Radio Communication

The Journal of the Radio Society of Great Britain

May 1991

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Radio Communication

This month's special edition:

- **New paper, better printing, better reproduction of photos.**
- **Sixteen pages of full colour.**
- **Four-page look at how to save money and have fun by building kits.**
- **Many features for beginners and Novice students.**
- **Pre-launch sample of RSGB's newest magazine *D-i-Y Radio***

NEWS AND REPORTS

TECHNICAL FEATURES

COVER PICTURE:

The Power Supply Unit to be built in our major series of construction-for-beginners articles by John Case.

See colour feature on page 38.

REGULAR ARTICLES

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS
Founded in 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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Telephone: 0707 59260 - *Radio Communication* only
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Correspondence to honorary officers should be passed directly to them (QTHR), not to RSGB HQ.

ANNUAL SUBSCRIPTION RATES
Once-off joining fee: £1.50
Corporate members: UK and overseas (*Radio Communication* by surface post): **£30.00**
UK associate member under 18: £12.75. Family member: £11.95
UK students over 18 and under 25: £19.20 (Applications should give applicant's age at last renewal date and include evidence of student status).
Affiliated club or society/registered group (UK): £30.00 (including *Radio Communication*): **£17.95** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)

Membership application forms available from RSGB HQ

50 MHz - It started with a KISS

THE ANNOUNCEMENT IN last month's issue of *Radcom* concerning additional new privileges for vertical polarization and mobile operation on the 6m band was the latest good news for radio amateurs. These new facilities, which will become very popular, admirably demonstrate the RSGB's continuing commitment to enhancing the status of all UK radio amateurs regardless of whether they are members of the RSGB or not. These new facilities also indicate the advantages of a deliberate series of experiments in order to take advantage of changing circumstances.

It was in 1977 that the RSGB first approached the UK Licensing Authority about amateur operation at 50MHz as part of its preparations for the 1979 World Administrative Radio Conference (WARC). The band at that time was used for TV broadcasting in ITU Region 1, which included the UK, and thus there was no chance of general amateur operation. However UK amateurs were keen to explore the band as it was allocated to the Amateur Service in many countries in Regions 2 and 3.

The first recorded amateur contact across the Atlantic involving 50MHz since 1958 took place between G3COJ (28MHz) and WB2RLK/VE1 (50MHz) on 10 February, 1979. In March of that year, *Radcom* reported that other British amateurs including GM3XLB, G3BHT, G3OUF, G4CVI and G8CKZ were equipped for 50MHz reception. All of this interest, and much more, added to the excitement and helped to formulate clear objectives for future amateur operation.

We decided to 'Keep It Simple' (KISS) and, in August 1979, I wrote a letter to the Home Office (then responsible for UK amateur licensing) requesting permission to operate a 50MHz beacon, GB3SIX, from Anglesea, outside TV hours. In February 1980 permission was given for GB3SIX to commence transmissions, but with a range of safeguards in case this time-sharing of frequencies with TV broadcasting went wrong in any way.

At the WARC in Geneva in the autumn of 1979 the UK Government supported a motion which would have given amateurs some access to a band at 50MHz in ITU Region 1. That motion was not carried, but only by a few votes. Despite this set-back, the RSGB continued to press for experimentation at this fascinating part of the spectrum. It was about this time that the Society first raised the subject of a limited number of experimental licences for operation at 50MHz. At first the idea was turned down.

Another most notable achievement in November 1980 was when G4BPY (70MHz) worked crossband to VE1ASJ (50MHz). The rest is perhaps history. The RSGB did subsequently gain permission for 40 UK stations to transmit on 50MHz outside TV hours. That number was later increased to 100 and a whole range of very interesting experiments and contacts took place. In August 1984 the 50MHz beacon, GB3NHQ, was switched on.

The biggest breakthrough came in December 1985 when following a Government review of Bands 1 and 3, to which the RSGB had contributed, the Department of Trade and Industry wrote to the Society giving permission for all UK Class A amateurs to use 50-50.5MHz from 1 February 1986. Just over a year later, and much to the delight of Class B amateurs, the 50MHz band (and the 70MHz band) was granted to Class B stations from 1 June 1987. At the same time the band was extended to 52MHz.

We have now come to regard 1987 only as a new starting point. As readers will know, many other countries now permit their amateurs access to 50MHz. We would like to think that the RSGB initiative inspired such development. Nothing ever written about the development of the 50MHz band in the UK would be complete without reference to the late Roy Stevens, G2BVN, who achieved so much prior to his death in 1982.

As those who operate on 50MHz will know, it is one of the most fascinating of amateur bands, producing the most unusual propagation often when we least expect it. The 50MHz story is a classic case of why amateurs should support their National Society because, by banding together, what was once considered impossible was achieved.

David Evans, G3OUF

NEWS & REPORTS

The First British Astronaut

GB1MIR to Link Space Station with UK Schools

SCHEDULED FOR 12 May is the first Anglo-Soviet space mission - JUNO: A Mission for Education — carrying two soviet cosmonauts and a British astronaut, Helen Sharman; first reserve is freefall parachute champion Tim Mace (35). The mission is to last eight days, six of which will be spent on the Mir space station.

Turn to page eight for the full story!

Tim Mace and Helen Sharman, the JUNO Mission astronaut candidates, in Star City (near Moscow).

HQ News

LATE LAST summer, when the extent of the Society's deficit was confirmed, there was an initial feeling that increasing promotion of membership and sales of books would reverse the trend, given sufficient time. However, it is almost impossible to trade out of trouble on a weak balance sheet without major operating changes.

The strategy that was formulated involved the strengthening of the balance sheet, the restructuring of the management to make operating changes possible and the more aggressive promotion of the Society's benefits and products.

The balance sheet was immediately strengthened by reflecting current asset values and a change in accounting policy. The management and operating changes were more difficult, but have resulted in substantial cost reductions which I hope will be sustainable. The promotion and public relations element of the strategy is about to be implemented with the NEC and Novice Licence programme which provides a platform from which to raise the profile of the Society. This latter phase may well be the most difficult to achieve, but is probably the most vital element. Membership of the Society must be seen by licensees as fundamental to their philosophy, and benefits of membership must be more tangible and more widely understood.

As a start, the members' discount on the Callbook will be substantially increased and, if this proves successful, may be extended to other in-house publications. To begin to improve our response time I have appointed a dedicated telephonist/receptionist, Emma Bransom, whose task is to respond quickly to incoming calls, and route them within the building. Gill Mitchell will, therefore, be free to deal more effectively with general queries from members, and requests for information.

I have been asked to clarify the circumstances under which Raynet is becoming independent. A request was made to Council by the Raynet committee, late last year, to become an independent Affiliated Society. Council, after much discussion, acceded reluctantly to this request.

For practical reasons 1 May was set as a transfer point but I will continue to provide all necessary support from HQ for the time being. This will allow all full and further discussions to continue.

Philip Smith
General Manager

RadCom's different!

WHEN I WAS formally appointed Editor, last July, the first thing I did was survey the members to see what they wanted in *RadCom*. The second thing was to investigate ways of improving the print quality, especially of the photographs.

Following meetings with our existing printers and requesting estimates from several others, the decision to change to Southernprint was made at the end of last year.

We were obliged to give three months notice of the change, but at last we are able to present the new look *RadCom*.

The cover is thicker which should protect your magazine for longer, and be less prone to falling off.

The quality of the paper inside is far better and this, together with a bigger press and Southernprint's expertise, should produce consistently better reproduction of photographs and tints.

A bonus is that we are now able to use colour from time to time on our inside pages, as has been demonstrated this month. We hope you like the new look of *RadCom*.

Mike Dennison, G3XDV, Editor

Honorary Trophies Manager

APPLICATIONS ARE INVITED for the above position. It entails: (a) Holding and maintaining the records of all of the Society's trophies, (b) arranging the recall of all trophies annually for engraving, and (c) organising the presentation of those relevant trophies at the VHF Convention, HF Convention and AGM each year.

Applications should be made to John Case, GW4HWR, QTHR, before the end of May 1991.

MØRSE

A unique callsign

AS PART OF the world-wide celebration of the 200th Anniversary of the birth of Samuel Morse, the RSGB has obtained permission to use the unique callsign M0RSE. It will be activated until the end of April, so there may still be a chance to get this one in your log. Those authorised to use the call are associated with several RSGB affiliated clubs around the UK, including the Cheltenham Amateur Radio Association, the Darwen and Verulam Amateur Radio Clubs the First Class Operators Club the Chiltern DX Club and the Three A's Group.

Operation is scheduled from a number of locations on all bands 1.8 to 28MHz, including WARC bands. Frequencies are 1835, 3520, 7020, 10102, 14020, 18070, 21020, 24892, and 28020kHz. There may also be some operation in the 50, 144 and 432MHz bands. Only CW will be used, of course.

The Cost of Using a Repeater

"22 pence per hour"

THERE ARE nearly 300 licensed repeaters in the UK; each owned and operated by a locally based group but in conjunction with the RSGB which provides a range of centralised services.

If you write off the costs associated with the repeater hardware and installation over 5 years, but add in annual consumables such as site fees, electricity, licence fee, insurance and administration costs, you can work out the cost of operating a repeater. We have worked out some typical costs for the above and assumed that the repeater is in operation for six hours a day; the running costs work out to about 22 pence per hour of operation. Now, 22p doesn't sound much, but multiplied up over the year it is a large sum and someone, somewhere, has to pay it.

Each local repeater group has to find the money to purchase or build its equipment, pay the site fee (if there is one) and pay for the electricity used. The RSGB has to pay for all the initial vetting work on repeater applications, including the technical vetting on the proposal. This initial work is done by the RSGB, free of charge to the group, as part of its ongoing commitment to the Radiocommunications Agency and amateur radio. RA would charge a commercial repeater user about £750 for such initial work and the same amount each year just for the licence fee.

In addition, the RSGB provides technical support and frequency co-ordination through its Repeater Management Group and pays for third party liability insurance and the licence fee. The latter is now £15 per annum.

For each repeater, it is estimated that the RSGB spends about £80 annually in direct costs, including the £15 licence fee. A closer breakdown of the administrative costs clearly indicates all the things which the RSGB does in the background, often unseen or unsung. These tasks include:-

a) The processing of all repeater applications from scratch, both from a technical and non technical viewpoint.
b) The presentation of the repeater application to the RA for site clearance.
c) The maintenance of repeater records for internal RSGB use.
d) The maintenance of an extensive (and mandatory) database of persons who can close down the repeater in the event of some kind of emergency.
e) The processing of site changes for established repeaters; a channel change might also be necessary in such circumstances.
f) Frequency coordination in order to minimise co-channel interference to mobile stations.
g) Discussions with the RA on repeater specifications, experiments and new facilities.
h) The keeping of records and documents.
i) Vetting and payment of site charges, and re-charging to groups.
j) International liaison with the IARU and societies in adjoining countries in order to minimise co-channel interference.

Until recently, the costs of the RSGB annual effort in running repeaters was paid for out of general RSGB funds, ie by all members, whether they use repeaters or not. However, as has been pointed out in *Radio Communication* on a number of occasions, there is a general trend towards individuals paying directly towards the services and benefits which they enjoy.

This has meant that the RSGB will now make an annual charge to each repeater unit of £25 per annum. This is a nominal charge only, for it is less than a third of the costs met by the Society (£80 pa) and does not include any charge for the licence fee.

The decision to make this charge was taken by the elected Council of the RSGB in July 1990 because of the increasingly difficult economic situation in the UK which has been affecting the Society. At the same time as introducing this nominal charge for repeater groups, Council also made some economies including staff cut-backs at HQ.

Council felt that if repeater users were not prepared to pay a small amount direct to the organising group each year, then perhaps they really did not want a repeater facility. Or to put it another way, if the local users didn't think it was worth £25 a year to them, why should the RSGB pay even more than that to keep it going?

Some repeater groups boast a membership of hundreds, some of only a handful. Even in extreme cases, a charge of £1 per annum for regular users should cover the token RSGB charge to groups.

The RSGB will still take most of the cost of the national running of repeater stations from the general fund, but will recover less than a third of the overall cost from users via their local group.

The Society believes that it is right and proper that users recognise that each time they use a repeater, someone is paying for that use, and that all reasonably minded repeater users will now contribute to their local group for the facility that they use.

More AROS successes

FOLLOWING THE continuing cooperation between the RSGB's Amateur Radio Observation Service and the RA's Radio Investigation Service, two more successful Wireless Telegraphy Act prosecutions have been made.

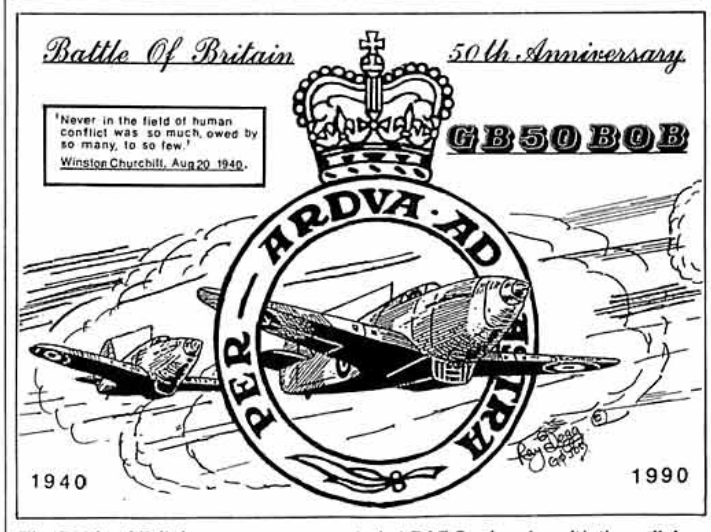
● At Nottingham Magistrates Court, David Shipstone pleaded guilty to four charges of unlicensed installation and use of radio apparatus. He was given a conditional discharge for two years and ordered to pay costs of £355 and ordered to forfeit £600-worth of radio equipment. Shipstone had been operating for some time as 'Broadsword' through GB3CF and other Midlands repeaters.

● At Medway Magistrates Court, a man was found guilty of unlicensed installation and use of amateur radio apparatus and was fined a total of £500 and ordered to pay costs of £525 to the Radiocommunications Agency. The prosecution was a direct result of a report of alleged unlicensed operation through the amateur repeater GB3KN, passed to the RIS by the AROS.

The Amateur Radio Observation Service was set up by the RSGB several years ago to help improve operating standards. Following the death of the original Coordinator, G4FJN, the Society appointed Geoff Griffiths, G3STG, to run AROS. Most of its work involves coordinating reports of poor or illegal operating. Most problems are easily solved by a letter politely pointing out the error. Just occasionally it is necessary to compile a case report for the RIS who have undertaken to provide resources for investigating AROS-originated cases.

