or audio recorders etc in brand new studio complexes.

Geoff Brown, GJ4ICO contributes an example of *'expensive dust'* although in his case the problem was overcome inexpensively. He writes:

"Last year my company was involved in overhauling a French 100MHz (Band II) power amplifier which had been used in a local FM radio station. This had a 3CX8OOA7 ceramic triode as now found in some amateur linears. When the amplifier, complete with its power supply, was fired up it provided full RF output but, every so often, there would be a small 'click' or 'arcing' noise, followed by loss of power and anode meter fluctuations. The user had noted the same symptoms on the fault-report card.

"The power supply was checked but proved faultless and attention turned to the amplifier. Each component in the anode section was carefully inspected — EHT connector, EHT leadthrough, EHT chokes etc — without result. A new (£325) 3CX800A7 was fitted and the problem disappeared.

"However, I was not satisfied to leave it at that. I sat down with the valve in my hand and tried to puzzle out why it should have apparently developed such an intermittent fault. Finally, close inspection of the ceramic section with a magnifying glass revealed all.

"A very fine hairline of dust, virtually invisible to the naked eye, was laying between the anode and grid pins! The ceramic was thoroughly cleaned with alcohol, the valve replaced and the amplifier fired up. The intermittent fault had completely disappeared. It was an illuminating experience that could have proved expensive. It suggests that no matter how much air-filtering is used, dust can still get to and form tracks on ceramic (and possibly other) valves. Since then, similar faults have been traced in amplifiers fitting the widely used 4CX250B tetrodes."

I feel tempted to misquote Lewis Carroll:

The Walrus and the Carpenter
Were standing close I trust
They wept like anything to see
Those tiny tracks of dust
"If these were only cleared away
The rig would not be bust!"

BOOSTING THE QRP RIG

Wes Hayward, W7ZOI in a two-part constructional article on a complete 14MHz QRP SSB/CW transceiver (*QST*, December 1989/January 1990) aptly expresses his feelings about the changes that have largely changed the shape of Amateur Radio: "It's hard to justify the construction of a complete SSB/CW HF transceiver in this 'modern' era of readily available commercial equipment. The popular, multiband MF/HF transceivers offer excellent performance, often at a reasonable cost. Still I feel a twinge of guilt when I use them. They offer nothing of the feeling of exploration that I've grown to expect from Amateur Radio."

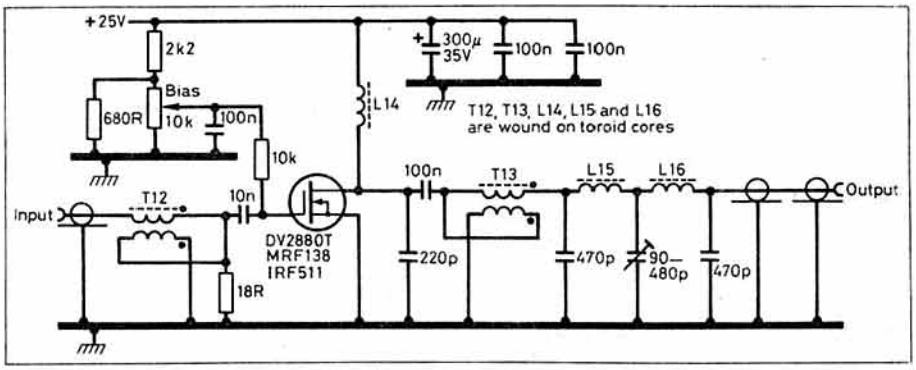


Fig 6. W7ZOI's FET linear amplifier designed to boost the 1-watt output of his 14MHz QRP SSB/CW transceiver to about 10 watts. The compact transceiver is presented as a home-construction project in *QST* December 1989/January 1990.

His new project provides a compact transceiver with a 1-watt output and a higher standard of performance than usually expected from QRP rigs. It has a superhet receiver with SBL-1 double-balanced mixer and a second one as product detector; a 9MHz crystal filter and 8998.5kHz crystal-controlled BFO.

With apologies to the stalwarts of the G-QRP Club, my personal feeling is that 1W output on 14MHz is pitching things a bit too low for pleasant two-way contacts. However, W7ZOI provides details of a suitable external FET power amplifier that gives about 10 watts linear RF output for CW or SSB. This uses an arrangement basically similar to the amplifier described by WA7MLH and him in the November *QST* and reproduced in the February *TT* (Fig 1 p31) but including adjustable bias circuitry etc: **Fig 6**. Such an amplifier could be used with any QRP rig providing about 1-watt drive.

The M/A Com DV288OT power FET used by W7ZOI is no longer available but can be replaced without other alterations by the similar Motorola MRF138 or the switching-type IRF511 Hexfet. Details of the wound components include: T12 broadband transformer, 7 bifiliar turns No 22 enamel on FT-50-43 ferrite toroidal core (observe phasing); T13 similar but 11 bifiliar turns No 18 enamel on FT-82-60 core; L14 50 turns No 26 on T68-2 powdered-iron toroidal core. L15, L19 both 19 turns No 20 on T-50-6 powdered-iron toroidal core.

Del Arthur, G0DLN is someone else who feels that the typical 1-3-watt solidstate QRP rigs for 3.5MHz can be a little frustrating, with contacts too often lost due to fading or QRM. He points out that a possible solution is to convert, at virtually no cost, a discarded domestic valve radio (jumble sale or even the local council rubbish tip) into a Class A linear RF amplifier.

He writes: "The secret is simple. Pull out all the valves except the audio output (and rectifier if this is a valve). The AF stage is likely to be an EL84 or similar self-biased for Class A operation. Disconnect the HT line to the earlier stages. Replace the AF output transformer with a home-made tank coil tuned with the fitted variable capacitor. Replace existing AF bypass capacitors with RF types taken from the early stages (virtually everything you need should be found on the receiver chassis). The only bought component should usually be a 50-ohm carbon resistor to go between grid and earth of the EL84 stage with the output from the QRP transmitter connected to the grid. This passive-grid configuration is simple, reliable and stable. The advantage of Class A operation is that less drive is needed than for Class AB or C and the output signal is clean (relatively harmonic free). My conversion provides 10 watts RF output on 3.5MHz with 3 watts input. Anode 350V (many domestic receivers have a 250V HT line), Screen 300V, grid bias -8V with the original 150-ohm cathode resistor. Although used only for CW, I have two-tone tested it and the scope display is near perfect. I would not recommend attempting to drive such an amplifier directly from a VFO since with passive-grid appreciable drive is required while if a tuned grid circuit were introduced there would be stability problems etc. To those familiar only with solid-state equipment, remember that even a domestic radio receiver with 250 to 350V HT will give a nasty bite if provoked, so take care."

MICROMINIATURE FUEL CELLS

For many years, there has been keen interest in developing more practical forms of fuel cells as a replacement for conventional forms of primary or secondary 'storage' batteries. In a fuel cell the substances that react chemically at the electrodes in the cell are stored partially or wholly outside the reaction cell; when these substances are exhausted, the current stops until more 'fuel' is added. A fuel cell is thus more akin to, say, a petrol generator in being run on 'fuel' stored outside and fed in as required. Dry batteries, accumulators and fuel cells, however, all depend on the same basic laws of electrochemistry with the chemical energy directly converted into electrical energy without significant energy-loss in the form of heat. Theoretically, electricity can be generated by electrochemical devices at efficiencies exceeding 70%, as compared to around 30% for a thermal power station using coal, oil or nuclear fuel and only about 15% for an internal combustion engine.

The first laboratory-model electric fuel cell was made by Sir William Grove some 150 years ago but it has never proved easy to develop practical fuel cells that can operate efficiently at low temperatures (ie ambient room temperatures). Much development work has been directed at developing relatively powerful fuel cells for such applications as electric vehicles but with relatively little success.

Now, however, C K Dyer of Bell Communications Research has described (*Nature*, 8 February 1990) a new form of solid-state fuel cell based on the oxygen-hydrogen reaction in which the reactive cell can be less than a micrometre across. Although the current output of a single cell is a matter of microamperes, its simple design and small size may make it suitable for use in series arrays of many cells as a means of powering microchips, and as a small, lightweight fuel cell that could be manufactured cheaply.

In an accompanying commentary on this development, Thomas Mallouk writes: "Conventional fuel cells use the combustion of hydrogen or methane to generate small voltages. To do this, they are constructed in the manner of an electrochemical battery, with the oxidation of hydrogen at one electrode releasing electrons and reduction of oxygen at the other mopping them up. The unexpected novelty of Dyer's cell is that it develops an unusually large voltage in *mixtures* of hydrogen and oxygen (voltages about 0.5-1V,

currents 500 to 20μA respectively).

"Regardless of the precise mechanism involved (apparently still uncertain), the facility with which the phenomena can be reproduced with a variety of different membrane materials should lead to rapid duplication of these results and eventually to a broad range of applications from low-cost, small, lightweight fuel cells as replacements for high-use batteries to new applications in information processing which was the original objective of this work."

EXPLOITING THE MILLIMETRE-WAVE BANDS

Amateurs normally think in terms of how to extend the range of their transmissions. Paradoxically, for military and telecommunications systems, the desire these days is often to *limit* the range, either to reduce the likelihood of interception or to reduce the distance at which the same frequency-channel can be re-used without the risk of interference. This combined with the ever increasing congestion on much of the VHF and UHF bands is leading to a growing interest in exploiting the still wide open spaces above 30GHz (EHF).

For over a year, BTRL have been testing at Saxmundham a mm-wave system working at 29GHz as a means of distributing multiple video channels as an alternative to the more expensive laying of broadband cables and last year it was confirmed that MVDS (microwave video distribution systems) will be licensed to use a band just above 40GHz with an expected service area of about 2-4km diameter. The prospect of domestic use of such frequencies is encouraging the development of low-cost MMIC devices, including the use of HEMT (high-electron-mobility transistors) devices that should give a receiver noise factor of under 7dB.

There is also much military and professional communications interest in using frequencies close to 60GHz where there is a very sharp peak of severe attenuation due to oxygen absorption even in the absence of rain attenuation which is also very severe at such frequencies: see **Fig 7**.

Peter Fry, G3TZV draws attention to an article in the August 1989 issue of *MSN* (Microwave Systems News) which describes how Hughes Aircraft have developed a "EHF applique millimetre-wave 'strap-on' radio". This enables vehicles with a conventional 30-88MHz VHF radio to use it, when required, on mm-frequencies between 53.469 and 53.715GHz: **Fig 8**. It uses a special circulator switch assembly that allows a single EHF mixer to perform both up- and down-conversion. Hughes have also been developing a new UHF bicone antenna with a view to its use for a dual-band (UHF/EHF) concept. The EHF range is limited to a few miles line-of-sight.

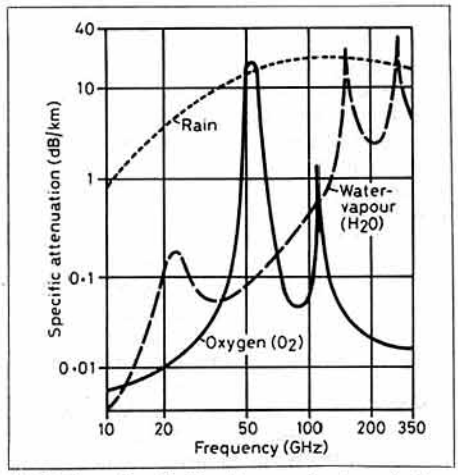


Fig 7. Attenuation of millimetric-waves by atmospheric gases and rain (medium rate). Oxygen (O_2) has a particularly sharp peak at about 60GHz, cutting signal intensity by 95% for each kilometre. Note that the effect of the various attenuations is cumulative. While rain/water-vapour attenuation varies in different climates, the Oxygen attenuation applies world-wide.

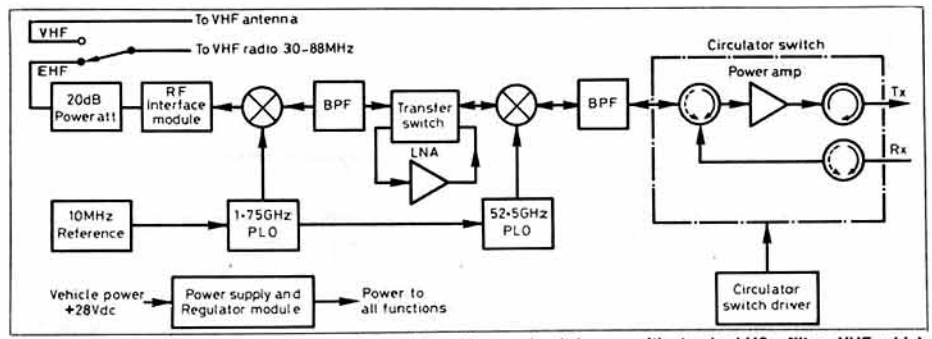


Fig 8. The Hughes VHF-to-EHF transverter designed as a 'strap-on' unit for use with standard US military VHF vehicle radios.

It may be worth a reminder that our UK amateur licences already include *primary* frequency allocations at 47, 75.4, 142 and 250GHz!

PREFERRED CW-COPYING TONES

TT (December 1989, p38) included some notes on the interesting 'Project Frequency Band' experiments carried out by members of the G-QRP Club to determine the optimum audio-frequency beat note for the reception of CW. As noted then, this emphasised that receiver designers should take fully into account the characteristics of human hearing. These are not necessarily the same for different operators but in general it was found that the lower frequencies of around 450Hz seemed preferable to the oft-recommended 750-850Hz.

Angus Taylor, G8PG has now passed along the results of a follow-up experiment carried out by G-QRP council member Tony Tuite, an experienced ex-RAF operator, with the help of a panel of ten operators, all aged 50 years or more. (As we grow older we lose the ability to hear the higher end of the audio spectrum: whereas a youth can often hear tones above 15kHz, this gradually reduces to around 8-10kHz, although this is perhaps not relevant to this particular experiment.)

In this project, the ten participants were asked to state their preferred usual BFO frequency and then to set up a receiver to this frequency and copy some morse at 18-20wpm. The actual audio frequency was then measured with an oscilloscope. The results were as follows:

Six out of the ten gave their preferred frequency as about 750Hz. In each case the actual frequency proved to be close to 500Hz.

Three gave 600-700Hz but found to be about 475Hz.

One (who had received musical training) gave 500Hz and set his BFO to within 50Hz of this figure.

Test material was then transmitted at 25wpm. Those of the operators who could copy at this speed, tended to adjust the BFO to give a tone of about 600Hz (ie some 100Hz higher than for the slower speed).

G8PG comments: "So far all our work points to frequencies in the range 450-600Hz as being the most acceptable, with many operators unconsciously adopting them. The impact on AF filter design and BFO crystal selection is obvious."

It is perhaps worth noting that at one time, operators with most designs of communication receiver were able, having adjustable BFO controls, to select their own preferred tone without worrying whether this accorded with their own 'guestimates'. But with sharp AF filters and crystal-controlled BFOs, combined with narrow-band IF crystal filters it is clearly important that designers/constructors of factory/home receivers/transceivers should be aware of that 450-600Hz preference.

TAKING OUT D/F

The average age of Australian amateurs has been recently put at 51 years, and there seems no reason to suppose that such a figure would differ greatly in the UK. This means that most of us have lived through (though not necessarily as licensed amateurs) a period of enormous technical change and development — but not always in the basic fundamentals of radio communication, for which the entire period of 1895 to 1945 was immensely important.

I have to confess a personal interest in the specialised topic of wartime 'clandestine' portable radio transmitter-receivers which has a habit of spilling over into *TT*. In this I am not alone. For instance, Rudolf Staritz, DL3CS has put much effort into tracing information on the many different such equipments developed not only for the German Abwehr (military intelligence) service but also in the UK, USA, USSR, Norway, Denmark and Finland etc. Another is Hugh Muller, KA7LXY who was surprised to read (*TT*, January) that the clandestine Dutch Inland Radio Service (originally organised by Jan Thijssen ('Lange Jan') in anticipation of a rapid liberation of occupied Holland) operated on frequencies between 2.7 to 3.0MHz. He felt (unfortunately correctly) that this must have been "a near perfect wavelength for the enemy D/F services (Funkabwehr etc)" and needed "a good long antenna to look for" making traffic on such frequencies "a near suicide mission". Unhappily, as I have mentioned before in *TT*, this was all too true with many groups wiped out by the D/F rigs described in the book by Fritz Trenkle "Die deutschen funkpeil-und-Horch-Verfahren bis 1945", roughly translated as "German D/F and listening services up to 1945," published by AEG-Telefunken in 1982 (once again my sincere thanks to Dr Ing Hans L Rath, DLK6KG for sending me copies of this series of publications).

It is clear from this book that some at least of the mobile and portable HF D/F equipments developed for the Funkabwehr did not operate below 2.9 or 3.0MHz, a fact possibly known to the Dutch engineers. For example, the well-built, miniaturised 'suitcase' D/F equipment, type Kofferpeiler Fu H P B ku3, which could be 'worn' under outer clothing and had a miniature 'wrist-watch' indicator, covered only 2.9 to 15MHz. Unfortunately, the Funkabwehr also used some twelve "Storch" army co-operation aircraft fitted with D/F receivers (R30) that covered 192 to 25,000kHz, and had fixed D/F stations that covered the complete MF/HF bands.

But the two operators of the Dutch Inland Service that survived from August 1944 until the end of the war in Holland in May 1945 — Jan Zandbergen, PAoZY and Jack Verhagen running the very active G11 station in and around Alkmaar, including a long spell with their station located in the nuns' bathroom of the St Elisabeth Hospital — did succeed in striking back at the D/F threat in a remarkable way. During December 1944, they observed increasing activity, in the district, of German D/F vehicles and decided to try and discover where these were based. They set out on

bicycles, with a bag of potatoes on the carrier of one as though collecting food from the farms — an all-too-common sight in that dreadful 'hunger-winter' during which some 15,000 civilians died of hunger. They found the D/F base at a farm at Dirkshorn, some 15km north of Alkmaar, spotting several loop antennas on the roof, covered by camouflage netting. On 30 December 1944 they transmitted the following cipher message: "Radio service threatened by newly erected German radio bearing station. Position as follows. Moving in southerly direction from the village Dirskhorn along the road leading to Oudkarspel some 550 yards along this road in meadow about 35 yards east of the road. Recognisable by two low redbrick buildings flat black roofs on which 10 circular direction finding aerials. No anti-aircraft guns."

On 6 January 1945, the RAF destroyed the farm! Later, a second German D/F base was "taken out" at Castle Marquette near Heemskerk, 15km south of Alkmaar. (Information received from PA0ZY and Dick Rollema PA0SE.) I have to admit that the December message was sent by the Alkmaar station a few days before I became actively involved with the Dutch service, although soon afterwards I had many contacts with the redoubtable Jack Verhagen, an ex-marine operator of outstanding ability who sent many messages for RvV/OD/BS even after G11 was told to discontinue the link with Eindhoven following the loss of many stations between December and February.

KA7LXY points to another category of portable HF equipment developed during the second world war: the beach-landing equipments. He gives the US Navy models as TBX to TBX-7 which used a single-valve transmitter (837) covering 2-5MHz with 500V HT from either a rotary convertor or hand-cranked generator, in a waterproofed aluminium case that (theoretically) could be floated to shore, opened and used. The TBX range were primarily for landing operations in the Pacific and as a lifeboat radio. A final model, TBX-8, which did not enter service until late 1945, used a two-stage 3A4 — 2E22 (miniature 807) transmitter with relay break-in switching.

The single-valve transmitter was AM/CW and VFO or crystal-controlled (two internal switchable crystals). KA7LXY points to an unusual feature: the power oscillator remained running and was controlled by putting a high negative voltage on the suppressor grid; keying the transmitter 'on' reduced the negative bias so that anode current flowed providing an RF output of about 25W CW or about 3W AM speech. Modulation was also achieved by controlling the suppressor bias: suppressor-grid modulation of power amplifiers was quite popular pre-war in the UK amateur transmitters and was also a feature of the RAF T1154 transmitters in conjunction with the PT15 pentode PA.

VHF/UHF ground/air/ship phone transmitters for clandestine operations included SOE's S-phone and the later OSS Joan-Eleanor (J-E) equipment with its airborne wire-recorder and an American military FM equipment on about 30MHz used by MI-6. These have all been mentioned before in *TT*. I wonder, however, if any reader could supply details of the 'Ascension' equipment developed by MI-6 for the 1944 joint US/UK/French 'Sussex' operation during which the HF CW links depended on the QRP battery-operated MkXXI transmitter-receivers? According to Anthony Cave-Brown in his biography of Sir Stewart Menzies "The Secret Servant", some 20 Ascension equipments were to be installed for Sussex in Mosquito aircraft and flown nightly over France to receive reports from the French agents by means of 'a recording device' (wire recorder?) installed in the tail of the aircraft. As someone who went to Normandy in support of the Sussex HF operations, I would be interested to find out more about 'Ascension', for which presumably a miniature portable equipment must have been developed for the agents on the ground.

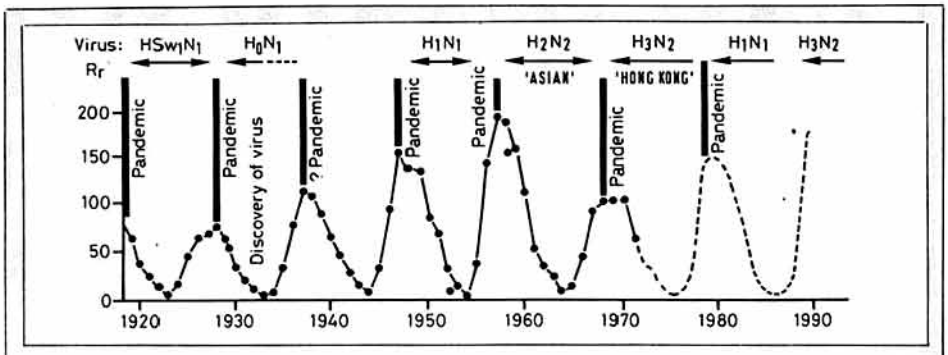


Fig 9. The yearly means of daily sunspot relative numbers compared with dates of influenza pandemics, as published in *Nature* in connection with the letter from Sir Fred Hoyle and Professor Wickramasinghe. The record up to 1971 is based on the earlier material collated by Hope-Simpson; the dashed curve has been added to show the situation betweenn 1971-89.

SUNSPOT FLU?

Sunspots have been blamed and/or praised for many things other than high MUFs. Now Sir Fred Hoyle and Professor N C Wickramasinghe have described (*Nature*, 25 January 1990) further evidence in support of the belief, first expressed by R E Hope-Simpson in 1978, that there is a remarkable coincidence between large-scale, world-wide outbreaks (pandemics) of influenza and peaks of the sunspot-cycle. **Fig 9** shows the more recent 'coincidences'. They conclude: 'It is tempting to connect the recent (November/December 1989) flu epidemic in Britain with the maximum or imminent maximum of (Cycle 22) solar activity. Although the new wave of flu and flu-like illness has not yet assumed pandemic proportions, the chances of this happening within a single complete cycle of terrestrial seasons must be reckoned to be high... we note that electrical fields associated with intense solar winds can rapidly drive charged particles of the size of viruses down through the exposed upper atmosphere into the shelter of the lower atmosphere... this could define one possible causal link between influenza pandemics and solar activity." Sir Fred Hoyle for a number of years has been suggesting that microbiological material exists in space and could have been the origins of Life on Earth. It has long been recognised that the outbreak of 'Spanish flu' in 1919 caused more deaths than the first world war — but the idea that such outbreaks might be due to solar activity is a new concept to me!

FEEDBACK AND POT-POURRI

Geoff Perkins, G3VIJ spotted an unfortunate error that crept into the circuit diagram of PA0FRI's high-power 'Frinear' linear amplifier (*TT*, February, p30, Fig 3). The diagram wrongly shows the positive screen voltage connected through a 100-ohm resistor to the control grid of the lowest PL519 (pin 1). In fact, the 100-ohm resistor should have been connected to pin 3 (screen grid) and the line common to the three screen-grid pins. Apologies to readers and to PA0FRI.

John Roscoe, G4QK adds a postscript-correction to his warning (*TT*, February) that modern petrol-pumps, if deprived of mains electricity, will fail to deliver. He subsequently made enquiries from the large retail chain that controls the petrol station attached to his local supermarket and received the following reassuring reply: "In the event of a power failure, the store's emergency generator will service the main store but not the petrol station. However, our petrol pumps are able to be manually operated and we would expect business to continue although at a much slower pace... we would expect any requests for petrol by the emergency services to be given priority. Cash transactions are always acceptable."

The increasing interest in 'wireless before transistors' is reflected in the number of specialised publications and newsletters now available in the UK. These manage to maintain high standards and to dig out much information on the equipment and practices of yesteryear (not all of which were crude or primitive). A number of such publications come my way and I take this opportunity of congratulating their editors and bringing these publications to the notice of *TT* readers who may not be aware of their existence:

Vintage Wireless (quarterly bulletin of the British Vintage Wireless Society) edited by Bob Hawes. An occasional extended *Supplement* has recently been introduced. The Society's Membership Secretary is Gerald Wells who runs the fascinating Vintage Wireless Museum in West Dulwich, south London.

Radio Bygones (bimonthly) the relatively new 'glossy' magazine complete with full-colour cover illustrations edited by Geoff Arnold, G3GSR, former editor of *Practical Wireless*. Covers communications as well as domestic radios.

The Radiophile (bimonthly) edited by Chas E Miller concentrates on domestic valve radios and is now emerging in printed rather than duplicated form.

Morsum Magnificat (quarterly) edited by Tony Smith, G4FAI as the "magazine for morse-telegraphy". Due to other commitments, G4FAI, who founded the UK edition several years ago (MM originated in Holland in 1983), is anxious to hand over editorship this year.

OT News (quarterly old Timers' News) publication of the UK Radio Amateur Old Timers' Association, edited by Dennis Lisney, G3MNO.

As a follow-up to G3MLS's explanation of the 'Kelvin-Varley heli-pot substitute' (*TT*, February, p31), Nev Kirk, G3JDK relates how walking into his local junk shop recently, he found a most elegant 'Kelvin-Varley Divider'. It was in pristine condition, beautifully made in 1978 by Electro Scientific Industries of Portland, Oregon. Some 9-in tall overall, about 3-in in diameter, the adjustment is with the aid of three concentric aluminium dials, each slightly less in diameter, at the top, graduated and engraved with black lettering. Purchased for an "unbelievable 50p", G3JDK is not quite sure what he will do with it, but in the meantime "it makes a wonderful shack ornament."

J P Bell, G4LSA mentions that since the circuit diagram of his battery-charger controller appeared in *TT* (October 1989, pp38-39, Fig 6) he has received a number of enquiries asking where a BT151 thyristor (SCR) can be obtained. His came ex-equipment but he points out that any modern thyristor will do provided that it is rated about 5A and 100V. □

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KENWOOD TS-950S DIGITAL HF TRANSCEIVER REVIEW

Peter Hart, G3SJX

Both Kenwood and Yaesu have recently unveiled new top of the range HF base station transceivers offering very high performance and a number of totally new features. The Kenwood TS-940S has achieved an excellent reputation over the years as a top-flight rig for the discerning DX chaser and contest operator. The launch of the TS-950S has attracted much interest.

PRINCIPAL FEATURES

The TS-950S is a highly versatile base station transceiver with built-in mains PSU. It is available in two versions; the fully fledged TS-950S DIGITAL and the reduced cost TS-950S. The differences will be made apparent later. The receiver tunes from below 100kHz to 30MHz with the transmitter inhibited outside the exact amateur allocations. LSB, USB, CW, AM, FM and FSK are provided with selectable FSK shift of 170, 200, 425 or 850Hz.

Tuning is in 10Hz steps at 10kHz per revolution of the main tuning knob on SSB/CW and 100Hz steps at 50kHz per revolution on AM/FM. Twin VFOs are used and any combination of receive/transmit split between the VFOs and memories is allowed. A separate tuning knob sets the frequency of the TX VFO independently of the main tuning in split operation and a single button allows the RX and TX VFOs to be momentarily swapped for instant checking of activity on the TX channel. On FM, the RX and TX VFOs may be tracked with a constant offset to simplify operation with repeaters. Push buttons select individual bands, returning initially to the last used settings on that band in terms of frequency, split combination, mode, IF filter, preamp status and ATU setting. The frequency may be stepped up and down in 1MHz increments for general coverage operation and a click-step rotary knob shifts the frequency in 5/10kHz steps for rapid frequency changes from one end of the band to the other. 100 memories are provided and these also store split frequencies, mode, IF filter, preamp status, ATU and tone data. The memory contents may be previewed before selection. The band buttons also double as a numeric keypad for direct entry of frequency or memory number. Scanning may be initiated between programmable frequency limits, across the entire active memories or in decade memory groups. Up to ten programmable scanning limits may be stored and the scan speed is variable.

Very comprehensive selectivity-related features have been built-in to aid reception under difficult conditions. Separate buttons select the filter bandwidth at the 8·83MHz and 455kHz IFs, giving bandwidths of 6000, 2700 or 500Hz at the first IF and 6000, 2700, 500 or 250Hz at the second IF. These filters are separately selectable and independent of mode. Whenever a mode or band change is made, the last used filter combination on each mode on each band is reselected. On SSB, twin concentric controls allow the independent adjustment of the low and high frequency slopes of the IF passband and on CW, separate variable controls for the IF bandwidth and AF bandwidth are provided. An IF notch filter operates on all modes except FM.

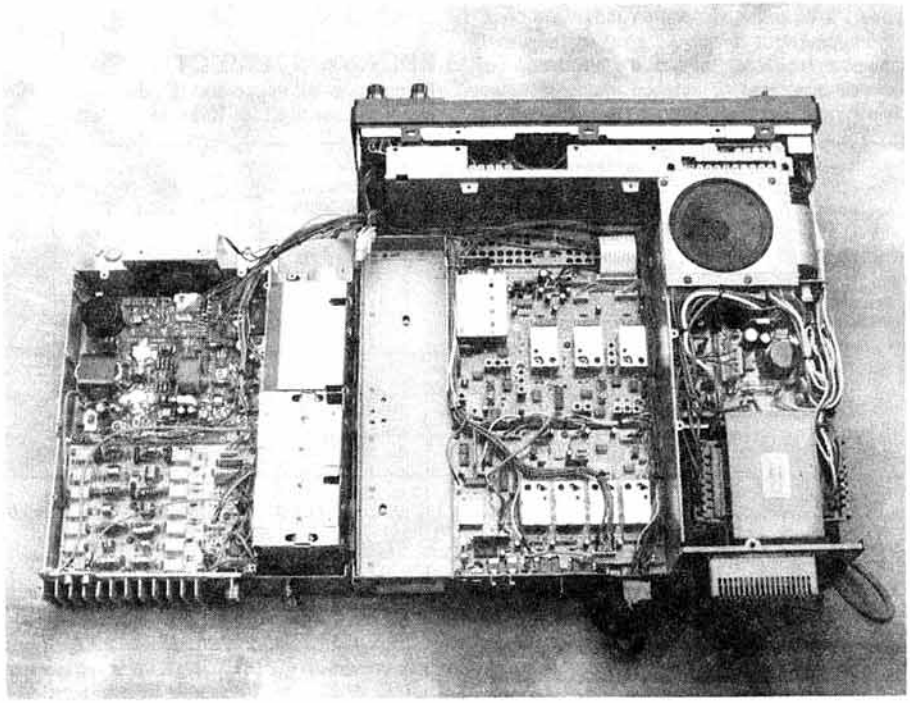
The most striking new feature on this rig is the use of a second or sub receiver to receive two frequencies simultaneously, the sub receiver being tunable ±500kHz relative to the main receiver. The audio output from the two receivers is combined through separate audio gain controls into the common speaker or headphones. The frequency of the second receiver is indicated on a separate display and may be tracked with the transmit VFO.

Other receiver functions include four selectable AGC speeds, input attenuator, all-mode squelch and receive/transmit clarifier. Two switchable preamplifiers are provided, optimised for sensitivity (AIP out) or signal handling (AIP in). Dual noise blankers are fitted with adjustable blanking levels for both the main and second receiver and with selectable time constants to suit impulse noise and "woodpecker".

To the best of my knowledge, the TS-950S is the first amateur bands transceiver to make use of digital signal processing techniques (DSP). This is used to generate the transmit signal on SSB, CW, FSK and AM. A very high quality SSB signal is generated with selectable audio bandwidth, and on CW, true cosine squared pulse shaping is adopted for minimum key clicks. The rise and fall time of the CW pulse is settable to either 2 or 4ms. On receive, the DSP unit provides an audio filtering function which tracks the IF slope tuning. The DSP unit is retrofittable and bolts on the bottom of the case.

The transmitter power output is nominally 150W, somewhat higher than most rigs, and variable down to 20W. Transmit features include RF speech processor with separate input and output gain controls, built-in electronic keyer with adjustable weighting, VOX, full/semi break-in, microphone muting when using data modes, thermostatic fan and a transmitter monitor facility. A programmable tone encoder is included for repeater use.

Other features include a CW pitch control and morse code or beep tone confirmations of key presses. Voice announcement of the operating frequency is available with an optional voice synthesiser unit and a host of parameters are settable on power-up to suit individual preferences. An auto-ATU is built-in which will cope with mismatches up to 3:1 VSWR. Tuning conditions are stored in memory for each band and are automatically returned to when that band is reselected. The ATU may also be manually tuned. A temperature compensated reference oscillator (TCXO) is used which ensures that the operating frequency has a maximum error of 10Hz at 20MHz.



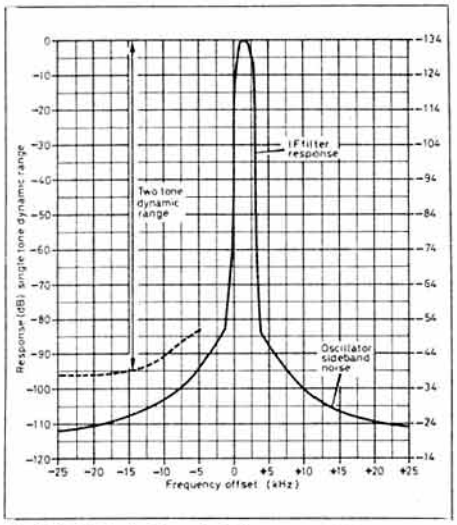


Fig 1. TS-950S effective selectivity curve on USB.

A large multicolour, multifunction fluorescent display panel dominates the front panel. The receive, transmit and second receiver frequencies are all displayed simultaneously to a resolution of 10Hz and RIT/XIT is displayed continuously together with IF bandwidth settings and various status indicators. A 30 dot digital bar meter provides S meter on receive and power meter on transmit with two additional bar meters to indicate ALC/collector current and SWR/speech compression. These meters provide a peak hold function.

The rear panel contains the usual comprehensive array of connectors to interface the rig to a linear amplifier, packet and data terminals, IF outputs for monitor scopes, audio in/out etc. Note that for RTTY use, this rig has been designed for US/Far East tones of 2125/2295Hz, not the more commonly used 1275/1445Hz tones in the UK. Most of the functions of the radio can be controlled from an external computer via the optional IF-232C interface. The transmitter drive level (about 10mW) and receiver antenna lines are routed via jumper leads on the rear panel. These leads may be intercepted to interface to VHF transverters or connect to a remote receiver or remote receiver antenna.

Naturally, a rig of this complexity requires a comprehensive and well-written manual. Although the manual has 80 pages and on the surface appears to cover full installation and operation of the equipment, it is not quite up to the usual Kenwood standards. Some of the information is not well described or indexed and sometimes misleading. Full circuit diagrams are included.

The lower cost TS-950S has all the features of the TS-950S DIGITAL with the exception of the DSP unit, CW IF filters and temperature compensated reference oscillator (TCXO). These units may all be retrofitted at a later date if necessary.

DESCRIPTION

The TS-950S is a big radio measuring 40·9 (W) by 15·4 (H) by 44·6cm (D) and at 23kg it is a heavyweight. This is the same front panel size as the TS-940S but somewhat deeper and heavier. The usual steel chassis and PCB construction is adopted with plenty of screening, which explains the weight. A plastic overlay front panel is used with a moderately sized 8·5cm diameter upward facing speaker. The PA unit is housed in a diecast assembly, which together with the ATU, unhinges to reach the carrier and PLL unit underneath. The PA unit and PSU are blown by separate fans.

The main receiver uses a quadruple superhet architecture with IFs of 73·05MHz, 8·83MHz, 455kHz and 100kHz. The second receiver is double superhet with IFs of 40·055MHz and 10·695MHz. A ring of 4 FETs are used in the receiver first mixer for wide dynamic range. The TMS320-15 DSP generates the SSB signal by a method analogous to the traditional phasing method but with a much tighter control over the phase shifts for improved rejection of the unwanted sideband. The signal is generated at 36·89kHz and upconverted to 455kHz. The DSP also generates the CW, FSK and AM signals which are also upconverted to 455kHz. The signals are then converted via the 8·83MHz and 73·05MHz IFs to final frequency where the transmitter PA operates from a 50V supply for increased power output and lower distortion. The memories used in this radio are battery backed using a lithium cell which should last 5 years. The battery is located on the digital board behind the front panel which simply unhinges.

S-METER CALIBRATION

The S-meter measurements are only approximate due to the resolution of the bargraph display. The S-meter sensitivity varied considerably with frequency and was somewhat pessimistic on the higher bands. SSB, CW, FSK and AM gave the same results but FM had the usual very limited range.

SPURIOUS REJECTION

Rejection of all image and IF related responses was in excess of 82dB. This is very good.

STRONG SIGNAL PERFORMANCE

The front-end intermodulation performance is excellent. With the AIP switched out, it is around 1-5dB better than the TS-940S. With the AIP switched in there is a remarkable improvement to over 100dB dynamic range on most bands. Blocking was difficult to measure as reciprocal mixing masked the measurement. The reciprocal mixing or oscillator sideband noise performance was also excellent, one of the best radios I have measured, and substantially better than the TS-930S or TS-940S even with the Lowe modification. The effective selectivity curve is shown in Fig 1. The inband linearity measured with 200Hz tone spacing varied considerably with AGC speed. In the fast position it was relatively poor but with slow AGC it was excellent (-44dB).

SELECTIVITY

The table shows the results using all the combinations of the fitted filters. The skirt selectivities are excellent. Fig 1 also shows that the 455kHz filters have better skirt selectivities than the 8·83MHz filters, but this is only to be expected.

POWER OUTPUT

The power output could be varied down to 12W with the power control, and on CW down to about 1W if the carrier level control is also reduced. Into a 2:1 VSWR and with the auto-ATU switched out, 53-105W could be obtained. With a 3:1 VSWR, this reduced to 25-35W. Switching in the auto-ATU restored power to 110W in all cases.

SPURIOUS OUTPUTS

The level of both harmonic and other spurious outputs was excellent.

SSB PERFORMANCE

The PA intermodulation performance was much better than the average rig. The speech processor degraded the close-in intermodulation products severely but not the out of band products. The DSP performance was amazing. In the widest setting, the -6dB audio bandwidth was 180Hz to 3·0kHz and yet the unwanted sideband and carrier rejection was in excess of 70dB! With the DSP unplugged, the audio bandwidth was about 350Hz-2·7kHz, and carrier and sideband rejections still around the -70dB level.

TRANSMITTER NOISE OUTPUT

The transmitter noise output of the TS-950S is a big improvement over the TS-930/940 as measured previously.