Anyone wishing to make a report can write to RSGB HQ, or directly to G3STG who is QTHR.

● FOLLOWING THE elevation of former Chairman John Case, GW4HWR, to the Presidency, the new Chairman of the Society's Training and Education Group is David Jackson, G4HYY, of Castle Lodge West, Halifax Rd, Todmorden, Lancs, OL14 5SQ.



The Battle of Britain was commemorated at RAF Coningsby with the callsign GB50BOB last September. A team of thirty operators kept the station on the air for a week. The event raised £300 for the RAF Benevolent fund

COUNCIL BRIEF

Jan 12/13

- Mr J T Barnes, GI3USS was co-opted as Zonal Member for Zone F. He was subsequently elected as Executive Vice President for the year.
- Mr W J McClintock, G3VPK, resigned as Honorary Treasurer, because of pressure of work. Council thanked Mr McClintock for his efforts.
- Council voted unanimously in favour of the RSGB voting for the admission of the Mongolian Radio Sports Federation to IARU.
- Mr G R Smith, G4AJJ, was appointed as Chairman of the Finance and Staff Committee, replacing Dr J N Gannaway, G3YGF, who is no longer a Council member.
- The proposal of the Raynet Committee that Raynet should become an independent organisation was accepted in principle.

Jan 26

- The President was asked to write to RNARS, RAFARS and RSARS on behalf of the Society, expressing the Society's best wishes to those of their members on active service in the Gulf.
- Dr J Gannaway was appointed as Minutes Secretary to Council.
- Council received a report from Mr T I Lundegard, G3GJW, who is involved in updating the *Green Book*, the Society's organisation and standing orders.
- The President introduced his 'Roof Fund' to Council.
- Mr G Benbow, G3HB, was appointed Chairman of the Technical and Publications Advisory Committee.
- The Code of Practice for Novice Kits was agreed.

March 7th

- Council appointed Peter Tucker, GU4DWZ, as Hon Treasurer and John Hall, G3KVA, as Company Secretary.
- A unanimous vote was taken in favour of making financial provision for an RSGB official to attend the WARC 92 conference for the full expected 33 days.
- Council accepted the draft of the *Green Book*, with a few minor alterations, and decided that it should be issued as the 1991 edition.
- Following a recommendation of the Finance and Staff Committee, it was decided to introduce a Novice grade of membership, with a reduced subscription.
- A report on the VAT situation was presented. Following representations to HM Customs & Excise, the proportion of the subscription liable to VAT has been reduced to 3%. Negotiations are in progress to obtain a hopefully substantial refund.
- Council received a report on the wiring at HQ.
- It was decided that Raynet should become independent with effect from 30 April 1991. Any applicable stocks of stationery would be given to Raynet, as would the BBC computer which they currently have on loan.
- It was agreed that advertisements in *Radio Communication* should not be accepted from anyone failing to give the proper quality of service.

New RSGB Magazine

As Project YEAR reaches full steam, the RSGB is to launch the first UK magazine devoted to the amateur radio beginner.

STAPLED INTO this issue of RadCom is a small sample of RSGB's new magazine, *D-i-Y Radio*. At four pages long, it can only give a flavour of what the magazine is about. The real thing will be a 16-page colour bi-monthly with a young-at-heart approach, intended for beginners of all ages.

The full size Volume 1, No.1, will be distributed free to all RSGB members with the July edition of *RadCom*, after which it will be available only by annual subscription.

Rip it out

NO DOUBT MANY members will regard *D-i-Y Radio* as far too basic for them, and will be tempted to remove it from their *RadComs*. This is exactly what we want you to do!

Remove your copy of *D-i-Y Radio* and give it to your son, daughter, grandchild, next-door neighbour, local teacher, scout leader, anyone who may benefit from its elementary approach to our hobby.

Project YEAR is all about increasing the number of radio amateurs for future years, as a diminishing number of amateurs will lead to a reduction in frequency allocations.

Giving away your sample copy of *D-i-Y Radio* may well lead to the recruitment of someone else to the hobby. Help us ensure the future of amateur radio.

Stolen

FROM THE premises of the Wigston Radio Club, Wigston Magna, Leicester, on Saturday 9 March were: a Yaesu FT707 S/N 1F 170207 and a Trio TS711E S/N 5050346.

Anyone with information should contact G8RFE on 0533 779689 or their nearest police station.

Fortunately, the Club had the foresight to have the equipment insured under the special deal which the Amateur Radio Insurance Service does for RSGB members only (see Classified advertisements).

RAIBC Fund Raising Activities

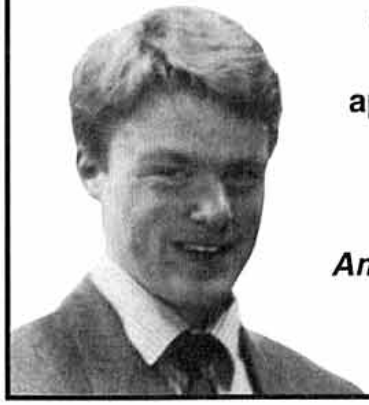
THE RADIO Amateur Invalid and Blind Club (RAIBC) raises money to help disabled members enjoy amateur radio.

The Northern Ireland section has raised over £12,000 from the vouchers and stamps given out by petrol stations. RAIBC (NI) would like to thank all members who have contributed so far. Although Shell ended their current promotion on 10 March, the stamps are still usable by RAIBC until the end of May. If you have any of these now useless Shell stamps, please send them *post free* to: RAIBC (NI), FREEPOST BE 1769, Belfast, BT12 5BR.

Members in South-East England can help the RAIBC by donating 'amateur radio gear, junk or just bric-a-brac', and they will sell it at the Maidstone Rally on 26 May where, thanks to the generosity of the Maidstone (YMCA) Amateur Radio Club, they have two tables available. Proceeds will be divided between the RAIBC and the Maidstone Cancer Hospice which is currently being built. Donations should be brought to the rally and not to the house of RAIBC Rep Peter Poole, G4EVY.

Young Amateur Of The Year 1991

DO YOU KNOW a young person who has made a significant achievement in amateur radio in the last year? Why not nominate him or her for the prestigious title of Young Amateur Of The Year 1991? See the enclosed application form for full details.



1990's Young Amateur Of The Year was David Martin, GM0NVE

Datacoms Column

AS, NEIL LASHER, G6HIU, has retired from writing our *Datacomms* column, a successor is sought.

Applications should be addressed to: The Editor, Radio Communication, RSGB, Lambda House, Cranborne Rd, Potters Bar, Herts, EN6 3JE, to arrive by the end of May.

Next Month's *RadCom*

will return to its usual format, plus:-

- **Extra *Technical Topics* pages**
- **HF DF explained**
- **The FT1000 reviewed**
- **Lottery winners**
- **NEPCON 91**

Question: **What connects Mars Bars, yo-yos and amateur radio?**
Answer: **The JUNO Mission**

First British Astronaut will use GB1MIR

THE SEARCH for the first British astronaut started in June 1989 with a nationwide appeal for volunteers; 13,000 applied! By November, after a seemingly impossible task (involving assessment of medical condition, technical expertise, language and communication skills and crew compatibility), two were selected to commence training near Moscow. This gruelling non-stop 18-month programme has reached its conclusion with both Helen and Tim being declared fit to fly. The final stages have involved working with their respective crews, undergoing simulated space flight practice including docking procedures, high altitude chamber testing for space suit integrity and extensive physical training to achieve peak fitness for the mission.

Before being selected for astronaut training, Helen Sharman (27) was a research technologist at Mars Confectionery (yes, we've heard all the Mars jokes). Before that, she worked at GEC working on the materials used in the manufacture of cathode ray tubes. In addition to a wide range of athletic interests, she plays the saxophone.

The first choice soviet crew comprises Anatoli Artsebarski who was one of the back-up crew for the recent Soviet-Japanese TBS Mission, and Sergei Krikalyov who is the only crew member to have been into space - he flew with Soyuz TM-7 in November 1988.

Final selection of the crew takes place only 24-hours before the flight so each must train assuming he or she will be going.

Juno

FINANCED BY the Moscow Narodny Bank, the JUNO Mission involves some twenty experiments which will occupy the crew for about seven hours each day. The experiments include the production of monocrystals and micro-organisms, and investigations into human hearing, the growth of plants, and stress reduction in space stations (and that, of course, is one of the uses of the amateur radio).

Rescued by Space School . . .

FOLLOWING A shortage of industrial sponsorship for the UK side of the mission, which almost caused it to be cancelled, the Moscow Narodny Bank in London agreed to underwrite the launch costs. This still left the astonaut with no official experimentation.

JUNO engineering project manager Rodney Buckland at Brunel University had the idea of involving schools to generate experiments which would not require external funding. He approached Richard Horton, G3XWH, who is Head of Physics and Information Technology at Harrogate Ladies' College with a view to linking Mir with some of the schools around the UK.

. . . . and Amateur Radio

HARROGATE LADIES College has a very keen interest in space technology and has been promoting amateur radio for over ten years with 30 girls having received callsigns. The invitation to participate with the JUNO Mission stemmed from the college having appeared on BBC1's award winning *Newsround* programme and on the RSGB's video *Amateur Radio for Beginners.*

Richard Horton contacted the RSGB's Amateur Radio Secretary, David Evans, who requested the Radiocommunications Agency to issue the special callsign GB1MIR to the Astronaut and a series of callsigns with very rare four-letter suffixes to the participating schools. The RA wrote readily agreeing to these rather unusual requests and wishing every success to the mission and all involved in it.

Using the callsign, GB0JUNO, six licensed YLs at Harrogate will spearhead the link to Mir (callsign GB1MIR) and will pass transmission to the other eight schools involved in the experiment. Communication time will be limitted as there are only four periods of just over ten minutes when Mir can 'see' the UK. This will, of course, be turned to advantage as it will teach the prediction of antenna bearings and conciseness in passing information.

It is expected that pupils will be able to ask Helen Sharman questions regarding the experiments she is undertaking. It is possible that a number of overseas schools will also participate. It should also be possible to talk to radio amateur cosmonaut Musa Manarov.

Experiments

A NUMBER OF UK schools and educational groups, including Harrogate Ladies College and Canterbury High School (featured in April 90 RadCom's *Close Encounters with a Moon Man*) have sponsored experiments for Helen to do, under the title Space School

For instance, seeds (from Suttons) will be taken to the space station to orbit the earth for 6 months and will subsequently be grown alongside similar seeds which have stayed on earth, and any difference noted. Another involves measuring the swelling of small cylinders of a Welsh potato when immersed in various common salt solutions. To provide a teaching resource for British schools, Helen will take photographs of interesting geological and environmental phenomena from space using a 60mm by 60mm Hasselblad camera.

Quite the simplest and most intriguing experiment comes from UK Students for the Exploration and Development of Space, and concerns the analysis of the mechanics of the motion of a yo-yo in the virtual absence of gravity.

Publicity

IN ADDITION to being a very exciting experience for those taking part, and yet another demonstration of amateur radio being involved with science and exploration (with enthusiastic endorsement by the Goverment), the event should provide the hobby with a great deal of publicity and may encourage more recruits.

The first UK astronaut is likely to attract a great deal of press, radio and TV coverage, including schools programmes.

The Callsigns

GB1MIR	Helen Sharman on the Mir Space Station
GB0JUNO	Harrogate Ladies' College
GB1JUNO	Bigyn Co Primary School, Llaneli
GB2JUNO	Alford Academy, Aberdeenshire
GB3JUNO	Hewett School, Norwich
GB4JUNO	Canterbury High School
GB5JUNO	Belfast Royal Academy
GB6JUNO	Looe School Sunrising, Cornwall
GB7JUNO	The Royal Grammar School, Guildford
GB8JUNO	Orwell Park School, Ipswich

The JUNO Mission crew (l to r): Anatoli Artsebarski, Helen Sharman and Sergei Krialyov.

CQ EARTH - How it all started

Abridged by kind permission from an article in *The AMSAT Journal* by Valery Kondratko, UV3DQE, and Joe Kasser G3ZCZ.

A MANNED SPACE flight that excited amateur radio began routinely on 21 December 1987, when Commander Vladimir Titov and spacecraft engineer Musa Manarov joined the Mir orbiting complex, for a one year tour of duty. For the first two weeks of a flight, the cosmonauts got acclimatized to the space station. Stellar observations, photographing of the Earth's surface, medical check-ups and experiments, and maintenance of the spacecraft systems occupied all the crew's attention. After that, things fell into a routine as, unlike in ships at sea, there is no weather in space to cause distractions. This happens to all long duration crews, so they try to find something interesting to counteract the monotony and boredom, and avoid negative psychological effects.

Initial Steps in Ham Radio

IN A CONVERSATION with ground control in March 1988, Musa Manarov asked for copies of *Radio* magazine to be sent up. The Psychological Support Group asked the editorial offices of *Radio* to provide several issues. They were delighted by his interest and enclosed a letter with the magazines asking whether he would like to operate on the amateur bands himself. Musa replied that there was no amateur equipment on board, that he didn't have an amateur license, and that in general no one among the crew members had operated on the air, but that, if mission control would help resolve these matters, he'd be happy to get on the air during his free time.

From that moment, the Flight Control Centre and the *Radio* editorial offices began to make things happen. As word spread that a transceiver was being sought. Valery Agabekov, UA6HZ, offered his YAESU FT-290 which was delivered to Mir by the regularly-scheduled freight vehicle "Progress-37".

Homebrew in Orbit

DELIVERY OF the transceiver didn't mean that operation could begin; Musa still needed an antenna. For the sake of maintaining dependable official communications, they decided not to connect the FT-290 to the existing antennas. After considering the alternatives, Musa concluded that it was necessary to put a separate antenna on the outer surface of the station's fuselage and to connect it to the existing hermetically sealed connector during an extra vehicular activity (EVA).

Installing the Antenna

AN EVA TO SERVICE the X-Ray telescope took place in June, 1988. Musa planned to use the occasion to install his homebrew antenna. However, the work outside the station lasted over 5 hours which used up almost all of the resources of the cosmonauts' spacesuits. There was no question of installing the antenna during that EVA, and it was postponed until the next one. Making use of the forced postponement, Musa asked mission control to send up a commercially-built unit so that they would have a spare on board.

On 30 August, 1988, the regularly-scheduled 'Soyuz TM-6' transport docked with the station, carrying an international Soviet-Afghan team including Valery Polyakov who subsequently joined the permanent crew to carry out advanced medical research.

Soon afterwards, in September 1988, a freight vessel delivered the antenna. By then, licenses had been issued to the cosmonauts; Vladimir Titov became U1MIR, Musa Manarov U2MIR, and Valery Polyakov U3MIR.

While preparing for a regularly-scheduled EVA, U2MIR prepared the antenna. He attached a handle made up of insulating tape to its base so that it would be easy to hold in his spacesuit glove and, as a final touch, he snipped a little red flag from his suit and stuck it on the end of the antenna.

A month later, work went very well during a regularly-scheduled EVA so the crew had time to install the amateur radio antenna. From the transfer compartment, U1MIR passed the antenna to U2MIR, who worked his way along the outer fuselage of the

station to the conical part of the working compartment. He then disconnected the hermetic convertor from the screen-vacuum isolation, and affixed the antenna to it. They were now ready to go on the air.

For some time after they first turned the set on, the trio just listened. At first, all they heard was noise. The first distinct speech came through when they were flying over the USA. Since none of the crew had previously operated on the air, difficulties arose. The first problem was language. The crew members could read and write English, but none of them could speak it fluently. They also had problems understanding the pronunciation of callsigns.

Recognizing these difficulties, mission control invited some radio amateurs to the ground control centre to help the crew. Teaching sessions were set up, to which radio amateurs came for consultations.

The first QSO

THE FIRST QSO, which took place on 8 November 1988, was with Leo Labutin, UA3CR, operating from UK3KP, the amateur radio station at the newspaper *Komsomol'skaya Pravda*. They made another QSO with UA3CR a few days later on 12 November, but this time Leo was sitting in a car in Atlanta, Georgia, with Byron Lindsey, W4BIW, and operating as W4BIW/M (being helped/watched by a host of others) at the AMSAT 1988 Space Symposium in Atlanta.

Who blew it?

SOME TIME later while flying over the United States, U2MIR heard a conversation between two high-quality stations. Wanting to join the conversation, he broke in and gave his callsign as U2MIR. They came back and asked him who he was. He repeated the callsign. "It's probably someone messing around" said one to the other, and they continued their conversation, ignoring U2MIR's attempts to contact them!

On the Air

MUSA INSTALLED the transceiver in his cabin. Now he went on the air whenever he had free time. He gradually acquired confidence, understood callsigns more easily, and became more proficient in spoken English. The others also tried their luck, but couldn't completely overcome their fear of the microphone. U3MIR translated for Musa what others were saying, but refrained from speaking into the microphone himself.

It didn't take long for the amateur radio world to know that a ham radio station was operating in orbit. Now others were calling Musa. While flying over Argentina, he contacted Carmen, LU1UK. When she understood whom she was talking with, she exclaimed "Wait!" - as though the space station could slow its orbit - and disappeared for a minute. A few minutes later Simon, LU6YH, called U2MIR. Carmen had telephoned him and told him to get on the air. LU6YH became a regular correspondent and one day U2MIR heard words in Russian from LU6YH during a QSO. It turned out that Simon had invited the Deputy Minister of the Forestry Industry of the RSFSR, who was in Argentina on official business, to be present for that contact.

The large number of stations in the US and Europe made contacts difficult, since signals came through as solid QRM. Beyond the Urals silence set in; in this area there are practically no radio stations. It was very pleasant to work stations from the Republic of South Africa and Australia; they operated in a very disciplined fashion. ZS2ELL couldn't manage to get through and started to call, inserting the Russian words *na zdorov'ya* (to your health) and *perestroyka*. Musa, of course, was impressed by the attempt and a contact took place.

Return to Earth

THE CREW WAS able to make over a thousand contacts with radio amateurs until 21 December when, after an unprecedented year-long flight, the cosmonauts returned to Earth. Much more time will be needed to assess the meaning of the results of over a year of scientific research. But already the crew's contribution in setting up the 'Space - Earth' amateur radio bridge can be assessed.

A lengthy stay in a limited space has a negative psychological effect on human beings; boredom sets in. Although an orderly schedule of work and rest time contributes to morale, it helps to find something to be really interested in. All crews adopt important milestones and points of reference for counting off the duration of the flight. These consist of: the launch, docking with freight vehicles, meetings with visiting expeditions, EVAs, and from now on ham radio.

With the addition of the amateur radio station aboard the spacecraft, the communications horizons of the cosmonauts has widened. Until then, their external communications had been restricted to the Flight Control Centre, even though specialists, relatives, etc had come to the Flight Control Centre to communicate with them. Amateur radio made possible random meetings and new acquaintances, an extremely important factor in the psychological health of the crew. Now, while over-flying any continent, providing they have the time, they can find someone to talk with.

The radio station remained on the spacecraft, and since that precedent setting flight, U4MIR and U5MIR operated briefly. On March 9, 1990 Anatoly Soloviev, U6MIR, and Alexander Balandin, U7MIR, started operating. The US STS-35 Space Shuttle flight carrying SAREX and Ron Parise, WA4SIR, (which finally took place last December) provided the opportunity for the first-ever Shuttle to Mir linkup.

The future

WHETHER THE Mir ham radio bridge experiment will be continued indefinitely will depend on the wishes of future Cosmonauts. Ham radio is being tested aboard Mir as an important activity for contributing to the success of long duration spaceflight. Remember that in general, just like the American astronauts, most cosmonauts are not radio amateurs. Consequently, most of the hams on Mir are new to amateur radio, and their reaction to being the target of a pile up may be to go QRT. If you hear Mir calling from space, remember who you are speaking to; your behaviour may influence the future of manned amateur radio in space.

Radio Amateur Becomes Telecomms Minister

Mr Katsutsugu Sekiya, JA5FHB, has become Japan's Minister of Posts and Telecommunications. Mr Sekiya has been licensed since 1970 and is one of the founding members of the Diet Ham Club (that's Diet as in national assembly, not as in food), comprising twenty-one members of the House of Representatives, one member of the House of Councillors and 59 of the Diet staff.

At a reception held by the Japanese Amateur Radio League, Minister Sekiya said that without the support of JARL members he could not have been appointed to the post. Prospective UK Cabinet Ministers please note!

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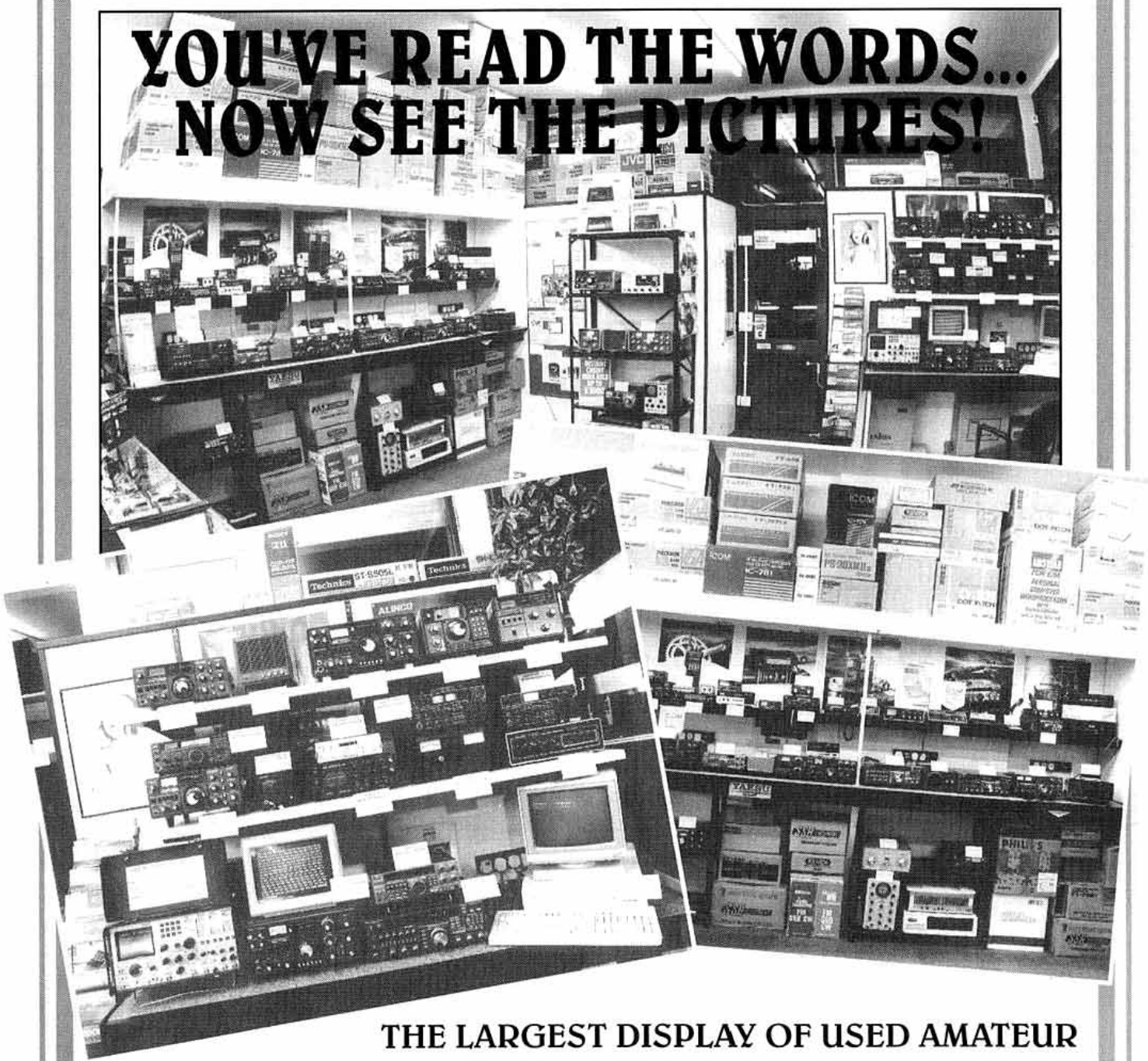

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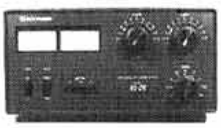

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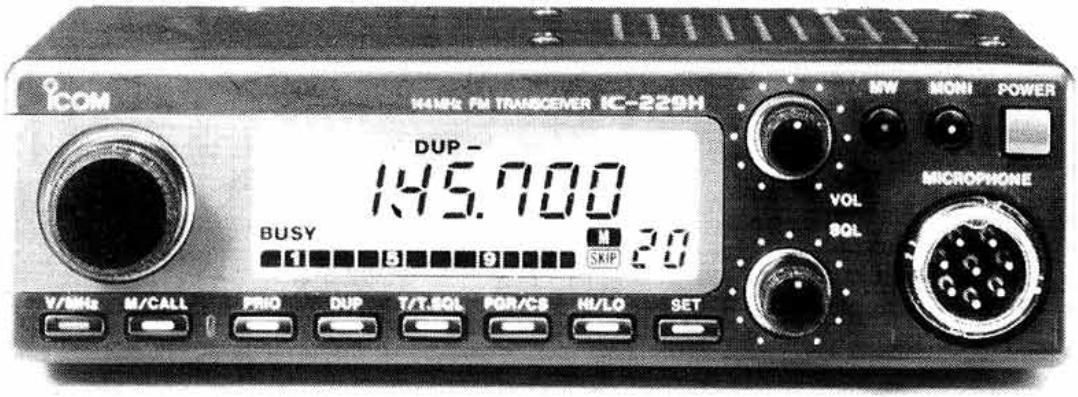

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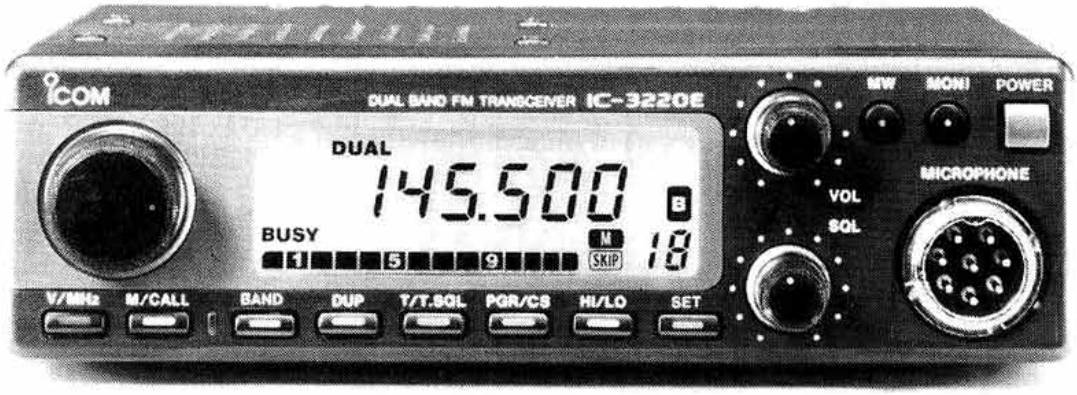

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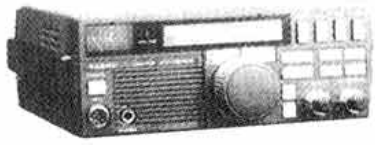

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HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham B17 8QB

MAYBE I sometimes give the impression in this column that contacting rare and exotic stations is the only pleasure to be had on HF - but of course this simply isn't true! This issue of *Radio Communication* should reach a number of beginners to amateur radio and I want to assure them that, although receiving pictures from the other side of the world - or from space - on your television set is now routine, things you can do via *our* kind of radio are very special! In effect, you conduct your own interviews and you can make friends with people who live in almost any country of the world.

Even language is no real barrier, particularly when you use the morse code, because of the many internationally recognised abbreviations used - and in any case you will be very surprised just how many of the world's amateurs seem to speak English. I still remember my very first on the air contact, and realise that it was the beginning of something which has given me endless pleasure ever since, and helped me to make a multitude of real friends all over the world. Try it and see for yourself - you will never regret it!

CONTESTS

CQ WW WPX CW CONTEST

0000 25 May - 2400 26 May

1.8 to 28MHz - no WARC bands. Single-operator single or multi-band and multi-operator all band. There is a QRP section for single-operators - power output must not exceed 5W. Single operator entrants may only operate for 36h, and rest breaks have to be clearly marked in the log and each has to be for a minimum of one hour. Exchange RST plus serial QSO number.

QSOs between stations in different continents are worth three points on 14, 21, and 28MHz, and six on 1.8, 3.5, and 7MHz. In the same continent, values are one and two respectively. Own country QSOs count only for multiplier credit. Multiplier is the number of *different prefixes* worked and each counts once only. The definition of a prefix is rather complicated and if you are serious about this contest I suggest sending me a SASE for a photocopy of the rules.

Entries have to be mailed by 10 July to *CQ Magazine*, WPX Contest, 76 N.Broadway, Hicksville, NY 11801, USA. Logs on disk will be accepted and questions about the contest can be made by packet addressed to N8BJQ @ W8BI.OH.USA.NA.