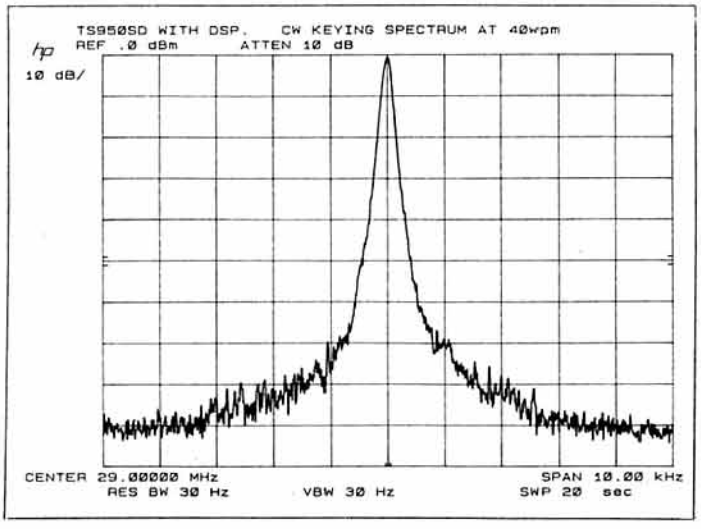


Fig 2. CW keying spectrum at 40 wpm with DSP. Horizontal scale: 1kHz/div; vertical scale: 10dB/div.

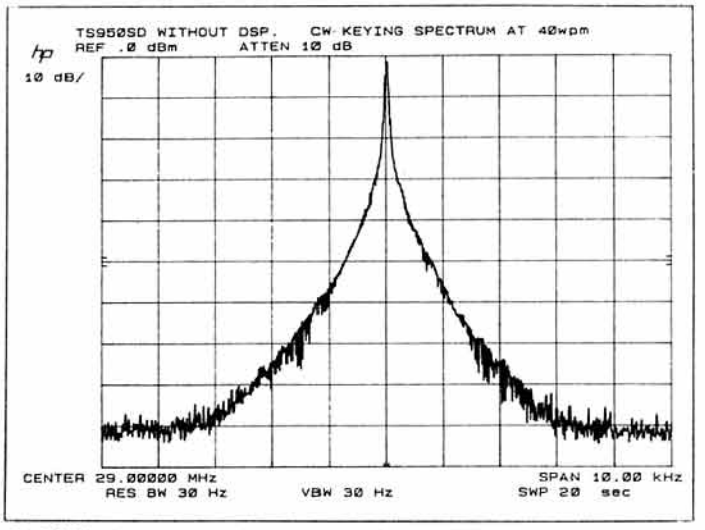


Fig 3. CW keying spectrum at 40 wpm without DSP. Horizontal scale: 1kHz/div; vertical scale 10dB/div.

KENWOOD TS-950S DIGITAL MEASURED PERFORMANCE

RECEIVER MEASUREMENTS

FREQUENCY	SENSITIVITY SSB 10dBs+n:n AIP OUT	AIP IN	Input for S9 AIP OUT	AIP IN
1.8 MHz	0.1μV (-127dBm)	0.32μV (-117dBm)	35μV	160μV
3.5 MHz	0.11μV (-126dBm)	0.35μV (-116dBm)	35μV	200μV
7 MHz	0.1μV (-127dBm)	0.28μV (-118dBm)	32μV	200μV
10 MHz	0.11μV (-126dBm)	0.32μV (-117dBm)	50μV	320μV
14 MHz	0.1μV (-127dBm)	0.32μV (-117dBm)	56μV	320μV
18 MHz	0.14μV (-124dBm)	0.28μV (-118dBm)	89μV	450μV
21 MHz	0.14μV (-124dBm)	0.28μV (-118dBm)	112μV	560μV
24 MHz	0.14μV (-124dBM)	0.28μV (-118dBm)	112μV	450μV
28 MHz	0.14μV (-124dBm)	0.28μV (-118dBm)	112μV	400μV

Frequency	INTERMODULATION (50kHz TONE SPACING) AIP OUT 3rd order intercept	2 tone dynamic range	AIP IN 3rd order intercept	2 tone dynamic range
1.8 MHz	+4dBm	94dB	+20dBm	98dB
3.5 MHz	+4dBm	93dB	+24dBm	100dB
7 MHz	+4dBm	94dB	+25dBm	102dB
14 MHz	+7dBm	96dB	+26dBm	102dB
21 MHz	+9dBm	95dB	+27dBm	103dB
28 MHz	+13dBm	98dB	+18dBm	97dB

Frequency offset	Reciprocal mixing for 3dB noise	TX noise WRT carrier in 2.5kHz bandwidth
3 kHz	86dB	
5 kHz	90dB	-83dB
10 kHz	102dB	-91dB
15 kHz	107dB	
20 kHz	110dB	-96dB
30 kHz	113dB	
50 kHz	119dB	-99dB
100 kHz	124dB	
200 kHz	130dB	

FILTER (8.83/455)	SELECTIVITY -6dB	-60dB
2.7/2.7	2440Hz	3600Hz
2.7/500	545Hz	1020Hz
2.7/250	290Hz	830Hz
500/2.7	560Hz	2450Hz
500/500	490Hz	970Hz
500/250	290Hz	660Hz
6/6	5960Hz	10.9kHz

Tone spacing (7MHz band)	3rd order intercept	2 tone dynamic range
5 kHz	-12dBm	83dB
10 kHz	-11dBm	84dB
15 kHz	-2dBm	90dB
20 kHz	+4dBm	94dB

S-READING (14MHz)	INPUT LEVEL SSB	FM
S1	1.8μV	0.7μV
S3	2.8μV	1.6μV
S5	5.6μV	2.2μV
S7	16μv	3.2μV
S9	56μV	4μV
S9+20	800μV	5μV
S9+40	6.3mV	8μV
S9+60	40mV	14μV

AM sensitivity (28MHz): 0.8μV for 10dBs+n:n at 30% mod depth
FM sensitivity (28MHz): 0.2μV for 12dB SINAD 3kHz pk deviation
AGC threshold: 0.9μV
100dB above threshold for +1dB audio output
AGC attack time: 2ms (fast) 3ms (medium) 4ms (slow)
AGC decay time: 0.1-0.5s (fast) 0.6-2s (medium) 2-7s (slow)
Max audio before clipping: 1.8W into 8ohm at 1.5% distortion
Inband intermodulation products: -26 to -44dB (see text)

TRANSMITTER MEASUREMENTS

Frequency	CW power output	SSB (pep) power output	harmonics	Intermodulation products third order	fifth order
1.8 MHz	145W	160W	-62dB	-32dB	-38dB
3.5 MHz	150W	160W	-62dB	-30dB	-40dB
7 MHz	150W	155W	-70dB	-36dB	-45dB
10 MHz	148W	152W	-65dB	-36dB	-40dB
14 MHz	145W	150W	-68dB	-30dB	-40dB
18 MHz	142W	143W	-64dB	-30dB	-37dB
21 MHz	140W	140W	-65dB	-27dB	-37dB
24 MHz	138W	138W	-60dB	-27dB	-36dB
28 MHz	132W	132W	-62dB	-26dB	-36dB

Carrier suppression: -65 to -70dBC
Sideband suppression: <-70dBC
Transmitter noise: see table above
Transmitter AF response: see text
Transmitter AF distortion: <1%
Microphone input sensitivity: 3.5mV for full output
FM peak deviation: 4.5kHz
T/R switching speed (SSB): mute-TX 10ms, TX-mute 1ms, mute-RX 15ms, RX-mute 1ms
Power into load mismatch: see text

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB with the receiver preamp switched in and with the filter settings of 2.7/2.7kHz. All two-tone transmitter intermodulation products quoted WRT either originating tone.

CW KEYING PERFORMANCE

Fig 2 shows the CW keying spectrum using the DSP and Fig 3 without the DSP when keying at 40 WPM. The keying envelopes, as observed using an oscilloscope, appeared similar but the correctly shaped rise and fall characteristic with the DSP results in a 15dB improvement in keying splatter at 1kHz from the carrier. The full break-in performance was also free of distortion up to at least 30 WPM. The t/r switching speed should permit entirely satisfactory operation on all data modes.

ON-THE-AIR PERFORMANCE

The radio arrived just in time for the 3Y Bouvet Island expedition and the QRM of the first few days proved an ideal testing ground for this transceiver. It was in this situation where the sub (second) receiver proved its worth by being able to search the receive band for the dxpedition receive channel whilst continuously monitoring the transmit channel. All credit to the TS-950S that 3Y5X was worked on six different band/mode combinations within the first day of operation. The receiver performed impeccably under all situations and it was never necessary to use the input attenuator, although it was usually desirable to switch in the AIP preamplifier on the low frequency bands. The receiver was very clean and no strong signal problems of any kind were experienced. VFO clicks were observed every 10kHz but were not objectionable. The weighted flywheel knob has a very smooth action and tunes like an analogue VFO although there is a touch of raspness to the note when tuning fast. The filters were excellent and so was the performance on the AM broadcast bands.

The quality reports received on transmit with the DSP were superb. On CW, the transmission was very narrow with no trace of clicks and on SSB, the quality reports both with and without the speech processor were most impressive. With the DSP unit disconnected, clicks were audible on CW on either side of the carrier and the SSB reports, whilst still good, were not quite as good as with the DSP unit in circuit.

Ergonomically, the TS-950S was very easy to use although there are a number of small points which could be improved. The IF filters are selected cyclically and this is not very convenient in practice. When operating on CW with 500Hz bandwidth, it involves a lot of button pushing to widen the bandwidth. The VOX button must be pushed in for CW and released for PTT on SSB and I always seem to forget this. Direct VFO from memory would be useful. Trying to listen to two receive channels out of one speaker is not easy and having the capability to use a separate speaker or split headphones for the two receiver paths would be a definite advantage.

CONCLUSIONS

The TS-950S DIGITAL offers a level of performance superior in all respects to the previous top of the range and highly regarded TS-940S. The receiver and transmitter performance is excellent, the ergonomics are good and the second receiver and other comprehensive features most useful. The high quality transmission is unsurpassed by any other rig I have used. The list price of the fully featured radio is £3199; although it is available less DSP unit, TCXO and extra IF filters for £2499.

ACKNOWLEDGEMENTS

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

REFERENCE

"Trio TS930S and TS940S HF transceivers" P.J.Hart, G3SJX. *Rad Com* May 1986, pp 328-333. □

Further Evolution of the G3LDO Double-D Antenna

A decade of development has led Peter Dodd, G3LDO, to improve and expand upon the original design of his Double-D Antenna. Here he describes his experiments.

INTRODUCTION

In the June/July 1980 edition of *RadCom*[1] I described the evolution of a compact two element parasitic wire beam. The objective was to create a compact antenna without loading coils and traps. The solution was to bend the elements, and the configuration shown in **Fig 1** was the result. In essence, this antenna can best be described as a two element Yagi with folded elements. A number of VHF models were built and tested to find the best way to bend these elements; and it was found that they could be folded back to within 20 degrees from the horizontal before the gain started to deteriorate. The resulting configuration was named the "Double-D".

The wire Double-D was found to be amenable to multibanding. Three of these antennas, for 20, 15 and 10 metres were mounted on the same support. The simplest method of feeding turned out to be the best; paralleling the driven elements and feeding them with the one coaxial line as shown in **Fig 2.**

The rest of this article is devoted to my experiences in trying to make the single band antenna design more compact, but at the same time retaining the same efficiency as a full size two element Yagi. VHF modelling was used to explore these configurations. Two practical designs resulting from this work, together with outline constructional details, are given.

DESIGN CONSIDERATIONS

To reduce the overall size of the antenna consideration has to be given to reducing both the element length and the boom length.

According to the diagrams in the ARRL Antenna Handbook, reproduced in **Figs 3** and **Figs 4,** whilst it is possible to reduce the boom length to 0.1 wavelength and to obtain a gain greater than 5dB the radiation resistance falls to around 10 ohms (and would probably be lower for bent elements). Any attempt to reduce the 'wingspan' of the Yagi elements using the bent element approach results in larger proportion of the ends of the elements in the vertical plane.

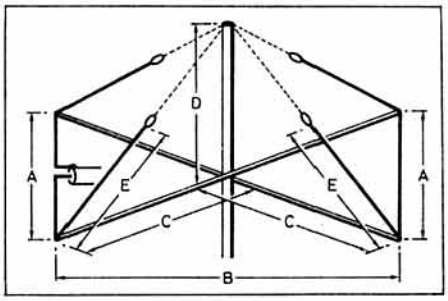


Fig 1. Standard wire Double-D antenna.

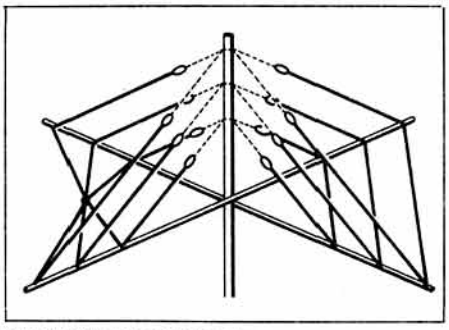
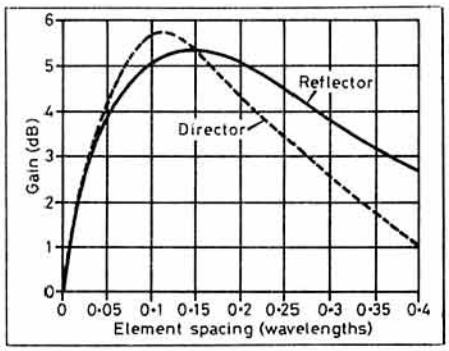
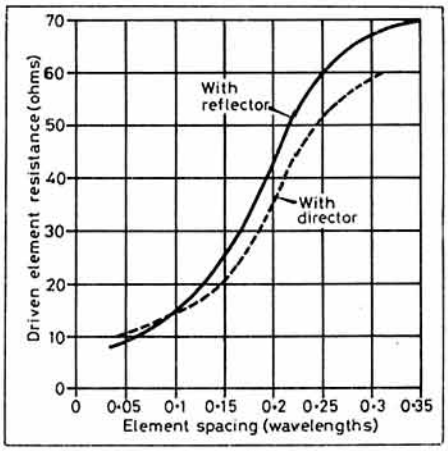


Fig 2. Multiband Double-D antenna.





Figs 3 & 4. Graphs showing possibility of reducing boom length. Source *ARRL Antenna Handbook*© 1988 ARRL.

EARLY EXPERIMENTAL WORK

A VHF model of a wire Double D single element was constructed and various configurations tried out. The element retained the gain of a dipole until the horizontal section was reduced to 0.16 wavelength.

I decided that it would be worthwhile trying to design a compact Double-D antenna using this element configuration; the implications of these initial experiments were that a 7MHz beam could be constructed having the same horizontal size as a three element beam for 15 metres. The actual construction would, however, depend on the radiation resistance. I measured the feed impedance of a dipole, a standard Double-D element and a compact Double-D element at approximately $^1/_4$ wavelength above the ground, via a full wavelength of 50 ohm coaxial cable. These wire element models were measured at frequencies between 28 and 29MHz and the results are illustrated in **Fig 5.**

Because the measured input resistance was low I concluded that the use of all wire elements would result in reduced efficiency because the relatively high resistance of the wire would dissipate much of the input power. The addition of a parasitic element would reduce the radiation resistance (and hence the efficiency) still further.

VHF DOUBLE-D MODEL

A VHF model of the Double-D element was constructed using 'plumbers delight' construction, with 18 AWG solid copper wire for the horizontal section and thin hook-up plastic covered wire for the end sections. The element was gamma matched and the element fed with 50 ohm coaxial cable. A parasitic element was then added using the same construction as the driven element. Initially I used an element spacing of 0.1 wavelength but it proved very difficult to set up. Any slight adjustment of the parasitic element, as either a director or reflector, or the slightest movement of the wire sections of the elements, caused large changes in feed impedance. The spacing was increased to 0.15 wavelengths and the model proved much more docile. The final model is illustrated in **Fig 6** and appeared to have a gain of 4 to 5dB relative to a reference dipole.

14MHz DOUBLE-D

The first large scale model was constructed for 20 metres. This decision was dictated mainly by the relatively small size of the garden at my previous QTH. This design used aluminium tubing for the horizontal section of the elements and plastic covered wire for the vertical end sections.

The only length of boom material available at the time was a 9 foot length of 2 inch aluminium tubing, so I decided on another attempt at the close spaced beam (element spacing about 0.13 wavelengths). The initial sizes chosen for the elements were 12 feet for the tubular horizontal section and 13'8" for the wire sections. The aspect ratio of these elements is slightly different to the VHF model, but as the model predicted good results for horizontal sections longer than 0.16

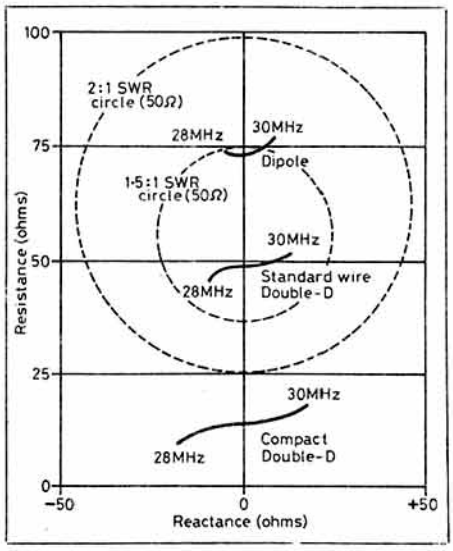


Fig 5. Impedance measurements of dipole and Double-D elements.

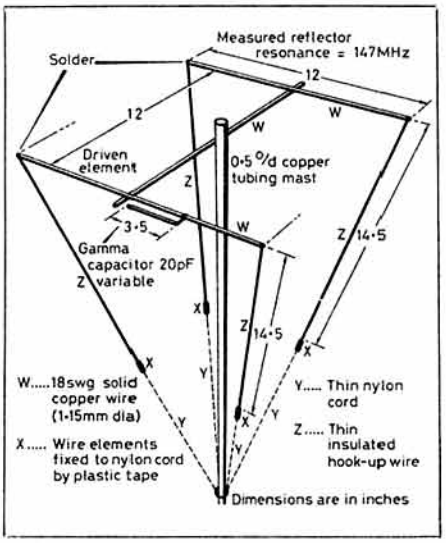


Fig 6. VHF two-element Double-D.

wavelength no problems were foreseen. The elements were then adjusted for resonance at 14.15 and 13.8MHz for the driven element and reflector respectively. The driven element was connected to the feeder via a gamma match.

All the tests were performed at a frequency of 14.15MHz. A receiver was connected to the antenna. A modulated signal generator, with an 18-inch short wire antenna, was placed at the apex of the roof inside the house, located about two wavelengths away from the antenna under test.

The receiver was tuned to the same frequency as the signal generator and the S-meter readings checked as the antenna was rotated. The length of the signal generator short wire antenna was adjusted to ensure the signal strength was within the range of the S meter. (This method had worked well for me in the past.)

The antenna exhibited poor directivity and the business of reflector adjustment commenced. Small adjustments to the reflector caused wild changes in feed impedance even before any improvement in directivity became apparent; in fact an action replay of trying to set up the VHF model. The lessons of the VHF model were being relearned. The boom was extended to 12 feet (0.17 wavelengths) with odd sections of tubing. This tamed the beast and the gamma match was adjusted without any difficulty. The front to back ratio continued to be very poor in spite of many adjustments of the reflector. Reflector resonances between 13.9 and 13.1MHz were tried with no improvement in antenna performance.

Because the VHF model predicted that the configuration would work I did not give up hope, although it was in a mood of desperation that I shortened the parasitic element to try it as a director. At 14.0MHz the element commenced to work as a reflector! At 14.1MHz the front to back ratio improved. The element continued to operate as a reflector, with a reduced front to back ratio, up to 14.45MHz. The final reflector resonance chosen was 14.1MHz because it appeared to give the greatest front to back ratio.

The final dimensions are shown in **Fig 7.** A table of design data was derived from these dimensions and is also shown in **Fig 7.**

The performance of the 14MHz band was quite encouraging even though the top section of the antenna was only 32 feet high. The antenna exhibited 'beam quality and a number of 6,000 miles plus DX contacts were made in the DX doldrums of December and January 1984.

So why were the front to back ratio adjustment difficulties encountered with the 14MHz beam not foreseen with the VHF model? The problem arose because no method of measuring element resonance accurately at VHF was at hand, although this situation changed later; see test equipment below. The VHF model, at this stage, was only capable of modelling the general configuration. Maybe I could have been more careful in extrapolating the physical dimensions, although I have not found this method very successful in the past.

In the spring of 1985 I moved QTH. At this new QTH I did not have an antenna mast so I looked into the possibility of fixing a 21MHz beam to the chimney of the house. The largest 'wingspan' practicable was around 12ft because the house is not very big. The design I came up with is shown in **Fig 8** and is halfway between the original wire version shown in **Fig 1** and the compact derivative shown in **Fig 7.** The vertical support for the ends of the elements has been used as a 2 metre J type vertical, and was also tried as a 28MHz ground plane. The former was very successful and the latter impractical due to interaction with the Double-D elements.

The main difference between this Double-D configuration and the compact model is that the reflector resonance has to be lower than the operating frequency. This antenna can be adjusted relatively close to ground level because the ends of the elements point upwards.

Groundwave tests with G3FXB, 20 miles away, showed a front-to-back ratio of about 2.5 S points

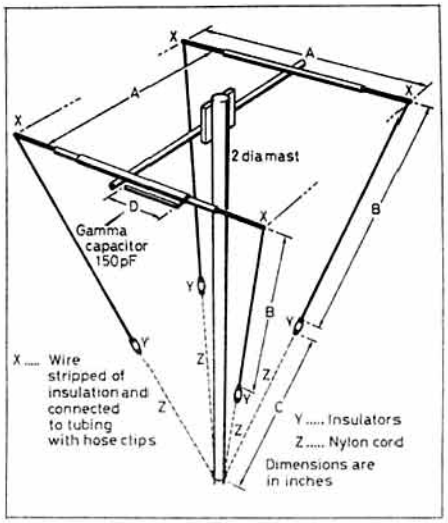


Fig 7. Perspective diagram showing constructional details of a compact Double-D antenna.

$A = \frac{l = 1870}{f(MHz)}$ $B = \frac{l = 2226}{f(MHz)}$ $C = \frac{l = 1176}{f(MHz)}$ $D = \frac{l = 620}{f(MHz)}$

l = length in inches

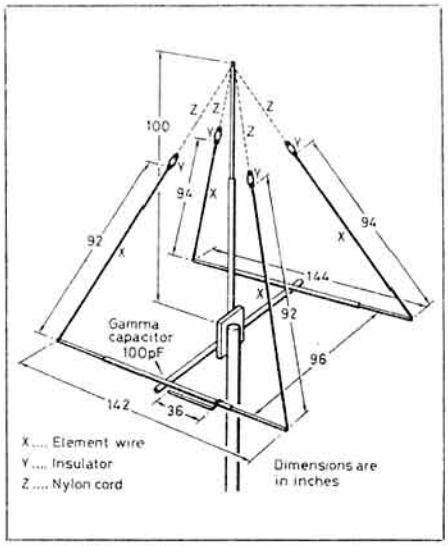


Fig 8. 21MHz Double-D.

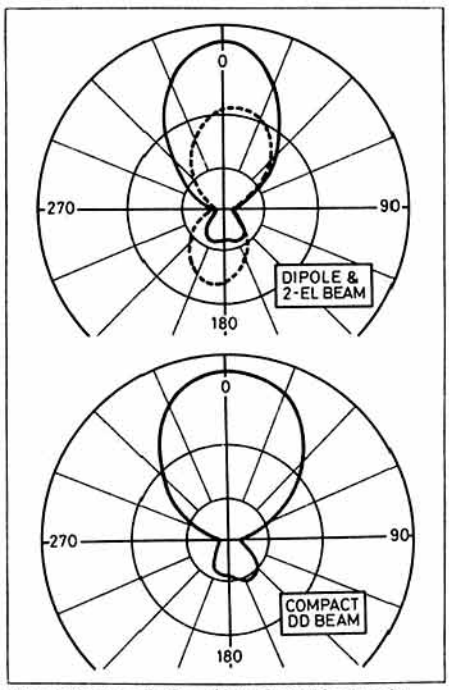


Fig 9. Reference dipole and two-element beam polar diagrams.

measured on the S meter of a Drake R4C. (1 S point = 6dB).

TEST EQUIPMENT

As a result of difficulties in modelling the early designs accurately I decided that further progress could only be made if I possessed better test equipment. As a result I acquired the following:

1. A FET dipper and a frequency counter so that I could measure the resonance of the elements of the VHF models more accurately. The original VHF model of the compact Double-D was measured and the resonance is shown in **Fig 6.**

The VHF Double-D element shows a good dip when resonance is measured. When I first used this test equipment to measure resonance of the elements the driven element was 4.5MHz lower than expected. The cause was found to be the two metres of 50ohm feeder attached to the element. The feeder should be removed when measuring driven element resonance. If removal of the feeder is not possible or impractical its effect can be minimised by terminating the transmitter end with a 50ohm resistor.

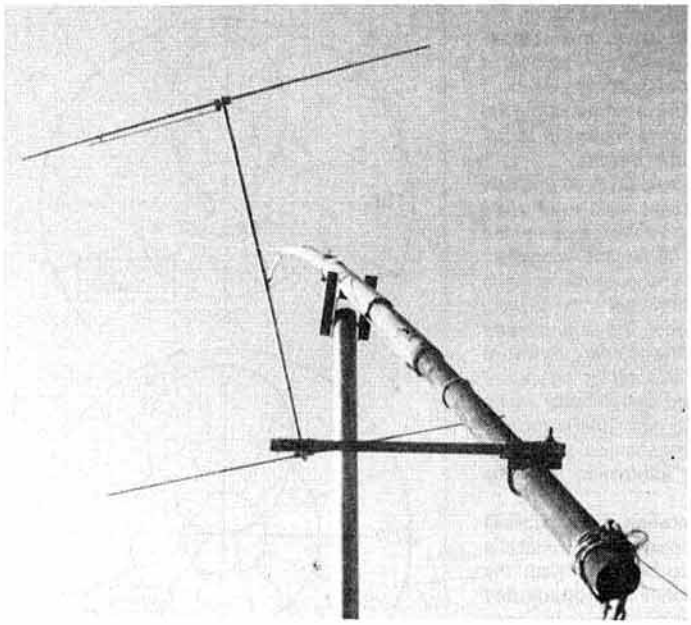
2. A professional VHF field strength meter; the one I use was acquired at a flea market at a radio rally. One of the disadvantages of the diode field strength meter is that the device is inherently non-linear particularly at low field strengths. The effect of this is to give inflated front-to-back ratio readings when making polar diagrams.

Because manual plotting of polar diagrams is difficult and tedious I have automated the process. I use a BBC computer, which has an analogue port accessible via the BASIC language. This, together with suitable software and a fast rotator, make a fairly usable automated system.

The outer, middle and inner rings on the printouts represent 0, -4 and -10dB respectively in these tests which indicated that the two element beam and the Double-D both have an average gain of approximately 4dB over a dipole.

VHF MODELS, POLAR DIAGRAM MEASUREMENTS

VHF models of a reference dipole and a two element beam were constructed. All the models used 'plumbers delight' construction and employed gamma matching. The polar diagrams of the reference antennas and Double-D are compared in **Fig 9.**



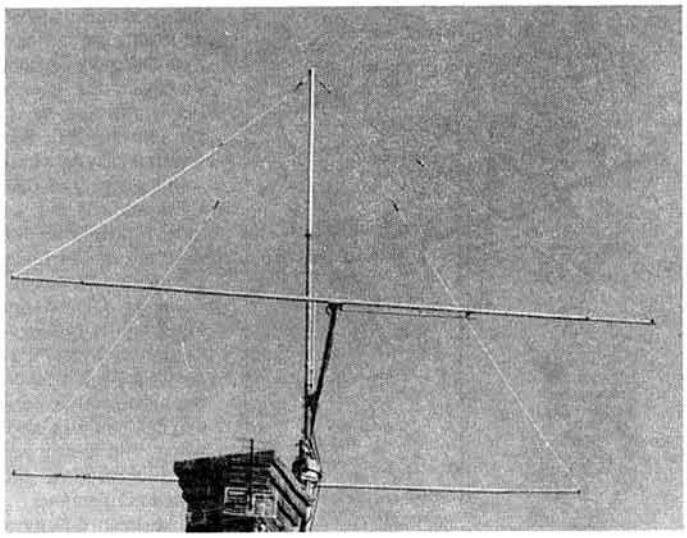


Fig 12 (left). The compset Double-D antenna in its upright position.

Fig 13 (above). The original standard Double-D mounted on the roof of the author's QTH.

The compact Double-D could not be made to operate with the parasitic element as a director. As the frequency was lowered the front-to-back ratio of the polar diagram did show a tendency to reverse before it collapsed.

10MHz DOUBLE-D

In the summer of 1988 I became interested in 10MHz mainly because I now had a rig (Drake TX4C/R4C) that would operate on that band. I decided to try a compact Double-D for 10MHz. I used the 14MHz design data as a starting point but modified it slightly by increasing the horizontal section and reducing the vertical sections of the elements to fit the existing mast. The final dimensions are shown in **Fig 7.**

Checking the front-to-back ratio on this band using the methods used on the 14MHz model was a problem because of the strong commercial stations, so I tried a different approach. I borrowed a professional HF field strength meter from G3PVH which had the advantage of having a very large signal strength meter calibrated in decibels. I placed this on the flat roof of the house extension about two wavelengths from the antenna. The transmitter was connected to the Double-D and a few watts fed to it. I then viewed the meter on the field strength meter, through binoculars, while rotating the antenna. The front-to-back ratio, measured this way, was about 14dB. (This antenna measurement procedure has cast doubts among my nearest neighbours regarding my mental stability).

CONSTRUCTION AND ADJUSTMENT

The construction of the 10, 14 and 21MHz antennas is very similar so I will describe only the construction here. The detail of each antenna is given in **Figs 7 and 8.** The boom was fixed to the tubular mast with a metal plate and car exhaust U clamps. The elements were constructed from $^3/_4$ inch diameter tubing and connected to the boom in the same manner. Half an inch of the plastic insulation was stripped from the wire element extensions and fixed with hose clamps to the end of the metal elements. The other end of the wire was terminated at an insulator and nylon cord. The nylon cord was then attached to the mast.

All metal surfaces forming a joint should be given a protective layer of grease. This is particularly important where copper wire is fixed to the aluminium on the elements. The effect of clamping dissimilar metals can result in a film of oxide on the joints within a few weeks of construction resulting in antenna inefficiency and the danger of TVI, if this protection is not carried out.

To tune the reflector on the prototype I used the traditional method of adjusting element lengths by using elements made from two different diameter tubes clamped with jubilee clips. Another method is to make the elements slightly longer than the design figure states and prune the ends of the elements for maximum gain or front-to-back ratio; this method has advantages when the antenna is mounted on a non-tiltable mast because the tips of the elements can be reached by climbing a ladder if the antenna is not too high.

In the initial stages of adjustment the best place to measure resonance by dipping is the point where the wire part of the element joins the tubular part. I find it very difficult to see any sort of a dip at the centre of the element because of the problem of coupling the dipper to the element.

Note that, although dimensions are shown for the Double-D, it is almost impossible to get complete reproducibility of any design. All installations are in different situations, made of slightly different materials and at different heights. For example, if you use bare copper wire instead of plastic insulated wire for the ends of the elements it will be necessary to multiply the wire dimension figures by 1.04 (plastic covered wire appears to have a velocity factor of about 0.96. Try dipping two identical lengths of wire, one with insulation and the other without to check this). The design data does not include extra wire that may be needed to fix it to the insulator. All installations benefit from some tuning and most well known DX operators have spent a considerable amount of time adjusting their antennas for maximum efficiency. However, having said that, I have found the Double-D not a critical antenna to tune and the 10MHz model worked first time using design data obtained from the 14MHz model. The Double-D has an excellent bandwidth for a compact beam and SWR plots are shown in **Figs 10 and 11.**

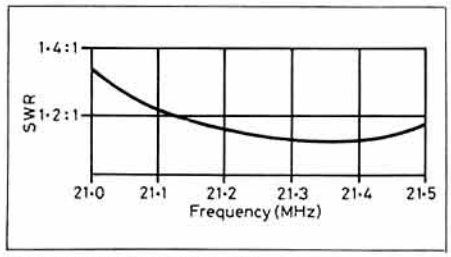


Fig 10. 21MHz beam SWR curve.

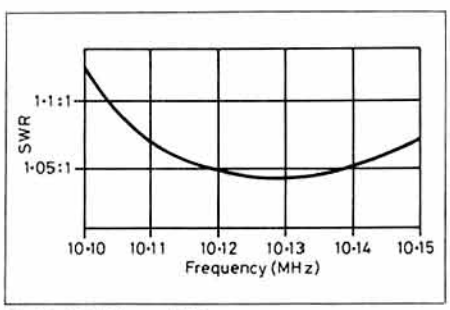


Fig 11. 10MHz beam SWR curve.

One point should be made regarding the Double-D antenna; it is horizontally polarised and requires the same height above ground as full size beam to get the equivalent performance. However, it is considerably easier to support an antenna with an element span of 16ft than a span of 40ft.

There is a further consideration; if a large Double-D is mounted on a tilt-over mast that bends like mine, the wire elements need to be slackened off to prevent the top element from being strained when the mast is lowered.

There is no reason why the Double-D should not be mounted on a more traditional non-rotatable mast, provided the element wire ends and the nylon cord supports are slack enough to allow the antenna to be rotated. I have not devised a way of guying my antenna system because I find it easier to just tilt the whole structure over if high winds are forecast. The antenna is shown in the upright position in **Fig 12.**

COMPACT DOUBLE-D PERFORMANCE

I now have had some operating experience with a 14MHz model at 32ft and a 10MHz model at 42ft. On 14MHz the antenna exhibited reasonable directivity and a lot of DX was worked but my signal was rather outclassed by the three or more element beams at more than one wavelength in height.

On 10MHz it was a different matter. Most operators on 10MHz use 100 watts to either a dipole or a vertical. It was surprising what one (theoretical) S point difference made on transmit; also the improvement in signal to noise (and QRM) ratio was well worthwhile.

REFERENCE

[1]P. Dodd, G3LDO, "Wire beam antennas and the evolution of the G3LDO Double-D", *Radio Communication,* June/July 1980. □

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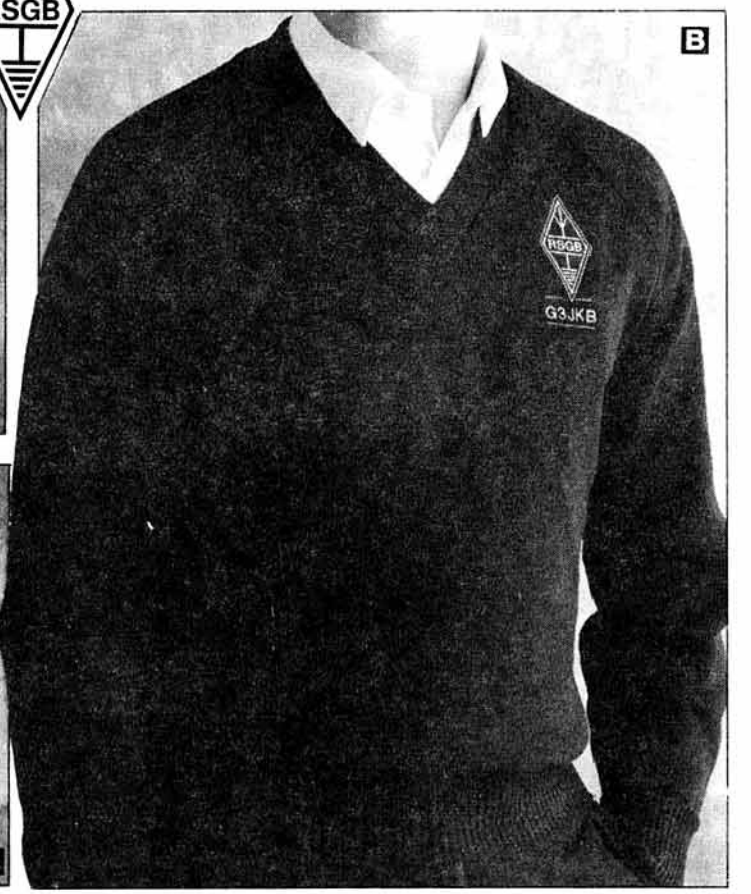

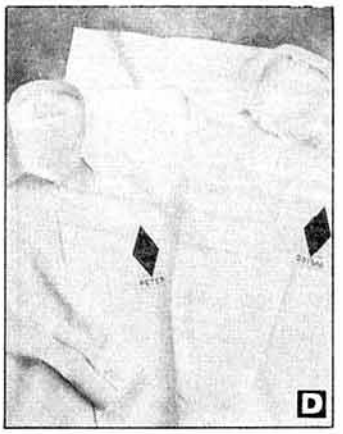

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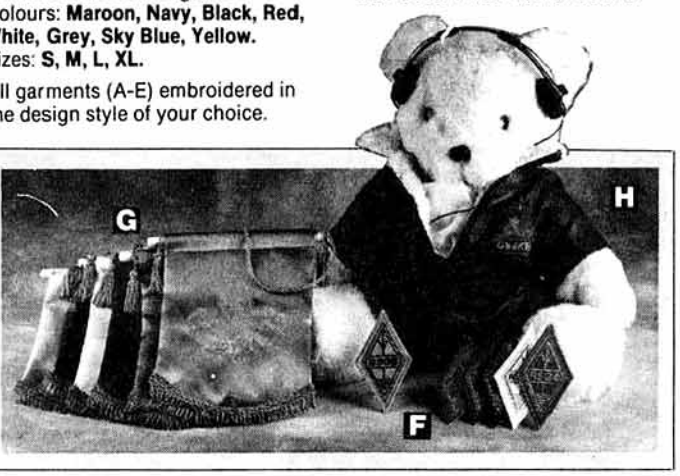

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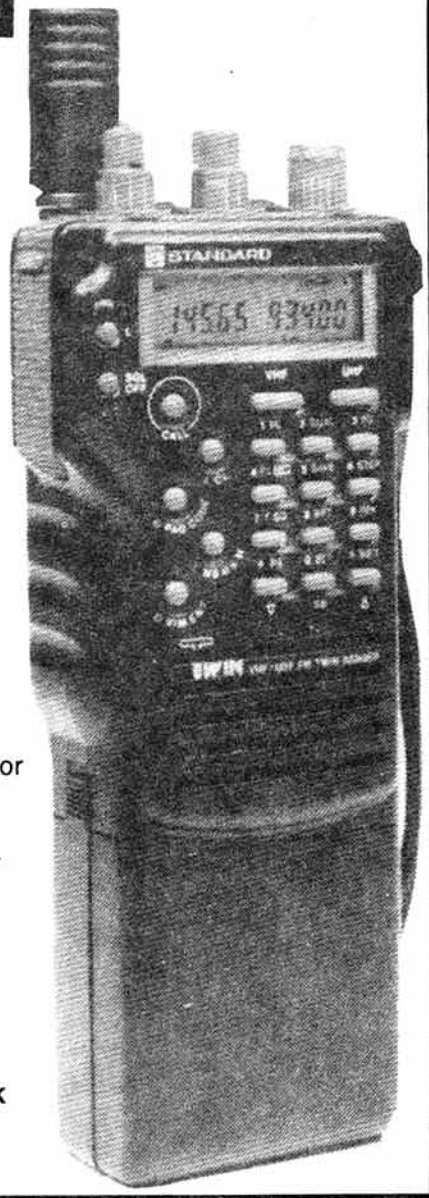

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Close Encounter with a Moon Man

When Canterbury High School opened its own amateur radio station and space observatory they expected some interesting contacts. But they hit the jackpot when a real astronaut came to visit. Brian Didman, G4RIS*, reports.

Readers will remember an article entitled *The Bardstown Experiment* in the December 1989 issue of *RadCom,* but could be forgiven for not realising that such things could also happen in this country.

Many schools, colleges and universities around the country have some amateur radio equipment but very often due to the lack of time, resources and licensed staff it is not used at all and rarely in an educational way. The Canterbury High School, however, decided to develop a theme of 'communication' in its many forms across the curriculum. The school is now finding that amateur radio has a very useful and definite place in the classroom.

THE FOUNDATIONS WERE LAID

The communication project was launched on March 20th 1989 with a live trans-Atlantic satellite link, set up by British Telecom, during which staff and students were able to talk to U.S. astronaut, Colonel James Irwin, the eighth man to walk on the moon.

Sponsorship was sought to provide a weather satellite receiving station. This was obtained and the equipment set up, giving the school the "earth from space" aspect of the communications theme - it quite literally gave the pupils a new perspective of the earth through the reception of pictures. This experiment proved to be very popular and so two of the science teachers decided to go one step better.

Instead of just receiving signals they believed they could actually transmit messages from the school, so they both studied and passed the RAE. Adrian, the school Head of Science, became licensed as G7FWF and Ingrid received the call G7FQU. Having got their callsigns they needed some equipment with which to operate. Again, sponsorship was sought and ICOM UK at Herne Bay were approached. After some discussion they were able to donate a complete HF station! An ICOM IC735 transceiver plus PSU was provided, together with a full size tri-band beam and rotator. They even volunteered to come and set the station up, erect the antenna and do the initial tests to ensure that everything was in order for the children to use.

From day one the interest was very high indeed. As Adrian, G7FWF, says "We were amazed at the amount of activity on the amateur bands. The children were able to pick up signals from all around the world and identify their locations from the world callsign map above the rig. This has the spin off benefit of strengthening their knowledge of geography. Children also rapidly discovered how much the different peoples of the world have in common with each other."

The enthusiasm for Short Wave listening was so great that there would often be pupils waiting at the school for Adrian to arrive at 7.30am - so they could turn the rig on. The children were learning something new every day, such as the way in which radio waves are propagated around the world, the influence of the sun and weather conditions on signal strengths, and the use of the phonetic alphabet.

Adrian had already had some contact with NASA the first thought was for an astronaut. This seemed most appropriate for the opening of a space observatory. So Colonel James Irwin was approached and he agreed to spend some time in Canterbury speaking to the children and performing the opening ceremony.

THE REALISATION OF THE DREAM

After months of planning and back-breaking toil Colonel Irwin finally arrived in Canterbury on Saturday 13th January 1990. While in Canterbury he launched the school's marketing of lunar rock holograms, made at the Johnson Space Centre in Houston, from a piece of lunar rock he had collected from the moon.

Dennis Goodwin, G4SOT, of ICOM (UK) Ltd presenting the hand made 'Roake' key to Col Jim Irwin.

To give the station more life local amateurs, in particular G0ILO, G0CBM, G3MDT and G3EMU, would come into the classroom one or two afternoons a week putting the station on the air.

During this period, there was another, much larger project on the drawing board - the building of a space observatory. This was planned and constructed by staff, with some help from local industry. For the official opening a 'personality' was sought, and as Colonel Irwin was very pleased to give his time to the children during the four days he was in Canterbury, always ready to answer questions, describing his trip to the moon and sharing his experiences of the Apollo 15 mission. This was the first mission to use the Lunar Rover, the first vehicle to have been driven on the moon. He gave a talk to a packed hall of parents and children from a number of local primary schools, and another lecture at a local theatre to a packed house.

Through the medium of amateur radio he was also able to speak to students at the Bardstown Middle school in Kentucky. Adrian had seen an article in *RadCom* describing the work of teacher Chris Luvisi, KC4IDX with his class, and their success in obtaining large numbers of Novice Licences with ten year old children. Adrian and Chris were able to arrange a sked for their classes.

As the Canterbury High School is very new to the world of amateur radio a special event callsign, GB0CHR was obtained so that students could send greetings messages. On the day there was great excitement on both sides of the Atlantic, in spite of the propagation predictions for 10 metres being very gloomy. The presence of a film crew from 'Blue Peter' might have had something to do with it. In the event, the conditions were perfect, with 59 copy in both directions. Colonel Irwin had been expected just to send a short greetings message to Chris, KC4IDX, but in the end most of the American novice licensees at Bardstown queued up in order to get such a rare event in their own log books! They all wanted to pass their good wishes onto the pupils at Canterbury and most had questions to put to Colonel Irwin. Missy, KC4INF, wanted to know if the space suits were hot to wear; Eric asked why he had wanted to be an astronaut; Gail, KC4ISM, was interested in what the earth looked like from space. The Colonel was able to pass a greetings message to Bardstown and, at the same time, briefly answer some of the children's questions.

It was clear from the excitement in the students voices that they thoroughly enjoyed having their own novice callsigns and being able to make their own QSOs. There is, in the UK, a discussion document before the DTI which might allow a similar novice licensing scheme to go ahead here; surely this is an import from the USA that we should be pleased to have.

The QSO was also joined by GB2SM from the Science Museum in London. Edmund, KC4ISM was very interested in the problem of acid rain and the GB2SM operators found themselves being asked awkward questions.

When the QSO was completed ICOM (UK) Ltd presented Colonel Irwin with a magnificent morse key, hand made by Peter Roake G0KDN.

Colonel Irwin then joined the BBC TV crew for the formal opening of the new observatory. Later that day he again took the microphone to pass greetings messages to a regular two metre net of Canterbury amateurs which surprised them greatly! The following day, Col. Irwin caught a flight back to his home in Colorado Springs.

CAN WE KEEP THE INTEREST ALIVE?

The enthusiasm for amateur radio has continued in the school, several of the students had expressed an interest in obtaining their own equipment for short wave listening and enquiries were being made to find a suitable receiver kit for the pupils to build. The school has facilities for construction so the necessary skills can be taught, and perhaps offered as a project in school time.

To further strengthen the link between school and radio, the East Kent Radio Society now holds its bi-monthly meetings at the school, using the school's rig and science laboratories. Members of the EKRS have taken an active part in helping the school - G4SOT and G4RIS giving up a great deal of their time to help B licensees discover the mysteries of morse code. The Society's first meeting at the school was attended by nearly a hundred amateurs, some of whom had travelled from as far afield as Brighton in order to hear TV weatherman Ron Lobeck reveal the secrets of weather forecasting and propagation.

CONCLUSION

Why is it so important for radio societies to make a major effort to get involved in schools just as the East Kent Radio Society has? The answer is complex and in two parts. Firstly, due to the ravages of time the hobby is losing its older adherents and at the same time it is failing to gain the interest of the young. Of the candidates who sat the RAE in Canterbury in May 1989 it was estimated that 90% of them were over 40 years of age. Even worse only 5% were female. Secondly, schools and their teachers are under-resourced and over-stretched. The pressures of trying to cope with more and more innovations such as National Curriculum, profiling, and the GCSE leaves teachers with no time to search for new ideas and no funding to support their introduction. Amateur radio has much to offer schools and their students so there is a great need for the Novice Licence to be made available as soon as possible. Furthermore it is essential that holders of A and B licences should do all they can to help and encourage the amateurs of the future, by helping the schools and by answering calls from novice licensees. Perhaps many of the novices of the future will never bother to go on to a full licence, but even so it will have excited their interest in the sciences generally - and we need a population which has a greater knowledge of science and technology.

Please help your local school - the teachers and students deserve and need your support. You know where to find them, but do THEY know where to find YOU?

The Canterbury High School would like to thank ICOM (UK) Ltd for the loan of the IC781 transceiver used to make the contact, an R9000 receiver, and the exhibition display stand.

* Additional material provided by Adrian Beaumont, G7FWF, and Dennis Goodwin, G4SOT

Watched by enthralled children, Col Jim Irwin passes greetings messages to KC4IDX at Bardstown School under the supervision of Dennis Goodwin, G4SOT of ICOM (UK) Ltd.

1989 – how was it for you?

A propagation review by C. Newton, G2FKZ

From a propagation point of view, 1989 was a very eventful year - and as usual 'eventful' implies both good news and bad. One bit of thoroughly bad news was that Radio Australia ceased broadcasting its solar data feature each morning. Many people in the UK used to rely on this for up-to-the-minute data; in fact I've been surprised at the number of telephone calls I have recently received asking where such data can be be obtained now. The short answer is that I don't know, unfortunately. However, there is the GEC-Marconi Research Centre's 'Short-Term Ionospheric Forecasting Service' which covers Western Europe and gives information on imminent ionospheric disturbances, expected geomagnetic activity, etc. This is available by telephone on 0245 73331, extension 3152. The data is updated at about 1600 hours daily and it's also placed on the Society's Prestel pages. Via amateur radio, K1JRW listens to the WWV broadcast at 18 minutes past the hour and then transmits the details on 28.885MHz just after 1818 hours. This gives spot numbers, solar flux and geomagnetic details.

We did hope that by this time the Society's solar data beacon station would be operating. We have official backing, promise of a frequency just outside the 3.5MHz band and a suitable transmitter. The solar data is available, but I'm sorry to say that the administrative problems of where to site the beacon and how to maintain and finance it remain to be resolved.

Solar Cycle 22 remains comparable with the largest of the previous cycles - Cycle 19 - both for smoothed sunspot number and solar flux levels. Cycle 22 commenced in September 1986, and from the word go it raced ahead of any of the previous cycles since numbering began in 1755. It maintained this lead for about two years. Although Cycle 22 is now falling behind Cycle 19, which was the previous largest, the final outcome may be neck-and-neck.

The invention of satellites has revolutionized the data now obtainable, and we now do a good deal more than merely look at sunspots. The previous sunspot cycle, Cycle 21, was the first to be scrutinized in any detail by satellites and hence there is a limited amount of previous data to go on. However, taking an equivalent period to compare the cycles up to October 1989 shows that the present cycle was ahead by 29 proton events to the previous 13 - more than double. The number of X-ray flares - the ones that really matter - has been 61 this time as against 38 for the previous cycle, which again is a very large increase. However, the ionospheric comparisons are not so startling. For the same period at Slough, October 1979 gave F2 critical frequencies around 13.8MHz as opposed to 14.4MHz for December 1989. However, we have had some very good days with up to 15.6MHz being reported — and there have been some good openings on 50 MHz.

The sunspot count smoothed Boulder six-monthly levels put the current cycle about 30 ahead of Cycle 21, and about 10 lower than Cycle 19. Considering the level of flare activity, the solar flux levels for this cycle have in my opinion been disappointing, although the monthly means have exceeded those of Cycle 21 for 10 out of the past 11 months. Examination of the Boulder six-monthly smoothed data up to October 1989 shows that present flux levels are about 25 units ahead of Cycle 21 and are comparable with Cycle 19.

Geomagnetic levels, however, are *not* comparable. This cycle has been very active and there have been many auroras, mainly due to the large number of proton events which have occurred. In comparison, Cycle 21 was very quiet. The highest A index recorded in 1979 was 42 units on 18 September; by comparison, most of us will remember the event on 13 March 1989 which recorded 284 units. Since then there have been 8 days of over 42 units, with 5 being over 60, 2 over 70, and 1 over 80.

All this brings us to the big question - when will the peak be? My guess is March 1990, which brings us to the matter of what will happen after that. Because the spot count will be going down, do not think that all the other parameters will be doing likewise; in fact the more energetic flares will become more plentiful. Out of the 60 proton events which occurred during Cycle 21, only 20 took place before the spot maximum. For X-ray flares, only 48 out of the 172 for Cycle 21 occurred before the spot maximum. On that basis, we could be looking at about 90 proton events to come - most of which could be expected to give an aurora. We should also have about 230 X-ray flares to come. So in about a year, when the sun's magnetic field has reversed and settled down, we can expect some big auroras. If the pre spot maximum is an indicator of what is in store, then the VHF DX-chasers are in for the time of their lives!

WOOD & DOUGLAS?

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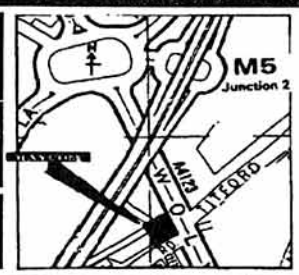

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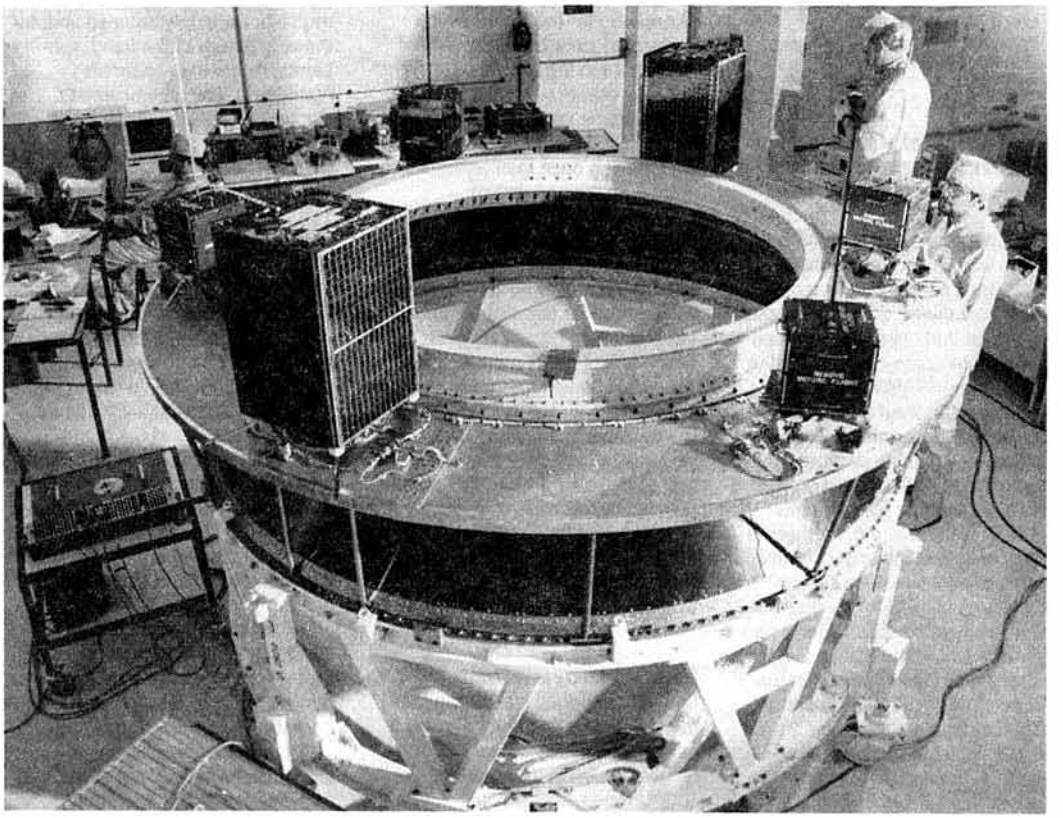

Integration of Microsats and UoSATs D and E on to the Ariane Structure for Auxiliary Payloads. (Photo. UoS Spacecraft Unit).

The various satellite launches referred to in this column last month have now taken place and both that from the ESA's launch site at Kourou and the Japanese launch from their TANE-GASHIMA Space Centre went off successfully. For the record, the Ariane launch was at 0135 UTC on Sunday, 22nd January last and that for the Japanese H-1 launch vehicle was at 0133 UTC on Wednesday, 7th February. A commentary of the launch from Kourou, was transmitted from the site and was well received in this country and thoroughly justified the effort made by many of staying up into the 'early hours' to listen to it. At AMSAT-NA's suggestion, the Japanese satellite JAS-1B which was named "Fugi No2" before launch can now be called "Fugi-Oscar 20" or simply "FO 20." All seems to have gone well. FO 20 has been well received in this country. At the time of writing all satellites have been heard and are in "testing phases" following which they will be brought into full use. It is not possible in the limited space available in this column to give details of all these satellites, but for those who are interested, the February 1990, Number 81 issue of OSCAR NEWS has a full account of them. The two UoSAT's D and E are fully described, as are the Microsats. Details of FO 20 will be given in this column when available. Non-members of AMSAT-UK who would like to read about these satellites can obtain copies of the Oscar News No81 from AMSAT-UK HQ, 94 Herongate Road, Wanstead, London, E12 5EQ, price £2.50.

I have been asked if I could give details of some literature suitable for newcomers to satellites who want to read about them "right from the grass-roots", as they put it. The following may help in this respect:

The Sheffield Project, a first handbook of satellites at £2.20.
Satellites for Beginners, on all Satellites SEUK at £2.60.
Guide to Amateur Satellite operating at £4.95.
25 Years of Amateur Radio Satellites at £2.75.

All these are available from AMSAT-UK HQ.

AMSAT at the NEC

The RSGB Amateur Radio Convention and Exhibition will be held at the National Exhibition Centre, Birmingham, on Saturday 21st April and Sunday, 22nd April, and AMSAT-UK will be having a stand there. It is an excellent opportunity for both the newcomer and the more experienced satellite enthusiast to discuss their problems with AMSAT-UK personnel at the stand. A special effort is being made this year to attract the newcomer with demonstrations of satellite operation with it is hoped tape recordings, etc, to which visitors can listen to satellite QSOs. So if you can attend this Convention look out for the AMSAT-UK Stand.

OSCAR News

AMSAT-UK's OSCAR NEWS has come out in a new format, much improving its presentation, which has brought very favourable comment from its readers. Its new printers, Waveney Print Services Ltd, in Beccles, Suffolk, deserve much praise for their production. OSCAR NEWS has in the past received commendation as the best radio club newsletter/journal. Its new image should certainly help it to maintain its position in future contests. Specimen copies can be obtained from AMSAT-UK HQ at £2.50.

Satellite news

News at hand at the time of writing, suggests that FO 20 should give some excellent opportunities for extreme DX working. Apparently its apogee varies from a high to a low position, which will give quite a variation in communication paths. We also hear that WEBERSAT which has a CCD camera has already had it in operation with good results. The satellite DOVE is also working well, being a very strong signal at the writer's QTH. There are some repeated short breaks in its transmission, which are a bit off-putting when you first encounter them, but be patient, it soon starts transmitting again! This break in transmission may be to avoid blocking the 2 metre receivers of the other microsats, as it has a 145.825 MHz transmitter output.

From the various letters, newsletters, communications from Kourou, etc, which come my way, one is able to get some insight into what must be a most fascinating period of activity needed to get the spacecraft ready for launching. One is liable to be quite amazed at the ingenuity of the planning and building of satellites and ignore the technological miracles needed in launching. The following excerpts from letters, etc, from Kourou give just a glimpse of these activities: NEWS from Kourou. T minus 30 days, 7 hours, until launch on 11th January, 1990 0135 UTC. "The folks in Kourou have spent a very busy weekend. Harold Price, NK6K, has been the centre of attention for the past two days as he finalises the software for the final load into the spacecraft. There is quite a bit of mechanical work to be done to the spacecraft. Not major rework, but tedious and vital tasks such as getting the final thermal coating on to the spacecraft. Chuck Stout and Jeff Zerr, have been doing most of this work. The mechanical problems with the ASAP have been worked as the place we will be riding is all set and ready to receive the spacecraft. Jan has spent most of his time with the battery charging scheme. The Arianespace people seem to have forgotten that we have trickle charged all three previous spacecraft while on the gantry and they wanted us to fly the spacecraft dead. Of course, this was unacceptable since they had told us we would be able to and we assumed we could, so we designed the separation around LIVE spacecraft. This meant that all systems but the transmitters were alive from the time the batteries were connected. We MUST charge the batteries or they will be pulled down to nil since we will be on the pad for many days with the live spacecraft. At last a compromise was worked out and that is we charge 10 hours per day. At the current rate of energy consumption by the system, the battery capacity is 55 hours. As you can see we are heating up on locking down the spacecraft to the launcher and getting ready to sit back and wait. I wish to say a special thanks to Dave Cowdin, who has selflessly volunteered to go down over the especially lonely time over Christmas to stay for almost a month to do nothing more than monitor battery charging if all goes well".

Finally, can I remind readers that useful nets take place on Sunday mornings at 1015 local time and on Monday and Wednesday evenings at 1900hrs on the frequency of 3780 or 3777KHz. The first frequency is that preferred but if QRM is too bad, the second is used. Both newcomers and old-hands will find the information given on these nets most helpful in keeping up with the latest satellite news.

MICROWAVES

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

Omissions! - Other publications plus some beacon news

In the February column I mentioned a number of other publications which were of interest to the microwave operator. A welcome letter from Geoff, G3TQF, Leicester, prompted that I hadn't mentioned some of the up-to-date material in the form of the ARRL Microwave Updates, published in '87, '88 and '89. For instance, the '88 update contained a number of designs for the "middle" bands based on the use of Avantek or Mini-Circuits MMICS. Remiss of me, for there is much excellent material contained within the covers of the several updates published following what now seems to be established as an annual event in the States. Other material has also appeared in the Proceeding of the Central States VHF Conferences, numbers 21, 22 and 23, also obtainable from ARRL. Geoff mentioned that the updates are available direct from ARRL HQ and may be paid-for by your plastic friend! Apart from the time for the surface mail delivery (about six weeks), Geoff was so well pleased with the contents that he has already "booked" his Update '90. In the same letter, Geoff apologises to users that GB3LES (2320.995MHz) has been running about 30% power output and a few kHz off-frequency. Power has now been restored but it is understood that the frequency is still slightly off: this will be corrected at the next service. Similarly GB3LEX on 10400.0MHz is possibly a few megahertz off-frequency, again due for correction at the service time.

Since writing the February column I've also obtained my copy of the BATC "ATV Compendium", a nice, compact pocket-sized publication devoted, as you would expect, to ATV. Nevertheless, there are several items of microwave interest including transmit and receive designs for both "24cm" and "3cm", both of which bands are now receiving considerable attention from our (really) wideband colleagues. Whilst on the subject of ATV, it is strongly rumoured that both G4DDK and G4FRE have been doing some experiments with microwave TV - watch out BATC!

New lamps for old

For about ten years the Alpha Cup was awarded to the overall winner of the annual RSGB 10GHz Cumulatives. It appears that this cup was awardable for a limited number of years. We were unaware of this fact and the award period apparently expired some time ago. Our thanks must go to Alpha Microwave for the award which gave many people a great deal of enjoyment in the events.

It was proposed that, from 1989, the award be replaced by the Dain Evans (G3RPE) Memorial Award, Dain having been instrumental in setting up the concept of Cumulative Activity Periods, later to become contests, in the first instance. Approval has now been obtained for a Memorial Cup which will be held for one year, supplemented by a silver plate which is retained by the recipient. There will be no changes in the terms of the award ie. it will go to the overall winner, as before. It is perhaps rather appropriate that the first (1989) award will go to Julian Gannaway, G3YGF, who, despite his busy year in the office of Society President, still found time to go out and be the overall winner of the event! Well done Julian!

Plans, more plans

Since I mentioned last month that the Microwave Committee were most encouraged to hear of renewed interest in the use of 10GHz for several old but "resurrected" beacon and linking projects, evidence of more interest has come to light which led to a rapid "planning session" at the last Committee meeting in early February. All the requests have come via the RMG Special Projects Co-ordinators, Dave, G4NJU and Jon, G4MDC and are, of course subject to approval by the licensing authority.

First, renewed interest in linking UHF repeaters to improve "patchy" coverage in poorly served areas. Originally specified in the 2.3 or 10GHz bands, most user groups are said to have found it too difficult or costly to produce equipment for those bands, although the Microwave Committee would not necessarily agree with that!. Therefore, would the 1.3GHz band be usable, where commercial equipment or designs or even "surplus" equipment is becoming available? The immediate answer is yes, provided that use is made of the already designated link channels at 1240 and 1909MHz. Although primarily digital, we see no reason why these channels should not carry speech signals also. The alternative, if there is local congestion or another very good reason why the channels cannot be used, would be to nominate some of the presently unused repeater channels. Channels RM16 to RM19 inclusive have been recommended. The existing link channels are most likely to be approved without undue delay, with the others held in reserve.

10GHz has received further attention with requests for nomination of further "channels" for ATV repeaters and "channels" for in-band voice repeaters. These requests were duly debated and, by the very nature of the band, sub-bands, rather than channels nominated. The recommended solutions are as follows:

Channel			
TV0	10,200	10,040	160MHz
TV1	10,225	10,065	160MHz
TV2 *	10,250	10,150	100MHz

*This "channel" already licensed for GB3TG, mentioned last month.

The apparently "odd" choices were made with due regard to existing band users - amateur and professional: due to the latter, the areas of the band which do not allow unattended use are 10,250 to 10,270MHz and 10,300 to 10,400MHz. Amateur links (digital or speech, as in the 1.3GHz band mentioned above) are designated between 10,006 and 10,026 and again between 10,150 to 10,170MHz. The areas around 10,100 to 10,130MHz and 10,380 to 10,410MHz are, of course, commonly used for normal WBFM operation and wideband beacons.

For in-band speech repeaters, the slot between 10,270 and 10,300MHz (where unattended operation is allowed) is recommended for speech repeater outputs. Inputs could be either around 10,100 or 10,440MHz, both about 170MHz away from the output sub-band. This should satisfy either northern or southern operators! Your comments would be welcomed.

Is this a record?

The new G4DDK 004 board is already in stock - even before the descriptive article has been published! The original intention was to publish my little review article "Making Microwaves Work" and to follow shortly after with Sam's new design as a detailed practical example of the general principles laid down earlier. However, for one reason or another, it didn't happen that way!

The 004 design is an LO/multiplier board with output between 2·0 and 2·6GHz, information on which is available immediately to purchasers of the board. It has been designed to be suitable for either receive or transmit use in the 2·3GHz band, providing about 7dBm output. One interesting feature which has emerged from the construction of several prototypes is that it is possible, because of the broadband nature of microstrip circuits, to tune up the final doubler to act as an amplifier! This means that besides its original function, the source could be used at about 1300MHz (23cm again!), in which case you might expect some 50 to 70mW output. The dedicated, dual output DDK 001 board gives 2 by 10mW, or 1 by 20mW. So the 004 board could be used as quite a nice little 1.3GHz beacon TX.

SWL

BOB TREACHER BRS 32525
93 Elibank Road, Eltham, London SE9 1QJ

The NEC Convention

This month sees the Society's amateur radio convention and exhibition to be held in Hall 7 of the National Exhibition Centre, Birmingham. For a few years now, a few of the country's established listeners have thought of manning a stand at the exhibition to provide an "advice shop" for the SWL. However, we never seem to get our act together in time, and advertisements for the event appear before we have approached the organising team! Perhaps next year.

There will, however, be many special features of the exhibition to interest SWL members. There will be comprehensive representation by the majority of the Society's committees, lectures to stimulate the mind, and the Society's bookstall. This really is the one event in the calendar which ought to attract a large listener following.

VHF contest rules

In an attempt to attract more SWL entries to Society contests, I have re-written, with the VHFCC's approval, the rules for such contests. The full rules will appear in Contest News when space permits. There are some important changes. Firstly, there will be an SWL section to any contest organised or adjudicated by the VHFCC, Next, the HF contest "1 in 3" rule has been introduced, and in "multiplier" contests, this will be "1 in 3 unless the station heard is a multiplier for the SWL". On UHF or other VHF bands there are to be no logging restrictions, but no more than five consecutive contacts made by any one station should appear in logs. The Hansen Trophy will now be awarded to the SWL with the best aggregate score in contests held between 21 January and 2 December this year.

In framing these rules, the views of David Whitaker BRS25429 and Mick Toms BRS31976 were sought. I hope that the full rules will be more attractive to listeners and that starting with either the 50MHz contest on 8 April, the 432MHz event on 5/6 May or the 144MHz contest on 19/20 May, we will start to see some healthier listener participation: and I wonder if we will now see an SWL entry in one of the 1296MHz events?

VHF Awards — Part III

We have already looked at VHF Awards in general, 50MHz awards, and the Countries and Counties Awards. Now, as mentioned last month, we shall look at the "4-2-70 Squares" Awards.

70MHz: 20/4, 25/6, 30/8, 35/8, 40/8, 45/8 and 50/8.
144MHz: 40/10, 60/15, 80/18, 100/20, 125/20, 150/20, 175/20, 200/30,225/30, 250/35, 275/35, 300/40, 325/40, 350/45, 375/45, 400/50, 425/50 and 450/50.
432MHz: 30/6, 40/10, 50/13, 60/15, 70/15, 80/15, 90/15, 100/15, 110/15, 120/18, 130/18, 140/20 and 150/20.

These are intended to mark successful UHF/VHF achievement and it might not be widely known that they are available to SWLs. Initially, a certificate and one sticker will be issued by Ian G4OUT. Further stickers will be issued as additional Locator Squares are claimed. The title of each award gives the number of locator squares and countries needed to qualify for the award, an example being the 144MHz "100/20" for which you will need QSL cards confirming 100 locator squares including 20 countries on 144MHz. The table shows the awards which are available:

All loggings must be after 31.12.78, and QSL cards must be arranged in alphabetical order of QTH squares claimed and a checklist must be provided.

Now listeners have as much information, over the last three months, as they need to start looking through their UHF/VHF QSL cards, or getting QSL cards off to stations heard in order to provide G4OUT with some extra work!

International Marconi Day

Following last month's insight into IMD, I can provide even more information this time around. First, a correction and an addition to the list of stations which will be active — the second Italian station will be IY4TTM, while the first French station to be active during IMD will be F?IMD.

G3FWE provided more information on the GB0IMD operation. This will be from the Wireless Museum at Puckpool Park which is near Ryde on the Isle of Wight. The station will be active on both SSB and CW. The CW station will be on 21MHz using wartime gear (an AR88 and 62 Set) into wire antennas. The station will support the Mary Rose Award and the Spectrum Award, together with the one day award from the Cornish ARC for the IMD certificate. Remember, the date is 21 April.

"Hugo" revisited

Tony VP2MIX (ex G3ZEN) wrote following my piece in January's Spectrum Analysis about Hurricane Hugo. As a number of people have commented on it, I thought it worth relating some "on-the-spot" views.

Tony said that the hurricane was a truly terrifying experience. Although sheltered on the ground floor of his house, and even a double set of 26-inch thick stone walls on all sides were not enough to make him feel safe. The living room furniture above was rearranging itself, water was pouring in, and doors complete with frames and nailed down shutters were exploding outwards. His ears were constantly "popping" from the pressure changes. Hurricane force winds lasted for about 8-10 hours, apart from a short period when the eye passed over the island when everything was eerily still for a few minutes before the wind resumed, but from the opposite direction. The general consensus was that winds have reached 200mph, with many small tornadoes spawned within the hurricane itself. Indeed, one amateur recorded one gust at over 160mph on his anemometer before it was destroyed.

VP2MIX was in QSO with the National Hurricane Centre in Miami until the power was turned off a couple of hours before "Hugo" hit and he had thoughts of getting back on the air soon afterwards, but when he wrote — four months later — there was still no power at VP2MIX!

Every amateur antenna and tower in Montserrat was demolished, and so were the huge towers of Radio Antilles (which claims to be the most powerful commercial station in the hemisphere, with a 200kW medium wave transmitter!) and every other radio station on the island. Tony, being an old friend, has offered the family and I a holiday in Montserrat — once it is rebuilt, so I'll have to start saving the pennies!!

Listener reports

This time, I have news of an amateur that took the trouble to write and tell me of a useful SWL report he had received. George, G2CIL (ex BRS1914), felt that the report he received from a Belgian SWL — ONL-07837 — was the best he had received during his many years on the bands. The report (which I do not have space to reproduce here) was for a CW report on a 7MHz QSO which George had with G0FIP last September. It was clear, concise, accurate, well presented, provided all the relevant information, and obviously impressed G2CIL. It was good of him to take the trouble to provide the information, as it is always pleasing when SWLs take time and trouble over preparing their listener reports — it pays in the long run!

HAB news

Dennis GW6JNE provided the latest news from the HAB hunters. SWL Dicken has obtained the first HAB Awards on 50MHz in the form of a basic award, and a Large Squares class 3 award. Many other Awards have been achieved since our last report, with no fewer than 22 mentioned in Dennis' letter. Finally, if any SWL heard the GW4ZQV/GW6JNE expedition to Wormshead and Burryholms Islands on 9 December last, QSLs can be obtained from Dennis.

The shack of Jean-Pierre Dutheil, F11AJB, in Paris, showing his R600 receiver.

Newcomers

I am delighted that a number of newcomers have written with information for this month's issue. Long may it continue! First, we have Mark Hayward BRS92649. Mark lives at Basildon in Essex and uses a Yaesu FRG-7 receiver into a 66' wire inside the garage. It works well, as his list of stations heard proves. He has 130 countries heard and is patiently waiting from some QSL returns.

Egbert Hertsen ONL4003 saw the column and decided to write. He has been an SWL since 1977. His main interests are DX chasing and Award hunting. He has 318/320 countries confirmed (missing ones are YA and XW8), and over 400 Awards. These include the "WPX Award of Excellence", the YASME Award, and the USA-CA 500. He is also an active member of the German Award Club (DIG) and Egbert suggests that anyone interested in Award chasing should join. The address is Eberhard Warnecke DJ80T, Postfach 101244, D-5620 Velbert 1, West Germany, and please enclose an IRC for the reply!

Garry Telloke ARS92633 is a newcomer, joining the Society in November. He explains that his entry to short wave listening is in a very humble way — listening on an 80m Howes DcRx built from a kit, a homebrew ATU and an audio amplifier recovered from a record player. Despite its simplicity and the very random length of wire, he feels that his loggings are consistent with what other SWLs are hearing. Garry had a query which is a common one amongst beginners — "why can I only hear one side of a QSO when, say, a German is working a station in the British Isles." This is a phenomenon called the "skip zone". I will attempt to cover this and other propagation issues in the next few months.

Stephen Slater BRS92755 has been a member of the Society since December. He has been an SWL since 1962, but has only listened to the amateur bands since last November. He has 133 countries heard on 14MHz. He uses a Howes DcRx 20, with only 20' of wire. Stephen would like to see a short "nostalgia" series in *RadCom*. He feels that there ought to be one member somewhere who is prepared to put pen to paper (or fingers to keyboard) in order to pass on such information to the membership. *(If there are any takers, perhaps they would write to HQ... Ed).* Stephen also provided some simple circuits which would be of interest to listeners, and I will find room for them next month.

Finale

That's it for another month. Once again a bumper mailbag has led to there being some overmatter. Keep the news coming — it's always easier writing the column with plenty of news at my side! Contributions for the June issue should be with me no later than Monday 23 April. Until the next time, 73.

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

A simple homebuilt QRP station by D3JNB. Left to right: 12 volt power supply, ONER transmitter for 80/40/20 metres, direct conversion receiver and audio filter.

"A bit of real amateur radio"

That is what one of the first timers told me about the QRP Winter Sports. This annual event takes place between Boxing Day and New Year's Day and attracts many of the growing number of QRP operators throughout the world. It's a simple idea: just go on the bands, using less than 5 watts and try to work as many other QRP stations as possible. It is not a contest but rather a fun event. The results and comments have now come in from the last Winter Sports and they make interesting readings. Perhaps if I quote a few examples, readers many want to join in next year's Sports.

On 3.5MHz, Colin, G3VTT, used his homebrew crystal controlled valve transmitter to work two way QRP with AA2U, W3TS, N4AR and EA6ZY. Carl, W1NV, operated a replica 1930's station with a single 45 valve as a Harley oscillator and a four valve TRF receiver to work Glyn, G4CFS who was using 1 watt to a 100 foot wire only 10 feet high. Chris, G4BUE worked AA2U on all eight HF bands and W3TS on five HF bands, all two way QRP. The list of two way QRP 3.5MHz transatlantic contacts is far too large to quote in this column. During 1990, daily transatlantic QRP Tests are to take place on 3560KHz from 0630 to 0800 GMT.

Bert, ZL2BSJ, suffers from an antenna ban at his home QTH and went portable by the seaside with a 15ft high antenna. On 14MHz he worked G4BUE and with his homebrew 10.1MHz transmitter he worked KH6JOI/QRP. Ben, CT4CH, found his magnetic loop was flooded by rain. Undeterred he worked all over Europe with a 1 metre helical whip, as did Kurt, HB9AMZ, with an indoor mounted mobile whip tuned against a metal window frame.

Mike, W3TS, was awarded the G4DQP Trophy for the best overall contribution to the Winter Sports. Mike worked over 40 new European G QRP Club members, including G0AMZ/M and five band two way QRP contacts with G4BUE and G3VTT. The runner-up was Bob, G4JFN for consistent DX contacts. The whole event was tremendous fun and proof that good results can be had with low power and simple equipment.

East to West QRP Weekend

This new event, sponsored by the G QRP Club and Czech QRP Group, is designed to bring together QRP operators throughout Europe and adjacent areas of Asia to strengthen amateur radio bonds and provide new data on the operation of QRP circuit paths. For the event, Europe is divided into two areas: Area A, being HA, LZ, OK, TA (inc. Asia), SV, All USSR Republics including Asia, YO and YU and Area B, which is the rest of Europe from the DXCC List. Only contacts between the designated areas will count, contacts between stations in the same area may be made but will not receive points.

Contacts must take place between 1600hrs UTC on Friday 28th September 1990 and 2359hrs on Sunday 30th September 1990. This is a friendship event and it is hoped that competitors will allow themselves good rest periods. CW is the only mode with a maximum power of 5 watts, calling "CQ EW QRP" on the International QRP Frequencies: 28060, 21060, 14060, 7030 and 3560 kHz, ±10kHz. The minimum exchange must be RST, power output in watts and the operator's name.

Logs may be submitted, within 30 days to OK QRP Group, U1 Baterie 1, 16200 PRAHA 6, Czechoslovakia. Separate sheets are required for all bands and entries must show date, time, RST in and out, power and name received. A cover sheet must give full details of the station and antennas used and state the total number of contacts made and the number of DXCC countries contacted in the other area. Certificates of merit are to be presented for area and country achievements. Full details will be included in the HF Spectrum Analysis in *RadCom*.

A QRP first on 50MHz?

Axel, N8AXA, has sent me photocopies of his log entries for working all six continents on 50MHz when using 5 watts mobile. The 5 watts was used with a bumper mounted quarter wave vertical and the entire WAC, and 9 DXCC countries were achieved in a month between 5 November and 8 December 1989. Axel choose periods when the band "was hot" and found that his vertical always outperformed his Halo antenna which is also available on the car.

The contacts were with CT1DTQ (cw), DL3ZM/YV5 (ssb), KL7NO (ssb), W6JKV/CT3 (ssb), AH6AP/KL7 (ssb) JA9IPF (cw), KG6DXs (ssb), CO2CB (ssb), HB1BI (cw) and GM0EWX (ssb). Like Axel, I suspect that this is a unique achievement and he wonders if there are any special awards he might claim.

The sixth Yeovil QRP Convention

This annual event, organised by the Yeovil Amateur Radio Club, is on Sunday 13 May, 1990 at The Preston Centre, Monks Dale, Yeovil, Somerset. I have never been able to attend the Yeovil QRP Convention but those who have tell me I have missed a good event. The entrance fee is £1.50 and here will be talk-in on S22 from 0830 by GB2LOW.