Results of the **1990 WPX SSB Contest** have now appeared in *CQ Magazine*. As far as the UK is concerned, there were four stations appearing in individual band 'Top Ten' lists - **GB0DX** who was 10th on 7MHz with 881,832 points; **GB8FX** (3,870,435) and **GW4BLE** (3,487,605) who were 5th and 7th respectively on 14MHz; and **G4CNY** who was 10th on 21MHz with 3,281,607 points.

Other scores were: **28MHz GB8DX**, 291,460; **14MHz GM4OBK** 113,092, GM3BCL 81,366, G4ZME 45,360; **3.5MHz G4LRP** 35,880. In the **Multi-operator single-transmitter** class top British entry was **GJ0LYP** with 6,425,280 - he came world 11th. Others were **GM0ECO** (4,412,655), G6UW (3,749,130), GB2SH (3,160,365, GM90CC (2,498,125), G0CCH (1,271,592), and GM0AEE/P (394,060).

CQ M CONTEST

2100 11 May to 2100 12 May

Open to licensed amateurs and listeners. Single-operator single or multi-band, multi-operator multi-band single transmitter and listener sections. 1.8 to 30MHz and via satellites (no WARC bands) phone and CW. Must stay on a band for at least ten minutes. Exchange RS/T and serial contact number (from 001).

Contacts within own country count one point, with other country in same continent two points, and with others three. The multipliers are the countries on the R-150-S countries list (which differs considerably from the DXCC list) worked on each band totalled together. Logs have to reach The CQ M Contest Committee, RSF, PO Box 88, Moscow, USSR, by 1 July 1991. I can supply a photocopy of the rules to anyone entering seriously (SASE please).

AGCW-DL QRP/QRP PARTY

1300 - 1900 1 May.

CW only. 3.510 - 3.560 and 7.010 - 7.040MHz. Class A 10W input, Class B 20W input, and C - listener. Send RST plus QSO number plus class. One point for QSOs with own country, two with others. QSOs with Class A count double. Multiplier is DXCC countries worked on each band. Send log before 31 May 1991 to Stefan Scharfenstein, DJ5KX, Himberger Str. 19a, D/W-5340 Bad Honnef 6, Germany.

GETTING GOING ON HF

THERE ARE various aids to learning the morse code but whatever method is used *practice* is the real secret. I remember mentally translating all kinds of advertisements and notices I came across throughout the day into morse - and it helped.

As well as the extensive GB2RS broadcasts made by RSGB's dedicated band of volunteers, the American Radio Relay League (ARRL) broadcasts code practice from station W1AW located at its HQ in the USA.

It transmits on 1.818. 3.5815, 7.0475, 18.0975. 21.0675, and 28.0675MHz and at speeds from 5 to 35WPM. The 5, 7.5, 10, 13, and 15WPM transmissions are made at 0200, 1300, and 2300 on Monday, Wednesday, and Friday, at 2000 on Tuesday, Thursday, Saturday and Sunday, and additionally at 0200 on Sunday. The 35, 30, 25, 20, 15, 13, and 10WPM transmissions appear at 2000 on Monday, Wednesday, and Friday, at 0200 and 1300 on Tuesday and Thursday, at 2300 on Tuesday, Thursday, Saturday, and Sunday, and also at 0200 on Saturday.

The texts come from *QST* Magazine and their exact source is given before each transmission and speed change. In addition to these, there are news bulletins on CW at 18WPM on the same frequencies at 0000, 0300, and 2100 daily as well as at 1400 on weekdays. The Friday news bulletin consists of DX news. There are voice news bulletins on 14.290, 18.180, 21.390, and 28.590MHz at 0145 and 0445.

The UK novice licence holder has people with similar interests and abilities in a number of countries to talk to. To name but a few - the USA, Bermuda, Australia, New Zealand, and (very soon) South Africa. Look for US novices between 3.675 and 3.725MHz, 21.1 and 21.2MHz , and 28.1 and 28.5MHz but remember that they are only allowed to use phone between 28.3 and 28.5MHz.

DX NEWS

G4VMG IS IN **Gabon** and will be there for the next year. John got his licence after nine months and offers to help anyone else needing a TR licence through the extensive procedures - including the oral test in French! His call is TR8JWH and he normally appears on 21.247MHz between 2000 and 2100 using his TS140S with 100W into a four band vertical antenna. Computer logging is used and cards are ready for immediate despatch. TJ1BJ in **Cameroon** sometimes appears on Mondays at 1230 on 21.303MHz, he also gets on 3.675 or 3.795MHz on Saturdays at 0500.

FT4WC on **Crozet Is** is reported as being on or near 14.115MHz at 1700 every Friday followed by an encore on 14.160 or 14.260MHz at 2000. FT4YD is

Florence, F6FYP, operating from Cameroon as TJ1YL last February — she and F6EEM (TJ1CW) made over 5,000 QSOs.

to be found on Wednesdays on 14.148MHz at about 0700. 5V7SA, in **Togo**, meets WB4LFM on Monday, Wednesday, and Friday on 21.360MHz around 1315 and he is sometimes joined by TL8HW. On Saturdays and Sundays TL8DS, TL8JL, and TL8SC keep a schedule with K4UTE on 21.303MHz at 1230.

UBA says that OR5EEC, the official station of the European Community, will be on the air between 0900 and 1700 on 9 May - the 40th anniversary of the Robert Schuman declaration. Frequencies to be used will be 7.080, 14.180, 21.224, and 28.550MHz.

F6DZU will be using unusual prefixes this year - he will be FU0U in the SSB section of the ARRL and IARU contests and FX0U in the CQ WW DX contest. EZ9AX will be the special call used by UZ9XWV from Komi Republic (Obl.090) from 1 to 9 May. QSLs go to the address in QTH Corner - with SASE please.

DXPEDITIONS

TOO LATE for mention in the last issue was a letter from the Colvins signalling the end of their latest expedition on 17 February, during which they made 40,000 QSOs - and their total countries visited score is now 218.

They operated on this trip from 5H0QL, 7Q7KG, C9QL, ZS9/W6KG, and 9U5QL and also visited the Congo, Zaire, Rwanda, and Uganda but were prevented from operating by time, fighting, or non-availability of licences !

The visit to **St.Peter & Paul Rocks** which I mentioned recently looks as though it may materialise at the beginning of May. Taking part will be PY4VB, PT7AA, PS7AB, PY5AKW, PS7KM, JH1AJT, and DJ9ZB and they should be there for ten days. The callsign is not being published in an attempt to prevent pirate activity. The Natal DX Group points out the very high cost of postage in Brazil with direct airmail costing the equivalent of US $1.48 - so please include more than this for return postage otherwise your card will be sent via the bureau.

HB9SL should be in **Anguilla** until 4 May using the callsign VP2EY, and he will be there again from 23 June to 26 July. He should have a good signal as he has stacked arrays on 21 and 28MHz and a five-wire yagi for 7MHz beamed towards Europe! Also planning to be on from Anguilla are KO8O, KB8WC, and K8BL who will be there from 1 to 8 May probably as VP2EOH mostly using SSB.

PA0VDV will be in the **Netherlands Antilles** from 2 May until 16 June and he will concentrate on using the WARC bands.

A large group of members of the HB9MM club will be in **Andorra** between 10 and 20 May. They will be on all bands from 1.8 to 50MHz on both CW and SSB. The AGCW Group will be doing an expedition to **Geneva** just before the CQ WW WPX Contest at the end of the month and will be on from the IARC station as 4U9ITU.

According to the *RSGB DX News Sheet*, VK2BCH may be on **Rotuma** for three weeks beginning 4 May as 3D2XV. He then intends to go to either **Samoa** or **Tonga** for a few weeks before returning to Rotuma for another three weeks. If you contact him - remember that he only answers QSLs sent to his home address and not those sent via the bureau.

Late news on the VK9NS visit to **Bhutan** is that it will most likely take place and should begin on 1 May. Kirsti and Jim should stay for at least two weeks.

A press release from the French DX Foundation says that F6FYP and F6EEM operated as TJ1YL and TJ1CW from **Cameroon** in February. Their prime motive was to set up a new club station in Douala and carry out some training of new amateurs. They made over 5,000 contacts and they will be returning sometime later this year.

THE EX-G RADIO CLUB

A REMINDER that this exists primarily to keep together those who were born in the UK and now live abroad. It runs a number of nets, the most relevant of which to UK stations are the Family Net which takes place on 21.440MHz at 1130 daily under the supervision of G3IOW, and one which takes place at 1030 daily on 7.090MHz. The UK secretary/treasurer is Ken Haswell, GM2CWL, 6 Cameron Ave, Balloch by Inverness, Inverness, IV1 2JT, from whom more information is available.

Finally, the usual thanks go to those who provided some of the information this month which included: *DX-NL* (DL3RK), the *Long Island DX Bulletin* (W2IYX), the *RSGB DX News Sheet* (G4DYO), the *Lynx DX Group Bulletin* (EA2KL), *DX'press* (PA3CXC), and the *Heard Is DX Association Bulletin* (VK9NS).

Please send all your news for the **July** issue to reach me no later than **May 29**. Thank you.

QTH CORNER

C21JM	PO Box 359, Nauru, S.Pacific.
D68KN, D68TS, D68YD, D68YH	all via JL3UIX, Hiro Kitayama, Box 62, Nara 631, Japan.
ET2A	WB2WOW, 625 Ratzer Rd, Wayne, NJ, USA.
EZ9AX	UA9XC, Andrey V.Pervacov, PO Box 1247, 167001 Syktyvkar, Komi SSR, USSR.
PJ8AD	PO Box 518, Saba, Netherlands Antilles.
TL8MB	F6FNU, 7 res du Val, Ollainville, F-91290 Arpajon, France.
TR8JWH	via G4TWT, H.W.Holmes, 7 Parkland Cresc, Old Catton, Norwich, NR6 7RQ.
ZL9DX, ZL9TPY, ZL9YL	all via JH4RHF, Junichi Tanaka, 1-4-6 Kotobuki, Hattori, Toyonaka 561, Japan.
9Q5UN	via OH3GZ, Varuskunta 47 as 11, SF-11310 Oitti, Finland.

BAND REPORTS

A very interesting month with conditions ranging from superb to deplorable (the kind where you check to see if the antenna is connected) but more of that elsewhere. The most notable feature has been the blossoming forth of 24MHz - most welcome, and long may it continue. I have concentrated on the HF bands this time but much good DX has been worked on LF also - Sheridan Street, A92BE, reports contacts with G3BDQ, G3NHS, G4BAH, GM0BMA, and G0KPW on 1.8MHz during the CQWW 160M contest at the end of February!
This time thank you to G2HKU, GM3CSM, G3s GVV and KSH, GM4CHX, G4s DXW, EHQ, FRV, GW4KGR, G4s MUW, NXG/M, PDQ (and the UK DX Packet Cluster), XAH and ZYQ, and G0s AEV, JZA, KDS, and LRX. CW signals in italics as always:

14MHz

0800	AH6GE, *FO5BI*, FT4YD, KL7, T32LN, ZL9YL
0900	FO0IGS, KA3HMS/KH3, ZL9DX
1000	*OE8NOK/ZL5*
1400	*P29DK*
1500	BV2DA, *JE2POF/JD1* (M.T.), *4K4/UA9CDV*
1900	S01A, T30DR, ZS9S, 7X5ST/3V8 (??)
2000	BV4AO, C21JM, ST0DX, SU1ER, VK9LM
2100	A92FN, WM4L/YI, 9M6GB
2200	BY1QH, J5CVF, ZS8MI, 5U7NU
2300	FR5ZN, VP8CEN, VU2GI, 3X1SG

21MHz

0700	A7/VE7GCK, FO4DL, V63AS, ZL9YL
0800	A35KB, FO0IGS, S01A, 8J8WUS
0900	BV3AI, BYs, JT1KAA, ZL9DX, 5W1s IU, UC, 9V1YQ
1000	DU3/WA6VRS, VQ9AY
1300	BY7WGL, *JA1EIA/JD1* (Ogasawara), P29NEP, PZ2AC
1600	A7/VE3SNL, HV3SJ, KL7GU, YF0CHA, 9N1MM
1700	BV2AR, ET2A, JW0GB, V85CJ, ZD9CS, ZS9H, 9L9DXG
1800	HS1BV, *PA0GAM/ST2*, 7Q7CM, 9M2QQ
1900	D68JM, KH6IDU, S79KMB, ST0DX, 9K2/HB9CVN
2000	FG4FL/A, FR4FP, ZD7VC
2100	TR8JWH, XF0C, ZL4BO
2200	JAs, VQ9IO, ZL9DX, 4K2CX

24MHz

0800	VKs, ZLs, ZSs
1000	FK8ER, FO0IGS, KH4AF, V73BN, ZL1AFU, 9K2EC
1200	D68KN, HL1IKH, TL8MB, VK8HN
1300	JAs, PJ8AD, 9X5NH
1400	A22AA, EL2SM, 3B8CF, ZS6AIS/7P8
1600	A71AL, BV2FA, D68KN, KH2D, S79GHW, ST0DX, W6s, 7Q7WL
1800	A61AD, P40MR, SV0HV/SV9, VQ9JR, VU2NUD, 7Z1IS, 9L9DXG
1900	D44BC, FG5DB, NH6C, KL7XD, PA0GAM/ST2, ZL2ANT, 4K2OIL (F.J.L)
2000	CO5DD, HF0POL, KP2A, 8P6CC, *9Q5UN*

28MHz

0700	BY9GA, JT1BS, *JA4FMS, K6NA, VK4CJB* (LP), V51BG
0800	BZ4WAB, D68KN, KH4AE
0900	BY5QD, AA6DX/KL7, V73AZ, YJ8AB, 5W1JM
1000	BV2AL, ET2A, J5CVF, KG6JJH, KH0AC, *P29PL*, T30A, VS6CT, YJ8RN, YK1AO, *XU8DX*
1100	A61AD, AP5HQ, FK8FR, HL2DIT, HS0AC, VQ9WM, WL7ARV, 4K2OIL, 9N1MM
1200	J28RQ, P29PL, PJ9M, T30NAD, VS6UK
1500	A92FF, VP8CFW, 7Q7RM, 9K2AL
1600	A22AA, C53GB, ET2A, FT4WC, W6-W7s, 5R8JD, 6D2X, 9L1US
1700	A41KN, A92T, D68YD, FH5EJ, V51BG
1800	J6LSW, KH6VG, VQ9HW
1900	D68KN, HC8K (RTTY), NH6YG/KH3, KL7KC, WH6KDY
2000	KH6s, W6-W7s, *ZL9DX*
2100	A71AL, KH6IJ, XF0C

1991 28MHz COUNTRIES TABLE

G0JZA	158	(SSB)	GM0GEI	55	
G4DXW	102		G0DUS/M	54	
G4MUW	101		G4YNG	54	
LA0GC	86		G0KDS	50	
G0AEV	81		G4XAH	40	(RTTY)
GM4CHX	70		G4NXG/M	40	

VHF/UHF NEWS

NORMAN FITCH G3FPK
40 Eskdale Gardens, Purley, Surrey
CR8 1EZ

THIS COLUMN IS for those readers with practical experience of VHF/UHF operation, but this month the Editor has asked regular columnists to include material relevant to Project YEAR (Youth into Electronics via Amateur radio) and what that implies. For regular readers, there is some spectacular 50MHz propagation and long overdue auroral activity to report.

NEW BLOOD

EVERYONE IS WORRIED that the average age of radio amateurs throughout the world is steadily increasing. This can only mean that fewer young people are entering the hobby, hence the reason for embarking on Project YEAR.

If you are content to just *listen* to broadcast or amateur radio transmissions there is no need to pass any examination, but if you want to communicate with other licensed amateurs, you must have a licence. You can either take the Radio Amateurs' Examination (RAE) or the recently introduced Novice course and exam.

YOUTH

There is a lot to be said for serving an apprenticeship as a short wave listener (SWL). I discovered amateur radio by accident during the early 1940s when tuning the short wave bands on the family 'all-wave' receiver. Although British amateur radio operation ceased on the outbreak of hostilities, amateurs in North and South America were still operating normally.

When the war ended I became a very dedicated SWL, participating in set listening periods and sending regular reports to various magazines. By the time I passed the RAE and the then obligatory morse test in 1948, I had a solid understanding of propagation, radio theory, and not least, operating procedures. There was a huge amount of wonderful government surplus equipment available at give-away prices, so I was able to construct simple receivers and transmitters from magazine designs at minimal cost. In the process, I acquired invaluable practical workshop experience in 'chassis bashing' and soldering, and learned how to get things actually to work after I'd built them.

Many of my generation came into the hobby by this route and I hope that the Novice Licence will provide a similar background in the 1990s. But the end result of all this studying and practical work is to communicate with other amateurs by radio, so don't neglect the SWL activity.

WRINKLIES

The idea of Project YEAR is to encourage young people to acquire skills in electronics, but we should also try to persuade older folk to take up the hobby. There are hundreds of thousands of people out there - known as 'wrinklies,' I believe! - who have successfully raised a family, paid off the mortgage and who either have, or are soon to become, retired, some on a generous pension, too.

Quite often they have time on their hands so could easily enrol on a Novice Licence course. They would buy equipment, which would make the dealers happy, and that could generate additional advertising revenue for *RadCom*, so everyone would benefit. Let's not overlook this untapped reservoir of potential radio amateurs.

REPORTING

THE MAIN PURPOSES of this column are to report and analyze what has been happening on the VHF/UHF bands, to publicize proposed operation from rare areas, to provide a forum for readers to air their views and to disseminate general news. Information comes from individual reports sent by post and electronic mail, from conversations over the air and telephone, and from assorted publications submitted by various groups.

To encourage activity and a little friendly competition, I include a couple of tables for licensed amateurs. Anyone can enter simply by sending in the required figures. No proof of contact is necessary and if anyone would like a copy of the rules for the Annual Table and/or the Squares Table, send me an SASE.

The VHF Committee Forum, held during the VHF Convention at Sandown Park on 24 March, provided an opportunity for members to have their say. About *VHF/UHF News*, one person said that he did not care for lists of who worked what, another that he would like to see more in-depth analyses of what caused a particular opening or event.

Priority must be given to reporting what was worked or heard from various areas as these data will be needed for future analysis. In its present condensed form, there is insufficient room for lengthy analyses but really major events are usually written up later as 'stand alone' articles.

CONTEST NOTES

THE NORDIC ACTIVITY Contest is a monthly event open to all amateurs. The 144MHz section is on the first Tuesday; 7 May, 4 June. The 430MHz session is on the second Tuesday; 14 May, 11 June. The microwave leg is on the third Tuesday; 21 May, 18 June and the 50MHz section is on the fourth Tuesday; 28 May, 25 June. All times in summer are 1700-2100UTC.

The UK Six Metre Group has arranged a 50MHz Summer Sporadic-E Contest, a 48 hours affair starting at 0000UTC on 8 June. For a copy of the rules and the recommended official log send an SASE to Richard Lax, G4AHN, who is QTHR.

The ninth *Practical Wireless* 144MHz QRP Contest is scheduled for 16 June, 0900-1700UTC with 3W maximum Tx output power. Full rules should have been published by now in *PW*.

DX NEWS

FIRST A REMINDER of operation from Molene Island by a group of French amateurs 4-12 May, callsign TW3M, locator IN78MJ with thanks to G8BQX and G1KDF for confirming the square. Next, Alexis Duchesne, ON1KTA, Vice-President of the UBA, wrote that OR5EEC, the official station of the European Communities, will be QRV on 9 May, 1000-1800 *local time* to commemorate the 40th anniversary of the Robert Schuman declaration. QRGs are 144.315MHz SSB and 145.525MHz FM.

On to the Reading and District ARC which proposes to operate from the summit of Ben Nevis (HLD/IO76LS), again throughout the 144MHz Open Contest on 18-19 May. Callsign GM3WGV/P; WAB square NN17; preferred QRGs 144.040 and 144.270MHz; station 200W to two 9-ele Tonna Yagis. John Linford, G3WGV, wrote that they made a high quality 35mm and videotape presentation of the 1990 expedition to Britain's highest mountain. If any club would to run these, contact John who is QTHR.

Finally, SM7s AED and FJE propose round-the-clock activity from JO96 square on Gotland Island between 7 and 10 June. This is a very rare square as it has no resident amateur. They will operate on 50.165MHz using split frequencies when necessary. The period coincides with the Summer Es contest and MS reflections are usually quite good in this period, too. QSLs may be sent direct to: Radio Club Grid Ghosts, c/o Bo Nilsson, V. Grevie 22, S-23594 VELLINGE, Sweden.

SOFTWARE

WITH THE GROWING interest in EME (Earth-Moon-Earth) mode, we must calculate the position of the Moon. In the March issue of the *2M Direct* newsletter, Editor Mark Turner, G4PCS, reports that Andy Steven, GM4IPK (SLD), offers to copy the VK3UM EME planner program onto 3.5" 1.44Mb HD discs for anyone sending a replacement disc and 50p for postage and packing. Andy is QTHR.

Mark can provide a similar service for the WA1JXN program which he has for the Amiga computer. He can also put it on any PC-compatible disc for use on an IBM or similar machine. For the Amstrad PCW-series machines, I have the WA1JXN software plus lots of other amateur radio programs but only for these computers which run under CP/M using 3" discs. Send me an SASE for the latest PROGLIST, but please don't send discs with your initial inquiry.

MOONBOUNCE

JUDGING BY THE attendance at Peter Blair's, G3LTF, EME lecture at the VHF Convention, there is little doubting the growing popularity of this challenging mode. The news that, from 5 April, the CW power delivered to the antenna system has been increased to the SSB PEP figure should encourage many more licensees to conduct EME tests. It equates to a whopping 6dB increase, equivalent to going from a single Yagi to four or from two to eight.

The third part of 'The ups and downs of EME propagation' was published in the March *2M Direct* and deals with atmospheric degradation, horizon gain and cos-

mic noise. Horizon gain can account for successful QSOs which were 'theoretically improbable.' This is due to the cumulative effects of ground reflection gain and tropospheric refraction at elevations of around 4°. This is proving to be a very useful series for budding EME enthusiasts.

In February on 144MHz there were activity reports from David Law, G0LBK (IO93JK), Nick Peckett, G4KUX (IO94BO), Andy Cook, G4PIQ (JO01MU) and John Regnault, G4SWX (JO02PB). USA stations worked included K0IFL, N1BUG, K2GAL, KI3W, W4ZD, W5UN, K7CA, W7VXW and KB8RQ. Europeans contacted were PA2CHR, OK1MS, PA3FOC, SM2CKR, SM5FRH and UA1ZCL.

The only 432MHz reporter was Dave Dibley, G4RGK (IO91ON), who found conditions poor to average in the 22-24 Feb period. There were very high winds on the 22nd and poor weather, and troublesome Faraday rotation was observed that whole weekend. He completed random QSOs with UA1ZCL, RB5LGX, NC1I, VK3UM, OK1KIR, PA3AEF, N4GJV and DL9KR.

METEOR SCATTER

THERE ARE SEVERAL potentially useful meteor streams in May starting with the Eta Aquarids, predicted to peak on the 4th. The RA is 336°, DEC -2°, ZHR about 50 and stream velocity 66km/s. The radiant is above a mid-UK horizon between about 0200 and 1300 and prime times are centred around 0600 for the NE/SW path; E/W 0800 and NW/SE 0930. The N/S path reflexion efficiency is only just over 50% around 0500 and 1100.

The Halleyids on the 8th has almost identical parameters and the parent body of both streams is Comet Halley anyway. The Piscids also peaks on the 8th; RA/DEC 12/19° and ZHR 30 while the Omicron Cetids is due on the 14th; RA/DEC 22/-4° and ZHR 15. These last two are daylight showers.

50MHZ

THE 6DB INCREASE IN CW power to 20dBW should produce at least another S-point at the distant RX. The long-overdue removal of the bans on vertical antennas and mobile operation is particularly welcome; it was an important amendment for mobiles, packeteers and local FM nets and should result in increased activity.

The Israel ARC received a letter from the Ministry of Communications dated 3 February granting 4X Class A licensees use of 50.100 to 50.150MHz, 25W output, on a secondary basis. The first 50MHz Israel/British Isles QSO was between 4X4IF and GI8YDZ at 0900 on 15 Feb. UL7GCC in Alma Ata, Kazakh, is equipped for 50MHz reception and has worked crossband to the UK. He listens on 50.140MHz.

The Swedish beacon SK6SIX (JO57) is now QRV on 50.080MHz running 10W ERP to a vertical antenna. JA1VOK reports the following Japanese beacons QRV: JA6YBR (PM51) 50.017MHz 50W turnstile antenna; JA7ZMA (QM07) 50.0265MHz 50W 6-ele Yagi beaming south and JG1ZGW (PM95) 50.491MHz 10W dipole antenna.

February and March were spectacular months with all continents workable. On 3 March, Geoff Brown, GJ4ICD, the new Chairman of the UK Six Metre Group, completed Worked All Continents (WAC) in just over three hours. The first QSO was at 0920 with VK6PA (OG89), followed by JA4MBM, TR8CA, SV1OE, PZ1AP and VE1YX. He also worked over 70 JAs in all districts in this massive Pacific opening. At one point, KG6DX (QK23), whose great circle azimuth is 35°, was coming in at 150°; any comments?

In the available space I can only provide a brief summary of the March openings based on your reports. 1st, South coast to TU and VK; 2nd, TL8, 6W and 9L; 3rd, everywhere, at least from Jersey! 4th, DU1, JA and TU; 6th, JAs galore in GJ, plus DU1, KG6, VK6 and ZS6; 9th, CX4, LU3 and V5; 10th, CX4, LU7, V5, ZS6, 6W and 9L; 12th, FR; 13th, V5, 7Q7 and 9L; 14th, FR, V5, ZS6 and 9L; 15th, FR, PY5, TL8, V5, ZP6 and 6W; 16th, A2, V5, ZS4,6,9 and 3DA0; 17th, TR8, 9L; 18/19th, 9L; 22nd, evening TEP from SW England 1950-2145 to V5, rapid flutter observed; 24th, big aurora to DL, G, GD, GI, GM, OH, ON, OZ, PA and SM.

70MHZ

JACK HUM, G5UM (LEC), complains about: "Operators with East Anglian accents . . ." conducting lengthy QSOs on the 70.450MHz calling frequency, apparently not appreciating there might be mobiles who wish to use it. He suggests the lack of reports received are because; ". . . very few members are interested in DX chasing." He states: "We must accept that an overwhelming proportion of VHF/UHF operators' interest is wholly FM and repeaters. . . . their interests are wholly neglected in the media." Do you agree with Jack?

Eddie Ashburner, G0EHV (TWR), uses a TS-830, home-built 'Spectrum' transverter, QQVO7-50 PA and 3-ele NBS Yagi. In the past three years he has worked about 270 stations, mostly on SSB. It's gratifying to read that *someone* apparently works further than his own back yard!

John Bruce, GI4SJB (DWN), proposes to activate counties Fermanagh and Tyrone this year. He will be QRV from one in the WAB Contest on 9 June and from the other in the Trophy Contest on 29 Sept. He uses an FT-290R and RN Electronics transverter at 25W. The antennas are either a 5-ele Yagi or a 12-ele ZL-type beam.

ANNUAL VHF/UHF TABLE
January to December 1991

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
G8ESB	4	2	13	3	36	6	25	6	4	2	101
G6HKM	12	26	-	-	29	10	12	3	-	-	92
G0EHV	-	-	20	3	12	2	25	4	-	-	66
G3FPK	-	-	-	-	35	7	-	-	-	-	42

British counties are those listed on page 64 in the January 1991 *RadCom*, but excluding HBN; 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.

144MHZ

CONDITIONS IN THE contest on 2/3 March were very uninspiring with no real DX heard from G3FPK; activity and scores seemed well down. The only relief from the boredom of listening to noise was the extensive auroral activity on 24-26 March, which Murphy had arranged for Convention weekend!

Doug Smillie's, GM4DJS (SCD), M-R Magnetometer registered full scale deflection from a very large magnetic pulse at 0340UTC on the 24th, followed by a series of lesser pulses till 1015. A radio aurora began at 1740, ending at 1820.

A second phase started at 2130, followed by more large pulses, until 2400. VHF beacons copied included DL0PR, OY6VHF and GB3s BUX, LER, NGI, RMK and VHF.

Further large pulses were recorded between 0100 and 0500 on the 25th, followed by a strong radio aurora 1300-1815. A second phase occurred 2330-2345. More pulses were noted 0215-0245 on the 26th with another radio aurora, 1428-1605, mostly UK and ON stations heard/worked from Scotland.

On return from the Convention, there were still a few auroral signals at G3FPK, and at switch on again at 2316 I worked EI4DQ (IO51WU), then GM0CDW (IO85IW) and GM0CLN (IO85OU). Stations further north were working SPs and the event was still going on when I switched off at 0100. While working VK2SB on 14MHz on the 25th, there was a sudden, complete fade-out at 0808. More auroral signals were heard/worked later that afternoon.