The event includes an impressive line-up of lecturers: George Burt, GM30XX, on "QRP — A Way of Life", Tim Walford, G3PCJ, on "Home Construction Techniques", Rob Micklewright, G3MYM, on "Daytime Milliwatting on 80 Metres" and Bert Arnold, G3RHI, on "Coherent or Synchronised CW". There are traders stand, displays, QRP station and food and drink are available all day. The Convention closes at 5pm.

Alongside the Convention, the club organises the Yeovil QRP Funrun. This is a light hearted contest for CW QRP stations on 3560 and 7030 kHz on the Bank Holiday weekend preceding the Convention: 0800 GMT, Saturday 5 May to 2000 GMT on Monday 7 May 1990.

The event demands an exchange of RST, Power Output, QTH, Name and G QRP Club number (if any). There will be three Funrun Stations, GB2LOW, G3GC and G3CQR which score bonus points in a rather cunning scoring system. Full details of the Convention and the Funrun can be had, for an SAE, from any of G1MNM, G3CQR, G3GC or G0HDJ, all of whom are as listed in the RSGB Call Book.

International QRP Day: Sunday June 17 1990

IARU Region 1 International QRP Day occurs on a Sunday this year, so a good chance to give QRP a try for at least one day. Just come onto the HF bands using less than 5 watts CW or 10 watts PEP SSB and try the International QRP Frequencies of 3560, 7030, 10106, 14060, 21060 and 28060 kHz (CW) or 3690, 7090, 14285 and 21285 and 28885 kHz (SSB).

The more competitive operators may like to attempt to win the Suffolk Trophy, which is a keepsake plaque and a book token. For this award operation must be for a period of 6 hours, on that day, in not more than 2 periods. Contacts are required with any Region 1 countries with normal QSOs and no serial exchanges. Each Region 1 country, contacted on each band, counts as 1 point, the total score being the total of IARU Region 1 countries contacted on all the bands used. Only one contact per country, per band, is allowed, irrespective of mode. Stations contacted may be QRO.

Entries must include name, address, callsign, power, equipment and time/call/band for each contact and a summary to give band and overall scores. Logs must be sent by 17 July to the Awards and Communications Manager of the G QRP Club, A. D. Taylor, G8PG, 37 Pickerill Road, Greasby, Merseyside, L49 3ND.

EMC MATTERS

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

Field strengths

The RIS policy statement in the Dec 89 EMC column mentioned the measurement of field strengths produced by an amateur station. Several readers have asked how Amateurs could measure the field strengths produced by their own station and what significance the results might have.

One method of measuring field strength is to use a measuring antenna and a measuring receiver. An amateur receiver could be used as a measuring receiver by connecting a large scale meter in place of its 'S' meter and using a signal generator to calibrate the new 'S' meter in terms of dBμV at the antenna socket. This calibration would only be valid at a particular frequency as there could be significant variations in gain across the frequency range of the receiver.

A calibrated antenna presents more of a problem. In theory a half wave dipole in a field of E volts/metre and aligned for maximum pickup gives an open circuit EMF e where :

$$e=E\lambda/\pi$$

where λ is the wavelength in metres and π is 3.1416.

So in a 1 V/m field at 144MHz for example, a dipole would give an EMF of 0.66 V RMS. The potential difference developed across a 50 ohm load would depend on the radiation resistance of the dipole, which is nominally 72 ohms, but is affected by proximity of ground and other conducting objects. For wavelengths of 4 metres and more, however, a halfwave dipole becomes inconveniently large for making indoor measurements.

One type of antenna used for professional EMF measurements is a biconical. It is a broad-band dipole whose elements are cone-shaped 'cages'. It is supplied with a calibration curve showing its antenna factor over the range of frequencies it is designed to cover (typically 20 - 200 MHz for a biconical). Antenna factor for an E-field antenna is the ratio of the incident field strength in volts/metre to the output voltage of the antenna into its designed load. A professional biconical measuring antenna can cost over £1000 however and a home brew version would be very difficult to calibrate.

Self contained E-field strength meters generally use an electrically short antenna with a broad-band RF amplifier, detector and meter driving circuit, but again professional field strength meters are not cheap. The problem with amateur designs for so-called field strength meters is the lack of a means of calibrating the finished instrument in volts/metre. If any readers know of published articles on construction and calibration of field strength meters to amateur use (without the use of an EMC test lab !) please inform me via the column.

Given we have a calibrated field-strength meter, a number of factors affect the field strengths which can be measured in the vicinity of an Amateur station. At a distance d metres from an antenna whose ERP is P watts, the theoretical field strength E in volts/metre is given by

$$E=(\sqrt{49.15P})d$$

This assumes 'free space' propagation conditions and a distance d large enough to ensure 'far field' conditions. As ERP is the power fed to the antenna multiplied by the gain of the antenna relative to a dipole, the above field strength would only be produced in the direction of maximum antenna gain.

In practice, wiring, pipes and any structural metal work in a building could cause reflections or could pick up the Amateur signals and re-radiate them elsewhere. This could cause considerable variations in measured field strength in different parts of a room, particularly at VHF and UHF. In the case of a TV connected to a long coaxial cable or an audio system with long loudspeaker cables it would be difficult to say what field strength the 'installation' as a whole was actually being subjected to, or to relate its immunity in situ to any level of immunity which the equipment may achieve in an EMC test laboratory.

Amateur field strength measurements could give a useful indication of whether the field strength produced by a particular transmitting antenna in nearby buildings is excessively high for a given ERP. In several cases known to the EMC Committee. breakthrough problems on the 10 metre band have been solved by changing from a G5RV antenna to a dipole, thereby reducing the field strength generated in neighbours' premises without reducing transmitted power.

Satellite TV

A member reported that his next-door neighbour was unable to view any TV programme when he was operating on 21 MHz. He had always taken the precaution of having toroids fitted on the mains and antenna leads from his transceiver. The problem had arisen since the neighbour had installed a satellite dish/receiver system. The reception had been free from breakthrough whereas now both terrestrial and satellite signals were affected. He had contacted the installer who disclaimed any knowledge or responsibility, stating that it was the amateur's fault. Assistance was sought from the EMC Co-Ordinator.

He advised that the reception of signals at the dish (Ku-band, 10.7 - 18GHz) and operation of the LNB (dish-mounted down-converter to approx. 1.5GHz) were unlikely to be affected. The particular satellite TV receiver uses an I.F. of 479.5MHz, a BREMA standard chosen to avoid mutual interference with mobile radio systems. Other similar receivers, inadequately designed, have the potential for being affected at I.F. frequencies by amateur transmissions. They also have the potential of radiating from the I.F., but this did not apply here. The satellite receiver operates on the UHF loop-through principle, also acting as a tuner for the terrestrial broadcast signal and receiving aerial input from the standard TV aerial and from the LNB, processing both and giving a modulated output to the TV set on approx. channel 36 UHF. It was therefore possible that the 21MHz signal was entering the LNB downlink cable, the terrestrial aerial and downlead, the mains input to the satellite receiver unit, or by direct radiation into the receiver itself since it was separated from the amateur's station by only a short distance.

A diagnostic sequence was suggested, following a logical progression with the cooperation of the neighbour, to determine at which point the unwanted signal was entering the system and being inadequately rejected.

The result of this was the fitting of a toroid on the terrestrial aerial lead into the satellite receiver, and two toroids on its mains lead. This resolved the problem completely, thus pleasing the neighbour, the amateur and the RSGB EMC service.

The Radio Teleswitch

The following information on the Radio Teleswitch has been supplied by Philip Howarth, G3YAC, who is one of the team at Cambridge Consultants Limited who were responsible for the design of the Teleswitch manufactured by Landis and Gyr Limited. We have had no reports of problems relating to this manufacture of Teleswitch.

Radio Teleswitches are widely installed by electricity supply authorities. They perform the same function as the time switch in an "Economy 7" installation. The time switch ensures that you are charged at the correct tariff and may control storage heaters.

The Teleswitch is an improved time switch that permits greater flexibility and improved performance. It works by receiving signals broadcast alongside the Radio 4 transmissions on 198kHz. The carrier is phase modulated at 25 bits per second with a peak phase deviation of 22.5 degrees.

The signals carry data packets each 50 bits long. Four bits define the message class and 13 provide error correction. Each minute, the data carries a time message containing information about the year, week, day, hour, etc. The other messages are mostly for electricity board Teleswitch use.

The messages broadcast to all Teleswitches permit accurate time keeping and allow the switching times to be programmed. Depending on the arrangements made with your electricity board, the unit may respond to a variety of commands stored in a diary which has been received off air.

The units contain a 198KHz receiver, phase demodulator and a microcomputer to store the diary information. One particularly interesting specification is the sensitivity. The unit should operate in field strengths of only 100 microvolts / metre. The BBC usually quote around 20 millivolts / metre as the normal service limit. There are also stringent requirements for correct operation in the face of severe interference from e.g. TV timebase harmonics. It is quite startling to observe perfect data emerge from a Teleswitch where absolutely no programme material is discernible on an ordinary broadcast receiver.

The bandwidth of the phase modulation is very small (about 70Hz) and Teleswitch receivers make good use of this and the error correcting coding. Despite these factors, siting a 198kHz ferrite antenna only an inch or so from the digital circuitry creates interesting design challenges. A great deal of effort was put into minimising the electromagnetic radiation from the unit with which I was involved. The result was a unit which is essentially undetectable in terms of RFI radiated from it. On 145 or 432MHz we could not find any noises - even with the "antenna" wrapped around a working unit.

There is nothing in a Teleswitch which should alarm a radio amateur. If you are suffering from noises radiated by a Teleswitch then I suspect it is faulty. You should insist that the electricity board remove it and replace it with a quiet one.

EC EMC Directive

A comment on the RSGB's response to the DTI Consultative Document is contained in the Society pages in the front of this issue.

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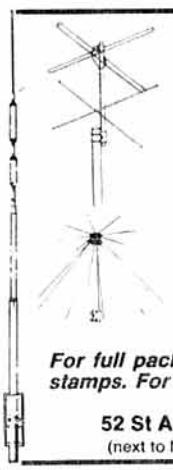

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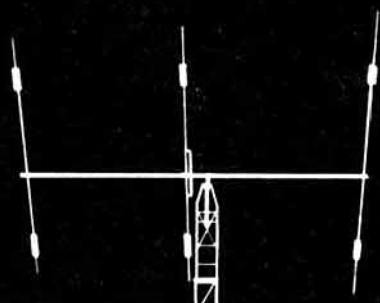

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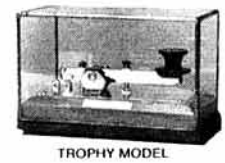

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G-QRP Club Circuit Book	£6.54	£5.56
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continued on next column

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RSGB — MAIL-ORDER PRICE LIST

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HOW TO ORDER

NON-MEMBERS. Use left hand price columns. Note that members' sundries are only available to members of RSGB.

MEMBERS. Use right hand price columns. It is essential that you quote your callsign or RS number so that you can be recognised as a member.

PRICES. These include postage, packing, and VAT (where applicable) and are subject to change without notice.

AVAILABILITY. Goods are available less postage and packing from RSGB Headquarters between 9.15am and 5.15pm Monday to Friday. However you are advised to confirm availability of goods by telephone before visiting Headquarters. We attempt to keep ample stocks of all our sales items, however as this list has to be prepared several weeks in advance we cannot guarantee that any item on this price list is immediately available.

PAYMENT. Payment may be made by post enclosing a cheque or postal order. These should be crossed and made payable to 'Radio Society of Great Britain'. If sending cash please use registered post. You may use your credit card for payment by post or by telephone. We accept RSGB Credit Card, Visa, Access (Mastercharge), American Express, and Diners Club cards. Our telephone number for orders is (0707) 59015 (24hrs). Our Giro account number is 533 5256.

DELIVERY. Goods will be despatched to UK destinations by 2nd class letter post or parcel post, or surface mail to overseas destinations. Please contact RSGB Headquarters for 1st class letter post or airmail rates. We normally despatch goods within 60 hours after receipt of an order, but as delays can sometimes occur please allow 28 days before enquiring about non-delivery of goods.

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November 1989

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Febuary/March 1989

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Control board	038942a	£4.50
Regulator board	038942b	£2.00
Complete set of 7 boards	0289TXQ	£23.50

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

CONTEST NEWS

RULES

SUMMER 1.8MHZ CONTEST 1990 RULES

1. Date and time: 2100UTC Saturday 23 June to 0100 Sunday 24 June 1990.

2. Sections: Single or multi-operator. British Isles entrants must be members of RSGB. (a) British Isles (b) Overseas (including EI).

3. Band and mode:1.820 - 1.870MHz, CW only.

4. Exchange:RST plus serial number starting with 001. British Isles stations must also give their county code as shown in *Radio Communication* January 1990.

5. Scoring:

(a) British Isles Section: three points for each completed contact with a bonus of five points for the first contact with each British Isles county and for the first contact with each country outside the British Isles.

(b) Overseas Section: three points for a contact with a station in the British Isles (not EI), with a bonus of five points for the first contact with each British Isles county.

6. Documentation: Logs to be headed: date/time (UTC);callsign; RST/number sent; RST/number received; code received; bonus; points claimed. *Duplicates must be clearly marked without claim for points.* Unmarked duplicates will be penalised at the rate of 10 times the number of points claimed for them, and logs found to contain more than five duplicate contacts for which points have been claimed would normally result in disqualification.

Each entry must be accompanied by a cover sheet and the following signed declaration : I declare that this station was operated strictly in accordance with the rules and spirit of the contest and agree that the decision of the Council of the RSGB shall be final in all cases of dispute.

7. Name and address for entries: Address logs to HF Contests Committee, John Allaway, G3FKM, 10 Knightlow Rd, Birmingham, B17 8QB, England.

8. Date for entries: Logs must be postmarked no later than 15 days after the end of the contest.

9. Awards: Certificates of merit will be awarded to the winner and runner-up in each section.

50MHZ TROPHY FIXED/SINGLE/MULTI OPERATOR AND SWL

8 April, 0900 - 1700 GMT

Only fixed stations in this event.

The general rules apply.

There will be three sections: S SWL; F Single Operator Fixed and M Multi-operator fixed.

County and Country multipliers will be in accordance with general rule 14. The Isles of Scilly count as Cornwall, North and South Humberside is only one county.

The station with the highest overall score will receive the Telford Trophy.

All entries and checklogs to G8XVJ Erik Gedvilas, 518 Manchester Road, Paddington, Warrington, Cheshire WA13TZ.

144MHZ AND SWL

19-20 May, 1400-1400 GMT

General rules apply (see above).

Three sections: S single operator; L SWL; M Multi-operator.

County and Country multipliers (general rule 14, but see above)

All entries to Bob Harrison, G4UJS, QTHR.

432MHZ TROPHY AND SWL

5 May, 0900-1700 GMT

General Rules apply (see above).

Three sections: F Single Operator Fixed; S SWL; O Open section.

The 1951 Council cup will be awarded to the station with the highest overall score in the contest.

All entries and check logs to VHF Contest Committee c/o G8HHI QTHR.

432MHZ TO 24GHZ

5-6 May, 1400-1400 GMT

General rules apply (see above).

There will be three sections: L SWL; S Single Operator stations using same call on all bands; M Multi-operator, who may operate on all bands concurrently using separate callsigns.

Scoring Radial Ring 432-1296 and 1 pt per km on all other bands. Half points may be claimed for cross band contacts. Individual band and overall tables will be published.

All entries to G4WAD Tanglewood, Bridge Street, Lower Moor, Pershore W102PL.

VHF NATIONAL FIELD DAY 1990 RULES

1. Duration. 1400GMT 7 July to 1400GMT 8 July 1990

2. Site Notification. Each Group intending to compete must send details of the site to be used to: VHF Contest Committee, c/o B Llewellyn G4DEZ, 110 South Avenue, Southend-on-Sea, Essex SS2 4HU., to arrive no later than 1 June 1990. The appropriate site registration form can be obtained from G4DEZ QTHR, or at NEC or VHF Convention stand and should contain the following information. The name and address of the person responsible for the entry, the name of the group, the callsigns to be used on each band, the section (Open, Restricted or Low power), the locator and national grid reference of the site, and sufficient access information for an inspector to locate the site (preferably a sketch map). Each group may only register one site. A stamped addressed post card should be included if confirmation of receipt is required.

3. Bands. Up to four separate stations may operate simultaneously on the 70, 144, 432, 1296 and 2320MHz bands. Single band entries for 144MHz will not be accepted. The 70MHz CW section will take place in the period 1400-2200GMT, and the 70MHz SSB section will take place in the period 0600-1400GMT, with close down between 2200GMT and 0600GMT. The same callsign must be used on 1.3GHz and 2.3GHz, with no simultaneous operation on these two bands. The 1.3GHz and 2.3GHz stations will close down for the period 2200-0600GMT.

4. Operators. Any RSGB member or group of members operating from the British isles (excluding Eire) may enter. Visiting foreign amateurs may also operate field day stations as long as they are members of IARU member Societies. Groups operating from the same site may combine their scores subject to rules 3 and 5.

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

6. Scoring. Contacts will be scored by the radial ring system. Scores on 1.3GHz and 2.3GHz will be added together to give a final microwave score. The overall score will be determined as per general rule 10 using the final 70MHz, 144MHz, 432MHz and microwave scores.

7. Contest exchanges.

(a) On 70MHz QTH information must be exchanged. It must be given in a different form on each mode.

(b) On 144, 432, 1296 and 2320MHz QTH information need not be exchanged.

(c) Contacts with stations whose callsigns appear on any of the group's cover sheets will not count for points.

8. Sections. There will be four sections: Restricted section (R):

(i) The height of any antenna must not exceed 10 metres above ground level.

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

(iii) 2.3GHz contacts will not count for points in this section.

Low Power section (L):

(i) The power output of any band must not exceed 25W PEP at the transmitter.

(ii) The height of any antenna must not exceed 10 metres above ground level.

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

(iv) 2.3GHz contacts will not count for points in this section.

Open section (O): as per general rules.

SWL section (S): as per general rules.

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

10. Entries.

(a) All entries must be postmarked no later than 31st July 1990.

(b) Entries must be addressed to: VHF Contests Committee, c/o B Llewellyn G4DEZ, 110 South Avenue, Southend-on-Sea, Essex SS2 4HU. [PLEASE NO RECORDED DELIVERY]

11. Awards. The Surrey Trophy will be awarded to the overall winner of the Open section, the Arthur Watts Trophy to the overall winner of the Low power section, the Tartan Trophy to the leading Scottish entry in the Open section, the Scottish Trophy to the leading Scottish entry in the Low power section, and certificates will be awarded to the winners and runners-up on all bands in each section, and to the leading stations in each country. Although nothing has been finalised it is hoped that a Trophy will be awarded for the leading station in the new Restricted section.

12. A position certificate will be awarded to any group who require it, however please enclose a separate SAE of at least A5 size, no SAE no certificate.

13. Please enclose postcard or SAE (separate from 12 above if you require confirmation of receipt or extra contest forms.

SWL RULES FOR VHF/UHF/SHF CONTESTS 1990 ONWARDS.

1. The 1990 general rules for SWL sections of the Society's contests have been revised in an effort to try to attract a greater number of SWL entries. Any contest organised or adjudicated by the Society will carry a listener section. The VHFCC have sought the views of some of the country's leading contesting SWL's in framing these new rules.

2. The 1990 general rules for VHF/UHF/SHF contests will apply except where they are modified below.

3. Listener contests are open to any non-licenced member of the RSGB. Only the entrant may operate the receiving station.

4. Logs must show the following information.

1. Date and Time (GMT).
2. Callsign of station heard.
3. SWL report of station heard.
4. Report, Serial Number, and QTH Locator/information (if applicable) sent by station heard.
5. Callsign of station being worked.
6. Points claimed.

5. Stations may only be claimed for points if they are in QSO with another station.

6. On 144Mhz, the callsign in the "station worked" column must only appear once in every THREE contacts logged. In "multiplier" contests, this rule shall be read "must only appear once in every THREE contacts logged unless the station being worked is a new multiplier for the listener".

7. If both sides of a QSO can be heard, both may be claimed for points provided that rule 6 is not contravened.

8. There are no restrictions on logging any station heard on any of the VHF UHF or SHF bands. However, it should be noted that the VHFCC expect that no more than five consecutive contacts made by any one station should appear in any listener log on any VHF UHF or SHF band.

9. The Hansen Trophy will be awarded to the SWL with the highest aggregate score in all the SWL sections of RSGB contests between 21st January and 2 December 1990. The aggregate score will be calculated in accordance with general Rule 10.

GENERAL RULES FOR RSGB VHF/UHF/SHF CONTESTS 1990

The rules governing all RSGB VHF/UHF/SHF Contests held in 1989 will include the following general rules, supplemented by individual rules for each contest. Please read the rules carefully before the event.

Queries on vhf contests may be made to Bryn Llewellyn, G4DEZ, 110 South Avenue, Southend-on-Sea, Essex, SS2 4HV. Telephone: 0702-460747.

The individual contest rules contain most of the detailed information on the sections, scoring systems and methods of tabulation. Unless otherwise stated in the individual contest rules, all of the general rules apply in every contest.

Please note that all points claimed for a contact will be lost by both stations if either station logs callsigns incorrectly, including any suffix. The receiving station will also lose all claimed points for a contact where other information is logged incorrectly. Ten times the claimed score will be lost for unmarked duplicate contacts.

The committee intends to make station inspections in events other than VHF NFD during 1990.

1. Entries

All entries must be sent to the contest adjudicator at the address shown in the individual contest rules. Entries sent to other addresses will be treated as check logs. All entries become the property of the RSGB and cannot be returned. Recorded delivery and registered post should not be used, as receipt of your entry may be delayed.

2. Last posting date

All entries must be postmarked not later than 16 days after the end of the contest or last cumulative activity period.

3. Cover sheets

All entries must be accompanied by a correctly completed current RSGB vhf/uhf contest cover sheet (Form 427-89) for each band used, including full details of antennas and final amplifier devices. In multiband events entrants must also complete a multiband sheet (Form 4422). In contests using a county/country multiplier scheme a multiplier check list must also be included.

4. Operators

All operators must be RSGB members.

5. Single-Operator fixed stations

Single operator fixed stations are those operated by the licensee in person from his/her normal place of residence, with no assistance with operating or log keeping during the contest.

6. Fixed stations

To be eligible to enter a fixed station section the station must be located at the main station address shown on the licence validation document.

7. Locations

In multiband events all stations forming one entry must operate from one site, defined as a circle of 1km radius. All equipment for /P stations must be installed on site during the 24 hours before the contest or during the contest itself. There must be no operation from the site on the bands involved in the contest in the week prior to the contest.

Entrants may not change the location of their stations during the contest.

8. Valid contacts

No points will be lost if a non-competing station contacted by an entrant is unable to supply and IARU Locator, or serial number, but the receiving operator must obtain and record enough information to be able to calculate the claimed distance score. Contacts with stations whose callsigns appear on the cover sheet will not count for points.

Only one scoring contact may be made with a given station on each band in use during the contest, ie any callsign regardless of suffix or prefix may only be worked for points once. Any non-scoring contacts must be clearly marked in the log. Unmarked duplicate contacts will be penalised at the rate of 10 times the claimed score for that contact.

In cumulative contests one contact may be made with a given station (as defined above) during each activity period. The adjudicator will normalise the scores in each session (see rule 10), and each entrant's best three scores will be combined to determine the overall placing. Entrants should submit logs for every session for which they are active.

9. Radial ring scoring

Contacts made between stations separated by the distances shown in the table will score as indicated.

km	Points
0-5	1
51-100	3
101-150	5
151-200	7
201-250	9
251-300	11

and pro rata. For computer scoring purposes a conversion factor of 111.2km/degree must be used. In 50MHz contests all contacts over 650km score 25 points.

10. Final Tabulation of multiband and cumulative contests

The final tabulation showing the overall results will be formed by taking the sum of the normalised scores on each band or from the three best sessions in cumulative contests. The normalised score will be calculated by dividing each station's points score by that of the band/session leader and multiplying by 1,000.

ie

Normalised score for each band/session =

$$\frac{\text{Score achieved}}{\text{Band/session leader score}} \times 1{,}000$$

11. Awards

There will be an award to the highest scoring station in each section. An award will also be made to the runner-up in each section in which there are ten or more entries. Certificates of merit may be awarded at the adjudicator's discretion.

12. Crossband contacts

Crossband contacts do not count for points.

13. Log keeping

The logs for contest entries must be made out on current RSGB vhf/uhf log sheets or, if computer listings are to be submitted, these must be cut to A4 size, RSGB log format, line spaced to contain 25 contacts per sheet, and be correctly collated (not Z-fold). Each sheet must be headed with the entrants callsign, IARU locator, contest title, and sheet number. The total points claimed on each sheet must be included at the foot of the sheet. Logs must be tabulated as follows:

(i) Date/time (GMT)

(ii) Callsign of station worked

(iii) My report on his/her signal and serial number

(iv) His/her report on my signal and serial number

(v) IARU Locator received

(vi) QTH or county received (when required) or comments

(vii) Points claimed

The contest exchange must consist of both callsigns, RS or RST report followed by serial number, and IARU locator. Where QTH information must be exchanged it must be given as a point identifiable on an Ordnance Survey route planning map or equivalent (scale 1:625,000) or as a distance and direction not greater than 25km from such a point. Any complaints received or made about signals must be recorded in the comments column.

14. County/country multipliers

a) In contests using a county/country multiplier scheme the contest exchange will include the full county name on phone or the code letters shown in this operating guide on CW. The county must be shown on each log sheet.

b) Each new county or country worked is a multiplier and must be clearly identified in the log. Note that this includes your own county and country, and that a contact with a station in another G Prefix area can count for both a county and country multiplier. Where more than one station is worked in a particular Scottish region, additional multipliers can be claimed for each contact, up to a maximum of three multipliers per region.

c) The score obtained under rule 9 is multiplied by the total number of multipliers worked to provide the claimed score.

d) A separate multiplier check lis must be included showing as a minimum the counties and countries worked in alphabetical order together with the callsign and a serial number of the first claimed contact for each multiplier. If other contacts are to be considered as alternative multipliers should the first contact be invalid for any reason, then please include callsigns and serial numbers for subsequent contacts with each county or country.

15. Serial numbers

Serial numbers start from 001 on each band and advance by one for each contact. In cumulative contests serial numbers increment from 001 for each activity period.

16. *The DTI licence limits must be strictly adhered to.*

In an RSGB contest (sponsored or controlled by VHFCC) where the contest power limit is lower than the DTI licence limit then this limit, (as described in the rules for the contest in question) must also be strictly adhered to.

If upon inspection a station is found to be running ILLEGAL power, or above the contest power limit, the station will be DISQUALIFIED, all operators of that station during the contest in question will be liable to a BAN on entering ALL VHFCC sponsored or controlled contests for a period of up to TWO years.

17. The same antenna system must be used on transmit and receive.

18. Stations using telephony in the recognised cw sub-bands are liable to disqualification. Entrants must observe the provisions of the IARU/RSGB band plans. Bands other than those included in the contest cannot be used simultaneously by a separate station for setting up contacts or talkback.

19. Stations which persistently radiate poor-quality signals, or otherwise contravene the code of practice for vhf/uhf contest operation (see below), are liable to disqualification or loss of points. Gross errors in logging will result in disqualification.

20. Contacts made via a repeater, man-made satellite, or moonbounce will not count for points.

21. Proof of contact may be required.

22. Entrants must permit inspection of their stations by members of the VHF Contest Committee, or its representatives, and give site access information if requested to do so. The inspector must be permitted to remain for as long as desired, and to return to the site an any time during the contest. Contestants must demonstrate to the inspector's satisfaction that they are obeying the rules of the contest.

23. The rules of the Council of the RSGB shall be final in all cases of dispute.

24. Site registration may be required at VHFCCs discretion.

RESULTS

21/28MHZ TELEPHONY CONTEST 1989 RESULTS.

The October event was marked by excellent propagation conditions, resulting in a number of records for this contest. These included the highest number of participants, QSOs and multipliers. Well over 30,000 different stations were active and 168 different countries were worked on the two bands. Fifteen UK stations made over 900 contacts with four topping the 1000 mark. How very different from a few years ago when this event was won with a QSO total of under 250!

The overall winner, who will be awarded the Whitworth Trophy, is once again GW4BLE, who made a total of 1200 checked contacts, of which 940 were on 28MHz. Second is G3NLY/P, who had almost as many contacts as the leader, but a few less multipliers. The 28MHz leader, and third placed overall, is G3XBY who made nearly 1100 contacts on the band with 89 checked multipliers. He will receive the Powditch Transmitting Trophy. The Metcalf Receiving Trophy is once again awarded to BRS32525, although he did not manage the double this year as he was pipped on 28MHz for the Powditch Receiving Trophy by BRS87156 who managed to find an extra multiplier or so. Martlesham DX & CG fielded two stations in the Multi-operator section and had a rare old battle to decide the 1 and 2 positions. Their 'A' station, G3PIQ/P managed to gain the certificate by making 1000 plus contacts and a lot of multipliers. Their 'B' station, G0KPW/P was second, with the Pontefract Group, G3FYQ, third.

The Committee was very pleased with the overseas entry in all three sections and for the many stations who sent in check logs. In the single-operator section, 9H1GI, was the run-away winner, followed by the regular supporter of RSGB contests, NM2Y, with another regular, G3GJQ/5N22 in third place. These three receive certificates. None of the other country leaders managed to get anywhere near the 50% of the leaders score to qualify for certificates. However, the committee have decided to award certificates to the other three continental leaders, RW9AB, ZL1AAS and CE7CX. In the overseas multi-operator section, UB4QWW receives the certificate and in the receiving section, certificates are awarded to UA3-147-122 for Europe, ILA-568 (VE) for North America, UA0-098-134 for Asia and ZS-SWL-Rosenburg for Africa.

Adjudication of this event has been a major task with over 80,000 contacts to check. Bearing in mind the overall QSO rate, which at times was over 120 contacts per hour for the leaders, logkeeping was generally of a high standard. Many stations lost points in checking, mainly through callsign mistakes and wrong claims for multipliers; however, it was pleasing to note that the majority of entrants used dupe sheets and unmarked repeat contacts were at a minimum. Although most of the logs were well presented, two UK entrants had not read the rules and their logs could not be checked as there were no separate band logs or summary sheets with their entries. The use of computer derived logs was widespread and while the majority were well formatted and easy to check, one UK entry was printed in compressed type with an excessive number of entries per page. Another used double-sized type with only 20 entries per page, while a number of overseas logs were printed on A5 or old style quarto paper with up to 100 entries per page!

The Committee thank all those who sent checklogs, including EA3CR, G4RWW, G4UJS, G6LX, GW3JI, HA5FA, IK7BPV, RA3DPD, RB5ICY, RO4OW, RW9HZ, RW0CVV, SK0MG, SM2NTU, SM4SET,

SM5OV, SM0GSA, SP9RVD, UA1MAR, UA3DPH, UA9MGX, UB5KF, UF6QBA, UR8QS, UZ3RZZ, UZ3TRJ, VE7XO, W2BS, W8XT, W0ZZ, YO2BLP, YU7SF, ZM1AAS and ZL4DX.

The next 21/28MHz Phone contest will be on Sunday 7 October 1990.

G6LX.

UK TRANSMITTING (SINGLE OPERATOR)

Pos		Callsign	28 MHz	TOTAL
1	#	GW4BLE	236208	555538
2		G3NLY/P	175617	532776
3	+	GW0ARK	28917	302436
4		G3XBY	291831	291831
5		G4FMO	45705	261435
6		G3PJK	70380	235800
7		G4YLO	234070	234070
8		G3TBK	45066	202950
9		G0BIR	161040	161040
10		G4OJH	133866	133866
11		G4BUO	36720	115232
12		GM3CIX	46800	114540
13		G4IOF	109394	109394
14		GW4OXB	9021	89306
15		G3WBM/P	8064	86328
16		G0IGM	19311	75096
	*1	GM3BCL	0	60264
17		G3NSY	59157	59157
18		G3FFH	12705	53058
19		G2QT	8025	49245
20		G3OLU	27544	43758
21		G4IQM	37791	37791
	*2	G0FGI	0	31356
22		G3MGW/P	12312	29028
23		G3NKC	1890	17700
24		G4PPR	288	9345
25		G40AJI	420	6570
26		G0GFQ	1440	5796
27		G4PTE	945	5145
28		GU4NYT/P	405	780

UK TRANSMITTING (MULTI-OPERATOR)

Pos		Callsign	TOTAL	Name of Group
1	+	G4PIQ/P	506385	MARTLESHAM DX & CG 'A'
2	+	G0KPW	445200	MARTLESHAM DX & CG 'B'
3	+	G3FYQ	365820	PONTEFRACT & DARC
4		G4NOK	338604	NORTH WAKEFIELD RC
5		G4SVV/P	327579	G4SVV GROUP
6		G0JSM	304896	G0JSM GROUP
7		G0MCG	276318	MANSFIELD CG
8		G4RFR	229554	FLIGHT REFUELLING ARS
9		G4IRC/P	205902	IPSWICH RC
10		G3CSA/P	157788	ELLESMERE PORT & DARC
11		GW4EZW	137940	NEWPORT ARS
12		G4SND	133878	NEWEY AND FRIPP
13		G3WQK/P	89817	SOUTHDOWN ARC

UK RECEIVING

Pos		Callsign	28 MHz	TOTAL
1	#	BRS32525	40440	121323
2	#	BRS87156	40500	100485
3		BRS20249	2829	22512
4		BRS28198	1914	20988
5		G7AOU	198	1134

OVERSEAS TRANSMITTING (SINGLE OPERATOR)

Pos		Callsign	TOTAL
1	+	9H1GI	65232
2	+	UB4QWW	39270
3	+	NM2Y	31500
4	+	G3GJQ/5N22	26568
5		UZ3XWC	20925
6		W4/G4BHE	17955
7		I5ECW	15117
8		HA5KFL	14850
9		UR2QA	13068
10		UV3AFB	10944
11		HA2KSD	10317
12		I0/N4QIV	8856
13		UA6LAM	8184
14		SP7LZD	7797
15		RB4JF	7068
16		UV3DN	6336
17		LZ1KCO	6318
18		K6SVL	5763
19		YU7LS	4802
20		CN8FC	4320
21	+	RW9AB	4230
22		N4NFS	4212
23		JA4YPE	4185
24		IK6BOB	4026
25		RB5IIU	3444
26		UO1GWW	3408
27		UC2OL	3360
28		RA9CDV	3204
29		YO2LDE	3168
30		UB4TWL	3076
31		JA7SN	2976
32		JM1LRQ	2940
33		UA1LOT	2925
34		OK3YK	2790
35		RV6LD	2700
36		K7RDH	2610
"		YU4XA	2610
38		EA3NA	2390
39		YU2TX	2310
"		IT9BCC	2310
41		UA3ZU	2304
42		LA1XDA	2211
43		UA3TAM	1989
44		SP9EMQ	1980
45		LA9DFA	1917
46		LZ1KRB	1840
47		UZ6AXQ	1836
48		IS0AEQ	1815
49		OH6GZ	1794
50		RI8AB	1764
51		WK4F	1692
52		UB5BBF	1650
"		I0KHY	1650
54		JY9SR	1547
55		YO9KPP	1520
56		UT5UBN	1518
57		UT4UZ	1443
58		UT5UHF	1200
"		LZ1DM	1200
60		UA9CI	1188
"		EA5AN	1188
62		JA1BUI	1110
63		JA1BNW	1080
64		JA6WJL	1008
65		RW3AN	992
66		JR7LVK	936
67		YU7SF	890
68		JA6EFT	837
69		SP7FOI	828
70		UO2GFU	819
71		UA4PMX	756
72		UW9CM	738
73		UB5SEL	735
74		SP8HPW	714
75		JA6QDU	696
76		UL7RER	693
77		HA9CD	690
78		UL8RWR	684
79		YO9FEH	672
"		OK1KZ	672
"		SM0JOQ	672
"		UV6LAP	672
83		Y44NO	648
84		OX3ZM	612
85	+	ZL1AAS	609
86		LZ1OJ	594
87		UV3CDR	585
88		YO4CVT	540
89		JA8RJE	522
"		SM4BTF	522
91		YO3JW	520
92		UA3DPX	486
93		Y35WF	480
"		JP1DMX/HI8	480
95		SP4GFG	465
96		UB5AFI	441
97		LZ2WM	440
98		LA3WBA	414
"		K2PS	414
"	+	CE7CX	414
101		LZ1KVZ	406
"		EA5CPH	406
103		LZ1BJ	378
104		UA3ZFT	360
105		Y25PE	294
106		JA9QOF	285
107		JH9CAV	210
108		YO2CMI	208
109		JH1IAQ	180
"		PA0KDM	180
"		YO6ADW	180
112		JA2NNF	165
113		ON5FV	150
"		OK3CXS	150
"		JA9RYL	150
116		KB0C	132
117		JA1YFG	120
118		SP6DVP	96
119		Y66ZF	27
"		Y38ZB	27
121		JH2WHS	12

OVERSEAS TRANSMITTING (MULTI-OPERATOR)

Pos		Callsign	TOTAL
1	+	UB4QWW	39270
2		LZ1W	31950
3		HK3JJH	6264
4		JA0AA	991
5		DF7HX	407
6		JA1YFG	108

OVERSEAS RECEIVING

Pos		Callsign	TOTAL
1	+	UA3-147-122	18100
2		LZ1M-333	10320
3		OK3-27071	2723
	*3	NL-8992-R33	2604
4		OH3-694	2028
5		OK3-28612	1512
6	+	ILA-568 (VE)	1452
7	+	ZS-SWL-ROSENBURG	1029
8		YO2-1572/HD	793
9		NA-123861	790
10	+	UA0-098-134	780
11		NL60-10700	774
12		EUMO-VU211-R	771
13		SWL-HL102	423
14		F.OTAWA-VS6	391
15		UA9-090-60	324
16		T.ISHIKAWA	168
17		I-SWL-GUARI	159
18		Y38-01-B	72

\# = Trophy Winner.

\+ = Certificate Winner.

*1 = No separate band logs, no multiplier list, no declaration or summary sheet (claimed score shown).

*2 = No bands shown on log or multiplier sheet, wrongly-formatted computer log, no declaration (claimed score shown).

COLCHESTER/CHELMSFORD D.F QUALIFYING ROUND RESULTS

Following the extended very hot weather of the 1989 summer, Sunday 10 Sept. '89 broke much cooler and windier. This was the day of the RSGB D.F. qualifying event jointly run by the Colchester and Chelmsford ARSs. At midday 20 teams assembled on the village green near the church at Long Melford in Suffolk.

At 1320 BST good signals were heard from both transmitters, the 'A' station being especially strong; the competitors took their bearings and made their deliberations. The decision in which order to locate the transmitters was made rather more difficult since they were located in diametrically opposed directions. At 1330 all competitors departed in search of the hidden transmitters.

Station 'A', G4PQY/P, operated by Alan Williams was located in a bamboo thicket in a damp, marshy area of a wood through which a stream passed, at Spencers, Man's Cross, Gt Yeldham, about 8.25 miles SW of the start. A fairly long run was required from the nearest access point, and competitors were then faced with a stream to cross and also a wet area. At the end of the afternoon the area surrounding the transmitter was indeed "squelchy", with several competitors going into the mud way beyond their knees. Nine competitors located this transmitter during the contest, with a further six being "talked-in" just after the end of the contest, as they were still on site.

Station 'B', G3WHR/P, operated by Dick Brocks was located within a tangled mass of uprooted fir trees, in Northfield Wood, at Onehouse, Stowmarket, about 13 miles NE of the start. A long, obviously visible antenna had been erected for the competitors to locate, and most did only to find that the friendly dummy transmitter operator "Fred" was in residence, and connected to the antenna. The real hidden transmitter was located some distance away from the obvious attractions, and connected via a 'tee' into this antenna, using very fine wire passing through the fir trees in the area. This wire was impossible to see in the dark wood. These ploys ensured that although a good many competitors were on site, a considerable period elapsed before the TX was eventually located. Nineteen teams eventually located this transmitter.

After the event, 48 persons enjoyed a splendid buffet tea at the Club House of Sudbury Town FC, where prizes were presented to the winners. They in turn then explained the secrets of their success.

POSN	NAME	CLUB	TIME OF ARRIVAL STN 'A'	STN 'B'
1	M Hawkins	Chelmsford	1444.00	1543.32
2	B Bristow	Mid-Thames	1448.00	1557.40
3	G Whenham	Coventry	1447.30	1559.26
4	P Cunningham	Colchester	1443.00	1600.00
5	A Mead	Chelmsford	1449.00	1616.57
6	P Larbalestier	Devizes	1621.00	1514.00
7	C Merry	Dartford Heath	1447.00	1628.58
8	G Nichols	Banbury	1629.00	1528.13
9	C Baisden	Chelmsford	1448.30	-
10	R Emeny	Colchester	(1639)	1519.29
11	A Collett	Chelmsford	-	1526.00
12	C Metcalf	Mid-Thames	-	1528.41
13	P Lisle	Mid-Thames	(1638)	1535.45
14	K Chan	South Manchester	(1637)	1536.00
15	D Newman	Northampton	-	1538.29
16	T Gage	Mid-Thames	-	1538.53
17	R Goodearl	Mid-Thames	(1636)	1539.45
18	W Pechey	Mid-Thames	(1634)	1540.30
19	P Clark	Paignton	(1644)	1544.55
20	M Standen	Mid-Thames	-	1604.30

(NAMED COMPETITOR FOUND TX AFTER OFFICIAL END OF CONTEST)

M HAWKINS and A MEAD qualified for the National DF Final on 24 September 1989. [see next month's RadCom]

G4HKC

SALISBURY QUALIFYING EVENT

Date: 13th May
Map: 184 (Salisbury and the Plain)
Assembly: 13.00 for start at 13.20 BST
Location: Woodhenge, just off A345 between Amesbury and Durrington, NGR 151434.
Competitors requiring tea should notify A.Newman, 74 Victoria Road, Wilton, Wiltshire, SP2 0DY; tel 0722 743837 not later than 3rd May.

MID THAMES QUALIFYING EVENT

Date: 10th June
Map: 165 (Aylesbury and Leighton Buzzard)
Assembly: 13.00 for start at 13.20 BST
Location: Great Kingshill village green car park, NGR 876981
Competitors requiring tea should notify Colin Boyce, Coombe Bank, Hatches Lane, High Wycombe, Bucks; tel 0494 712083 not later than 3rd June.

BANBURY QUALIFYING EVENT

Date: 24th June
Map: 151 (Stratford upon Avon)
Assembly: 13.00 for start at 13.20 BST
Location: Drayton Hall School car park, NGR 435417
Competitors requiring tea should notify Graham Nicholls, 64 Mascord Road, Banbury; tel 0295 265492 not later than 17th June.

IARU/RSGB 432MHZ-24GHZ, OCTOBER 1989 CONTEST RESULTS

The only bright spot in this contest was the slightly increased entry across most of the bands from single-operators. As for multi-operator stations, they were conspicuous by their absence with several bands unrepresented and overall participation down by about 50%. The SWLs deserted the contest totally. Certainly the weather was not kind, very wet and windy over most of the country on Saturday, improving Sunday. Although this might have been a factor, it is more likely that the lack of activity from groups centres around a lack of desire to operate unless a lift is guaranteed.

Only the overall single-op winner, G4FUF on the east coast, reported any DX. Throughout the rest of the country, contestants' comments included hostile, unspeakable, boring, and poor, with just a slight improvement in the last two hours. Even worse was the lack of activity, particularly on the higher bands. Several stations commented that it was the worst they had known in many years of contesting. The only multi-op to report on 5760 MHz, G3OHM/P, spent several frustrating hours trying to find a contact on this band and G8APZ/P had a similar lack of success on 24 GHz.

Some remarks were made about the rules and these will be reviewed before this contest is run again.

Congratulations to the winners and runners-up in each section. Entries will be forwarded for adjudication in the IARU contest.

G4WAD

OVERALL RESULTS

SINGLE-OPERATOR SECTION

Pos	Callsig	Point	BAND POSITIONS 432	1.2	2.3	3.4	5.6	10
1	G4FUF	4288	2	1	1	2	-	2
2	G8IFT	1732	12	9	3	6	-	1
3	G4PMK	1460	8		4	1	-	-
4	G4EZP/P	1020	-	-	-	4	-	3
5	G3SEK	1000	1	-	-	-	-	-
6	G6DER	1000	-	-	-	-	1	-
7	G4EQD	962	11	5	2	-	-	-
8	G4LRT	840	-	-	-	3	-	-
9	G1GEY	815	4	2	-	-	-	-
10	G8OPR	783	5	3	5	-	-	-
11	G8APZ/P	530	-	-	-	7	-	4
12	G4ZTR	435	7	6	-	-	-	-
13	G8CHW	405	-	4	6	-	-	-
14	G4LDR	387	3	-	-	-	-	-
15	G4NBS	377	9	7	-	-	-	-
16	G4AUC/P	370	-	-	-	5	-	-
17	G4NTY	228	6	-	-	-	-	-
18	G1NRM	130	10	-	-	-	-	-

MULTI-OPERATOR SECTION

Pos	Group	Point	BAND POSITIONS 1.2	2.3	3.4	5.6	10
1	South Birmingham RS	3183	5	2	2	1	-
2	Three Spires & Ariel CG	2688	1	3	1	-	-
3	South Manchester RC	1949	4	1	3	-	-
4	Five Bells	1053	3	4	-	-	-
5	Bracknell ARC	735	2	-	-	-	-

432 MHZ

SINGLE-OP SECTION

POS	CALLSIGN	POINTS	QSOs	LOC	PWR	ANT	BEST DX	KM
1	G3SEK	22264	106	91IP	400	21y	F6KSX/P	694
2	G4FUF	20669	70	01GN	300	21Y	DL3NAD/	716
3	G4LDR	8697	45	91CD	50	17Y	PA0PLY	495
4	G1GEY	7290	29	94FW	100	21Y	F6CTT/P	784
5	G8OPR	5157	23	91FE	25	17Y	PA0PLY	469
6	G4NTY	5077	36	83TM	100	21Y	G3DAH	338
7	G4ZTR	4110	17	01LV	25	21Y	F6KSX/P	681
8	G4PMK	3538	27	93GT	70	19Y	G0GJV/P	340
9	G4NBS	3385	14	02AF	100	21Y	DL0UD	500
10	G1NRM	2891	28	91UO	100	12Y	F6CTT	419
11	G4EQD	674	9	93QN	15	8Y	G4NBS	154
12	G8IFT	62	1	82XJ	10	18Y	G8KQW/P	62

MULTI-OP SECTION

1	G4HRY/P	35864	154	93XH	400	32OM+	FF6KPQ/P	
2	G0GJV/P	26349	122	80ST	350	2x21Y	DL0UD	671
3	G4NPH	23755	111	02BI	400	4x17Y	DF0SAR/P	
4	G3FVA/P	22462	121	93EH	150	4x23Y	FC1DBE	936
5	G8OHM/P	14480	95	92GB	100	21Y	DF3KV/P	571

1296 MHZ

SINGLE-OP SECTION

POS	CALLSIGN	POINTS	QSOs	LOC	PWR	ANT	BEST DX	KM
1	G4FUF	12505	53	01GN	350	2.5D	F6KSX/P	645
2	G1GEY	6100	23	94FW	200	4x23Y	G4CVI	455
3	G8OPR	5515	31	91FE	70	23Y	G1GEY	416
4	G8CHW	4918	42	91TQ	100	48QL	DJ5BV	528
5	G4EQD	3308	25	93QN	80	27QL	G4CVI	298
6	G4ZTR	3129	29	01LV	100	23Y	DF0HS/P	365
7	G4NBS	2817	18	02AF	4	4x23Y	DL1EBR	419
8	G4PMK	1901	16	93GT	50	23Y	G4CVI	319
9	G8IFT	1455	10	82XJ	150	4x23Y	G3GIM	267

MULTI-OP SECTION

1	G3UHF/P	7200	45	93EH	80	8x23Y	PA0EZ	475
2	G1OHM/P	6175	43	92GB	100	4x23Y	DF0HS/P	532
3	G2LO/P	4939	29	93XH	350	4x55Y	PA0WMX	427
4	G4NPH	2818	18	02BI	200	47QL	ON7WR/A	399

2320 MHZ

SINGLE-OP SECTION

POS	CALLSIGN	POINTS	QSOs	LOC	PWR	ANT	BEST DX	KM
1	G4FUF	1614	11	01GN	70	2.5D	PA0PLY	319
2	G4EQD	1076	9	93QN	5	49QL	G4FUF	235
3	G8IFT	408	3	82XJ	20	1.2D	G4FUF	-
4	G4PMK	241	5	93GT	15	0.6D	G4EQD	61
5	G8OPR	178	2	91FE	25	23Y	G4FUF	150
6	G8CHW	19	1	91TQ	0.5	66QL	G3JXN	19

MULTI-OP SECTION

1	G4IEV/P	807	8	93XH	2	1.8D	G4FUF	198
2	G3OHM/P	743	7	92GB	30	1.5D	G4EQD	174
3	G8SMR/P	261	4	93EH	4	1.2D	G4IEV/P	105

3456 MHZ

SINGLE-OP SECTION

POS	CALLSIGN	POINTS	QSOs	LOC	PWR	ANT	BEST DX	KM
1	G4PMK	76	2	93GN	0.8	0.6D	G3ZTR/P	49
2	G4FUF	67	5	01GN	7	2.5D	G8BKE	30
3	G4LRT	64	2	92KJ	0,03	1.3D	G3OHM/P	35
4	G4EZP/P	48	2	01DO	1.3	0.6D	G4FUF	12
5	G4AUC/P	28	1	01QX	18	0.7D	G3LQR	28
6	G8IFT	27	½	82XJ	-	1.2D	G3OHM/P	54
7	G8APZ/P	18	2	01EO	0.06	Horn	G4FUF	18

MULTI-OP SECTION

1	G3OHM/P	68	½	92GB	21	1.3D	G4LRT	42

5760 MHZ

SINGLE-OP SECTION

POS	CALLSIGN	POINTS	QSOs	LOC	PWR	ANT	BEST DX	KM
1	G6DER	34	1	93GN	6	0.6D	G3ZTR/P	67

10GHZ

SINGLE-OP SECTION

POS	CALLSIGN	Pts	QSO	LOC	PWR	ANT	BEST DX	KM
1	G8IFT	62	1	82XJ	0.2	Horn	G8KQW/P	62
2	G4FUF	30	2	01GN	0.25	0.45D	G4EZP/P	18
3	G4EZP/P	24	2	01DO	0.0002	0.3D	G4FUF	18
4	G8APZ/P	18	2	01EO	0.01	0.4D	G4FUF	12

CONTESTS CALENDAR

RSGB HF CONTESTS

1 Apr	Ropeco 1 (Jan90)
1 Apr	Peck Memorial Trophy DF (Mar 90)
9 Apr	1st 28MHz Cumulative (Feb90)
15 Apr	Low Power Contest (Feb90)
17 Apr	1st 28MHz Cumulative (Feb90)
Apr 22	Northampton DF (Mar 90)
25 Apr	1st 28MHz Cumulative (Feb90)
3 May	1st 28MHz Cumulative (Feb90)
11 May	1st 28MHz Cumulative (Feb90)
13 May	Salisbury DF (Apr 90)
19 May	County Roundup SSB (Mar 90)
20 May	County Roundup CW (Mar 90)
2,3 June	HF National Field Day (Feb90)
10 Jun	Mid-Thames DF (Apr 90)
23, 24 Jun	Summer 1.8MHz (Apr 90)
24 Jun	Banbury DF (Apr 90)
14, 15 Jul	SWL
15 Jul	Low Power Field Day
15 Jul	Ripon DF
29 Jul	Chelmsford DF
19 Aug	Coventry DF
26 Aug	ROPOCO 2
1, 2 Sept	SSB Field Day
9 Sept	Torbay DF
10 Sept	2nd 28MHz Cumulative
18 Sept	2nd 28MHz Cumulative
26 Sept	2nd 28MHz Cumulative
30 Sept	DF National Final
4 Oct	2nd 28MHz Cumulative
7 Oct	21/28MHz Contest
12 Oct	2nd 28MHz Cumulative
21 Oct	21MHz Contest

RSGB VHF CONTESTS

8 Apr	10GHz Cumulatives
8 Apr	50MHz Trophy Fixed/Single/Multi OP and SWL (Apr 90)
5,6 May	432MHz Trophy & SWL (Apr 90)
5,6 May	434MHz to 24GHz (Apr 90)
6 May	10GHz Cumulatives
19,20 May	144MHz & SWL (Apr 90)
10 Jun	10GHz Cumulatives
10 Jun	432MHz CW Single/Multi
10 Jun	432MHz FM Fixed & Open
7,8 Jul	VHF Field Day (Apr 90)
22 Jul	10GHz Cumulatives
28 Jul	144MHz Low Power/SWL
29 Jul	432MHz Low Power/SWL
All Aug	432MHz Activity
12 Aug	1·3 & 2·3GHz Trophies
19 Aug	10GHz Cumulatives
All Sep	1296MHz Activity
1,2 Sep	144MHz Trophy/SWL
9 Sept	10GHz Cumulatives
16 Sep	70MHz Trophy/SWL
30 Sep	50MHz CW
6,7 Oct	432MHz - 24GHz SWL & IARU
7 Oct	10GHz Cumulatives
9 Oct	1·3 & 2·3GHz Cumulatives
17 Oct	432MHz Cumulatives
21 Oct	70MHz CW
25 Oct	1·3 & 2·3GHz Cumulatives
2 Nov	432MHz Cumulatives
3,4 Nov	432MHz CW 8-hr Marconi/RSGB
10 Nov	1·3 & 2·3GHz Cumulatives
2 Dec	144MHz AFS/Fixed/SWL
4 Dec	432MHz Cumulatives

There will be an SWL section in every VHF contest even if not mentioned in rules

OTHER CONTESTS

First Tuesday each month
144MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

First Thursday each month
432MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

First Monday each month
Microwave Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

Dates of publication of rules in *RadCom* are shown in parentheses

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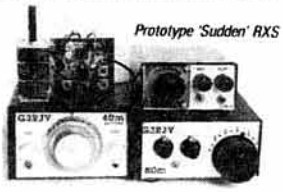

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●BNOS 144MHz linear and preamp 3W in 180W out: £250. Yaesu FT790R, nicads, case etc: £250. Mutek 50MHz tvtr 144MHz IF: £200. MM 1296MHz tvtr, 144MHz IF: £150. SSB Electronics 23cm linear: £90. All exc.cond. Hokushin 2m/70cm diplexer unused: £25. Rotator speed controller kit, see Radcom Jan 86: £25. Pye PFI pocketphones RX and TX, chrgrs, etc. Details. G6MXL QTHR. Poole 0202 665284

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●IC735: £700. Drae PSU 13.8V 24A: £100. SPC300 ATU: £125. Heatherlite Hunter linear: £650. Tennamast 30ft mast and ground post: £150. Complete data station, phone for details: £370. Butternut HF2V vert: £50. Homebrew tcvr 20W output 160-80-40: £50. G-whip: £60. Many books and components. Phone for details. G3XMZ QTHR. Hinckley 0455 616034.

●YAESU FT102, plus FM board. FC102 ATU. MD1 base mic. Weltz CT00 dummy load. All in 1st class cond: £700ono. Prefer sell complete. Cleve, G0JRU QTHR. Newcastle 091-483 7919.

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●TS940S immac cond: £1490. FL2100Z HF linear, FL2277Z. Exc. Little used: £490. Yaesu FC102 1.2kW ant tuner pwr meter: £130. 6m conv SSB rig c/w ant. Good order: £50ono. PX 2m h/held. G4VIO QTHR. 0388 763501.

●FTV901 tvtr c/w 2m/4m/6m modules. Transverts from 10m. All modes: £350. G4VNR QTHR. High Wycombe 06285 24118.

●KENWOOD TS940S built-in ATU, voice synth. V.little use, 16mths old. Service manual: £1500ono. G3MMM QTHR. Ashford, Kent 0233 622996

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●BIRD 43 with case and elements. As new: £325. G4SKX QTHR. Stockton, Cleveland 0642 676477

●MIC.MOD freq.counter MMD50/500: £35. Surbiton 01-390 1566 G5DS.

●YAESU FRG7. VGC unmod manual. Used standby rcvr. Buyer collect or pay carr: £110. G3AZW QTHR. Trowbridge 0225 752655.

●YAESU FT726R. 2m unit only fitted. As new cond. No mods: £425. G3AWI QTHR. Mansfield 0623 842227.

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●ICOM ICO2E 2m h/held, with BP3, BP5, case. Exc.cond. Spectrum ZX plus 2 128k computer. Both items: £120ono each. Also orig. Olympus XA rangefinder camera. Offers around: £100. G6JEU. W.London 01-573 2081.

●YAESU FT726R fitted 2/6/70, exc.cond. 6m module, only 6mths old. Recently overhauled by main dealer: £750ono. G1EBH QTHR. Basildon 0268 45573.

●TS530SP CW filter, audio filter VFO 240, SP230, MC50: £650. Heathkit SB230 linear: £350. Frank QTHR. Altrincham 061-928 6828 anytime G0AKX.

●AR2002 scanning comms RX 25-1300MHz. As new in box: £300. Datong D70 morse tutor: £30. Icom discone AH7000 25-1300MHz, only used indoors: £35. Jaybeam VR3 HF triband vert 10/15/20m, never used: £50. Buyer collects. Not QTHR. Reading 0734 668532 G0HFN.

●YAESU FL2100Z, little used. Buyer collects. Regret no packing. Also unable to carry personally due being disabled: £500ono. G3DYY QTHR. Huntingdon 0487 841558.

●PRINTER, Brother M1109, as new. Serial and parallel interfaces. Tractor feed: £129. G3XSO QTHR. Gt.Missenden 02406 5234 after 6pm-w/e.

●TS940S, mint cond. Auto ant tuner: £1600. ICO2E used: £150. ICO4E, unused: £225. Vince, G4ODG QTHR. Bourne 0778 422795.

●TS680S HF tcvr plus 6m, boxed. 14mths old with CW filter YC455CI: £113. New £750. PS430: £110. Hi-mound marble base straight key: £25. Standard C120 VHF FM handie, as new: £140. G4FKR. Winchester 0962 880411.

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●DRAGON 64 computer, as new. Spare keyboard, datacorder PSU, manuals, several books: £60. Lawrence G0BJG. Coalville 0530 36595.

●YAESU FT101 tcvr. Good cond: £220. G0IPD QTHR. Ashford, Middx 0784 251310.

●RACAL modems P263A-OIU: £5ea. Large quantity valves, state requirements. 12Vin 240AC out 400W inverter: £25. RadComs 78-89 incl: Offers. Transformer 240V in 6V 500A, 12V/250A, 24V/125A output: £40ono. G4IOY QTHR. London 01-455 0540.

●AR88 good cond: Offers. Spares and manual incl. Cheshunt, Herts 0992 28110. RS91563.

●LOWE HF RX: £80. MM RTTY-TV cvtr: £80. Digiscan 2MHz digital freq.expander, 28-23MHz: £25. Bremi 28-30MHz 100/200W 240V amp: £45. RTTY TX/RX Morson terminal unit, ZX81-16k computer, keyboard: £50. Some games. Jaybeam 2m 5XY c/w harness: £12. G4VOQ/G4VZZ QTHR. Staines 02814 5461.

●YAESU FT102 HF TX/RX with matching FC102 ATU. Fitted AM/FM and narrow CW filter: £575. Will accept modern 2m mobile pt/exch and provide demo and free delivery 100 miles. G3XFN QTHR. Sutton Coldfield 021-353 3364.

●SCANNING rcvr SX200N. VGC: £190ono. Genuine reason for sale, upgrading station. GW4HAT QTHR. Swansea 0792 290770.

●JAYBEAM 8XY/2m, new, boxed, 2 at: £45ea. CR/23 as new: £10. Met 144-6X, as new, 2 at: £35ea. Carr. by arrangement. Roger, G3MEH QTHR. Tring, Herts 044282 6651 or 01-380 6121.

●BBC-B, RX80, Cumana 40/80 track drive, Crofton monitor Morley teletext adaptor, Eprom blower, expanded firmware, super desk, as new. The lot: £400. Valve QQVO7-50, boxed: £30. Cirkits DSB 160m tcvr with PLL and freq readout: £25. Buyer collects. G3ZYL. Hertford 0992 582307.

●JRC 125 incl 250Hz filter. NBD500 PSU. NFG97 ATU. Yaesu SP102: £900. FT736. BNOS LP144-10-50. BNOS LPM432-10-50. Revex swr/pwr meter. W540 Drae VHF wavemeter: £1000. All as new. Any trial, going QRT. G4OER QTHR. Dunstable 0582 608152.

●10M mobile rig SSB/CW/FM, prof conversion of Superstar 2000: £95. HC220 Howes 2-20m tvtr. Ideal for 20m mobile, 10W out: £46. MML 2m linear amp, 3W in, 30W out: £45. G4YRY QTHR. Bournemouth 0202 420909.

●ZX Spectrum computer 48k. Simplest for CW/RTTY transc and CW training. Recently repaired and under guarantee. 10 amateur and game tapes, manuals etc: £50. Plus £2.50 post. Gilbert, GM0DLZ QTHR. Largs 0475 673271.

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●EDDYSTONE 830 9-bands 300kc 30mc with manual. Exc. rcvr in good cond. Would deliver reasonable distance: £145. Sheffield 0742 585937 G0LNV.

●YAESU FT200 HF tcvr 10-80m with PSU: £250. G0MMA. Crowthorne 0344 771990.

●4X150A, chimney, cap base, unused: £35. G3SSE QTHR. Brighton 0273 302186.

●TEMPO 2002 linear 2x8874, h/book, immac. £850. ARR MM144VDG m/head preamp, unused: £100. New MFJ949D ATU, boxed: £100. G4JBH QTHR. Yeovil 0935 28341.

●SONY ICF7600 with manual and s/case and PSU: £80. Saisho SW5000 150kHz-30MHz similar to above. As new: £60. G4WJJ QTHR. Hatherleigh 0837 810184.

●HW8 QRP rig: £80. MM 2m multimode tvtr type 144/28R 25W: £120. G4EYD QTHR. Birmingham 021-478 2429.

●FT7B, exc. rig: £240. Plus Kenwood AT130: £60. FT270R 2m 3 or 25W. Exc.cond, boxed: £175. Kenpro 200 mem keyer: £100. Roy, G4WHQ QTHR. Grimsby 0472 840304.

●JRC CW filter type CFL231: £79. Exch poss for type CFL232 or CFL233 or pristine Datong FL3 filter. G4GXE QTHR. Buxton 0298 78861.

●YAESU FT75B plus AC PSU adapted QRP/QRO

xtalled most QRP freq: £75. KW Ezeematch: £25. FT290 plus m/mount: £200. G4UGC QTHR. Carnforth 0524 732778.

●FT290 with nicads and chrgr: £240. FDK multi 700 ex 2m/FM: £135. SM220 Kenwood, not used, as new. Boxed: £300. Buyer must collect or pay for delivery depending on locality. London 01-350 2348 G1NID.

●SHARP MZ80k computer I/O box and printer incl s/ware, manuals and toolkit: Offers. G3TQX QTHR. Bury St. Edmunds 0284 754847

●RSGB Journals 1935-84. SAE for list: Offers. Principles of Wireless Telegraphy, GW Pierce, McGraw Hill 1910: Offers. G3HB QTHR. Harrow 01-863 1765.

●KENWOOD TS140S: £675. Matching AT230: £150. SP940: £75. Trio TS120S matching AT130 matching PS430: £525. Icom PS55 20A: £150. Trio UHF/70cm tcvr: £195. Uniden 100XL h/held scanner: £125. Yaesu 221RD 2m multimode: £250. G0HWV QTHR. Stoke-on-Trent 0782 771573 after 6pm.

●FT290R, nicads, chrgr, case, rubber duck, headset mic with switch box: £240. G1JHT QTHR. Halifax 0422 368790.

●KW Viceroy HF SSB transmitter with Homebrew PSU: £50. 19in equip rack: £5. No.10 xtal calibrator: £5. G4AEV QTHR. Didcot 0235 835594.

●FT726R 2m/6m modules. VGC: £600ono. Illness forces sale. Bremi PSU 20A: £60. Drae PSU 6A: £50. Both VGC. 2m MM 10W input 100W output. VGC: £100. Jaybeam 4m/6m 4ele ant. Buyer collects: £40. VGC. 2m tonna yagi 17ele: £25. G1HBZ QTHR. Leominster, Hereford 056885 320.

●YAESU FT209RH h/held: £165. Sony ICF7600D rcvr: £130. Katsumi electronic keyer EK150: £60. Tokyo HT110 10m SSB/CW tcvr: £235. G4XCS. Hereford 0432 77661.

●BNOS 144MHz linear, 3W in, 180W output with preamp: £250. Yaesu FT790R, nicads, case etc: £250. Mutek TVVF50C 50MHz tvtr 144MHz IF: £200. MM 1296MHz tvtr 144MHz IF: £150. Rotator speed controller kit, RadCom Jan 86: £25. G6MXL QTHR. Poole, Dorset 0202 665284.

●CLARKE heavy duty 40ft telescopic pneumatic mast with self-supporting legs. Cost new £3000. Ideal field days etc: £450ono. Army bomb disposal team comm kit based on Pye PF1 70cm system. Complete, mint, boxed: £120ono. Sony ICF2001D, mint, HF plus airband: £250. Janes Military Comms, mint: £20. Janes Weapons Systems, mint: £20. Regency MX4200 scanner, nicads or 12V 6-band incl 800-950MHz: £135. PAS5 night vision binoculars, mint cond: £250. G6CUQ. Redditch 052789 2282.

●2M multimode TX/RX FDK multi 750E. 10W/1W SSB/CW/FM 144-147MHz c/w fist mic, m/bracket and matching PSU, PS750. Both boxed in exc.cond. not used mobile. Must sell hence: £200. Ian, G0AYN not QTHR. Stoke area 0782 331853 anytime G0AYN.

●OLYMPUS OM1, Vivitar 28-300mm zoom lens, both mint cond, never used: Offers. Pye PF2AMB 149MHz, working TS120V 500Hz CW filter, PS20 PSU. VGC: £350. Steve G4EDG. Exeter 0392 216579.

●APPLE IIE computer 128k with 2 7D drives, 20Mb HD, s/ware. Omms and Multiplan. 7 disks, other s/ware. V.little use: £450ono. Tono 9000E incl monitor, printer: £450ono. Icom 720A incl PS20 swr PSU, fitted narrow CW filter and AM filter. VGC: £700. Lathe table-top 5in between centres x 4in ht. 4-jaw chuck burnars and motor: £150ono. Free delivery Yorks. Myford ML10 lather 3 and 4-jaw chucks and rev motor. Full set change wheels, drip tray. Some tools. VGC: £600ono. Can deliver 75 miles York. G3VGH QTHR. York 0904 769245.

●TRIO 2400 accs package, nicad pack, chrgr, leather case, shoulder strap, belt clip, helical: £15ono. G0KYS. Plymouth 0752 670490 G0KYS Edgar RA Mr 16 2.50 2.50 0.00 NO A FOR SALE 14/02/90

●TRIO R1000, exc.cond, manual, orig box: £195. GW4RYK QTHR. 0686 86255.

●TRIO TR9130 2m 5/25W multimode mobile, mic, mobile bracket manual. VGC: £295ono. PK232 Packratt multimode data controller incl PC s/ware and all manuals: £175ono. Buyer to inspect/collect or arrange/pay for carr. G0DTJ. Notts 0636 814922.

●ICOM R70 rcvr fitted with FM option. Mint cond, service manual: £450. Racal RA17 rcvr: £125. Scope Telequipment D54 with amps type A and C: £100. Scope Telequipment S32a: £40. LDF4-50A Andrew heliax cable, with 2off N-type jacks and plugs. All unused: £125. Jaybeam aerials 70cm 46ele multibearn: £25. 70cm 12XY crossed yagis: £25. 70cm 8/8 slot: £25. 2m 10XY crossed yagis: £25. 50-500MHz discone ant: £30. All aerials used only for contests. VDU Hazeltine Executive: £35. VDU Dacoll: £25. Wavemeter W1191, 0.1-20MHz: £20. Wavemeter type T74 20-280MHz: £30. Multimeter Metrix 430, with AC current adaptor: £25. Video monitor Crotech B/W 14in screen 19in rackmount, high resolution: £30. Prefer buyer collect York area, otherwise carr extra at cost. G3WXI not QTHR. York, YO4 5PS 07595 8172.

●AMT2 ICS term unit with PSU and manual. £85ono. G4PTT QTHR. Instow 0271 860530.

●KENWOOD TS140 tcvr, used twice only: £700. Also Drake SPR4 rcvr, exc.cond. Brentwood 0277 823434 G3YOE.

●TRIO 2300 2m FM portable tcvr. Carrying case, nicads, chrgr: £100. MM 2m tvtr all-mode 10W output 28MHz IF: £80. Mal, G4OAB QTHR. Runcorn 0928 565804.

●2M and 6m modules for FT767GX, both still in boxes, as new: £140ea. Or both for: £270. Also BNOS 6m amp LP50-10-50: £90. BNOS 2m amp 144.3-50: £90. FT290 Mk1 with carry case, nicads and hel ant. £230. Oxford 0491 38462 G7EHK.

●TS120V good cond with mic and orig packing. £275ono. BBC-B computer twins 80/40 disks. High res monitor. Extra processor runs CPM. Many disks and s/ware: £400ono. Kevin G4HHA. 0394 411957 eve. 0473 642692 day.

●RACAL RA117E orig.cond, not ex-mod: £225. Yaesu FRV7700B: £50. FRT7700: £30. Labgear stabilised PU 700V: £20. 300V: £20. Solartron lab 1000V DVM Tektronix plug-in analyser: £25. Solartron plug-in amp: £20. All GWO. Various valves SAE list. G1NAX. Plymouth 0752 775375.

●MAPLIN ant rotator, unused: £25. MOD geiger counter, vintage: £10. Working PFI RX with batt and 433.0MHz xtal: £4. Burroughs 5in B/W monitor, 12V operation: £30. John G8FDJ. Sheffield 0742 333847.

●FACSIMILE Plessey KD111, electrostatic flatbed transmitter and rcvr. Working. Offers: £15. Ring for details of a bargain. Steve, G8HQY QTHR. Birmingham 021-422 3067.

●ONE Hamgear PMX preselector in good cond, 12V. Input only: £45. Birnie, Elgin, Moray 034386 391 RS86238.

●YAESU FT757GX pristine cond, c/w manual. Boxed. Little use through ill health: £595. Buyer collects or pays carr. GW4TUL. Blaenavon 0495 792545.

●YAESU FT101ZD tcvr, fan: £385. Plessey solid state HF rcvr PR155B: £300. Redifon GK202 10ch HF drive unit: £35. Redifon SD1 HF synthesised drive unit: £100. Racal MA1724 10ch HF drive unit, as new: £75. G8CAN QTHR. Wokingham, Berks 0734 783827.

●CUSHCRAFT R4 vert ant for 20/15/12/10m. No radials needed. New: £150. 0534 54186 eve GJ3AME.

●HALLICRAFTERS comm RX SX100. 538kc to 34Mcs. Bandspread 80/40/20/15/10m AM/CW/SSB xtal calibrator, modified 250V. Collectors item with manual, spare set valves: £45. RadComs 1975-87, PW 128 copies 1971-85. As one lot: Free. G4CKO QTHR. Burnham-on-Sea 0278 786419.

●SILENT key sale. Linear amp Yaesu FL2100B 1200W. Best over: £350. Shure 444, lambic key. Best offers. Jim Terry G4GEU. Birmingham 021-444 3114.

●HOKUSHIN HF5 5-band trap vert ant with radial kit. Full assembly insts: £48. G4VXZ QTHR. Woodbridge, Suffolk 03943 4992 G4VXZ

●144MHZ linear amp, 4CX250B. Frontier Electronics, grid and anode tuned. Very clean 300W plus output, PEP: £295. No offers. Buyer collects or arranges delivery. G4JXK. Fareham 0329 230737 G4JXK

●TRIO TS500 tcvr 80-10m. 2x 6146s PA with 5763 driver. Recent full o/haul. In v. good working order. Matching mains PSU, h/book and orig.carton. Ideal starter rig: £180. Prefer buyer inspect/collect. National NC multiband tank coil assembly type MB40SL. Old, but unused, in orig.box. As new: £30, or good offer. Barker and Williamson audio phase shift networks 2Q4 for SSB. Unused: £15pair. KW Electronics 50ohms lowpass filter: £10. Post/carr by arrangement. G3MOE QTHR. Cheltenham, Glos 0272 524217

●BBC computer with APTL sideways RAM/ROM: £250. BBC dual disk drive 80 track: £70. Wordwise plus ROM and Acornsoft view ROM. Both with reference manuals: Offers please. MM MML432/50 70cm 50W PA: £95. Yaesu FT290R, nicads: £190. G8JAY QTHR. Cheltenham 0242 578914.

●TRIO 530S perfect cond, narrow SSB filter. Pair 6146B PA valves. MC50 desk mic: £550. Nigel, G4PJJ QTHR. Gloucester 0452 75542 G4PJJ Mizrahi N Mr 18 2.50 2.50 0.00 NO A FOR SALE 17/02/90

●TS120V with remote VFO for mobile HF: £400ono. FT290R Mk1, nicads, Mutek, heavy duty, carrying case, whip, chrgr, manuals: £245. Birmingham 021-430 5453 G4ZTG.

●YAESU FR50B rcvr: £80. GWO. Still in use. Only reason sale, required licence. Goddard. Tavistock, Devon 082281 792 RS35028.

●KENWOOD TS520SE HF tcvr c/w mic and DG5 digital display. Orig.cartons: £450. Lord, G4KHT QTHR. Hull 0482 843457.

●FT767GX plus 2m module, exc.cond: £1275. KW1000C linear amp plus spare set 572Bs: £275. Hanson PEP pwr meter: £50. SEMI Transmatch with Ezitune 160m model: £90. Thandar freq.counter: £60. Yaesu LP filter: £15. HF ant switch: £10. 40ft lattice tower: £200. KR600C rotator: £100. 240V electric winch: £200. Jaybeam TB3 Mk3 with stainless steel fittings slightly damaged hence only: £100. Plus variety of books, mains filter, TV1 filters, coax cable, computer progs. G4DXG QTHR. Tunbridge Wells 0892 35830.

●VERSATOWER BP60 as new, tiltover and crank up facility, winches, head unit, rotary bearing, bolts, baseplate etc supplied. Hygain TH5 Mk2 ant, as new. Both items never used. In mint cond. Lack of space forces sale: Offers. GM4VZW. Bridgehouse 0501 32884 after 10pm.

●BOUND vols RadCom 1964-78 plus 1981, 1982 in easibinders: £170. GI3SXG QTHR. 02318 5146.

●YAESU FT102 c/w WARC/FM/AM/SSB/CW. In superb cond. Icom IC255E 2m FM rig in good cond. FT102: £550. 255E: £140. GW0LBJ QTHR. Penarth 0222 530070 Ansaphone.

●SB200 amp: £300. 2m all-mode Yaesu FT221R: £295. Colour monitor with BBC-B cable: £85ono. G3XMA QTHR. Coventry 0203 410208.

●TR9000 Trio with Mirage 30W amp H/B reg pack, ants vert and halo, mobile fittings: £350. Drake mobile supply DC4: £30. TR2600A 144MHz h/held, 2x nicad packs, 120VAC chrgr Kenwood: £150. All had little use, owner lives abroad. Clwyd 07456 89903 GW3JI.

●MOBILE tower 70ft with head unit and bearing. Needs tidying. Also Drake T4XC, R4C, AC4, MS4. Offers WHY. GW0JKB not QTHR. Burry Port 05546 4029.

●YAESU FT767GX with 6m and 2m modules and MD1 mic. Mint cond with latest mods, manuals and boxes: £1600ono. Carr extra. Going QRP. Dave G0LUA. Wallingford, Oxon 0491 36873.

●60FT Versatower heavy duty. Tilt facility plus winches and new cables. Cut groundpost will require extension: £575. GM4ZNG QTHR. Cross Hill, Fife 0592 860591.

●RARE sale. Nye Viking 3k ATU swr PEP meters. 6 connectors plus auto ant switch: £275ono. Tokyo Hy-power ATU, 4mths old, as new. Cost £205. Sale: £150ono. Model No HC400L. John G0IOR. Grimsby 0472 358449.

●FT209R h/held 2m 3.5W with nicad chrgr. As new: £130. Jaybeam Q42M 4ele quad. As new: £45. G5CW QTHR. Cotswolds 0451 30518.

●FT290R Mk1 c/w nicads, chrgr and manual. Good cond: £200. Birmingham 021-784 1752 G0HRX.

●10MHz kit for TS520S, ex Lowe: £8. Trio 2200GX 2m tcvr, leather case: £60. Post extra. G3RB QTHR. Whitley Bay 091-253 0504.

●TRIO 520S 250c/s CW filter. Good cond, boxed and manual: £320. Dave, G4VFQ QTHR. Gillingham, Kent.

●GRAND junk clearance! Collectors item, vintage storage scope Memoscope 104, VGC, dual-trace, manual, autotransformer, spar mainframe: £50 lot. German WW2 Samos RX, Lorenz TX chassis: Offers. SAE list, nothing over £10. Buyers collect. G8LIU QTHR. Uxbridge 0895 30006.

●TRIO matching pair TX599 100W transmitter and JR599 double conversion rcvr. Both with built-in PSUs, linked for full TX facility incl twin VFOs. Immac plus manuals: £210 pair. Farnell 15A h/duty PSU 13.8V: £40. 8ele met 144MHz yagi: £18. Sidcup 01-309 1295 G0KPZ.

●TRIO/Kenwood TM201A 144MHz FM mobile rig. 25W. M/mount, fist mic, Heatherlite mic: £225ono. Buyer to collect. Mike, G1HGD QTHR. Kenilworth 0926 513073.

●IC211E 2m multimode: £300. Belcom LA106 2m linear: £100. TR7500 2m mobile FM: £130. G4IBN QTHR. Pontefract 0977 678300.

●COMMODORE 64C c/w following: PSU, Oceanic 5.25in d/drive and PSU, 12in and 5in, Hi-res monitors, mono, Citizen 120D plus serial interface cartridge, Inmac V21/23 modem plus RS232 interface, s/ware. RX4 programme 5.25inn floppy with serial interface and filters, all manuals, documents incl. Boxed, as new cond: £220. Philips D2935 world radio digital keyboard access 100kHz-30MHz plus VHF/FM. Absolutely brand new: £85. Bude 0288 354564 G3XNE.

●ICOM 260E multimode trcr with switchable preamp, and remote mic: £220. Plus other 2m equip for sale. Chelmsford 0245 466956 G6LUP.