Colin Smith, GM0CLN (LTH), sent photocopies of his log for 24/25 March. Countries worked were DL/Y, EI, F, G, GM, GW, LA, ON, OZ, PA, SM and SP. Best DX were SP2AOZ (JO94) at 2206, EI8EF (IO54) at 2235, PA0PAU (JO23) at 2249, Y22ME (JO72) at 2340 and SP5CZA (KO02) at 2359 on the 24th, and SP2MKO (JO83) at 0006 on the 25th, all new squares.

430MHZ

JOHN TYE, G4BYV (NOR), reckons many CQ calls are far too short; before he can get to his Rx, the caller has gone.

Another problem is those who replying to his call, give his many times and theirs only once. He suggests it is essential to call on 432.200MHz in flat conditions as nobody will be listening anywhere else.

G0EHV operated in the 2/3 March contest, best DX being PA0PLY. Eddie heard more on the band than on 144MHz and promises to try to stimulate more activity from the northeast. Ela Martyr, G6HKM (ESX), also used the contest to accumulate a few table points.

DEADLINES

THE **JULY** DEADLINE is **30 May** and the **August** one is **27 June**. They are the *very latest* dates for your reports and table entries to pop through my letterbox.

Don't forget I have use of a BT Gold Mailbox - 76:MSX021. You can also Telex messages to 9312 111074(CN).

SWL NEWS

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

DENNIS SARTIN, GW6JNE provides the latest from the HAB scene. With listeners joining the HAB all the time, the Committee is beginning to see some new names coming forward for recognition after attaining awards. This month sees new awards for SWLs Russell, Mead, Brown, Davidson, Rodgers, Destoop and Hague. Congratulations to all.

CRAY VALLEY CONTEST RESULTS

OWEN, G4DFI, provided the results of this ever-popular contest. The Cray Valley Society was delighted with the 1990 turnout, with 15 logs received. This must be the best turnout for a contest by listeners for some considerable time. I hope that the trend continues in 1991, and that other contests - sponsored both by Cray Valley and other RSGB Affiliated Societies - can be blessed with such a fine entry.

David Whitaker, BRS25429, won the SSB event, while another old stalwart, Don Piccirillo, BRS52868, came home first in the CW leg. Space does not allow me to reproduce the full results, but if entrants write to Owen Cross, G4DFI, who is QTHR, with an SASE, he will send the full listings.

50MHZ ACTIVITY

WITH YOURS truly, David Whitaker and Mick Toms, BRS31976, so keen on DX on this band, a telephone alerting system has been introduced. Many of the established HF DXers operate such a system, so why not the SWL?

In the last month, some exceptional DX for a VHF band has been heard by all three of us. Indeed, the following list would grace many 14MHz logs: CG1YX, KG6UH/DU1, KJ6WO/DU3, KE0SC/DU3, TL8MB, TR8CA, TU4DH, VE1XDX, V51KC, W1XT, W2CAP, ZS6WB, ZS9H, 6W1QC and 9L1US. Unfortunately we all have to earn a living and the list of gotaways is as mouthwatering: CX4HS, KG6DX, VK6JQ, VK6PA, VK8ZLX, VS6WV, ZP5XDW and G8MFE/5N2.

On the 50MHz QSL front, David Whitaker reports receiving a card from LU9AEA, while the Bureau provided me with cards from CU1EZ, EI5FK and EL2B.

DXTV

EVEN IN THE 'QUIET' months for DXTV reception, I have still been receiving letters on the subject. This time around, the most interesting communication was from HS Publications who provided much information about their range of DXTV orientated products (books as well as equipment). 'HS' is run by two active DXTVers - Keith Hamer and Garry Smith, who designed the D100 converter used by G0MLE, and mentioned in December's *SWL News*.

Garry agrees that the hobby is taking off here in a big way now, but is also popular around Europe. The 1990 Es season in the UK was not that good although in PA0, Iranian TV was good copy on many days in July. The F2 DX was not as good as in 1989, but signals from VK, W, VE, EP2 and HS were identified. During some tropo in November, ORF-2 (Austria) was copied on Ch 36. Others had copied TV signals from OH and UA on Band III and UHF.

If any reader would like more information on the products - converters, aerials, amplifiers and publications - marketed by 'HS', an SASE to HS Publications, 7 Epping Close, Derby, DE3 4HR will secure the up to date catalogues.

HF SUMMARY

SPRING SEEMS to have sprung early this year, with a number of listeners reporting how good band conditions were in late February and early March. The ZL9, ET and T30 expeditions seem to have kept listeners on their toes, while 1.8MHz provided some interesting DX if you were prepared to lose some sleep.

It is suggested that those who do not care for contests but like chasing countries (if these are two different animals) take refuge on the WARC bands where some tasty morsels were spotted during several of the longer American sponsored DX contests.

Now for our usual summary of conditions. I must thank a number of listeners for their information, but the following report is mainly based on loggings taken from reports received from BRSs 1066, 8841, 20249, 25429 and G1VDW:

28MHz - BV2AL, FR5CN, RA6LEV/JT, JX7DFA, KG6JJH, KH6IAA, VP2V/VE5RA and 9K2SJ; 21MHz - BV2TA, FR/DK9FN, HK0NZY, JH0PGF/JD1 (Minami Torishima), J5CVF/A, J6CQ, OD5ZZ, P29NRJ, T30DT, VK9LM, VS6UK, XW8KPL and 9X5HG.

14MHz (with most DX being heard during early mornings or at night) - A71CD, WE6C/BV2, FT4WC, ST0DX, S79KMB, T30DR, VP8CFR and 9M8WB.

7MHz - A92BE, G3UUV/V2, PJ7/K2KTT and 9Y4EMC.

3.5MHz - FM5DN, K4SXT/DU3; 1.8MHz - CU2CE, FG5R, VP2VM and 9L1US.

The WARC bands provided FO0IGS, KH3AE, VP2MLD, ZS6AIS/7P8, 3X1SG and 9X5NH on 18MHz, 10MHz accounted for VP2V/W2GUP and 4S7NE, while 24MHz produced much DX, the best appearing to be FO0IGS, KL7XD, NH6C, TA3T and 7X5VRK.

PHOTOGRAPH: GM1DSK

DXTV: A Russian news programme.

CQ AWARDS FOR SWLS

EGBERT HERTSON, ONL4003, had written asking if I could give some publicity to the fact that he has received a quite positive response from *CQ* Magazine about them reviewing their policy on permitting short wave listeners to apply for CQ DX, WAZ, 5BWAZ etc awards.

Before coming to a final decision, *CQ* apparently wish to gauge how much support such a move would have with SWLs worldwide. I made a similar request a few years go, but my representations were turned down. Now that *CQ* seem prepared to listen, I would like as many SWLs in the British Isles to write in support of the proposal to widen the very prestigious *CQ* Awards Program to include SWL applications. Simply drop me a line saying you support the idea, and I will ensure that all your letters are sent to the magazine.

INTERNATIONAL LISTENERS ASSOCIATION

GW4OXB HAS WRITTEN with details of the Association's latest activities. The ILA received much backing from *Amateur Radio* Magazine which ceased last autumn; with it went the only other listener column in the UK. However, the ILA will continue but the membership fee has had to rise to £5. This will mean that their newsletter *Just Listening* will expand from its current size of 24 pages. As usual, the magazine has something for all listeners. The current issue includes the results of recent contests, a Medium Wave corner, news on the Airbands, Heard All Britain news, antenna designs and HF DX news. Further details can be obtained from Trevor Morgan GW4OXB, 1 Jersey Street, Hafod, Swansea SA1 2HF.

FINALE

FOR THOSE listeners who have asked, the 1991 HF table is a casualty of the reduced space, but with luck, there might be some more space for the SWL in 1992. For now, please continue to let me have as much news as you can for the listener column. The next deadline is Tuesday 14 May.

THE FIRST FEW potential Novice Licensees have now completed the RSGB Training Course. The very first four were brothers Malcolm and Scott McDonald (aged 12 and 14), Antony Waterfield, and Adam Rose (both 13) from Burton on Trent, who were on a course run by Roy Oakton, G0IWF. The next course completion forms to arrive at RSGB HQ were from Scotland; Colin Wylie and David Herron of Strathclyde and Robert Cloney of Paisley, all youngsters, too. Congratulations to all.

Their next move will be to take the City and Guilds Novice Radio Amateurs Examination on 3 June. The results are expected within a month of the exam so the first Novices should be licensed in the second half of August.

Anyone wishing to find out where local Novice courses are should write to Sylvia Manco at RSGB HQ for a list.

TETNEY COUNTY PRIMARY SCHOOL

HEAD TEACHER, Paul Hewitt, G0NUE, has written enclosing a letter from his pupils (opposite). He organised groups of two or three children to sample amateur radio for an hour or so each afternoon at the end of the school day. They have been so impressed that they felt they just had to write to express their appreciation.

Paul says: "the response of the people we contacted has been absolutely wonderful. QSL cards and even letters have arrived at the school by first class post and the encouraging and friendly interest has made a great impression on the children. The unfailing courtesy and enthusiasm of everyone we have contacted has shone through - what a wonderful advert for amateur radio they have all been."

The next stage is to establish a permanent station and Paul is seeking sponsorship from local industry for the purchase of a transceiver. His experience with running the courses has led him to believe that radio has a great deal to offer young children right across the school curriculum.

Paul's letter ends with a quote from a letter written by one of the children in response to an exceptionally interesting QSL card: "I hope I make more contacts like yours. When I'm older, I hope I'll get a radio and I'll try to contact you so that I could speak to you again."

D-I-Y RADIO

THIS MONTH'S *RadCom* contains a four-page sample of the first UK magazine targetted specifically at the amateur radio beginner. *D-i-Y Radio* number 1 will be distributed free with the July edition of *Radio Communication*, and will be available on subscription after that.

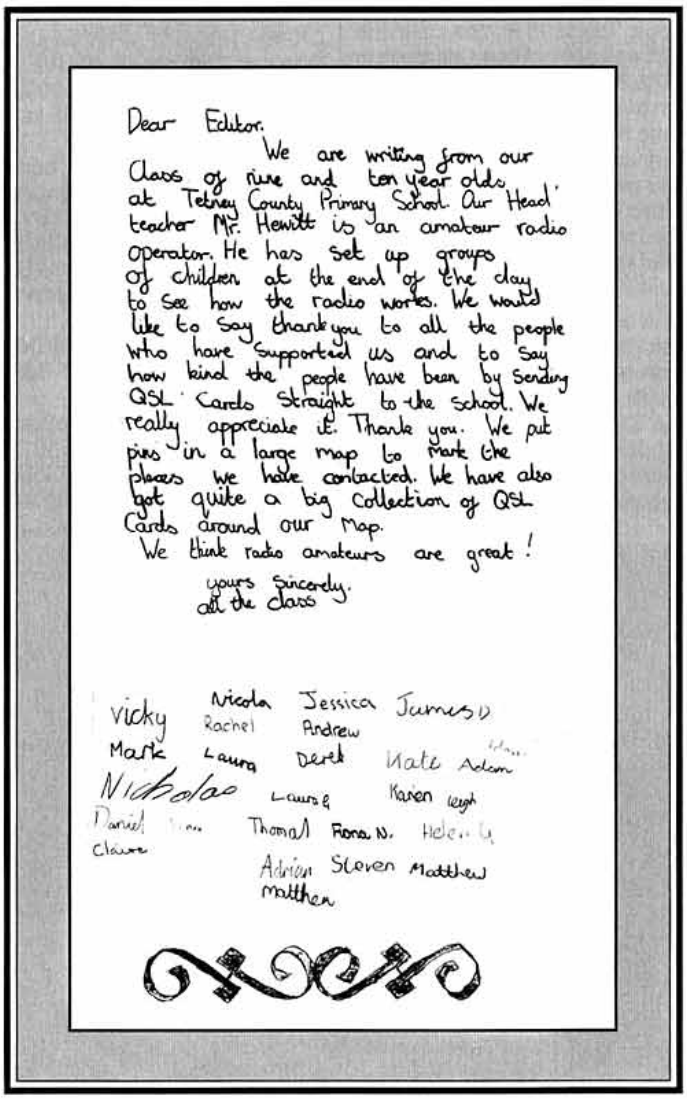
We expect *D-i-Y Radio* to interest many of those who read this column, and RSGB members will be able to subscribe to it at a special reduced rate; see the July edition for details.

If you do not want to read this month's sample yourself, or if you have finished with it, remove it from the magazine and give it away. You are bound to have a young friend, family-member, teacher or youth leader who would be interested in it. Remember, the more youngsters we can interest in amateur radio, the better chance we have of being able to hang onto our frequencies for many years to come. And, in any case, you will want others to experience the pleasures of our wonderful hobby.

HAVE YOU SEEN THE VIDEO . . . .

YOU'VE NOT YET seen the RSGB's video, *Amateur Radio for Beginners*? You have missed a treat. Turn now to this month's club news pages (66/67) to see where the video is showing . . . . at a radio club near you. If it isn't showing, your local RSGB Affiliated Club has been sent a copy; have a word with the Secretary and find out when you can see it.

And clubs, why not write and let us know the audience reaction when you showed the video. RSGB is ready to respond to the increased interest in amateur radio from those who have seen the video. An information pack for newcomers is being sent out to all enquirers.



Dear Editor.

We are writing from our class of nine and ten year olds at Tetney County Primary School. Our Head teacher Mr. Hewitt is an amateur radio operator. He has set up groups of children at the end of the day to see how the radio works. We would like to say thank you to all the people who have supported us and to say how kind the people have been by sending QSL Cards straight to the school. We really appreciate it. Thank you. We put pins in a large map to mark the places we have contacted. We have also got quite a big collection of QSL Cards around our map.

We think radio amateurs are great!

yours sincerely.
all the class

Vicky Nicola Jessica James D
Rachel Andrew
Mark Laura Derek Kate Adam
Nicholas Laura G Karen Leigh
Daniel Thomas Fiona N. Helen G
Claire
Adrian Steven Matthew
Matthew

A delightful letter received from the pupils of Tetney County Primary School.

. . . . OR READ THE BOOK?

LAST MONTH, this column gave the wrong title for the RSGB's new introductory book - well, it was the April edition. The book, as eagle-eyed readers will now know, is really called *Amateur Radio For Beginners*, and it is available by post at £3.88 for RSGB members or £4.56 for non-members. See pages 74/75 for how to order it.

INSTRUCTORS

THE LIST OF Senior Novice Licence Instructors published in February's *Novice News*, and amended last month, had another error. The telephone number of the Senior Instructor for Highland, Rev J Lincoln, GM0JOL, is 0641 2 208.