●HF tcvr FT747GX with NBFM board: £540. ATU Capco SPC300: £150. HF rcvr FRG7700 with ATU FRT7700: £200. Rob G0LCA. Stafford 0785 56562.

●HF rig complete, comprising Kenwood TS520S tcvr, VFO520 remote VFO, DG5 digital display, AT200 ATU, SP250 spkr. In perfect cond. Ideal beginners rig. Only needs ant and mains supply and will work VK. Prefer buyer collects. Price complete: £550. Lancs 0704 78037 G0GY.

●BUTTERNUT HF5B Butterfly 2ele beam, used few months only. Performs well: £175. Re-advertised due to time wasters. G0JFU QTHR. Gloucester 0452 862773.

●INDIVIDUALLY designed det house, gas CH, partial dble glazing. Porch, hall, guests cloakroom, 2 rec rooms, part fitted kitchen, rear lobby with CH boiler leading to radio shack. Upstairs 3 beds, bathroom, landing. Outside, 150ft rear gdn, greenhouse, garage, parking for several vehicles/caravan. Good radio location Wab Square SP29 Staffs. Comes c/w all ants located in the middle of good motorway network. Approx 2 miles from Jnc 10 M42: ú89,950. Further details G0FXL QTHR. Tamworth 0827 281095.

●YAESU HF SSB tcvr FT7B 50W 160-10m. Ideal mobile: ú350. Yaesu rcvr FRG8800 HF/VHF: ú550. G3NMZ QTHR. Luton 0582 591749.

●MIC.MOD 144MHz AM TX and RX: ú15ea. 14in Pye B/W monitor: ú10. BBC Micro Prestel adaptor: ú20. Teletext adaptor: ú20. Joysticks: ú3. Unboxed 144MHz cvtr 24MHz output: ú5. Practical Electronics 1974 CCTV camera: ú10. KW Atlanta: ú120. Guildford 0483 575870 G3WZR.

●MM 28MHz tvtr 2m IF, 2m in, 28MHz out. 10W output. Only used on RX: ú80. 0272 693235 after 7pm G1DOX.

●TS120S 100W h/book, w/shop manual, mic. Pwr lead GWO. Price incl delivery: ú375. Newport, Shropshire 0952 825983 G0GQK.

●2M amp, 2x 4CX250, W1SL Design new valves. No PSU: ú150. 70cm amp 1x 4CX250, DL7YC Design new valve. No PSU: ú125. Parts for PSUs available. Brigg 0652 54222 G1DXI.

●YAESU FT101E. GWO: ú300 collected. Carr.extra. G0JNC QTHR. Chadderton 061-652 9127 days/eve.

●DRAKE separates T4XB, R4B, AC4 PSU. 160-10m, TX or split operation. VGC, orig.manuals: ú400. G4IPI QTHR. Alton 0420 63993.

●NORTHUMBERLAND Roman wall country. Stone built det house, 1977, 3 beds and 1 bed en suite bathroom. Lounges, dining room, cloakroom, fitted kitchen, utility, conservatory. Full CH, dble garage, 1/3 acre site. Superb views. 500ft ASL long wire ant: ú130,000. G0AXZ QTHR. Bardon Mill 0434 344467.

●TR9130 multimode 5/25W in VGC incl all accs and box: ú340. G4FAS QTHR. Stockport 061-437 7784.

●TRIO TS830S with CW filter. Exc.cond, orig.packing and manual: ú650. G4PJW QTHR. Crewe 0270 661971.

●VERSATOWER P60, TH3 Mk3, 10-15-20, Ham 2 rotator. Also QTH with planning permission for sale. G4EAN QTHR. Nottingham 0602 262360 or 595261.

●FT790 mint cond. Orig.packing: ú290. Unbuilt G3RUH 9600 baud modem. Complete kit of parts plus insts: ú50. 18ele Sandpiper 70cm parabeam. Unopened kit: ú30. Ideal station for new VO5ATs: Offers. Mike, G0JVC not QTHR. Stevenage 0438 353040.

●G3LIV RTTY computer interface plus G3WHO Eprom for BBC-B: ú45. G4EKG QTHR. Evesham 0386 41105.

●TRIO 120S, good cond with h/book, w/shop manual, mic, p/lead. Sounds good: ú375. Newport 0952 825983 G0GQK.

●SCOPE, dual beam 15MHz. Mint: ú125. Audio generator: ú20. 10A PSU: ú20. Pye Westminsters FM low-band 70MHz: ú25. UHF: ú30. All 10ch. PF70 batt tester: ú5. Manual, Tektronix, Telequipment, Marconi, Advance etc. Meters, components etc. G4YVJ QTHR. South Somercotes, Lincs 0507 85203.

●CAPCO r/coaster: ú15. Caps 250pF: ú12. 250-250pF: ú13. 12V/40A: ú50. BC221: ú10. 2X6SJ6Cs matched, new: ú1250. G3OAB. Birmingham 021-747 8489.

●KENWOOD AT230 ATU, boxed with manual: ú125. Welz SP400 large scale VHF/UHF pwr/swr meter: ú30. 70cm 2x 5/8 co-linear. As new: ú15. Met 5ele 2m yagi, only used indoors: ú10. Martin G0HRZ. 01-590 5490.

●PYE MM1 dev/mod meter, SG2/IF sig.gen, TMS2 audio level meter: Offers. Jaybeam D8/70cm: ú20. Roger, G3MEH QTHR. Tring, Herts 044282 6651 or 01-380 6121.

●RTV640 40ch VHF FM tcvrs, 2 working, one for spares. Could be modified for 6m: ú50 the lot, or exch any 2m/70cm synth rig, scanner, RX, or xtals for 2m. Shane G7EWL. Irthlingborough 0933 652709.

●JAYBEAM tribander with baluns. Installed 1yr. Boxed. Dismantled through change of QTH. Mint cond. Buyer collect: ú100. G4ZND. Felton 0670 787888.

●EDDYSTONE 940 and type 935 spkr in mint cond. Boxed: ú150. SX200 scanner, PSU: ú125. G4PNC not QTHR. Blackpool 0253 35764.

●FRG7 comm rcvr. Perfect cond, boxed, manual: ú135. QTHR. Huddersfield, Yorks 0484 606085 G0CVJ.

●YAESU MD1B8 desk mic: ú50. Datong FL2 filter: ú60. Datong ASP707 processor: ú55. All boxed, mint. G0KIH. Farnham 0252 722139.

●ICOM IC701 HF 100W tcvr incl ICPS701 PSU: ú350. MML432/100 amp: ú195. Jaybeam 9ele x-yagi: ú25. G0CFS QTHR. Oxford 0993 771424.

●DFC230 digital VFO suit TS830/530, TS130/120. Boxed: ú60. TL120 linear amp, suit TS130/120V: ú100. YK88SN 1.8kHz SSB filter: ú30. G3VWH, Shrewsbury 0743 65061.

●KW2000E c/w mic, manual, some spare valves. GWO: ú200. No offers, prefer buyer collects or half carr. John, G4VPU QTHR. Whitley Bay, Tyneside 091-252 2304.

●YAESU FT290R nicads, chrgr, carrying case, HB9CV beam. Little used: ú210. G0FFZ. Southampton 0703 738399.

●YAESU FTV901R mainsframe with 2m module, FT101/902/757 etc: ú180ono. G4UVJ QTHR. Canvey Island 0268 697978 or 0860 847836.

WANTED

●CORSAIR 2: Offers. Spreadsheet s/ware for Sony HBG900P MSX. Dead F23R wanted for spares. G0DOM QTHR. 04022 22581 G0DOM Oskis DJ Mr 16 2.50 2.50 0.00 NO V WANTED 03/02/90

●YAESU FT101Mk1 inst manual to photocopy. Early model essential as already have FT101Mk2. Howard, G6CVY, 15 Kilbride Ave, Bolton, Lancs. 0204 387468 G6CVY

●MOBILE mounting bracket, MMB27 for Yaesu FT2700RH dual-band tcvr. Will pay up to £5. G7GAB. Rugby 0788 67288 eve

●TEKTRONIX scope model 465 manual, orig or copy. Also Adonis compressor base mic connection details. Costs repaid. G1BWW QTHR. Hitchin, Herts 0462 711722.

●HW7 or HW8 for young student QRP operator. If poss, unmodified c/w PSU. G0LCQ QTHR. Devizes 0380 723839

●YAESU FT730R UHF tcvr. Must be in good cond and c/w h/book. Mike Watson, G8CPH QTHR. Ipswich 0473 831448

●RESISTOR 54000ohms, 300W or equiv for Collins 30SI linear. G3AJT QTHR. Romsey, Hants 0794 512557

●NEW licencee requires HF tcvr, preferably with PSU and ATU, FT767, TS440S or similar. Peter G7EQW. Plymouth 0752 892690.

●SET of extender cards for Marconi TS2210 scope especially timebase extender. G8MGP QTHR. Bedford 0234 854388.

●PYE Reporter, covering 139.010, 139.170, 139.185MHz AM or any other type of tcvr covering these frequencies. G1JHT QTHR. Halifax 0422 368790.

●DRAKE R4245, DSR2 or RR3, any cond or info. G3YFK. Shrewsbury 0743 884858.

●AP1086, RAF stores, ref nos all sections particularly 10-10A to 10Z. Also air publications relating to radio, radar and navigation equip, such as Babs, Oboe, Loran, Gee, H2S, Rebecca-Eureka system etc. Also would purchase post-war to current magnetrons, klystrons, T/R-cells and special types of EEV-M-OV valves. Exc. price offered. Martin Gee, 17 Foxley Cl, Mountford Est, Fernciiff Rd,

Hackney, London E8 2JN. 01-254 9083 or 01-790 2846 anytime RS91943.
●PYE A200 amp, working or not. Nolton flat relay, Pye mic. FM Westminster for spares. GW3UMD QTHR. Cardiff 0222 761813
●EDDYSTONE EC958 RX, 10kHz-30MHz, or similar with LW coverage. Display unit with Eddystone considered, otherwise digital readout preferred. Must be in VGC. Also, LW down-cvtr for Racal RA17L required. Will collect. David, Shanklin, IOW 0983 864227 RS92758.
●CIRCUIT diag/manual for Pye F30 AM base. Cheap low-band mobiles. London, E11 1JX 01-539 5130 G8ALM.
●ATU AT230 or FC707 if poss, but will con all bar kits please. Andy, Lymington 0590 673476 G0JZW.
●W15FM Pye Westminster low-band suitable 70MHz. Steve G4EDG, Exeter 0392 216579.
●HF mobile rig TS120, FT7 etc. WHY? Non-working considered. G4JNT QTHR. Southampton 0489 787424.
●VFO230 for Kenwood TS530SP. Must be in good cond. Roger, G4VYK QTHR. Bristol 027581 3351.
●MIC MOD RX cvtr MMC144/28 HP double balanced mixer. G8AYY QTHR. Birmingham 021-783 2996.
●SCOPE Telequipment D54. Datong speech processor. Both in good and working cond. Good price for right equip. G3HRH QTHR. Winchester 0962 712045.
●2M SSB tcvr like Mizuho or similar. Also Shimizu tcvr or SSB-TX HF kit. G4BVL. London 01-244 8110.
●2M FM mobile rig, anything considered. Will travel. G0HET QTHR. Charmouth, Dorset 0297 60556.
●TURNER Plus 3 base mic, must be in top cond and working. John, Edinburgh 031-558 1170 11am-5pm Mon-Sat RS92350.
●TEMPO 2004A UHF linear also MM 70cm ATV 20W transmitter MTV 435 or Foretop TVT432 TV TX. G4ZEK. Colchester 0206 851343.
●CASE FOR Heathkit RX GR78. Also circuit and h/book. G6DAW QTHR. 01-854 4926.
●OPERATING/service manuals for Dymar Electronics transmitter 940T and rcvr 940R. Stan G4OPG. Taunton, Somerset 0823 251764.
●23CM 55ele tonna yagis. Brigg 0652 54222 G1DXI
●KENWOOD ex VFO VFO120 for TS130S. G4KBY. 01-778 9422.
●TRIO TR2600E h/held 2m FM. G4PKT QTHR. Leamington Spa 0926 313534.
●WW2 TX/RX Mk3 NR18. John, GW4KVJ QTHR. Mid Glamorgan 0443 813100.
●AESU FC107 ATU. Dark grey version. Will collect up to 100 miles or pay post. G1SNI. North Dorset 0747 823574.
●INSTRUCTION manual for Panasonic 6-band portable dble superhet model DR26 wanted urgently. Good price offered for clear photocopy. Coalville 0530 36595 G0BJG.
●R1475, Welz AC38M, SP15M good/exc appearance and fully working. Dick Fixter G0DIC, 18 Linley Drive, Boston, Lincs, PE21 7EJ.
●HEATHKIT h/books for the following, scope model no. 10-17. Also audio wattmeter model no. AW1U. Harwich 0255 502195 RS85450.

EXCHANGE

●FT101E CW filter. Fan, spare PA valves with mic. FB cond. Require 2m multimode base station. QTHR. Wolverhampton 0922 415048.
●MY 6m HT106 with matching HP100S PSU/spkr and HNB100 noise blanker for best scanner offer. G7AHE QTHR. Somerset 0823 451593.
●MANUAL, circuit details of Marconi electronic voltmeter TF2604. Buy, loan, copy and return. G3WR QTHR. Brighton 0273 501100.
●HAVE 200MHz prof timer/counter Racal 9905 as new. Require exch modern 2m h/held and chrgr. No rubbish. G4TLY QTHR. Malmesbury 0666 822935.
●YAESU FT7B with digital accs for computer. Amiga or ST or PC WHY. G3LEN QTHR. Birmingham 021-478 1551.
●WW2 German DF RX, Telefunken T8PL39 Martin, with manual, for other WW2 German gear, esp RX R4, KST, E52A, motorised tuning, or Schwabenland, or WW2 Japanese HRO copy. G8LIU QTHR. Uxbridge 0895 30006.
●GEMQUAD, 2ele boomless quad. Made in Canada, c/w insts. Good cond. Can be adapted for WARC bands. Planning permission problems. Exch for Butternut HF5B compact minibeam. Must be in good cond. Maurice, Mid Calder 0506 880345 after 5pm RS92797.
●STAR ND10 9-pin 80col printer, 180cps draft, 45cps NLQ with parallel interface and tractor feed. Mint cond, never used, boxed with manuals. Bought for £419. Sell for: £250 or exch for FT290R or dual-band h/held or best HF rcvr offered or WHY. Also exch Sony Discman portable CD player for best scanner or WHY. Laurence, G1SWL QTHR. New Malden 01-949 5099.
●LIMITED special edition collection of models of yesteryear. Police ambulances initially released through Police Magazine, incl rare -/5 City of London white police ambulance, alone fetching £180 at swapmeets, together with 9 Lledo fire fighting models, for 2m multimode or HF valve TX/RX. Value of collection around £300. Please ring and haggle. G0FUS. Southampton 0703 620176.
●R1082, R1155, BC778E, SX28, B2 etc for T1083, T1115 or TR9 req'd for small museum C. Baker, 71 Sunnyhill Ave, Derby, DE3 7JR. RS85130.

FAMILY RESEARCH

As part of a family history project, Mr WL Cook is researching contacts he made whilst operating from RAF Seltweg, Austria, just after the war. Any other members interested in ham history of this period please contact Mr Cook, 54 The Castleway, Willington, Derbyshire, DE6 6BU.

Mr MG Taylor has written requesting help to trace whether his late father ever held a callsign. His name was Mr Geoff Taylor, late of 230 Priory Road, Wellingborough, and 119 Jubilee Crescent, Wellingborough. During his term in WW2 he served in the Royal Navy as a radio operator and, as Mr M Taylor, G0EAE, only came into the hobby after his father's death, he has no information regarding his ham activities whatsoever. If anyone can help please write to Mr Taylor at 39 Melton Road, Wellingborough, Northants, NN8 1PU.

HARNESS FOR FLYING HELMET

Mr Ian Haggart, G3JQL, has an unusual request this month for a wiring harness for a WW2 flying helmet or, alternatively, the 2-pin socket for the mic which was part of the harness. He is also looking for a companion rcvr to his MK119 tcvr. This rcvr would have been diecast waterproof, case size 10"x4"x6". You can contact Mr Haggart at 22 Alnwick Road, Newton Hall, Durham, DH1 5NL.

PYE EQUIPMENT IN N IRELAND?

Help is required by Mr Andrew Maclean, RS92002, to find a supplier in Northern Ireland of Pye equipment as he is interested in converting radios. If anyone knows of a dealer in that area selling such equipment would they contact Mr Maclean at 23 Old Park Road, Ballymena, Co Antrim, BT42 1AY, or phone him on 0266 656439 after 7pm.

LEESON MIC DIAGRAM

If anyone has a copy of a schematic diagram for the Leeson OT-251 base mic, or the address of the main dealers for Leeson, Mr JD Bolton of 10 Bowness Road, Conniston Park Estate, Timperley, Cheshire, WA15 7YA, would be interested to hear from you.

1937-8 SW TUNER REQUIRED

Mr Sullivan, G2DGF, has been trying to obtain a British General Short Wave Tuner circa 1937-8 without success so far. Anybody know of one - even damaged? G2DGF is at 12 Glebe Road, Letchworth, Herts, SG6 1DR.

SABTRONIC FREQUENCY COUNTER

Mr JK Gaukrodger, G6VNK, is experiencing problems with his Sabtronic frequency counter bought in 1983. The prescaler has packed up due probably to input amplifier IC failing. The number on this unit is SAB-1009B. If anyone can suggest a suitable substitute for this please write to him at Oakleigh House, Windmill Lane, West Hill, Ottery St Mary, Devon, EX11 1JP.

SPEC REQUIRED

Has anyone got a circuit diagram and specification tucked away for the regulated power supply made by All Power Transformers Ltd, Model 508. Please contact Percy Greenwood, G2BUJ, 32 Pound Lane, Pinehurst, Swindon, Wilts, SN2 1PS.

RETRIEVED EDDYSTONE 358

Mr GS Garrett, G3IJW, has retrieved a unit believed to be an Eddystone 358 from his local dump, and would like to renovate it. The semi-circular dial is calibrated 1200 to 22000(KHz?) in four overlapping ranges but only one plug-in coil unit (the LF one?) remains. The BFO is missing apart from on/off switch and a mains power supply. The valves are 3xGK7; GK8; GQ7 & GV6. He would like help to (1) positively identify this unit, and (2) any information to help him restore this. Telephone him on 01-303 1879 eve/w.ends or 01-858 3291 ext 3354 office hours.

DYMAR LYNX CONVERSION

Colin Palmer, G4FMO, is changing a Dymar Lynx onto 70MHz fm and is having problems getting the receiver to work. If anyone has a copy of the circuit diagram and/or advice please contact him at 29 Paget Rise, Abbots Bromley, Nr Rugeley, Staffs, WS15 3EF.

RAIBC REQUEST

A request from Brig Johnny Clinch, G3MJK, arrived requesting help in tracing a simple ATU for use by "white stick" operators. One he has seen which would be suitable is fed with 52 ohm coax and mounted on the wall outside the QTH. It looks like an oversized coffee tin with a terminal at the top for a long wire. The base has a 50239 socket for a PL259 plug. This unit requires no tuning and works all bands. This unit was designed by G4ZZZ who was a member of the Wimbledon Radio Club, but efforts to locate G4ZZZ have so far failed. If anyone has a unit like this please contact Johnny Clinch on Preston Candover (025687) 439.

TS145XT CIRCUIT DIAGRAM

Mr JM Butcher, G4GWJ, is looking for a circuit diagram for his Sommerkamp TS145XT, a 22-channel xtal-controlled 2m FM mobile rig. He has been told that this unit is similar to the FT224, so he would be grateful of a photocopy of the circuit details of either unit. All expenses reimbursed. His address is 20 Beaconsfield Way, Earley, Reading, Berks, RG6 2UX.

WW2 VINTAGE RECEIVER

David Streeter, G6XNC, has been given an American aircraft receiver, Model RU19, manufacturerd by Western Electric for the Navy Department Bureau of Ships in 1941. It appears to be a 6-valve superhet and is provided with separate plug-in coil packs which each cover two frequency ranges via a switch on the end of the coil packs. The only connection to the unit is via a multi pin socket on the front panel; this unit covers a frequency range of 390-9120KHz. The full details of the unit are Model "Aircraft Receiver type CW-46048D, a unit of RU19 aircraft equipment" S/No 8271, dated 21.4.41". Any information would be greatly appreciated. Also does anyone know the address of Coutant Electronics Ltd, makers of power supplies? Mr Streeter is available on 01 462 4461.

Helplines is designed to help put people in touch with each other. If you have a problem, it's more likely there's someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell the rest of us. 'Helplines' is there to help you and to give you the opportunity of helping others. Write to us marking your envelope 'Helplines' and we'll do what we can to get the message out.

MAYDAY!(?)

In the unlikely circumstances of hearing a distress call on the amateur bands the most important thing to do is to ***LISTEN.*** Note down everything that is transmitted by the station in distress and also the time and frequency.

Pass all this information to the police. You may have some difficulty convincing them of your sincerity as this is unlikely to be an everyday occurrence, so be patient. They will pass on the details to the Coastguard Rescue Co-ordination Centre.

Only transmit in response to a distress if you are absolutely sure that it is going to help. Remember that a local station will be of much more use than someone half way around the world.

NEVER reply to a distress call heard out of amateur bands.

HF AND VHF RECEIVERS AND SCANNERS

From the ICOM stable come three new models - the R1, a handheld receiver covering the frequency range from 150KHz to 1300MHz with 10 different channel spacings, 100 memories and keypad frequency entry. Although it omits ssb and cw, it has continuous coverage, and includes wide FM as well as narrow FM and AM. The case size is similar to the most recent ICOM mini walkie talkies at only 49 x 102 x 35mm deep.

For mobile or base station use comes the R100 covering 500kHz to 1.8GHz. It has 120 memories, 9 selectable tuning steps, and again, receives AM, FM, and FMW.

ICOM also announce a budget SW rx, the R72 covering 100kHz to 29.999MHz. Modes are AM, FM (OPTIONAL), SSB, and CW. It has similar facilities to the IC 725, and incorporates direct digital synthesis. The usual filter options are available.

The Fairmate is another hand held scanner and is available from many sources. It has a frequency coverage of 25 - 550MHz, and 830 - 1300MHz. AM, FM, and FMW are included. It has 1000 memories, and channelling can be selected from 5 to 995kHz.

Similar to the Fairmate is the new AOR AR 1000, a handheld covering 8 - 600MHz, and 805 - 1300 MHz. It also offers AM, FM and FMW. It will be priced competitively and will include a trickle charger, nicads, a dual band antenna, soft carrying case, earpiece and belt clip. It also has 1000 memories, and channelling can be preset from 5 to 995kHz. This should be quite a bargain.

HF TRANSCEIVERS

Tentec have announced the Omni V, similar to the Argosy 2, but with some extra facilities. It has a large digital frequency read-out, and covers all the amateur bands from 1.8 - 28MHz, with up to 100 watts out. It has an analogue VFO, and works from 12V DC.

ICOM have introduced their new budget model, the IC 725, reviewed by Peter Hart in RadCom September 89. Hard on its heels is the IC 726 (RadCom review February 90), identical except that it includes the 50MHz band, with just 10 watts out.

Kenwood have just introduced their flagship, the TS 950S or SD. The S version is basic, whilst the SD includes all the normal options; digital signal processing, switchable RF front ends (best sensitivity or intercept point), two RX tuning knobs and assemblies giving two separate receivers, various filters, CW keyer etc. See Peter Hart's review this month.

FM MOBILES AND PORTABLES

From ICOM come two dual banders, the IC 2400 for 144 and 432 MHz, with 45 and 35 watts respectively, and the IC 2500 with 432 and 1296 MHz having power outputs of 35 and 10 watts.

ICOM have also released their replacement for the fibre optic connected IC 900, the IC 901. It normally comes with both 144 and 432MHz but can also include 1296 and 50MHz. An optional adaptor is available for SSB and CW. This rig is particularly suitable when there is not sufficient room for any more than a control unit under the dashboard. There are four new monoband handy talkies, the IC2SE, a very small but effective WT with 12.5 kHz channelling but unfortunately with a wide IF filter, and a more complex version, the IC2SET, including DTMF tone provision and a frequency keypad on the front. 432MHz versions are the IC4SE, and IC4SET, thus completing a welcome new series of WTs.

A two band walkie talkie, the IC24E also comes from ICOM, covering the 144 and 432 MHz bands, and allowing talk through. Like the other new ICOM models, it gives 2 watts on its normal battery, but can give up to 5 watts on 13.8 volts DC from an external supply such as a car system. It is supplied with a dual band antenna. The usual options are all compatible with other recent ICOM models. It can be set to give a small selection of channelling but, again, has a wide IF filter.

Kenwood's latest dual band mobile for 144 and 432 MHz is the TM 731E which has separate tuning controls for each band. It has two audio outputs, one for each band, which are separately controlled and can feed separate external speakers but mix into the internal one. The rig allows duplex operation, and seems an ideal one for RAYNET. It gives 50 watts out on 144, and 35 watts on 432. A remote front panel option, RC 20, duplicates facilities, which could allow the rig to be used in small spaces. As with most other Kenwood VHF rigs, the IF filter is an "F" type.

A less expensive dual bander is the Kenwood TM 701E which has a single display, is very small, but has full duplex facilities. It gives 25 watts on each band. Kenwood monobanders include the TM 231 (144MHz), TM 431 (432MHz), and TM 531 (1296MHz). These are all very compact, and include a digital voice bank, which records and plays back up to 30 seconds of speech. Outputs are 50, 35, and 10 watts respectively.

Manufacturers and importers can contact the author by phone on 081-346-5372 to provide details of new products. Photographs should be sent direct to the Editorial Department at RSGB HQ.

by Angus McKenzie, G3OSS

CLUB NEWS

DEADLINE - Items for inclusion in the June 1990 issue must be sent to HQ marked "Club News - DIARY", to be received by April 23 latest.

If news is received by the published deadline, it will appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

AVON

▶South Bristol ARC - 4, hand-held rig meeting; 11, 70cms activity evening; 18, practice Morse Tests under exam conditions; 25, 10M activity evening; May 2, talk "How to Use an Oscilloscope"; 9, HF activity evening; 16, club project - construction evening.
▶Thornbury & DARC - 4, Annual General Meeting; 18, HF activity evening; May 2, talk "Amateur Satellites" by Ted, G3JMY.
▶Weston-Super-Mare RS - 2, talk "The Communications System of the SWEB" by D. Wright; 23, constructors night; May 14, talk "Tracking the Bismark by Radar" by Cliff Brent, G2BFI. Details 0934 514429.

BEDFORDSHIRE

▶Bedford & DARC - 3, talk "Fighter Aircraft of the Wars" by Stuart, G0GOF; 10, social evening; 17, talk "Magnetic Loop Antenna" by Clem, G0EYG; 24,31, social evenings. Details 0234 266443.

BERKSHIRE

▶Burnham Beeches RC - 2, quiz vs MADARC at BBRC QTH.
wMaidenhead DARC - 5, talk "Operating from Ben Nevis" by John, G3WGV; 17, talk "Smith Charts" by Bernard, G3SMW; May 3, talk "RTTY the DX Mode" by Bob, G0BTY; 15, preparations for HF Field Day. Details Maidenhead 25952.
▶Reading DARC - 12, talk and demonstration "Amateur TV" by G8LES; 26, club quiz competition; May 10, talk "Satellites and their use by the Ordinary Radio Amateur" by G1HBD. Details 0734 774042.

BUCKINGHAMSHIRE

▶Aylesbury Vale RS - 3, talk "EMC and its Implications to Radio Amateurs" by Neil Brinkworth, G3UFB; 18, talk "HF Contesting and the Work of the HF Contests Committee" by Don Beatie, G3OZF. Details 0280 817496 or 0908 560026
▶Chiltern ARC - 11, demonstration of QRP equipment. Details 0494 776420.
▶Home Counties TV Group - 24, talk "PLL Phase Noise" by G3RZP. Details 0494 445972.
▶Milton Keynes & DARS - 11, junk sale. Details 0908 316435.

CHESHIRE

▶Chester & DARC - 10, talk "Certificate Hunting"; 17, Piccadilly Radio visit; 24, talk "An Experimenter's Diary" Part III.
▶Stockport RS - 11, "Amateur Radio's Newest Frontier" (video) W5LFL Space Shuttle; 25, talk "The Z80 Microprocessor" by Ray Dawson, G3JLX; May 9, talk "Vertically Polarised Antennas" by Andy Paterson, G0HAL.

CLWYD

▶Conwy Valley ARC - 5, talk by Dr. David Last.

CORNWALL

▶Cornish RAC - 5, Annual General Meeting at Perranwell Village Hall; 9, computer club at Treleigh Church Hall; 10, radio constructors workshop at Perranwell Village Hall; May 3, main meeting at Perranwell Village Hall; 8, radio constructors workshop at Perranwell Village Hall; 14, computer club at Treleigh Church Hall.

CUMBRIA

▶Eden District ARS - 26, talk "50 MHz" by G8TXJ. Details 09312 514.

DERBYSHIRE

▶Derby & DARS - 4, junk sale.

DEVON

▶Plymouth RC - 3, activity night.
▶Sidmouth ARS - ***NEW SECRETARY*** R.E. Hamson, G8NFK, 43 Arcot Park, Sidmouth, Devon EX10 9HU, tel: 0395 515349. Club now meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth on the 2nd and 4th Tuesday of each month at 7.30pm.
▶Torbay ARS - 6,13, club nights; 20, Annual General Meeting; 27, club night.

DORSET

▶Plessey Christchurch ARS - 12, talk on Marconi by Harry Barnes.
▶South Dorset RS - 3, Annual General Meeting and constructors competition.

EAST SUSSEX

▶Hastings E&RC - 18, surplus equipment sale.

ESSEX

▶Chelmsford ARS - 3, talk "HF Aerials" by G3XAP; May 1, mini lectures by club members. Details 0245 260831.
▶Clacton-on-Sea RC - 18, talk and live demonstration "Amateur Radio Satellite Communication" by Frank Howe, G3FIJ. 7.30pm.
▶Loughton & DARS - 6, Annual General Meeting; 20, talk "Facts on Fax" by Tony Mothew, G0LWM; May 4, night on the air - G4ONP on 6m from Loughton Hall; 18, Aylmers Farm planning night.

FIFE

▶Glenrothes & DARC - 4, talk "Test Gear - Oscilloscopes" by GM4ALA; 11, talk "Worked All Britain" by GM0GNT; 25, talk "Aircraft Archaeology" by GM0GNT; May 2, talk "Test Gear - Signal Generators" by GM4ALA; 16, talk "Electronic Make-up of Computers" by GM3ZVF. Details 0592 204715.

GLOUCESTERSHIRE

▶Cheltenham ARA - 6, talk "Square Bashers in Madeira and Gozo" by G4VXE. Details 0242 242336

GRAMPIAN

Aberdeen ARS - 6, junk sale.

GREATER LONDON

▶Acton, Brentford & Chiswick ARC - 17, talk "Audio Filters" by G3IGM.
▶Biggin Hill ARC - ***CHANGE OF NAME*** Now called Bromley & DARC.
▶Coulsdon ATS - 9, talk "Computer Aided Design" by Dave Young, G8VXB; May 14, open evening with cheese & wine - demonstrations of radio etc. Details 01-668-7004 (Home)
▶Ealing & DARS - meet every Sunday morning 10am - 1pm and every first and third Tuesday 7.30pm to 10.30pm for talks and demonstrations. Using the Impedance Bridge, Satellite and the Hidden Pitfalls. Do you know your Balun? are future commitments.
▶Edgware & DARS - 12, talk on money matters by F. Claytonsmith, G3JKS; 26, TBA; May 10, talk "Masts and Rigging" by G3SJE; 18, straight key evening. 3.5MHz band. 1900BST onwards.
▶Southgate ARC - 5, grand surplus equipment sale; 26, youths' construction evening; May 10, talk "History of Valves" (Part 5) Marconi Historian Stan Wood.
▶Wimbledon & DARS - 27, Desert Island Radio II; May 11, construction contest. Details 01-330-2703.

GREATER MANCHESTER

▶Eccles & DARS - 3, talk "HF Aerial Design" by G0KLF; May 1, talk "Going Stateside" by G6FEI.
▶South Manchester RC - 6, TBA; 20, club activities review; 27, talk "Understanding and Repairing a 2M FM Transceiver" by G4HON; May 4,contest preparation night -club open for non contesters;11,talk "Frequency Stable UHF Signal Source" by G3SVW.

HAMPSHIRE

▶Basingstoke ARC - 29, 10.30 Direction Finding Foxhunt, OS map 185, 2 metre FM channel S17.
▶Fareham & DARC - 11, talk "They Laughed When They Saw my Radio" by Alan, G3CCB; 25, The "Bird", update by Dave, G2BFO. Details 0705 321411/2 (daytime).
wFarnborough & DARS - 11, bring and buy sale; 25, inter-club quiz evening; May 9, special open evening.
wHorndean & DARC - 5, talk "EMC" by G4RLE; May 3, visit to Copnor Fire Station.
▶Liphook (Three Counties ARC) - 11, talk "RTTY" by Alan Hobbs; 25, Annual General Meeting; May 9, talk "A Short History of Telegraphy" by Smudge Lundegard.
▶Winchester ARC - ****NEW SECRETARY**** Victor Webb, G3REN, 46 Bodycoates Road, Chandlers Ford, Eastleigh, Hants. Tel: 0703 260341.

HEREFORD & WORCESTER

▶Bromsgrove ARS - 10, Microwaves; 24, night on the air; May 5, Annual General Meeting.
▶Bromsgrove & DARC - 13, members' construction competition.
▶Kidderminster & DARS - 3, general meeting plus RSGB videos; 17, talk "First Aid" by Geoff, G1ZIH. Details 0562 751584.
▶Hereford ARS - 6, talk "Operation Raleigh - Part 2" by John Layton, G4AAL; 20, annual constructional contest; May 4, "Jandek Kits" by Derek Pearson, G3ZOM.

HERTFORDSHIRE

▶Cheshunt & DARC - 4, construction contest; 18, mystery talk by Dennis, G3TIK; May 2, talk "Radio - The Latest Trends" by Peter Clarke of Arrow Electronics; 16, portable evening - Baas Hill Common, Broxbourne. Details 0992 464795.
▶Stevenage & DARS - 3, talk "Meons 50MHz and All That" by Tony, G1ZZH; 17, talk "Converting Commercials" by Mo, G1ZOO; 24, committee meeting; May 2, talk and demonstration "Slow Scan Television" by Tony, G1ZZH; 16, talk "Reading EPROMS" by Mo, G1ZOO.
▶Verulam ARC - ***NEW SECRETARY*** Andy Ince, G0BZS, Cottage No. 1, Rounton, 28 Nascot Wood Road, Watford WD1 3SD. 10, activity evening; 24, talk "World War 2 Transmitters and Receivers" by Mr. D. Purchese, G3LXP. Details 09277 62180.
▶Welwyn-Hatfield ARC - 16, QRV? Foxhunt; May 7, Lemsford Village Fete SES.

HUMBERSIDE

▶Goole R&ES - 13, DF session; 20, talk; 27, social evening (Old George Inn). Details Goole 769968.
▶Hornsea ARC - 4, talk "PC Unlocked" by Geoff, G3PWN; 11, talk "Operating from Exotic DX" by Tony, G4HYD; 18, visit YTV Facility, Hull; May 2, visit Bridlington Coastguard; 9, committee meeting; May 16, talk "Omega, Further Revelatiokns" by Richard, G4YTV.

KENT

▶Bromley & DARC - 17, bargain basement; May 15, quiz.
▶South East Kent (YMCA) ARC - 4, Annual General Meeting and presentation of club awards; 11, committee meeting; 25, Special Events planning for 1990; May 9, 144MHz Fox Hunt.

LANCASHIRE

▶Lancaster Univeristy ARS - meets 2nd and 4th Monday of each month at the Assistant Staff House, University of Lancaster. 9, surplus equipment sale; May 14, talk by G4UWG.
▶Thornton Cleveleys ARS - 9, talk "Mining" by Colin, G0EPY; 23, demonstration of members' equipment, particularly test gear.

LEICESTERSHIRE

▶Leicester RS - ***CHANGE*** Assistant Secretary is now Owen Taylor, G6NGB QTHR, tel: 0533 742617. 3, HF/VHF night on the air; 10, HF/VHF activity night; 17, VHF Contest review, VHF NFD preliminary planning meeting; 24, constructors competition; May 1, HF/VHF activity night; 8, HF/VHF activity night; 15, talk "Digital Circuits".

LOTHIAN

▶Lothian RS - 11, national awards by Sam Hall, GM2AOL; 25, construction competition and DF Tune up; May 9, talk "Home Construction" by Alf Lowe, GM4UZP.

MERSEYSIDE

▶Wirral ARS - 4, talk "Decca Navigation Station" by Colin Sykes, G3XJZ.
▶Wirral & DARC - 11, Computers in Radio. Demonstrations etc; 25, talk "Interference - Causes and Cures" by Phil, G0JSB; May 9, talk on RAYNET.

NORFOLK

▶Norfolk ARC - 4, Annual General Meeting; 11, talk "Contest Techniques and NFD Analysis" by Pat Gowen, G3IOR; 18, committee meeting; 22, club outing to RSGB Exhibition at NEC; 25, "REAL RADIO" evening and construction contest; May 2, club visit to BBC Transmitter Site at Tacolneston; 9, first HF NFD briefing; 16, GB3NB Repeater AGM.
▶Yarmouth RC - 12, return quiz with Norwich/ Lowestoft; 26, talk "QRP Techniques" by G3OEP; May 10, caravan maintenance party. Details Yarmouth 721173.

NORTHAMPTONSHIRE

▶Northampton RC - 5, talk "Transverters" by Phil, G4IIO; 27, talk "DFing" by Keith, G4YKE; May 10, construction contest.

NORTH YORKSHIRE

▶YAXPAK - 8, Annual General Meeting. 2pm, Ashcroft Hotel, York. Prospective new members also welcome. Details 0723 85845.

NOTTINGHAMSHIRE

▶ARC of Nottingham - 5, Annual General Meeting; 12, activity night; 19, junk sale; 26, talk TBA
▶Mansfield ARS - 5, air band radio, 19, 10M FM; May 3, Annual General Meeting.
▶Worksop ARS - 10, junk sale; 24, questions and answers on Radio Interference with Jim Roche; May 8, talk "Contests" by Bill, G3ZVG; 13, visit to Drayton Manor Park.

SHROPSHIRE

▶Salop ARS - 12, talk "Aural Propagation" by G3USF; 26, construction competition; May 10, junk sale at the Beachamp. Details 0743 235087 (daytime •
▶Telford & DARS - 4, Annual General Meeting; 11, talk "RAYNET at Leicester Special Olympics" by G6FHM; 18, novice construction projects; 25, ATV TX update and helpline; May 2, club station on VHF; 9, club quiz night. Details Telford 770922.

SOMERSET

▶Yeovil ARC - 5, talk "Refracting Radio Waves" by G3MYM; 12, talk "Lambda Diode Fundamentals" by G3MYM; 19, Annual General Meeting; May 3, talk "Lambda Diode Projects" by G3MYM; 13, 6th Yeovil QRP Convention at The Preston Centre, Yeovil. Details from G1MNM, QTHR.

SOUTH GLAMORGAN

▶Cardiff RSGB Group - 9, new members night; May 14, talk "Aerials" by Ross Clare, GW3NWS. Pantmawr Inn, Cardiff.

SOUTH YORKSHIRE

▶YAXPAK - 8, Annual General Meeting. 2pm, Ashcroft Hotel, York. Prospective new members also welcome. Details 0723 85845.

STAFFORDSHIRE

▶Stafford & DARS - 10, night on the air; 17, quiz, radio and electronics; 24, construction evening; May 8, night on the air; 15, talk "Semi-conductors" by G3EHM.

SUFFOLK

▶Felixstowe DARS - 2, open evening at the Ferryboat Inn. All radio amateurs and SWL's are invited to come along and see what the club is about; 30, night on the air at Orwell Park School; May 14, ESWR planning at the Ferryboat Inn.
▶Leiston ARC - 3, talk "Something Practical" by Alan Melia, G3NYW. Also construction competition judging. Details 0728 830791.

SURREY

▶Dorking & DARS - 10, informal; 24, TBA; May 8, informal.
▶Guildford & DARS - 27, Annual General Meeting; May 11, quiz night.
▶Reigate ATS - 17, Annual General Meeting - members only; May 15, talk "Planning Permission" by Roy Hill, G4HLH.
▶Sutton & Cheam RS - 20, junk sale; May 12, annual dinner at the Stoneleigh Inn, Stoneleigh, 18, Annual General Meeting.

TAYSIDE

▶Dundee ARC - 17, construction evening; May 8, construction evening; 15, talk "The Linear Amplifier" by GM3VEY.

WARWICKSHIRE

▶Mid Warwickshire ARS - 10, Radio sale and auction; 24, talk "Cellular Radio" by Terry, G3MXH; May 8, talk and demo "2M DFing made simple" by Malcolm, G0 GLU.
▶Rugby ATS - 10, Annual General Meeting.
▶Stratford upon Avon & DARS - 19, Annual General Meeting and surplus sale; 23, talk "Electricity Supply" by Ivor Bowen, G0JJY; May 14, visit to Eddystone Radio

WEST GLAMORGAN

▶Swansea ARS - 5, final preparations for the Rally; 21, 53 seater coach to NEC. Few seats left. Details from Roger, GW4HSH, tel: 0792 404422.

WEST MIDLANDS

▶Coventry ARS - 6, TBA; 13, night on the air and Morse tuition; 20, talk "Clandestine Radio" by Mr. Douglas, G3BA; 27, indoor DF contest; May 4, 2M DF contest; 11, night on the air and Morse tuition; 18, night in the Air (gliding) (provisional)
▶Midland ARS - 17 (Sunday), Fox Hunt; May 15, rally debrief.
▶South Birmingham RS - 4, talk and slide show "Canals" by Bob Brown, G7BZM; 21/22, RSGB Convention; May 2, TBA.

WEST YORKSHIRE

▶Halifax & DARS -17, talk "Telecommunications, Navigational Aids & Radar ATC" by Reg, G3PRO; May 15, Bits and Pieces - Roy, G4YDI.
▶Keighley ARS - 10, night on the air G0KRS; 24, junk sale; May 15, annual Foxhunt.
▶Northern Heights AR - 1, White Rose Rally (stall); 2, quiz at Todmorden & DARS; 4, Annual General Meeting at the Clubhouse, Bradshaw Tavern, at 8.15pm.
▶Otley ARS - 3, talk and demonstration by Derrick Pearson, G3ZOM, proprietor of "JANDEK" on QRP designs; 10, Annual General Meeting; 17, visit by John Birkett
▶Spen Valley ARS - 5, Annual General Meeting; 19, talk "VHF/UHF Contesting" by Chris, G3ZDM; May 3, surplus equipment sale; 17, demonstration "Chassis Bashing" by Tim Clough, G4PHR. Details 0274 875038.
▶Todmorden & DARS - 2, fun night. Details from Mrs. E. Tylor, G0AEL, QTHR.
▶White Rose ARS - 1, White Rose Rally at Leeds University; 4, party night - to celebrate a successful Rally; 11, informal; 18, junk sale; 25 committee meeting. Details 0532 648521.
YAXPAK - 8, Annual General Meeting. 2pm, Ashcroft Hotel, York. Prospective new members also welcome. Details 0723 85845.

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'.

1 APRIL

▶Bournemouth RS Amateur Electronics (Radio, Electronic and Computer) Bring & Buy Sale - Kinson Community Centre, Pelhams, Millhams Road, Kinson, Bournemouth. Doors open 2pm. Admission 50 pence, including prize draw ticket. Refreshments. Talk-in on S22. Details and table space arrangements from Vic, G4PTC, 0202-516593 any evening after 6pm.

▶White Rose Rally - Leeds University. Details G4DXA, PO Box 73, Leeds LS1 5AR.

8 APRIL

▶Cambridgeshire Repeater Group Amateur Radio Rally/Junk Sale/Bring & Buy/Auction. Philips Radio Communications - Catering Centre, St. Andrews Road, Chesterton, Cambridge. Doors open 10.30am. Auction items accepted from 9.30am. Details G0HEM (QTHR).

▶Launceston ARS Rally at Launceston College. Doors open 10am. Bar; hot snacks; bring & buy; traders; Morse tests; opinions on your CW progress; RSGB publications on sale; breakfast bar for traders from 6am; parking; talk-in on S22. Details from Maggie on 040921 219 or Rodney & Joy on 0566-5167.

▶Lough Erne ARC 9th Annual Mobile Rally - Killyhevlin Hotel, Enniskillen. Doors open 12 noon. Details from Alwyn Magee, GI0BFD, tel. 0365 23802.

▶Swansea ARS Rally - Swansea Leisure Centre, situated on the A4067 Swansea-Mumbles coast road. Doors open 10.30am. Trade stands; bring & buy; repeater groups; demonstration station; bar; refreshments. Talk-in via GB2SWR on S22. Details from Roger Williams, GW4HSH, tel: 0792 404422.

15 APRIL

▶Centre of England AR Rally - Motorcycle Museum, Bickenhill, near NEC Birmingham. Details from Margaret or Frank, G4UMF, tel: 0952 598173.

22 APRIL

▶Marske-by-the-Sea Radio Rally - Marske Leisure Centre, High Street, Marske-by-the-Sea, near Saltburn. Doors open 11am. Talk-in on S22. Details from Allen, G7CBR, tel: 0642 480055.

6 MAY

▶7th Anglo Scottish Rally - Tait Hall, Kelso. Details from Bruce, GM4UIB, QTHR.

7 MAY

▶Mid Cheshire ARS Rally - Civic Hall, Winsford. Doors open 11am (10.30 for disabled visitors). Full catering and ample car parking.Details from David, G4XUV, tel: 0606-77787.

13 MAY

▶Drayton Manor Mobile Rally - Drayton Manor Park, near Tamworth, Staffs. Details from Norman, G8BHE, tel: 021 422 9787.

19 MAY

▶Swindon Radio Rally - Oasis Leisure Centre, North Star Avenue, Swindon, Wilts. Doors open 10am. Ample parking. Refreshments. Bring & Buy. Talk-in by Raynet S22. Admission £1 adults, 25p children. Sports facilities available including Lagoon Pool with wave machine. Details from Jim, tel: 0793 611859 or John, tel: 0793 619014.

20 MAY

▶Cambridge & DARC 5th Annual Rally and Radio Car Boot Sale at Coleridge Community College, Radegund Road, Cambridge.Opens 10.30 (traders 8.30). Talk in on S22. Details from Brian, G4TRO, tel: 0223 353664.

▶Dunstable Downs RC 7th National AR Car Boot Sale - Stockwood Park, Luton. This venue is near Junction 10 on the M1.Details from Clive, G4ENB, tel: 0582 27907.

▶33rd Northern Mobile Rally - Flower Show Hall, The Great Yorkshire Showground, Harrogate. Showground open 10am, doors open 10.30am. Talk-in on S22 2M. Cafeteria. Bar. Car parking and entry is from Railway Road off the Wetherby to Harrogate road. Separate arrangements made for disabled visitors with parking and entry near to the Hall and close by the Crimple Valley Golf Club in Hookstone Wood Road.Details from Mike, G0MKK, tel: 0423 564353/507653.

▶Mid-Ulster ARC PARKANAUR Rally - Silverwood Hotel, Lurgan, Co. Armagh. Open 12 noon. Entance fee £1; Usual trade stands. Bring & Buy. Bookstall. QSL Bureau. Talk-in S22 145.550. Details from Jim Lappin, GI1YGS, tel: 0762 851179.

27 MAY

▶14th Annual East Suffolk Wireless Revival 1990 - Civil Service Sports Ground, Straight Road, Bucklesham, Ipswich. Indoor Bring & Buy. Car Boot Sale. Bookstall. 50 MHz Demonstration station; Vintage Radio Display. BYLARA, RAIBC, Scout Radio, RAYNET stands. Children's play area; Model flying display. Details from Paul Whiting, G4YQC, 77 Melford Way, Felixstowe, Suffolk, tel: 0473 642595.

▶Plymouth Radio and Electronics Fair - Plymstock School, Church Road, Plymouth. Doors open 10am. Usual traders. RSGB Zonal Meeting. Morse Tests. Bring & Buy. Refreshments. Talk-in S22. Details from Jan Fisher, G0IVZ, tel: 0752 340946 evenings/weekends.

28 MAY

▶Bircotes Radio Rally - near Bawtry, Doncaster. Doors open 11am, 10.30 for disabled visitors. Talk-in S22. Booking forms/details 23 Florence Avenue Balby, Doncaster. Tel: 0302 857526.

3 JUNE

▶British Telecom (S. Wales District) ARS 2nd Annual Radio Rally - BT Headquarters, Coryton, Cardiff. Bar. Restaurant, Bring & Buy etc. Bring & Buy stall display fee £1 per item. Entrance fee £1 per person and 50p for OAP and children under 14. Talk-in on S22.Details from Martyn Jenkins, GW7EYP, tel: 0222 379634 (office hours).

▶Southend & DARS Mobile Rally at Rocheway Youth Centre, Rochford Essex. Details from John Stone, G0DFE, tel: 0702 202216.

▶Spalding & DARS Mobile Rally. Springfields Arena Spalding. Details from T. Kettlewell, G4TWR, tel: 0775 722940.

10 JUNE

▶21st Elvaston Castle Mobile Radio Rally, Elvaston Castle Country Park near Derby. Details from John, G4PZY on 0332 767994. Trade enquiries from Peter on 0332 700265 (evenings).

▶Norfolk Raynet Annual Rally. Barford Village Hall, 5 miles west of Norwich. NGR: TG 113078. Opens 10.30am. Local traders. Bring & Buy. Car Boot Sale etc. Details from 0603 667189 (daytime) 0692 650865 (evenings).

▶Royal Naval ARS 30th Annual Mobile Rally - HMS Mercury, Nr. Petersfield, Hants. Trade, RSGB, RAIBC, BARTG and RAYNET stands. Crafts exhibition. Have-a-go archery. Radio-controlled power boats, helicopters, cars and trains. County Sound Radio Mobile Rig. Refreshments. Morris Dancers. Many other attractions. Talk-in on 2m and 70cms. Details 0703 557469.

17 JUNE

▶Denby Dale Rally - Salendine Nook School, 2 miles west of Huddersfield on A640. Opens 11.00am (10.30 for disabled visitors). Usual good food. Ample parking. Traders. Talk-in S22 and SU22.Details from G3SDY, tel: 0484 602905.

▶Newbury & DARS Car Boot Sale - Recreation Field and Acland Village Hall, Cold Ash, Newbury, Berks. Opens 10am. Free admission and car parking. Talk-in on S22. Refreshments and children's play area.Details from Mike, G3VOW, tel: 0635 43048.

24 JUNE

▶City of Bristol Group 33rd Longleat Amateur Radio Rally, Longleat Park, Warminster, Wilts. Details Shaun O'Sullivan, G8VPG, tel: 0225 873098.

1 JULY

▶Worcester & District Droitwich Strawberry Rally - High School, Droitwich. Details from Tony, G4OPD, tel: 0905 620507 or Derek, G4RBD, tel: Worcester 641733.

▶York Radio Rally - Tattersall Building at York Race Course. Details tel: 0904 625798.

14 JULY

▶Cornish RAC Rally - Richard Lander School, Truro. Details from Rolf Little, G7FKR, tel: 0872 72554w

15 JULY

▶Sussex AR and Computer Fair - Brighton Racecourse. Details from Ron Bray, G8VEH, QTHR, tel: 0903 763978 or 0273 415654 (office hours)

22 JULY

▶Burnham Beeches and Maidenhead & DARC McMichael Rally. The Haymill Centre, Burnham near Slough. Details from Bob Hearn, G0BTY, tel: 0494 29868.

29 JULY

▶Rugby ATS Amateur Radio Car Boot Sale - venue to be advised. Details from Kevin, G8TWH, tel: 0203 441590.

▶Scarborough ARS Rally - The Spa, Scarborough. Details from Ian, G4UQP, tel: 0723 376847.

12 AUGUST

▶Derby Mobile Rally - Lower Bemrose School, St. Alban's Road, Derby. Details from Kevin Jones, G4FPY, 20 Pinecroft Court, Oakwood, Derby DE2 2LL. Tel: 0332 669157.

▶Flight Refuelling Hamfest - Flight Refuelling Sports Grounds, Wimborne, Dorset. Details from John, G0API, tel: 0202 691649 or Rob, G6DUN, tel: 0202 479038.

19 AUGUST

▶Royal Forest of Dean, Gloucs, Speech House Rally. Details from Terry, G4HZT QTHR, tel: 0594 33334 (mid evenings).

▶West Manchester RC Red Rose Summer Rally - Bolton Sports & Exhibition Centre, Silverwell Street, Bolton. Details from Dave, G1IOO, tel: 0204 24104 (evenings only).

26 AUGUST

▶Torbay ARS Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3HTX QTHR.

2 SEPTEMBER

▶Preston ARS 23rd Annual Rally - University of Lancaster. Details from Godfrey, G3DWQ, tel: 0772 53810.

▶Telford Radio Rally & Exhibition - Telford Exhibition Centre, Telford, Shropshire. Details from G3UKV, QTHR, tel: 0952 255416.

9 SEPTEMBER

▶Vange ARS Annual Rally - The Laindon Community Centre, Aston Road, Laindon, Basildon, Essex.

16 SEPTEMBER

▶Bristol Radio Rally - Brunel's Great Train Shed, Temple Meads Station, Bristol. Details from David Farr, G4WUB, tel: 0272 839855.

30 SEPTEMBER

▶Harlow AR & Electronics Mobile Rally - Harlow Sports Centre. Details from Alf, G7FNY, tel: 0279 418392 (weekdays) or Mike, G7BNE, tel: 0279 722569 (evenings and weekends).

▶6th North Wakefield R.C. Rally - Outwood Grange School, Potovens Lane, Outwood, Nr. Wakefield. Details from Richard, G4GCX on 0532 622139.

7 OCTOBER

▶Armagh & Dungannon DARC Annual Rally - Drumsill House Hotel, Moy Road, Armagh. Details from T.E. Hall, GI0MSJ, tel: 0861 523454.

▶South Devon RC. Sixth Annual Ham Radio Computer Exhibition and Rally - Hillhead Campsite on the Dartmouth Road in Brixham. Details from 0803 5222116

21 OCTOBER

▶4th North Wales Radio Rally - Aberconway Centre, Llandudno. Details from E. Shipton, 34 Argoed, Chester Avenue, Kinmel Bay, Rhyl, Clwyd LL18 5AY, tel: Rhyl 336939.

11 NOVEMBER

▶MARS Birmingham Mini Mobile Rally - Stockland Green Leisure Centre, Erdington, Birmingham. Details from Norman, G8BHE, tel: 021 422 9787.

18 NOVEMBER

▶West Manchester RC Winter Rally at Bolton Sports and Exhibition Cenbtre, Bolton. Details from Dave, G1IOO, tel: 0204 24104 (evenings only)

▶Bridgend & DARC Annual Rally - Bridgend Recreational Centre. Details from Don, GW3RVG.

OTHER EVENTS

1 APRIL

▶IARU Region 1 Conference starts - Torremolinos, Spain. Details G3FKM.

21/22 APRIL

▶RSGB National Convention - NEC Birmingham. Details 0277 225563.

29 APRIL

▶Bury RS 1990 Hamfest - Castle Sports Centre, Bolton St, Bury. Doors open 11am, for disabled and blind visitors at 10.30am; talk-in on S22 and SU8; traders; catering facilities; giant 'Bring & Buy'. Details from C.D.W. Marcroft, Mosses Community Centre, Cecil St, Bury, tel: 0706 229930 (evenings only).

MAY

▶BATC Convention, Harlaxton Manor, Nr. Grantham. Details from Paul Marshall, G8MJW; tel: 0522 703348.

12 MAY

▶RSGB VHF Convention - Sandown Park Racecourse. Details from Geoff Stone, G3FZL, tel: 01-699-6940.

13 MAY

▶Yeovil ARC 6th QRP Convention - Preston Centre, Monks Dale, Yeovil. Doors open at 10am by Editor of Practical Wireless, G3XFD. Talks during the day by GM3OXX, G3RHI, G3MYM & G3PCJ. GB3LOW will be on the air all day also for talk-in station. Traders as in previous years. Refreshments served from 9am. Further details D. Bailey, Hon.Sec., QTR or P. Burridge, Chairman, tel: 0935 813054.

2 JUNE

▶RAIBC (Northern Ireland Area). First Belfast Amateur Radio Convention - Ormeau Park Recreational Centre, Ormeau Embankment, Belfast. Commencing 12.30. Usual attractions. Demonstrations and talks on the hobby. Demonstrations on Microwave Cookery. Crafts and First Aid by Red Cross. Talk-in on S22. All the proceeds to go to the Northern Ireland Area to buy equipment for Club members in Northern Ireland. Details from David Caldwell, GI0HOW, tel: 0232 471370.

17JUNE

▶Eighth Annual Practical Wireless 144MHz QRP Contest. 0900 - 1700 UTC. Transmitter output power will be limited to 3 watts as usual. Full rules will be published in due course in Practical Wireless. Contest adjudicator; Neill P. Taylor, G4HLX.

1 JULY

▶Newport ARS 3rd Grand Surplus Equipment and Junk Sale, Brynglas Community Education Centre, Brynglas Road, Newport. Details from Kevin, GW7BSC, tel: 0633 262488 or Bob, GW4IED, tel: 0633 280958.

15 JULY

▶Sussex Amateur Radio and Computer Fair (formerly the Sussex Mobile Rally) - Brighton Racecourse. Details from Ron Bray, G8VEH (QTHR). tel: 0903 763978 or 0273 415654 (office hours).

15 SEPTEMBER

▶Scottish Convention - Cardonald College, Glasgow. Details from GM3EDZ.

26/27 OCTOBER

▶RAF ARS AGM - RAF Cosford. Further information will become available on Packet, news broadcasts, RadCom and QRV (the RAFARS magazine) in due course.

the last...

STAMP SUGGESTION

With reference to the request by Eric Simpson, G3GRX, that envelopes for incoming cards be kept up-to-date with the correct postage, I would suggest that this need not be a problem in future as the Post Office now issues stamps simply marked '1st' or '2nd' without value shown.

Further, it is possible to purchase from most post offices pre-stamped envelopes of good quality, measuring 220 x 110mm, at 24p each first class, or 19p each second class. If purchased in a packet of 10, the cost is reduced to £2.16 for first class, or £1.71 for second class. Due to normal delays in receiving cards, first class postage is hardly justifiable, but £1.71 for 10 pre-stamped second class envelopes is very reasonable. This represents a cost of only 21p for the 10 envelopes, and gives peace of mind both to the addressee and to the QSL sub-manager, since the stamps will remain valid irrespective of any future changes in postal charges.

W M Hamilton, GM3GDX

MORSE IS SIMPLE, SURE, . . .

Maybe the morse test is not so important as in years past, but CW will always be the simplest and surest mode of communicating with persons in different countries and dialects.

With the ever increasing pollution of our HF bands, can we really permit the luxury of SSB and RTTY to increase?

At least 8 to 10 CW QSOs only need the space of one SSB QSO, and with Government policy to gain as much revenue as possible from the frequency spectrum, may I suggest the RSGB consider a two-tier licence be introduced, the SSB/Data licence fixed at, say, four times the CW fee as a help to improve our HF bands.

George A Hook, G2CIL

. . . DESIRABLE . . .

Surely, both G4OZL and G8BZL are missing the point when they suggest that the morse test is no longer relevant for qualification to operate on HF (Last Word, Jan and Feb RadCom).

This requirement derives not from sentimentality, nor even to grant those who pass the test a 'superiority complex' over those who have not passed it. It is sound common sense as relevant today - as it ever has been.

The HF bands contain very little spectrum compared with the VHF bands and above. Moreover, this spectrum, because of the propagation properties of these bands, has to be shared with amateurs from many other countries, whereas higher frequency bands are local in character by and large.

G8BZL is therefore correct when he says that the numbers on these "already overcrowded" bands need to be limited, but that is only half the story. As every amateur surely knows, the bandwidth required for CW operation is a fraction of that required for any type of voice mode. Thus, perhaps ten CW operators can work in the same slice of precious spectrum as a single SSB operator.

If morse ceases to become a pre-requisite to using HF, it is obvious that very few amateurs will bother to take the time and trouble to learn it. The result will be an explosion of the number of HF operators, very few of whom will be using CW. If these bands are crowded now, they will become a shambles.

I can only point out to G8BZL that as far as I am aware, the advent of the 21st century is unlikely to affect either the bandwidth available to us on HF, or the fact that CW is the most economical mode in terms of that bandwidth.

A R Gardner, G4OKC

. . . AND SATISFYING

It seems so clear to me that the people who criticise the morse code, know very little about it, and therefore fail completely to understand the pleasure and satisfaction one derives from being proficient, as with any other foreign language. I have enjoyed morse for 50 years and I still try hard to send smooth, accurate code with rhythm and precision.

I have just had an enjoyable conversation with a fellow amateur in Osaka, even with heavy interference. This would have been quite impossible using speech, as neither of us was fluent in the other's language.

Morse and speech on the amateur bands are rather like comparing a musician playing a violin with a man shouting through a megaphone.

Jack Pemberton, G3DOZ/FOC 188

RSGB AFFINITY CARD

When I first saw the RSGB's affinity credit card being offered, I confess that I thought it was a bit of a gimmick. I even thought about the possibility of ridicule that I might have received for being unconventional, but dismissed this since most radio amateurs are a little off the norm anyway.

As it happens, I was already the owner of an Access card and a direct debit Visa card which meant I could use plastic just about everywhere. I always paid my Access bills on time, thus relieving the bank of their chance to get some interest out of me.

Around the end of September I heard of Lloyds Bank's decision to bring in an annual charge on their Access card. Well, you could imagine the look of horror on my face. Darned if I was going to pay an annual fee, I was about to shop around for a cheaper Access card when I remembered the RSGB affinity card, which, carrying the Master-card symbol, can be used wherever the Access sign is shown.

I sent off the application form which I rescued from the bin. Within a few weeks it had arrived, the credit limit being almost that of the Access card which was now on its way back to Southend-on-Sea.

I quickly got into the swing of things, using it to fill the car up with petrol, taking one's parents out to dinner, buying radios; all the sort of things any radio amateur would spend money on, and of course I still pay the bills off before they are due to avoid having to pay any interest - and I do not pay an annual fee either.

The card itself, with a morse key that covers the southern Sahara Desert, is different and gets some interesting questions asked whenever I present it as payment. I have even had someone notice the callsign and tell me that their son is licenced.

One can easily spend a couple of hundred pounds in a month. Out of that money, a little will make its way to the RSGB. I do not mind contributing to the Society in this way, and would recommend an RSGB credit card to any member, especially those who hate paying bank charges or would prefer a lower interest rate.

Pete Swynford, G6ZYT

REGIONAL CALLBOOKS?

I feel that the members at the AGM who sought to have the different call letter areas of the UK listed separately in the Callbook, had not fully thought the matter through.

When listening to weak signals with difficult to copy callsigns, and wishing to swing the beam round, time used to be wasted thumbing the pages to find the QTH, only to find the need to refer to another section of the book. I was pleased when the present system of listing was implemented.

R F Hills, G0BDA

[See this month's News and Reports for the 1990 Callbook plans - Ed]

WHY NOT USE SSB ON 10.1MHz?

In common with the many UK and European SSB operators now using 10MHz on a regular basis, I was most surprised to learn that our usage is considered anti-social (GB2RS 28 Jan 1990).

Reference to the RSGB Callbook, defines (SSB use of) the band as being for emergency use only, an obvious ploy. We are now told of a "gentlemens' agreement", if and when did the terms of reference change, who changed them, and why?

What we seem to have now is an ever changing concept, that is both a nonsense and an anachronism.

Please note that the views expressed in 'Last Word' are not necessarily those of the RSGB.

We reserve the right to edit letters and regret that we can no longer acknowledge them individually but will pass them on to the relevant department.

In the course of a recent QSO, the only notes of dissent were from irate CW operators peppering us with anonymous obscenities, it would be better to address yourselves to this kind of deliberate interference than make censorial comments on the news broadcasts.

Every month more licencing authorities are permitting unrestricted use of the band, is it not about time the RSGB became realistic and gave us their unequivocal consent.

B S Sutherland, G3IES

[At 50kHz wide, the 10.1MHz band is our smallest allocation. IARU Region 1 has recommended adhering to the use of narrow band modes except in emergencies. The RSGB fully endorses this as, in the simplest terms, the band can accomodate either about 16 simultaneous SSB QSOs or more than 100 on CW. Ed]

MOBILE MOUNT TIP

I have discovered an easy method of setting up a mobile mount which other members might find useful.

I have a Ford Escort, and was having a problem finding a convenient space to fix my mobile mounting bracket. The solution I found was as follows:

There is a large, robust ashtray situated low down in the centre of the dashboard (an ideal location for a 2m transceiver). I removed it, drilled some holes in the front of it and secured the mobile mounting bracket thereto. I then mounted the rig in the bracket and slid the ashtray back into its slot. The result? A perfect "slide mount"!

The rig is now permanently fixed to the ashtray, and it takes only seconds to remove it from the car. When operating in the shack the sight of an ashtray sticking up on top of the rig does cause a few raised eyebrows, however!

I see no reason why this arrangement will not work in any car that has an ashtray sturdy enough to support a transceiver safely, and which remains secure when slid into place.

Harry Phillips, GW0BLZ

BUYING GEAR ABROAD

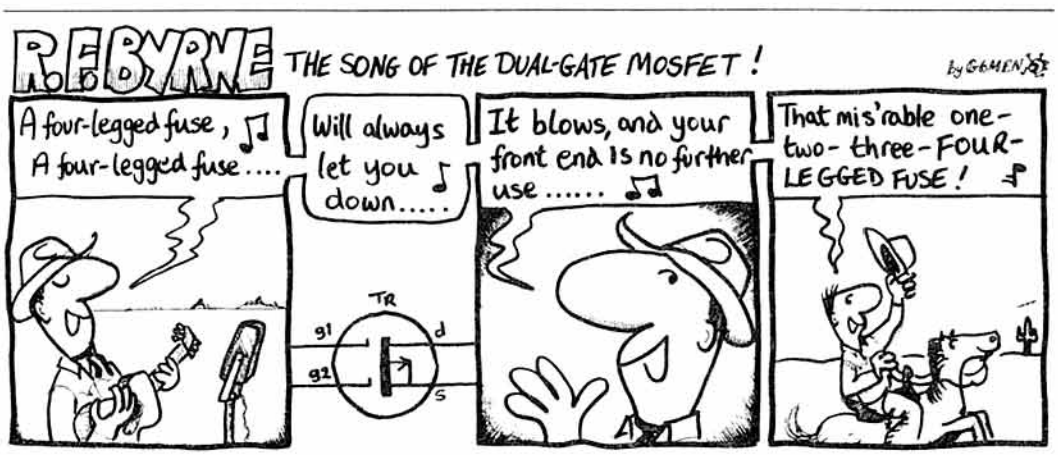
Re G3KPO's letter Jan 1990 RadCom i.e. buying gear abroad using a Credit Card, he was probably unfortunate in the suppliers he rang - conversely I was obviously lucky.

I spent 6 weeks in the USA in Jan/Feb 1989, I went with a shopping list of linear, antennas, atu etc being fortunate in having private transportation arrangements.

I rang around the USA on free phone numbers for best prices emphasising that I was from UK at a Motel address and that I would leave by a specified date. I received no queries whatsoever on the use of my card and I must have contacted at least a dozen suppliers found in the QST Ads.

Re savings in price - I found at the then rate of exchange USA equipment at approx half the UK price - also an item which cost about £120 in the USA seemed to attract duty and VAT of about £35 leaving me a good £10 plus discount on UK prices.

Michael Faulkner, G3IZJ



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INDEX TO ADVERTISERS — APRIL

OFFICIAL PROGRAMME

RSGB 1990

National Convention

NEC

Saturday 21 April and Sunday 22 April

- Daily Lecture Programme
- RSGB Committee Representation
- Morse Tests
- Comprehensive Trade Exhibition
- Specialist Group Representation: G-QRP, WAB, RNARS, RAFARS and more.

Hall 7 is one of three new halls opened in January 1989. The halls are interconnected via an Atrium-styled concourse which contains restaurant and bars. They are also linked to the main central piazza via a railway and a totally enclosed skywalk. *And no parking problems!*

This is the Premier Amateur Radio Event in the UK in 1990

See us at R.S.G.B. National Amateur Radio Convention N.E.C. Birmingham April 21 & 22

ICOM

From the manufacturers of the superb IC-R7000, two new wideband communication receivers, would you accept anything less than the best from ICOM!

Both the IC-R1 and IC-R100 are shown full size in this advertisement.

IC-R100 Mobile/Base Receiver

For the enthusiast who prefers a more permanent installation the IC-R100 is ideal giving full frequency coverage of 500KHz – 1800MHz and AM/FM.FM wide modes of operation. The IC-R100 boasts 100 memory channels to store your favourite stations and features similar to the little pocket receiver.

IC-R1 Handportable Receiver

The new IC-R1 is a pocket-size receiver with continuous 150KHz through 1300MHz, AM/FM and FM wide reception. With 100 memory channels this tiny receiver is packed full of features: Multi-scan functions, 11 search step increments, clock timer, power-save, S-meter and a convenient frequency selection via the keypad or tuning knob.

Refusing to compromise on quality can have its price but at ICOM our products reflect our style. We only make the best.

Icom (UK) Ltd.
Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour. Fax: 0227 360155.
Visa & Mastercards: Telephone orders taken by mail order, instant credit & interest-free HP.
Despatch on same day whenever possible.

VISA RSGB MasterCard

Welcome to the RSGB's Annual National Convention and Exhibition, held once again at the prestigious National Exhibition Centre.

This is the largest event in the UK amateur radio calendar and provides the only opportunity for amateurs to see in one place all aspects of our hobby. We not only feature a vast range of transmitters, receivers, aerials, test equipment, second hand gear, and components, but also provide an opportunity to meet those responsible for bandplanning, contests, Raynet, repeaters, packet radio, EMC advice, propagation studies, and most importantly those responsible for our licences - the DTI. The G-QRP Club, BYLARA, WAB, the RNARS, RAFARS, RSARS, the Scouts, Guides and the German national society (DARC) also have stands. In addition there is a comprehensive lecture programme on Saturday, and of course a very large RSGB book stand and information desk.

The Society is launching the 1990 edition of the Call Book at the show. This essential reference work includes details of approximately 60,000 UK callsigns plus no less than 130 pages packed with information on all facets of amateur radio. Be sure you don't leave without one.

May I wish you a most enjoyable day at the NEC, and a safe journey home.

Frank Hall, GM8BZX.
President.

PROGRAMME OF EVENTS

All lectures, meetings and morse tests are held on the first floor above the exhibition hall (Hall 7)

Opening times

Saturday 21st
Doors open 1000
Doors close 1800

Sunday 22nd
Doors open 1000
Doors close 1700

Lecture programme (Saturday only)
(Seminar Room 1)

1130 "Training for the Novice Licence" *by John Case, GW4HWR, Chairman of the RSGB's Training and Education Advisory Group.*

1245 "Construction Forum" *by George Dobbs, G3RJV*

1400 "An introduction to frequency synthesis" *by Peter Chadwick, G3RZP, Chairman of the RSGB's Technical and Publications Advisory Committee*

1515 *Hately Antennas*

1630 *Raynet*

Morse tests
(Meeting Room 4)

1030 - 1300
1430 - 1530

Meetings
(Meeting Room 5)

Royal Signals AGM 1500 - 1700

RAOTA - Time T.B.A.

The National Convention and Exhibition is organised by the Exhibition and Rally Committee of the Radio Society of Great Britain

New Products Available at the RSGB National Convention

We asked exhibitors at the Show to tell us what products would be launched or featured at the NEC. Here are their replies . . . .

WATERS AND STANTON ELECTRONICS (Stands B 10 - 12)

Introducing two new handheld radios for 2 metres and 70 cms - the DJ-160E and the DJ-460E.

Power output is 2 watts with a standard pack but 5w is possible with higher voltage packs. Extended receive range is available covering 137-174MHz and 410-470MHz. These "high tech" models have a host of features that use the latest technology to maximum benefit. The LCD display provides full information on programming but for those that still yearn for manual control the frequency and channels can be selected by manual rotary controls as well as up/down buttons.

Features include 20 memories, versatile programmed scanning, priority channel, DTMF Tx (Rx optional), comprehensive DTMF calling functions, free split function, battery save, auto power off, reverse repeater, multi-frequency steps including 5kHz and 12.5kHz, S-meter, 1750Hz tone-burst, direct 13.8 volt operation, 700mAh high capacity battery, plus charger and belt clip etc. as standard.

Prices are provisionally set at £229 inc VAT for each model which will include ni-cads, charger, carry strap and belt clip.

C M HOWES COMMUNICATIONS (Stand J11 - 13)

C.M.Howes Communications, well known for their QRP CW transmitters, are introducing SSB transmission equipment in to their range of amateur radio kits.

The kits will make their debut at the NEC, and include a 21/28MHz dual band SSB/CW exciter module kit - the HTX10, and a matching dual band VFO kit - the VF10.

These are designed to be compatible with the popular DXR10 receiver kit, and can be used as part of a 21/28MHz SSB/CW transceiver, or as part of a 28MHz tunable IF for use with transverters. A demonstration transceiver will be available for inspection on the Howes' stand.

The HTX10 features a specially designed crystal filter, double-balanced mixer ICs for both the modulator and frequency changer, relay switched bandpass filters, and an amplifier stage with an ALC input. All broadband output amplifier stages are operated in Class A, giving very good intermodulation performance. Output from this exciter is 50mW, suitable for driving transverters. A linear amplifier kit can be added for direct operation on 21MHz and 28MHz. All modules operate from 12 to 14 volts DC.

The HTX10 will be launched at the NEC at the very keen price of £49.90 for the kit (PCB and all board mounted components, including the crystal filter). Prices of the companion accessory kits, the kits themselves, and copies of the new 1990 Howes Kit Catalogue will be available at the show.

DATONG ELECTRONICS Ltd (Various stands)

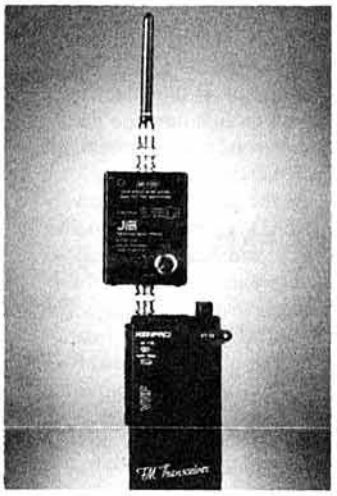
The name Datong Electronics has been associated with innovative and high quality amateur radio products for over 15 years, with Datong products used by enthusiasts worldwide. Datong's FL3 Audio notch filter is a worthy bearer of the name as its thousands of users will testify.

Anyone who has listened to a transmission on the HF bands knows how often interfering signals spoil the unwanted signal. This is exactly where the FL3 can help. It is extremely good at removing those unwanted noises while leaving the weak wanted signal in the clear. However, it is the automatic notch filter which really puts the FL3 in a class on its own. The FL3 will remove any single note from a received signal automatically - those annoying whistles which plague short wave broadcasts become a thing of the past. The filter is as simple to install as an external speaker and requires only a 12v supply.

The FL3 and many other products will be on show on various dealer stands at the NEC.

NEVADA (Stand B23)

For hand-held transceivers and scanning/monitor receivers, the Jim wide-band pre-amplifier is particularly flexible since it has an inbuilt high quality 50 ohm rf relay that enables it to be used effectively on VHF or UHF radios up to 5 watts max. It boasts fully adjustable gain control, internal or external battery supply, switchable band pass filters to reduce blocking, and covers from 24MHz to 500MHz. Price is £79.95.



AMDAT (Stand C21)

AMDAT are now stocking the famous KANSAS CITY TRACKER hardware and software package that allows computer control of an azimuth and elevation rotator. The package consists of a half-size card that plugs into an IBM PC or clone, and software which allows a satellite to be tracked whilst the computer is running other software.

Also available is the KANSAS CITY TUNER which controls your radio to compensate for the effects of doppler-shift. This is particularly important for low earth orbit satellites such as the new Microsats. The software will interface with the QUICKTRAK and INSTANTTRACK tracking programs.

To assist amateurs new to digital satellite communication AMDAT can provide a free booklet which explains what the satellites are and how best to communicate with them. Prices for the KANSAS CITY TRACKER package start at £179.00.

ICOM (UK) Ltd (Stand A1, A5)

The new IC-970E is the highest class multi-band transceiver giving 144, 430 and optional 1200MHz operation plus continuous 50 - 905MHz coverage for receiving.

Perfect for satellite communication, it features simultaneous dual band receive capability with an automatic tracking function and 10 satellite memory channels. The IC-970E has independent main and sub dials, volume and squelch controls for convenient operation, an extra large function display showing all the required information, a large main dial with a click function to give a comfortable tuning feel, the advanced Icom DDS system for fast PLL lockup times, up to 396 memory and 5 call channels, a built-in pager, and code squelch.

J & P ELECTRONICS Ltd (Stands 1 - 3)

The time taken in loading software for the Spectrum has long been a sore point with amateurs. Loading from EPROM takes but a second or so and is now available to owners of the Spectrum, Spectrum Plus, Spectrum 128 and 128+2 (owners of the +2a and +3 and owners of the SAM COUPE have not been forgotten and we are working on it).

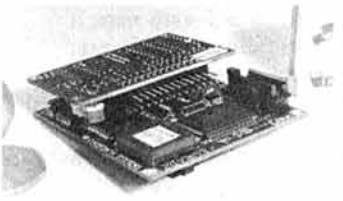
The EPROM loader is available in a number of forms, for one program only, or for up to 4 programs, and can be supplied with automatic PTT for licensed users. For those interested in FAX, the unit can be supplied with the FAX hardware incorporated, and audio filters, with AGC, are also included in the top of the range.

The purchase price will include one program on EPROM installed, and additional programs can be installed in the 4 program version at the time of purchase, or supplied later for fitting by the customer. Upgrading from the one program only, to the 4 program version can also be carried out at J & P's workshops.

The unit is simply connected to your Spectrum using the multi-way lead and connector fitted to the unit. Switch on and the program is loaded and ready to run quicker than you can read this sentence!

Prices are still to be finalised, but the one program, basic receive only version for CW, RTTY or SSTV, will cost around £47.50, while the top of the range, transceive version, fitted with Facsimile, RTTY, Slow Scan TV and Morse programs with all hardware, filters, AGC and PTT control will be less than £200.

SISKIN (Stand B4)



Siskin Electronics will be unveiling two exciting new products at the NEC, including a commercial radio product partially developed from the world of AX25 packet radio.