Novice instructors are needed for Guildford, Kingston, Twickenham, and surrounding areas. Anyone interested should contact Senior Instructor Russell Horton, G4AOJ, telephone 081 668 7003.

NEW COLUMNIST

UNTIL NOW, *Novice News* has been compiled by *RadCom*'s editorial staff from news and information available at RSGB Headquarters.

From next month's edition, *Novice News* will be written by Mrs Esde Tyler, G0AEC, a keen supporter of Project YEAR and contributor to the second pilot edition of *D-i-Y Radio* published last year.

Esde would love to hear from anyone involved in the Novice programme - Instructors, Senior Instructors, Morse Examiners and especially the Novice students themselves, or anyone else who reads this column. Her address is 43 Nest Estate, Mytholmroyd, Hebden Bridge, West Yorkshire, HX7 5BH.

Over the next few months, the column will change in style, partly because of the change of writer, but mainly because it will begin to support those who have been through the exams and have started to enjoy amateur radio as fully fledged Novice Licensees. We hope, of course, that *Novice News* will continue to appeal to those who are not yet licensed.

Propagation NEWS

Compiled from reports supplied by G3FKM, G3FPK and the Propagation Studies Committee

HF

THE G8KG HF report this month proves to be very interesting reading. He says that "solar indices continued to be high right up to the time of writing (25 March) though there had been no days with solar flux above 300 sfu as had been seen in January and February.

Nevertheless the 27-day average had been above 230 sfu for more than 50 days, and the average solar flux for the first three months of 1991 will certainly be the highest quarterly average in Cycle 22, and very probably the highest for the past 32 years.

"The low geo-magnetic activity in the second half of February continued into early March giving, incidentally, outstanding conditions during the weekend of the ARRL SSB Contest. The magnetic field then became rather less settled, taking the edge off conditions on the higher bands during the Commonwealth event but not preventing some outstanding DX openings during that part of the month, including rather rare trans-polar paths on 28MHz.

"Things changed dramatically in the fourth week. In place of the very high solar indices 27 days earlier there came a period of major flare activity, which in turn caused a major magnetic storm (Boulder A index in the 80s on 24/25 March) with auroral conditions and a near blackout on DX paths on the HF bands.

"What happens next will be known by the time this appears in print so it would be foolish to hazard a guess ! Subsidiary peaks in solar activity like the one early this year often last about three months so it is probable but by no means certain that this one is nearing its end.

At the same time the seasonal decline in northern hemisphere MUFs is now taking effect. It may well be that it will be a long time before we see HF band conditions as good as those in the first three months of 1991."

50MHz

FOR THE BENEFIT of those reading this section for the first time, the idea is that it complements the general reporting of VHF topics in the *VHF/UHF News* column.

It incorporates information compiled by Ray Cracknell, G2AHU, from the reports of observers in several overseas countries as well as from a number of regular British Isles contributors. Thus a comprehensive worldwide picture of propagation can be derived.

At the peaks of a sunspot cycle, as we are presently experiencing, longer distance propagation via the F-layers of the ionosphere is possible. Normally, we would expect these F-layer signals to follow a great circle path, but there are consistent reports that this is not always the case. Such anomalies are noted in this feature and explanations suggested.

On 50MHz, signals can also be propagated by other modes, mostly via the lower E-layer which is situated about 100-130km altitude. Most notable is Sporadic-E, the main European 'season' for which is from May to September. It is called 'sporadic' due to it's unpredictability, and received signals are often extremely strong for lengthy periods. The majority are single-hop from stations 1,000 to 2,000km distant, although multi-hop mode does occur.

Auroras produce a curtain of ionization in the E-layer from which VHF signals can be scattered back, but they are always distorted to some degree. Stations in more northerly latitudes can often communicate via Auroral-E mode, a forward scatter mechanism not subject to the distortion suffered by back-scatter signals. Contacts via reflection from ionization resulting from meteor trails are another E-layer phenomenon.

Trans-equatorial propagation (TEP) occurs around the equinoxes on 50MHz and above, the equator in this instance being the geomagnetic one. On 50MHz, this mode can be enjoyed by the most southerly stations in the British Isles. Descriptions of the various VHF propagation modes will be found in the Society's VHF-UHF Manual (see page 75 for price).

HF F-LAYER PROPAGATION PREDICTIONS FOR MAY 1991

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	.....1..	....1211221.	..1344445641	213566667874	656666666898	875333334689	65211..11367	42.....35
MALTA	.....1111..	...12222231.	1.1455555652	323677777675	877766667899	998543345689	886211112478	++3.....4+
GIBRALTAR	.....	.....1..	...122233431	1..355555763	644776667898	998654445689	886422112478	++3.....4+
ICELAND	.....	.....	.....11.	12222331	311245555775	876654445678	776422122346	443.....3
** ASIA								
OSAKA	.....	....11112.1.	...132234231	...142224452	....2...2573	351	.....12.	.....
HONGKONG	....111111..	...13323332.	..1244345652	1..132235774	2.....3686	364	142	.....
BANGKOK	...12222221.	..133444453.	112234446763	311113235886	5.....3688	3.....367	145	2
SINGAPORE	...22322331.	..1344445531	112344446763	311123235886	5.....3688	3.....367	145	2
NEW DELHI	...22333321.	..1344445431	212334446773	432112235886	73.....3689	51.....368	3.....146	3
TEHERAN	..133443442.	..2445556642	325433457875	655211235898	873.....3689	851.....378	62.....146	3.....3
COLOMBO	..133444442.	..2445556642	323335457875	642113235898	84.....3689	61.....378	4.....146	3
BAHRAIN	..1444545431	113555566753	435433457886	766211236898	973.....3689	851.....378	62.....146	4.....3
CYPRUS	..1344444531	112566666753	435777778886	767766668998	987533346799	98421..13578	762.....257	43.....24
ADEN	1.1445656543	323555667765	756533457888	977311225899	985.....2689	862.....378	74.....146	4.....3
** OCEANIA								
SUVA/S	.....	.....	....1111232.	..1221123531	..242...264.	..12.....31.	.....1..	.....
SUVA/L	3213.....64	43351.....75	44573....185	226741...373	..452...155.	..13.....32.	.....1..	.....
WELLINGTON/S	.....	.....1.....	...12222..21	112332221152	11452...1362	..22.....34.	.....11.	.....
WELLINGTON/L	3212.....13	5334.....25	66671.....57	567721...176	23662...374	.133.....341	..1.....1.	.....
SYDNEY/S	...1121.....	..123331....	..25543221.2	112642223314	1.152...2555	...2.....363	.....14.	.....
SYDNEY/L	1.....2	31121.....14	533441....47	434641....67	21263....285	...3.....262	...1.....3.	.....
PERTH	..13344.....	..255551....	32356542....	53234322111.	62..1...244.	3.....364	1.....145	2
HONOLULU	.....	.....	....1111221.	...121113311	..332...22..	..32.....	..1.....	.....
** AFRICA								
SEYCHELLES	1.1444556333	323555667665	756434457888	976211225899	984.....2689	861.....378	73.....146	4.....3
MAURITIUS	2.1445666643	4.3656667876	726535457898	947313235899	975.....2689	862.....378	74.....146	4.....3
NAIROBI	311445667754	533656678877	866633457999	988411235899	9971....2689	884.....378	761.....146	43.....3
HARARE	31.445777755	642656778877	875744457999	997622225899	9984....2689	8861.....378	763.....146	43.....3
CAPETOWN	...345777863	1..666678985	5..865457998	72.752225899	97.52...2689	8832.....378	763.....146	44.....3
LAGOS	4213447777864	642565668987	975763346999	998741115899	99861...2689	8863.....368	763.....146	44.....3
ASCENSION Is	221.44556751	443165567874	776365346897	998553114899	99852...1689	8863.....368	773.....146	44.....3
DAKAR	2112445667763	5334656666885	876764334898	998752112799	99862....489	8863.....168	774.....36	44.....3
LAS PALMAS	1..133344531	211255566763	633677778887	876787777899	998765445799	997532112479	88521....157	552.....24
** S. AMERICA								
Sth SHETLAND	.....57776.	677882	2446895	1....2225897	612.1...2689	8752.....367	774.....35	44.....2
FALKLAND Is	2....1566753	5....2667875	832..3446898	954112224789	99741...1579	8863.....258	7741.....25	44.....2
R DE JANEIRO	211..4566653	432115566775	865325444798	988543212589	99862....279	8863.....48	7741.....26	44.....3
BUENOS AIRES	21.1.3465652	4323.5566775	7656.5445688	987713223589	99862....269	8863.....37	773.....15	44.....2
LIMA	1....1.233332	31.131454454	643353344457	875553222248	99863.....16	8863.....3	6641.....1	34.....
BOGOTA	1....2222332	21..23343454	632244333357	865453221137	99763.....6	7863.....3	5641.....	23.....
** N. AMERICA								
BARBADOS	1...12233332	31.124344454	643354333367	875553211158	99863.....27	8863.....4	6641.....2	44.....
JAMAICA	1111221	2....2232343	521123332246	753333211127	88753.....5	6863.....2	4631.....	.3.....
BERMUDA	1111121	2....2222343	521123332356	753333211147	88753.....16	7863.....3	4631.....1	23.....
NEW YORK	11	1.....111122	41...2222245	642112121136	78642.....15	5863.....2	3631.....	.3.....
MEXICO	111	1.....111222	31..1.232223	532121121113	67642.....	3763.....	.531.....	.2.....
MONTREAL	.....1.	1.....111122	31...1222245	631112122236	77542.....15	5863.....2	253.....	.2.....
DENVER	.....	1	2.....112	4211...11112	46531.....1	2563.....	.231.....	.....
LOS ANGELES	.....	11	1.....11112	2211...12111	25431....1...	.453.....	.13.....	.....
VANCOUVER	.....	.....	1.....1	2111....1111	24431....1...	.353.....	..3.....	.....
FAIRBANKS	.....	.....	....1.....	1..121111111	12332...121.	..32.....	.....	.....

The provisional mean sunspot number for March 1991 issued by the Sunspot Data Centre, Brussels was 140.6. The maximum daily sunspot number was 188 on 16 March and the minimum was 55 on 4 March. The predicted smoothed sunspot numbers for May, June and July, were respectively: (classical method) 125, 123, 121; (SIDC adjusted values) 116, 114, 113.

KITS * KITS * KITS

As Novice Licence training gets under way, *RadCom* shows how it is possible to get on the air cheaply and to have fun doing it.

TECHNICAL TOPICS this month refers to a piece in *IEEE Spectrum* bemoaning the demise of home construction, and many of the points made are valid. However, there is something of a renaissance in 'home brewing', at least for smaller projects. This was clearly shown by the overwhelming demand, in our recent Readers' Survey, for more technical articles.

The *IEEE Spectrum* article goes on to say "I never see ads for kits any more." The author plainly does not read *RadCom* which has always carried advertisements for a wide range of inexpensive kits.

The RSGB has a policy of encouraging manufacturers to provide cheap but high quality kits for those studying for the Novice licence, and for the licensees themselves, as well as the very basic kits which can demonstrate to youngsters the excitement of electronics and radio.

The Lake Electronics catalogue puts rather well the contrasting experiences of home construction and of buying ready-built equipment: "Building your own receiver or transmitter is certainly an enjoyable pastime in itself but the tremendous sense of achievement when you get that first contact or hear that real DX station - all as a direct result of your own skill and effort - is a thrill that once experienced is never forgotten".

The selection of kits shown below range from a solderless crystal set for the very young, to synthesized multi-band transceivers. In addition to being inexpensive and fun to build, it is possible with kits to build up a sophisticated station in easy stages, whilst being able to use the station as soon as the first building block is assembled. In this article, kits suitable for use on the Novice bands (though not necessarily suitable for the beginner to build) have been identified.

A major advantage of kits is that it is not necessary to locate each of the components oneself. Beware, though, that few include every component required to make the finished article; often variable capacitors, potentiometers, meters and knobs are missing, as well as the case. It is correctly argued that these parts are frequently to be found in junk boxes, or at rallies, far cheaper than they can be bought new, but this does reduce the convenience of buying a kit.

There are those who say that amateur radio will never catch on with the young because it is too expensive. Well, have a look at the tables below and you will see it is possible to get on the air for as little as £40.

Home brewers will argue that there are the added benefits of learning a bit about electronics and the thrill of using such gear; low power operators will add that there is a greater sense of achievement in working a station when using only a few watts. Why not have a go and see what they are getting at?

KANGA PRODUCTS

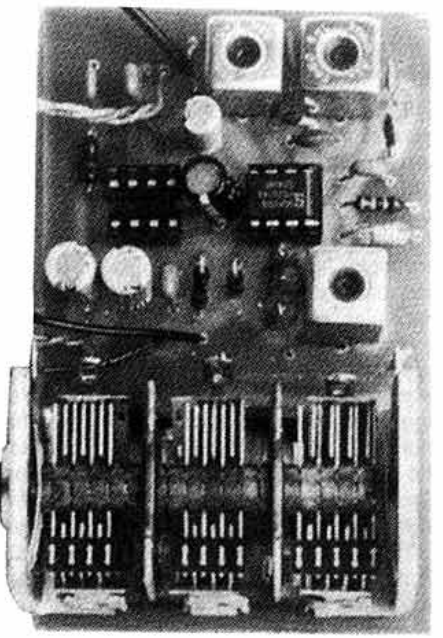
KANGA SEEMS INEXORABLY linked with the very popular G-QRP Club. It follows then that a great many of its kits are in use by low power operators worldwide. Some useful kits are produced for RF measurements, too.

The OXO crystal controlled HF transmitter is described as ideal for the Novice (or those with less than perfect eyesight) to construct. It is supplied with the crystal. A companion receiver is the Sudden which "is almost guaranteed to work first time". Instructions for the receiver are designed for the newcomer. The L.C.K transceiver looks more complex but would provide a good Novice rig at around £50.

Kits have all on-board components but may require other parts and a box to complete the project.

Kanga Products, 3 Limes Road, Folkestone, CT19 4AU. Tel 0303 276171.

The 'Sudden' receiver from Kanga.