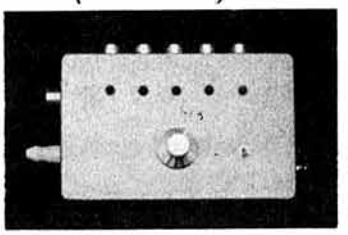
With the successful commissioning of the Microsats, Siskin will be launching a Microsat modem for use with the birds deploying 1200 baud BPSK packet.

Direct connection to and from existing TNC audio sockets alleviates the need for internal TNC modification. Siskin have been producing 9600Bd systems suitable for UOSAT D etc. for over 9 months!

It is a well known fact that many commercial radio engineers and consultants are themselves licensed radio amateurs, accordingly Siskin have chosen the RSGB NEC Convention as the venue to launch its first purpose built commercial radio product, the EURAD data controller.

As the photograph shows EURAD is somewhat smaller than its amateur TNC counterpart yet retains all the features found on today's TNCs but with the addition of data encryption, conventional RS-232 and PIO (parallel input/output port). As the photograph suggests EURAD is a surface mount device.

CAP. CO ELECTRONICS LTD (Stand A10)



In addition to our established range of HF components, aerial tuning units, and magnetic loop antennas, we shall be displaying for the first time our kit form Magnetic Loop Antennas. This has been in response to demand from many amateurs who prefer to build as much of their own equipment as possible. Although termed a kit, it is really a collection of sub-units and all that is required is about half an hour's work to put the whole assembly together. The kits present a useful saving over the cost of the assembled aerials. For instance £38.40 can be saved on the AMA-3 (13.9 to 30MHz) and £58.35 on the AMA-5 (3.5 to 11MHz).

We shall also be introducing the remote version of our AS-305 Aerial Switching Unit which enables instant selection of any one from five aerials, cutting down the amount of cabling required between the shack and the aerial. The switch unit is totally waterproofed and is controlled by a single multi-core cable from the shack. The control unit incorporates LED indicators to show which aerial is in use, and requires a 9 volt power source at 100mA max.

Finally we shall be exhibiting for the first time our new receiving only Magnetic Loop Antenna which is a true desk-top version but with efficiency equal to the standard Magnetic Loop Antennas.

TECHNICAL SOFTWARE (Stand 21)

The display of weather satellites (METEOSAT, NOAA and METEOR etc) has until now meant expensive interface units and even more expensive framestores or computer systems. Now, the APT-1 Weather Satellite Decoding Module enables you to display these satellite pictures on any FAX system.

The module incorporates AGC for the APT signal, allowing it to be driven from any convenient audio source without adjustment and eliminating the black and white level controls which are such a tiresome feature of framestores. To let you change the display for special effects, brightness and contrast controls are provided. The clock frequency of the APT transmission produces a synchronising signal eliminating picture distortion due to Doppler effect or variations in tape speed on recorded transmissions.

For users of the RX-8 multimode receive system, the module comes complete with everything to connect it into the RX-8 and to control the functions. Power to the module is supplied by the computer and no external supply is needed.

A software upgrade for the RX-8 will also be available providing several new features, six extra controls and even better performance. This upgrade is now being supplied as standard with all RX-8s and will be given free of charge with APT-1 modules purchased by existing RX-8 users.

The price of the APT-1 module, assembled, tested and calibrated, is £59.00 inc p&p and VAT. And if purchased at the same time as RX-8, it comes complete with all connections and software upgrade for a very special price of £39.00

A.R.E. Communications Ltd (Stand B22, B24, B26 B28)

A.R.E. have been fortunate enough in securing a large quantity of YAESU FT747GX transceivers which they are able to offer for £499 inclusive of VAT. The list price in the UK is £659, a saving of £160.

The TOKYO HI POWER TRANSVERTER is a new item available from stock and allows the operator to transceive on five HF bands - 10, 15, 20, 40 and 80m using a 2m transceiver as a driver. The transverter will deliver up to 40w rf on the hf bands with 3w to 10w drive. This could be extremely useful for mobile hf operation using the YAESU FT290 as a driver. The transverter is £249.

IR & D Electronics
(Stand 11)

R & D Electronics manufacture a wide range of high quality and reliable weather monitoring equipment attractively presented in wooden cabinets. Most information is readable at a glance without the need to press buttons.

The full range of information now available is wind speed and direction, gust speed, temperature outside with max. and min., barometric pressure, rainfall in millimetres, relative humidity, and sunshine hours.

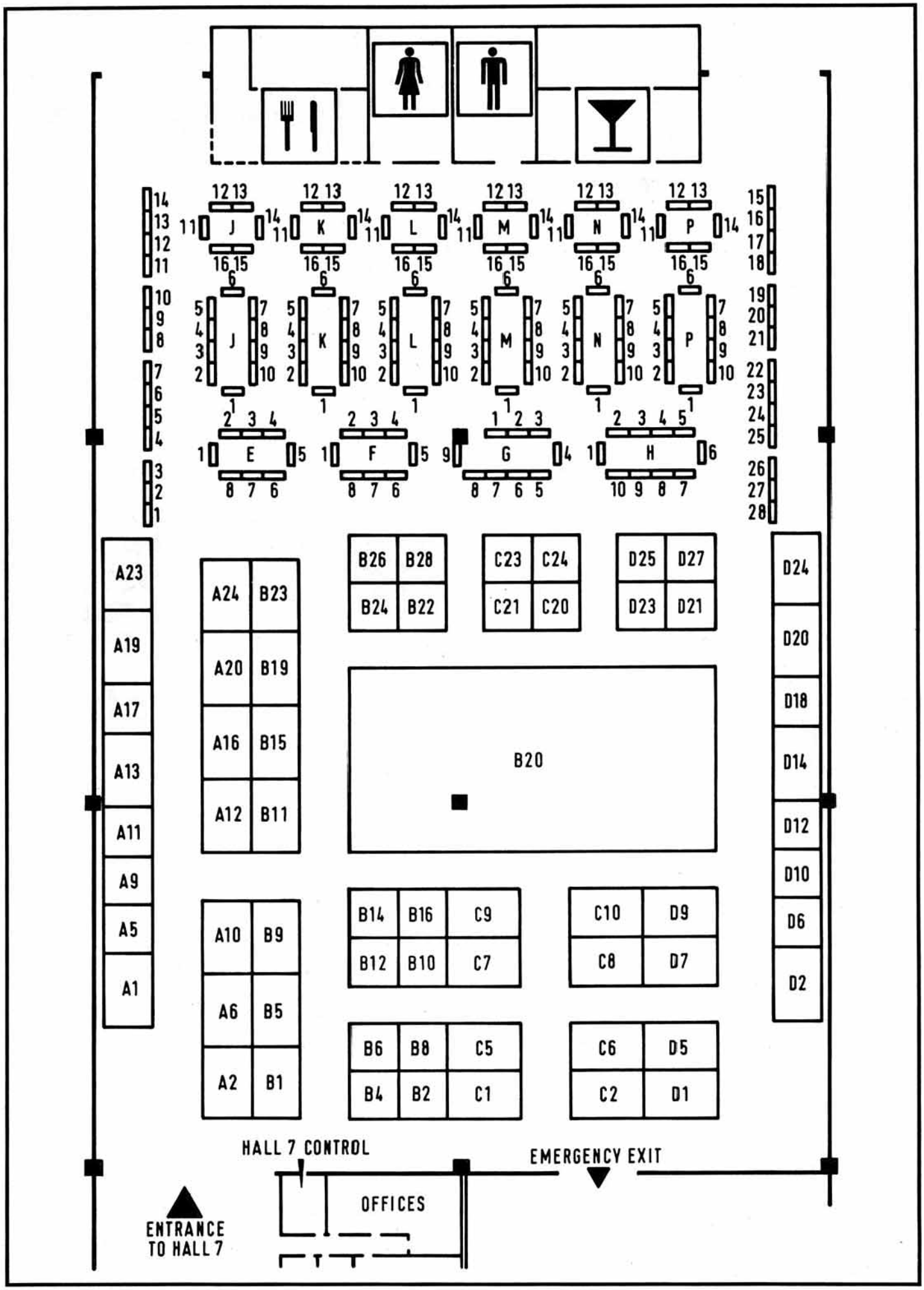
A Gust Alarm designed with tower owners in mind is one of the latest additions to the range. This will sound a bleeper and operate a relay if the wind speed exceeds a value determined by a control on the cabinet.

The isolated relay contacts could enable motorised towers to be automatically dropped when the wind exceeded a predetermined strength.

R & D will also have on show an electronic sunshine sensor (patent applied for) for use with their Weather Station Plus or as a separate instrument. Both will record hours of sunshine in tenths of an hour. It is hoped to have a range of instruments housed in polished brass cases on show and details of data logging and computer interfacing under development.

ICS Electronics Ltd
(Stand B1)

ICS will have available their AMT-3 AMTOR/RTTY Terminal Unit, a proven third generation product with many features.Also the AVT (Amiga Video Terminal) Master System providing high performance SSTV and FAX capability for the Amiga Computer. Lastly the MET-2 Weather Satellite Receiver is capable of receiving high resolution cloud cover images from geostationary satellites such as Meteosat 4 and GOES and storing and displaying them on any IBM PC or compatible.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HALL 7 CONTROL
EMERGENCY EXIT
OFFICES
ENTRANCE TO HALL 7

RSGB
National Convention and Exhibition

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RSGB PRODUCTS . . .

COUNTER PRICES
NON-MEMBERS **MEMBERS**

Amateur Radio Awards Book — £8.18 — £6.95

Cris Henderson, G4FAM

3rd edition, 186 pages

A recently updated and much enlarged compilation of all the world's popular and obscure awards suitable for the avid parchment chaser or casual QSL card collector. Fully referenced and with many check lists.

Amateur Radio Operating Manual — £6.16 — £5.24

Ray Eckersley, G4FTJ

3rd edition, 204 pages

This well-known book not only makes an interesting read for the new or experienced amateur, but makes an excellent reference book for the shack. Topics covered include DX operating, contests, mobile, RTTY, satellites and includes a 38-page appendix containing detailed information on each country's licensing details and prefixes.

Amateur Radio Call-book — £6.55 — £7.70

RSGB

1990 Edition, 432 pages

The Call Book is no longer just a dry list of callsigns! It now contains an 130-page Information Directory section. So if you want to know about the QSL Bureau, bandplans, clubs, special-event stations or any of the other 35 major sections, this is the book you should have at your fingertips.

G-QRP Club Circuit Book — £5.82 — £4.95

George Dobbs, G3RJV

96 pages

If you like construction, and want to build some simple circuits that work, this is the book. It is a pot pourri of eight years of the best articles that have appeared in *Sprat* - the journal of the G-QRP Club.

HF Antennas For All Locations — £5.19 — £4.41

Les Moxon, G6XN

260 pages

This book explains the "why" as well as "how" of hf antennas, and takes a critical look at existing designs in the light of latest developments.

How to Pass the RAE — £5.65 — £4.80

Clive Smith, G4FZH and George Benbow, G3HB

2nd edition, 84 pages

Multiple choice questions may look easy, but they are not - especially if you have not sat an exam for years. As the RAE is held only twice a year, it makes good sense to optimise your chances of passing so that you do not have to wait another six months. This book contains some excellent practical advice on how to tackle the exam and has nine sets of typical papers (and their answers) on which to practice.

Microwave Handbook Vol 1 — £22.12 — £18.80

Mike Dixon, G3PFR

224 pages

A brand-new book giving practical advice for the microwave enthusiast. This volume deals with operating techniques, antennas, transmission lines and devices.

COUNTER PRICES
NON-MEMBERS **MEMBERS**

An Introducton to Weather Satellites and Their Reception — £2.85 — £2.18

M. Mansfield, G6AWD

A difinitive text on the equipment required to establish a complete reception system for taking weather pictures from Polar and Geostationary satellites. This 29 page booklet has been written by someone who has good practical experience of this subject. The advice and information is presented logically and in an 'easy to read' manner. The booklet concludes with three pages of useful addresses and notes on what and where to buy the necessary parts to make up a receiving station.

Morse Code for the Radio Amateur — £2.88 — £2.45

Margaret Mills, G3ACC

6th edition, 20 pages

This favourite book for many years contains words of wisdom for the novice and graded and timed passages for the tutor to send to the students.

Practical Wire Antennas — £7.53 — £6.40

John Heys, G3BDQ

96 pages

Wire antennas offer one of the most cost-effective ways to put out a good signal on the HF bands, and this practical guide to their construction has something to interest every radio amateur on a budget. Theory has been kept to a minimum - instead, the author has shared his years of experience in the field.

RAE Manual — £5.65 — £4.80

George Benbow, G3HB

12th edition, 129 pages

This is *the* standard text book that almost every radio amateur has studied in order to pass the RAE. The author is an experienced course tutor and this knowledge is reflected in the style and presentation of the material. The book reflects just the RAE syllabus, so the student is not distracted by any extraneous facts.

Radio Communications Handbook — £11.35 — £9.65

5th edition, 779 pages

First published in 1938 and a favourite ever since, this large and comprehensive guide to the theory and practice of amateur radio takes the reader from first principles right through to such specialised fields as slow-scan television and amateur satellite communication. Excellent value for money.

Teleprinter Handbook — £2.29 — £1.95

Eric Yeomanson, G3IIR
A Hobbs, G8GOJ, Arthur Gee, G2UK,,

2nd edition, hardback, 347 pages

This handbook covers the theory and practice of mechanical radio teleprinter equipment of both European and American origin. In addition to full descriptions and maintenance data of common machines, it fully describes the design and use of ancillary equipment.

. . . AT NEC PRICES !

	COUNTER PRICES NON-MEMBERS	COUNTER PRICES **MEMBERS**

VHF/UHF Manual — £8.94 — £7.60

George Jessop, G6JP

4th edition, 511 pages

The standard textbook on theory, techniques and equipment for amateur radio transmission and reception at frequencies from 30MHz to 24GHz.

Amateur Radio Logbook — £1.96 — £1.67

A4, 96 pages, spiral wire bound

The standard fixed-station logbook. The wire binding gives easy fold-back to save space and the large A4 size ensures plenty of space for notes.

Mobile Logbook — £1.13 — £0.96

5.75" x 4.25", spiral wire bound, 32 pages

A small logbook to keep in the car so that you can keep track of your mobile operating.

Receiving Station Logbook — £3.66 — £3.11

50 pages

Especially designed for the listener to the amateur bands, this logbook includes three columns for RST reports: given, received and at the SWL station.

Great Circle DX Map — £2.35 — £2.00

Wall: 3 colour 24" x 31.75" and desk: A4 printed in black.

This popular station accessory shows the bearing in degrees from London of any DX station and is invaluable for the HF operator using a directional antenna. The wall map is plastic laminated for extra durability.

Locator Map of Europe — £1.29 — £1.10

Wall: printed in black, 22" x 24.5" and desk: A4 printed in black

Covers whole of Europe from Iceland and Finland to North Africa and the Black Sea. Shows the medium locator squares, eg KN80, as well as country prefixes.

Locator Map of Western Europe — £0.76 — £0.65

Wall: printed in blue and black 36.5" x 49"

Shows the full IARU locator squares, eg JN36BF, for the whole of the British Isles, Southern Norway, Denmark, France, Northern Spain and Italy.

World Prefix Map — £2.47 — £2.10

This is a superb multi-coloured wall map measuring approximately 1200mm x 830mm. It shows amateur radio country prefixes worldwide, world time zones, IARU locator grid squares, and much more.

Software Register — £0.96 — £0.82

A multi-page list with brief details of where to obtain programs relating to amateur radio for all the common home computers.

Meteor Scatter Data Sheets — £3.37 — £2.86

G H Grayer, G3NAQ and Chris Bartrum, G4DGU

32 pages

This set of tables enables the keen vhf DXer to optimise his or her effort. It lists at hourly intervals, for all the regular meteor showers, the best azimuth and elevation angles for communications across particular paths. It also gives an inidication of the effectiveness of that path as well.

Car Stickers

Discover the world of Amateur Radio with RSGB — £0.53 — £0.45

11.5" x 2.25"

Black on yellow

I Love Amateur Radio — £0.77 — £0.65

12.25" x 2"

Black and red on white

I'm on the air with amateur radio — £0.72 — £0.61

7.625" x 3.125"

Black, red and white on blue

I'm monitoring .5 are you? — £0.53 — £0.45

3.25" x 6.75"

Black on yellow

RSGB Emblem — £0.70 — £0.60

For members only

Knitware

A range of personalised sweaters, slip-overs, shirts/blouses and sweatshirts are available in a large variety of sizes. The colours available are maroon, navy, black, red, white, grey, sky blue and yellow and all can be personalised with any comination of RSGB logo, name and/or callsign. Also available are a personalised ham bear, shack banners and sew on badges.

Ties — £4.85 — £4.12

A selection of good quality ties containing the RSGB logo. Available in navy, maroon, green and coffee colours.

Callsign lapel badges

A range of four different styles of badge are available - two with just the RSGB diamond and two with space to have your callsign engraved. Different colours are available according to the length of continuous RSGB membership.

Radio Communication Bound Volumes

Just the thing if you want to refer to articles before you joined RSGB or simply desire a tidy bookcase.

Radio Communication Easibinder — £4.45 — £3.78

Each issue of *Radio Communication* is packed with many pages containing lots of information. An Easibinder enables you to keep your collection in a safe, tidy and ordered way, so that it enhances your bookcase and is ready for quick reference. A good Christmas or birthday present.

ALINCO DR 110 2M 45 Watts!

£269

Receive Option: 140-169MHz.

The new 2 metre mobile transceiver from ALINCO is superb value. Steps of 5, 10, 12.5, 20, 25kHz plus high power make it suitable for a wide number of applications. 14 memory channels and rotary dial control make operation a joy. Improved LCD display makes night operation much easier. The dimunutive size (5.5' x 2.5' x 6.75') makes for easy installation in the modern car. Other features include up/down mic., 3 way scanning, 1750Hz tone-burst, reverse input, memory skip, and of course a full mobile mounting kit. Send for colour brochure today!

ALINCO DJ100E

SPECIAL SPRING PRICE

£169 inc VAT!

Lowest Priced
Compact Handheld
2M 3 Watts.
Rx Extendable
10 Memories
Programmed Steps
LCD Display
Ni-Cads and AC charger
Rubber Antenna
DC/DC Converter built in.

HF TRANSCEIVER DISCOUNTS!

Most transceivers are designed for 12 volts. The manufacturer's own PSUs are expensive. But our REVEX "BIG BERTHA" P300 is just as good and a lot, lot cheaper. Fully protected, large hunky transformer, and thermal fan cooled! Below is a list of autumn packages that we invite you to consider. Part exchange welcome. Credit? Most certainly. Just ask for quote.

Model Type	Mfr's PSU	REVEX PSU
Kenwood TS440S	~~£1360.00~~	£1200.00
Kenwood TS140S	~~£1035.00~~	£959.00
Kenwood TS680S	~~£1158.00~~	£1080.00
Yaesu FT747GX	~~£918.00~~	£759.00
Yaesu FT757GX2	~~£1228.00~~	£1069.00
Yaesu FT767GX	~~£1858.00~~	£1699.00
ICOM IC751A	~~£1878.00~~	£1589.00
ICOM IC735	~~£1357.00~~	£1069.00
ICOM IC725	~~£1137.00~~	£859.00

The above price comparisons use the manufacturer's nearest equivalent PSU to the P300. Each Revex is fully guaranteed for 12 months as is the matching HF transceiver. All mail orders against credit cards are despatched by 24 hour Securicor at our risk. If payment is made by cheque please allow an extra couple of days for clearance.

STILL THE BEST PERFORMERS!

25-1300 MHz* Handheld JUPITER II

£299

Price now includes ni-cads, case, 12V DC power/charger lead, and belt clip.

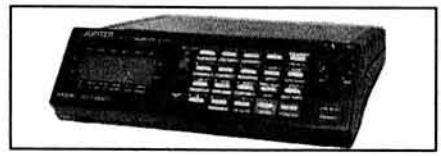
★ AM/FM
★ Direct up/down tuning
★ 5, 10, 12.5, 25, 30 KHz steps
★ 100 memories
★ 10 programmable bands
★ Step change frequency correction
★ High speed scan 20 per sec.
★ Carrier or audio scan
★ Battery Saver
★ Telescopic antenna (BNC)
★ Fast memo load feature
★ Individual memory unload
★ Uses 4 × AA cells (Jupiter II)
★ Size 7" × 2.5" × 1.5"
★ 700 MHz first IF
★ Proper English Manual
★ Superb sensitivity.
★ Does not cover 550-800MHz.

No other similar receivers offer the same features at anywhere near the price! And inside the construction is a Joy! Lots of space, nicely laid out boards all linked with quick connect plugs. Not a "Taiwanese Rat's Nest!

- **Direct up/down control.**
No need to punch anything into memories. Just enter frequency and use up/down buttons for manual or electronic tuning.
- **AF Scan.**
No more annoying blank carriers for the receiver to lock on to. Simply tell it to ignore carrierss not containing audio and it will!
- **One Button Memo Read.**
A single button takes you directly into the memory bank. Up/down or scan will quickly move you around or use direct access for a particular channel number.
- **Battery Saver.**
For long term single channel monitoring this feature will reduce battery consumption by 70%.

25-1300 MHz* Mini - mobile/base JUPITER 6000 inc. P.S.U.

£345



- **Skip Function**
Whether you want to bypass a single memory channel or an entire bank, this control provides the answer.
- **High Speed Scan.**
Select high speed scan or search and you will whiz through the range at a healthy 20 steps per second! That means you can scan 100 memories in 5 seconds or 1 MHz of space (25kHz steps) in 2 seconds. It really works!
- **Fast Memo Write.**
Enables you to quickly write into the memories, no need to select a number, the receiver will use the next empty memory.
- **User Friendly Search Programme.**
You can search in either direction and change direction at the press of a button. Total agility with a speed to match.
- **Unique Multiband Programme.**
No less than 10 separate band segments can be stored in the receiver's memory.
- **Total Flexibility.**
The basis upon which the receiver has been designed. It means you tailor the receiver to do exactly what you want it to do, almost like having a receiver that was designed for your own personal needs. No other receiver can match it, feature for feature and the good news is the cost.

World demand is tremendous. We are getting only small quantities so pick up the phone now and you could be lucky!

FREE CATALOGUE & PRICE LIST! We now have an illustrated catalogue of some interesting products for the radio amateur that we have never had the space to advertise. Also details of new items coming along. Just drop us a first class stamp and we will send you this plus our price list of over 700 items!

MIZUHO "MX" QRP SSB/CW RIGS £189

Now in stock these 2 watt single banders for 80, 40 or 20 metres are real beauties. VXO control (one xtal supplied) gives 25kHz segments on 80 and 40, and 50kHz on 20 metres. Features IRT, noise blanker, S-meter, speaker, morse key, BNC socket. Powered from AA cells or external supply. Pocket size 66W x 39H x 142mm deep. As used by GB5BN on Ben Nevis. Amplifiers also in stock. Send for gen.

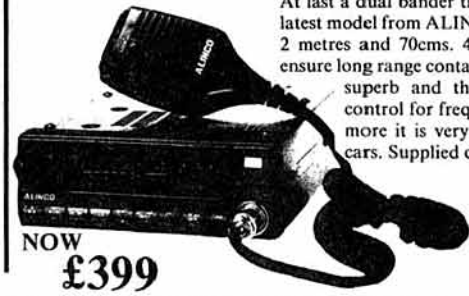
SPECIAL OFFER THIS MONTH

A QRP STATION

Free Offer!

Buy a Mizuho 80, 40 or 20m rig and we will give you a set of ni-cads, 12V DC charging lead and a G5RV aerial system completely free of charge! Limited offer so act now!

ALINCO DR510E 2M/70cms Mobile



NOW £399

DUALBINDER DISCOUNT!

At last a dual bander that you can afford! This latest model from ALINCO offers full duplex on 2 metres and 70cms. 45 and 35 Watts output ensure long range contacts. The digital display is superb and there is a proper rotary control for frequency selection. What is more it is very small and will fit most cars. Supplied complete with mic, etc.

IN STOCK NOW!

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RSGB NATIONAL VHF CONVENTION

Sandown Park Racecourse, Esher, Surrey

SATURDAY 12 MAY 1990

- **One day exhibition and lecture programme**
- **Specialist groups**
- **Full lecture programme on VHF, UHF and micro-wave subjects**
- **Equipment test facility**
- **Morse tests**
- **Presentation of trophies**
- **Comprehensive trade exhibition**

PROGRAMME

1030 **Convention opens.** Enter through main entrance.
Refreshments. Snack bar in the hall will be open from 1100 to 1800 and the licensed bar will be open throughout the convention.

1130 **AGM** 6m Group.

1330 **Convention address and presentation of trophies** by RSGB President Frank Hall GM8BZX

LECTURE PROGRAMME

Detailed Arrangement for Lectures will be Notified on Arrival

	A	B	C
1415	'The Optimum System for VHF/ UHF-Transverters or Black Boxes' *Angus McKenzie, G3OSS*	'New Amateur Satellites launched This Year' *Ron Broadbent, G3AAJ*	'Communication by Light' *Dr. Julian Gannaway, G3YGF*
1515	'DX and the Solar Cycle' *Ray Cracknell, G2AHU* *Prof. Martin Harrison, G3USF* *Ted Collins, G4UPS*	Microwave Committee Forum	Remote Imaging Group AGM *Henry Neale, G3REH*
1615	VHF Contests Committee Forum	'Construction of Simple Microwave Sources' *Sam Jewell, G4DDK*	Morse Test Forum *Robert McEwan Reid, G4GTO*

1715 Lecture Sessions Ends

1800 Trade exhibition closes. Convention ends

ADMISSION

To simplify management and to reduce costs, it has been decided, as last year, not to issue admission tickets for this convention, either in advance or at the gate.
Admission will be by payment on entry as follows:

Convention and exhibiton	£1.50
,, ,, ,, (under 18)	£1.00
,, ,, ,, (under 14)	Free

RAIL TRAVEL
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TO ESHER
ACCESS MAP TO SANDOWN PARK
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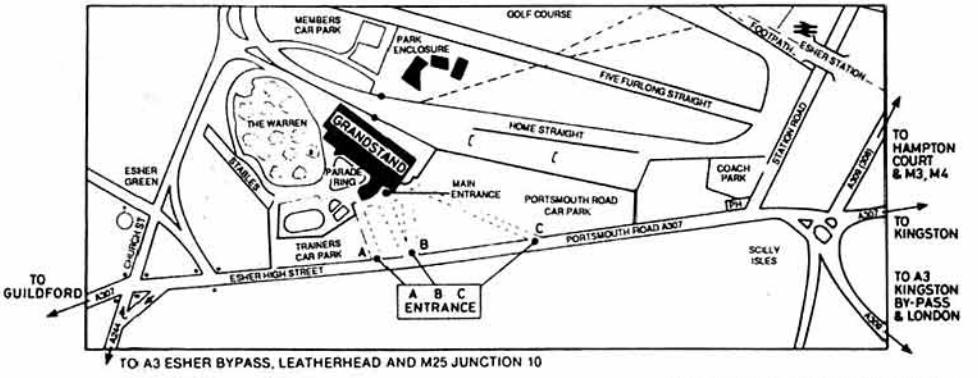
GB2VHF:
channels S22
SU22



Map by courtesy of United Racecourses

AEA's NEW PK-232MBX With PakMail™

Now AEA's popular PK-232 multi-mode data controller has new features you've been asking for...PakMail™ Mailbox with selectable third-party traffic, seven-character AMTOR (CCIR R.625) call identity, TDM (Time Division Multiplex) receiving for SWL's, and Prioritized Acknowledgement (ACK) protocol for improved packet performance. Compatible with almost every computer or asynchronous data terminal, you can enjoy the full spectrum of amateur digital communications with AEA's new PK-232MBX.

All Operating Modes. The PK-232MBX includes all authorized amateur digital modes available today...Morse, Baudot, ASCII, AMTOR/SITOR 476 and 625, Packet, WEFAX receive and transmit, as well as commercial standard NAVTEX automated marine information services.

Superior Modem. An eight-pole Chebyshev bandpass filter limiter- discriminator modem improves the signal-to-noise ratio at the detector and virtually eliminates interference from adjacent signals. System performance has been proven superior to that of PLL modems designed for telephone line services.

PakMail.™ PakMail™ mailbox with selective control of third-party traffic is now a standard feature. Your friends can now leave you messages around the clock. Your local full-service BBS can automatically forward your messages directly to your PK-232MBX.

WEFAX Transmission and Reception. AEA brought you the first multi-mode controller to send and receive WEFAX (weather facsimile) charts. The PK-232MBX directly supports the widest range of printers on the market using the optional RS-232/printer cable.

Host Mode. Only AEA provides the type of full-featured Host Mode preferred by many professional programmers for efficient control of the PK-232MBX. AEA's Host Mode programs include PC-Pakratt with FAX for the IBM PC's and compatible MS-DOS computers, COM- Pakratt with FAX for the Commodore C-64 and C-128, MacRATT with FAX for the Apple Macintosh, and Amiga-Pakratt for the Commodore Amiga.

Two Radio Ports. Independent radio connection ports allow convenient, interchangeable all-mode operation regardless of port selection. You can connect two VHF/UHF radios, an HF and a VHF/UHF radio, or two HF radios, selectable by a front-panel switch.

Signal Analysis. The PK-232MBX's internal software features AEA's exclusive SIAM (Signal Identification and Acquisition Mode). The PK-232MBX automatically identifies Baudot, ASCII, AMTOR/SITOR and TDM signals, then measures signal speed and polarity. A simple "OK" command automatically switches the PK-232MBX to the recognized mode and starts the data display.

PakMail™ Upgrade Kit. The easily-installed PakMail™ upgrade kit includes a plug-in board and new software EPROMs, and is fully compatible with all existing PK-232's. Please contact ICS for details.

You Deserve The Original. AEA produced the first multi-mode data controller. The PK-232 continues to be the standard against which all other multi-mode controllers are judged; the choice of critical amateurs, commercial services and government agencies. Don't settle for less than the best.

AEA Brings You A Better Experience.

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Unit V, Rudford Industrial Estate
Ford, Arundel, West Sussex BN18 0BD
Tel: 0903 731101

KENWOOD

Is this the best HF transceiver in the world?

We believe that it probably is, and as you read the review in this magazine, you will begin to understand why.
When a reviewer of the stature of Peter Hart uses phrases such as: "The quality reports received on transmit with the DSP were superb." Or "The PA intermodulation performance was much better than the average rig." "The reciprocal mixing or oscillator sideband noise performance was also excellent, one of the best radios I have measured, and substantially better than the TS-930S or TS-940S even with the Lowe modification," you can begin to understand why we really do belive that Kenwood have set new standards for others to attempt to emulate.
Does the digital signal processing (DSP) really justify itself, or is it just a "gimmick." Peter Hart says: "The DSP performance was amazing In the widest setting, the –6dB audio bandwidth was 180Hz to 3.0kHz and yet the unwanted sideband and carrier rejection was in excess of 70dB!" The exclamation mark is fully justified.
See the TS-950SD at the NEC, or at our Matlock head office if you can. We can't at the moment put one in every branch simply because of the demand for this definitive new transceiver, but a fully descriptive brochure is available on request.
If you happen to come across a TS-950SD being used on the air, just take a listen and you will soon answer the question...

"Is this the best transceiver in the world?"

NEC STAND D21-23

LOWE ELECTRONICS LTD.

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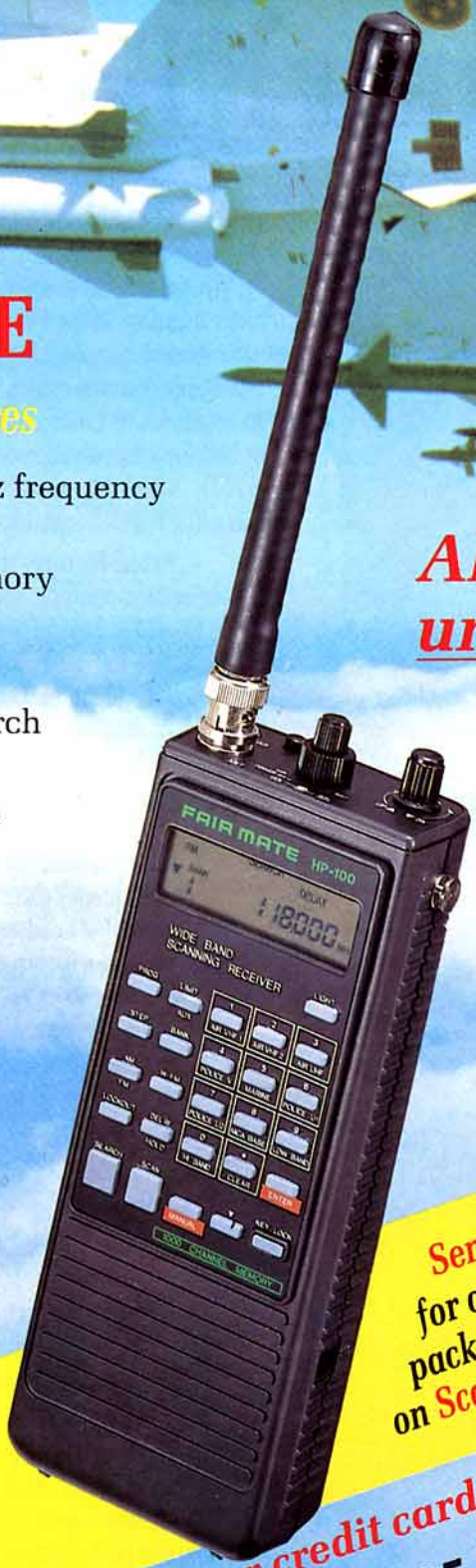
NEVADA introduce the world's FIRST

1000 CHANNEL PROGRAMMABLE SCANNER

the Fairmate HP100E

packed full of the latest features

- 15 - 600MHz and 830 - 1300 MHz frequency coverage
- An incredible 1000 channel memory capacity
- 10 independent search bands
- A fast 40 channel per second search speed
- User-selectable search steps from 5KHz to 995KHz
- Modes - AM, FM and new Wideband FM for commercial reception
- Selectable 10dB attenuator
- Keypad and rotary tune controls



All this for under £300

Each Fairmate 100E comes complete with:

- Full set of high capacity Ni-Cads
- Two antennas (one VHF, one UHF)
- Carry case
- Shoulder strap
- Belt clip
- DC cable
- Earpiece for private listening

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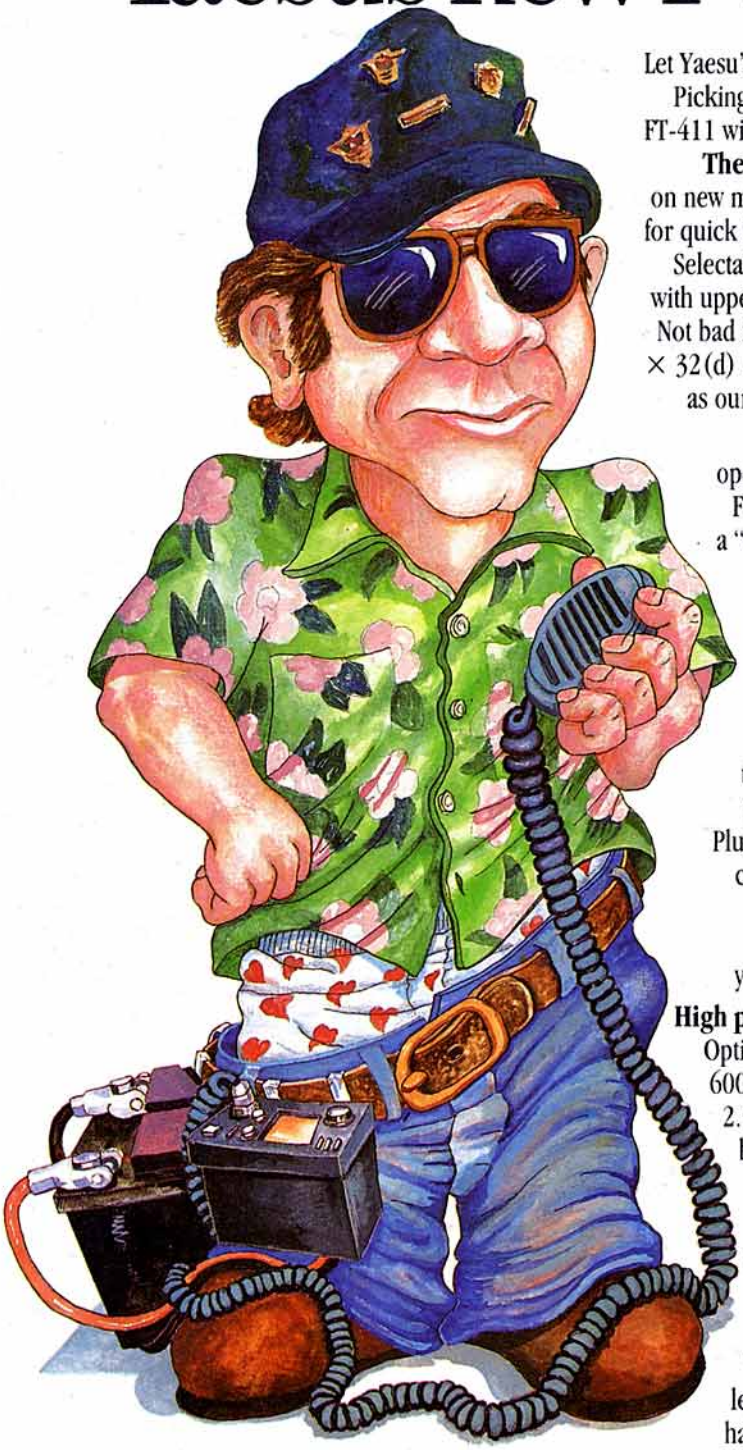
You'll be hard-pressed to beat the performance of Yaesu's new FT-411 handheld.



Let Yaesu's "next generation" handheld lighten your load!

Picking up where our popular FT-209R Series left off, the 2-meter FT-411 will amaze with its astounding array of features!

The brains of a base station. "Sophisticated operation" takes on new meaning in the FT-411. You get 49 memories, plus dual VFOs for quick band-hopping. Keyboard frequency entry. Automatic repeater shift.

Selectable channel steps: 5/10/12.5/20/25 KHz. Programmable band scan with upper/lower limits. Selectable memory scan.

Not bad for a handheld measuring just 55(w) × 32(d) × 139(h) mm (the same size as our FT-23R Series handies).

Friendly operation. For operating convenience, the FT-411's keypad features a "do-re-mi" audible command verification. Both the display and keypad can be backlit (brightly!) for night operation at the push of a button. A rotary channel selector allows fast manual tuning. Or key in the frequency directly. Operate VOX (with YH-2 headset option).

Plus you get a battery saver to conserve power while monitoring. And a (defeatable) automatic power-off feature that shuts down your radio if you forget to turn it off!

High power capability.

Optional nicad packs available are FNB10, 2.5-watt, 600-mAh. FNB-12 5-watt, 500mAh pack or tiny FNB-9 2.5-watt, 200mAh pack. Or you can get 6 watts output by applying 13.8-volts DC from an external power supply.

Swap options with Yaesu's FT-23R Series. Our rugged best-seller's chargers, batteries, and microphones are fully compatible with the FT-411. The FT-23R is the perfect companion for the FT-411, and at a great price!

Try out an FT-411 today. At your local authorised Yaesu dealer. And experience the legendary Yaesu handie performance!

YAESU

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