KANGA PRODUCTS

Description	specification	price
OXO Transmitter	Xtal CW transmitter (Tx) 'up to 2W' on 80. 40 or 20m	£10.95
Dummy Load	100W load	£10.95
Sudden Receiver	Simple single band (160, 80 or 40m) VFO DC Rx	£19.95
Morse Code Trainer	Code practice oscillator, side-tone generator and audio amp	£12.95
Low Pass Filter	70dB suppression. Single-band (160, 80, 40, 20, 15 or 10m)	£4.95
Power Supply	Voltage control and crowbar safety kit. Just add transformer and large capacitors	£14.95
Crystal Marker	Calibration tones at intervals of 10, 100, 1000, and 10000kHz.	£13.95
Directional Wattmeter	Accurate power meter measuring forward and reverse simultaneously on 1.81 - 146MHz	£32.85
VFO	Stable VFO up to 10MHz, with IRT	£13.95
L.C.K Transceiver	160 or 80m 3W CW Tx and superhet CW Rx	£49.95
L.C.K Receiver	As above but Rx only	£33.93

WOOD AND DOUGLAS

Like many companies which started with amateur radio equipment only, Wood and Douglas has become successful and has expanded into the professional radio sphere. However, W&D has not forgotten its roots and the amateur radio products are still there benefitting now from the professional test equipment available.

The kits require the addition of a number of items such as boxes, microphones and crystals. Many add-on features are available, including tone-bursts, pre-amplifiers and CW filters.

The 6m and 70cm equipment will be useful for Novices wanting a quiet chat frequency, and would be very suitable for data communications.

Wood and Douglas, Lattice House, Baughurst, Basingstoke, Hants, RG26 5LL. Tel 0734 811444; Fax 0734 811567.

WOOD AND DOUGLAS

Project Module	Price (kit)	Price (built)
70cm 0.5W FM xtal Tx	£38.25	£60.75
70cm FM xtal Rx with PIN RF c/o	£57.50	£80.00
70cm Bandpass Filter	£4.00	£6.75
70cm PIN RF Switch	£6.50	£10.50
70cm 0.5W transceiver package price	£94.00	N/A
70cm 3W PA	£26.50	£37.25
4m or 6m 1.5W FM xtal Tx	£34.25	£54.75
4m or 6m FM xtal receiver with PIN RF c/o	£55.00	£75.00
6m Converter with 2m or 10m IFs	£25.50	£36.50
4m or 6m pre-amp	£10.50	£16.50
15W 6m Power amplifier	£26.75	£37.75
2m 1.5W FM xtal Tx	£34.25	£54.75
2m FM xtal Rx	£55.00	£75.00
2m Bandpass filter	£4.00	£6.75
2m PIN RF switch	£6.50	£10.50

Note that all prices are subject to the new VAT rates. Readers are advised to check with the supplier before ordering

CIRKIT

Number	Specification	Price (kit)
41-03435	Miniature MW pre-set tuner for headphone use	£5.50
41-03414	Direct conversion 80m Rx	£15.95
41-03412	14MHz DC Rx (RadCom's RC-14)	£37.89
41-03413	3.5MHz converter for RC-14 or any 14MHz Rx	£24.10
41-03404	ATU matches most antennas to Rx or Tx (up to 20W) 1.8-30MHz	£45.54
41-02501	Single band (160 or 80m) 2W DSB/CW Transceiver	£39.86
41-03400	Improved single band (160, 80, 30 or 20m) 2W DSB/CW Transceiver with synthsised VFO (41-03300)	£60.14
41-02503	Case and hardware for above transceivers	£26.80
39-17700	Digital display for above transceivers	£27.08

CIRKIT

Cirkit has a wide range of kits, including several for the radio amateur, from a simple medium-wave radio project for the beginner at £5.50 to a synthesized DSB/CW transceiver with digital readout for less than £90. A sample of these is listed in the table.

Novices will be able to use the VFO tranceivers for DSB on 160m or CW on the 160 or 80m bands from as little as £40. CW on the 30m band can be had for £60.

Cirkit includes more of the parts than many kit suppliers though some components (eg boxes and knobs) are in a separate hardware kit.

Schools, colleges and universities have automatic account facilities.

Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts, EN10 7NQ. Tel 0992 444111; Fax 0992 464457.

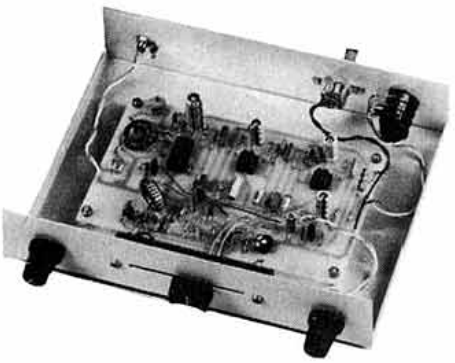
FJP KITS

FJP provide a large range of kits inspired by articles in *Practical Wireless* and *Radio Communication*. There are many cheap projects but FJP also supply all parts for the very sophisticated G4WIM dual-band transceiver, available either per-board or for the entire project.

FJP Kits, 63 Princess Street, Chadsmoor, Cannock, Staffs, WS11 2JT. Tel 0543 506487.

FJP KITS

PW Cub 2m 6-channel xtal Tx inc one xtal	£65.00
2m Rx with box	£60.00
PW Irwell 40m QRP Tx with box	£46.00
PW Otter 6m Rx with box	£50.00
PW simple 6m converter (2m IF)	£18.00
PW FET Dip Oscillator complete kit	£22.00
4m or 6m transverters (2m IF) complete kit	£48.00
RadCom Simple Spectrum Analyser	£62.00
RadCom G4WIM 6m/4m transceiver, complete kit	£492.00



RadCom's RC-14 receiver.

MALSOR KITS

Cat Ref	Description	Price
DSM100	Direct reading SWR/Power meter	£17.50
QCT40	40m 2W CW Tx plus superhet Rx.	£86.00

MALSOR KITS

Malsor produce a most useful kit for reading an SWR directly rather than having to calculate it from forward and reverse measurements. The unit also measures Tx powers from 100mW to 100W, and PEP on a bargraph. The 40m CW transceiver features semi break-in and sidetone

A number of kits require external components. Postage is included in the prices.

Malsor Kits, 21 Green Street, Milton Malsor, Northampton, NN7 3AT. Tel 0604 858090 after 7pm.

BADGER BOARDS

Well known for supplying PCBs for *RadCom* projects, Badger Boards also supply complete kits (via JAB Components) as well as bare boards.

A couple of projects are available for the beginner, and the very popular White Rose receiver would be most suitable for the Novice.

Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield, B74 4JF. Tel 021 353 9326; Fax 021 353 9326.

BADGER BOARDS

Description	Specification	Price
Mk1 Crystal Set	A short wave radio for the absolute beginner	£4.00 + VAT
Audio Amplifier	Beginners amplifier for the Crystal Set or other projects. Inc speaker	£7.75 + VAT
HF Wavemeter	Vital piece of test gear, buildable by the Novice, complete with box.	£20.00 + VAT
White Rose Rx	From Feb '90 *RadCom*, a receiver capable of working from 160m to 2m with converter kits	£29.95 + VAT
	Converter kit - one required for each band	£9.90 + VAT

The HW-9, a professional looking multi-band rig.

MAPLIN

Although Maplin's kits are more expensive than most, they do come complete with all parts, including professional looking boxes. In addition to those listed, Maplin's catalogue includes a Wattmeter/SWR bridge, Balun, Active antenna, noise bridge, dummy load, and a 1000W linear which is definitely not for the beginner.

The Heathkit HW-9 transceiver is suitable for Novice use as it covers 80 and 15m. It would certainly look smart on the shack table but is quite expensive at over £300 inc VAT. A conversion kit is available to add 30, 17 and 10m, two of which are available to Novices. The assistance of someone experienced in radio construction may be required.

Maplin Electronics, PO Box 3, Rayleigh, Essex, SS6 8LR. Tel 0702 554161; Fax 0702 553935.

MAPLIN

Cat ref	Description	Price
HK23A	1.6-250MHz Dip Meter	£121.69 + VAT
HK22Y	Morse Code Practice Oscillator	£23.43 + VAT
H563T	HW-9 CW Transceiver: 4W Tx and superhet Rx on 80, 40, 20 and 15m.	£273.86 + VAT

continued on page 40

PRODUCT NEWS

Note: Product news is compiled from press releases sent in by the manufacturers and distributors concerned. Details are published in good faith but *Radio Communication* cannot be held responsible for false or exaggerated claims made in the source material.

You've seen this month's kits feature; here are two ready-built radios at the cheaper end of the market, plus advice on buying secondhand.

Mizuho MX series

SUITABLE FOR NOVICE Licensees is this 3.5MHz version of the tiny Japanese transceiver available from Maplin at £164.34 plus VAT. Its 14MHz partner was given a user review by QRP expert George Dobbs in February's *RadCom*.

The MX series of HF handhelds, which includes a 7MHz version as well, features SSB, plus the CW usually available to budget purchasers.

Included in the metal case, which is only 66mm by 39mm by 142mm, are a noise blanker, IRT, attenuator, power/signal meter and internal mic, 'morse key' and speaker. Sockets are provided for external mic, speaker and key.

On 80m, a 25kHz wide frequency range can be tuned, but other 25kHz parts of the band are available by installing extra crystals. Power is by the 6 AA dry cells supplied, or optional NiCads. Output is 2 watts.

Maplin Electronics: PO Box 3, Rayleigh, Essex. Enquiries 0702 552911.

The Mizuho MX3.5S is suitable for the novice or low power operator who does not want to build. The picture shows the actual size of the rig.

Buying secondhand?

THE *NEW AND USED Equipment Costing Guide* (ECG) has published its first edition and is already on the way to its second. This pocket-sized 100-page booklet is dedicated to giving information and prices on all manner of new and secondhand amateur radio equipment.

Anyone who uses *RadCom's* small ad pages (and who doesn't?) will find this guide essential reading. In addition to giving the 'list price', and the average price or equipment, the approximate annual depreciation is shown. In case you ever wondered what an AR800E or a PC320 was, or the difference between an FT209 and an FT209RH, each piece of equipment listed is briefly described.

Technology Partners: PO Box 82, Lytham St Annes, FY8 2EN; Tel 0253 62925, Fax 0253 798006.

HF-225 Communications Receiver

BRITISH COMPANY, Lowe Electronics has produced a first class general coverage communications receiver at a fraction of the cost of professional receivers.

At £434, including VAT at the new rate, the 225 is not the cheapest way of buying a receiver. The alternatives are kits or secondhand equipment, but these all leave something to be desired. For the Short-Wave Listener who wants a high specification compact unit which looks really good, the HF-225 is just the thing.

Coverage is 30kHz to 30MHz without gaps, so the receiver is suitable for both amateur and broadcast listening. A synthesizer produces 8Hz steps to give a true 'VFO feel'. Supplied filter bandwidths are 2.2kHz, 4kHz, 7kHz and 10kHz, with a 200Hz filter for CW. The most appropriate filter is automatically selected whenever the mode is changed, though manual selection is possible.

Microprocessor control allows digital readout and 30 memories which can be manually scanned by using the tuning knob.

Claimed sensitivities for 10dB S/N above 2MHz are: 0.3μV on SSB and 0.6μV on AM. Intermodulation-free dynamic range is quoted as >93dB at 50kHz spacing, reciprocal mixing as >90dB at 10kHz in the SSB mode, and all image and spurious responses as >80dB rejection.

The receiver operates from 12V DC but an AC mains adaptor is supplied for home use. Overall dimensions are 253mm wide, 109mm high and 204mm deep. It weighs 1.9kg. Optional extras include a NiCad battery pack, a carrying case, NBFM and synchronous AM detector, remote entry keypad, external loudspeaker and an active whip antenna.

Lowe Electronics Ltd, Chesterfield Road, Matlock, Derbyshire, DE4 5LE. Tel 0629 580800.

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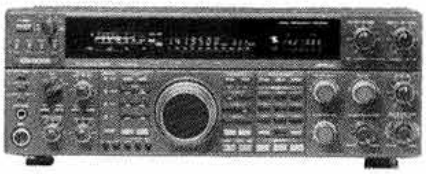
SAVE £ + BONUS

YAESU 1000

Looks beautiful and performs the part well, a new star this one, call for the brochure to see how the other half live

SAVE £ + BONUS

KENWOOD TS950S/SD



Here is a perfect example of high-tech and hi-spec, but there are other giants. Call for the three brochures and compare them from the comfort of your easy chair. ***call 0674 84312***

SAVE £ + BONUS

KENWOOD TS850

We have been playing with this for about six weeks and have to say we are delighted with the rather new approach adopted by Kenwood, not simply the looks of the unit, which are quite splendid - but also the ergonomics which are quite outstanding. The performance matches that too. Call now for info or leaflet.

SAVE £ + BONUS

ICOM 726

Super compact tcvr with DDS, Warc bands + 6 mtrs and gen coverage receiver, it has plenty of features and we have plenty of stock ***call 0674 84312 for leaflet***

SAVE £ + BONUS

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AMCOMM

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Postal Address: *P.O. BOX 73, MONTROSE DD10 9YE*
TEL: 0674 84312 FAX: 0674 84283

AMCOMM Services Ltd, Logie Pert, Montrose DD10 9LA

YAESU 757 GX

An excellent small base station which doubles as a mobile, very popular with a bundle of features that compares with some of the bigger ones.

£ + BONUS

ICOM R9000 & R7000

Two fantastic multi-mode general coverage rcvrs which the professional and commercial users declare the best available, call for the leaflets if you feel you can't afford it you may like to frame the picture of the 9000.

£ + BONUS

ICOM 725

A great deal in a small box and easy to use, DDS, band stacking, general coverage receiver with 10b dB dynamic, 26 Mems, RX to 33 Mhz, call for price and brochure.

£ + BONUS

ICOM R72

HF gen Cov Rx, a real winner say the SWL's and amateurs alike, 100dB dynamic range and Direct Feed Mixer for excellent Cross Mod rejection, includes DDS which places it right at the top.

£ + BONUS

YAESU 747

The highly popular mobile/base, so simple to use and it has no hidden extras, it does have the CW and AM filters and the price is competitive.

Call 0674 84312 for details

VHF TRANSCEIVERS

From Yaesu, Kenwood and Icom three great ranges of VHF transceivers including the very latest ones. Delighted to send you a leaflet. Ask by post or telephone.

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PLEASE PLEASE, NO PHONE CALLS FOR THIS ONE, SASE ONLY.

BUTTERNUT

The full range of these antennae is now available, with good stocks of the highly rated verticals HF6V and HF2V, both have considerable advantage over trap configurated antennae.

£ + BONUS

MFJ, in stock now

Transmatch devices, 949, 962, 949, 945 and others, also 931 artificial ground, dual tunable CW/SSB filter type 752C, plus keyers and more.

Call 0674 84312

STOCK POSITION

Please note that at the time of writing, all advertised on this page is in stock, however, we cannot guarantee this will be the case when you read this. We are now producing advertisements six weeks ahead of publication — and the stock position may change.

£ + BONUS

Lots of receivers

HF, VHF and scanners including the R1, R100. HF from Kenwood, Icom and Yaesu, send or phone for details.

YAESU FT767GX

Now with a spec to match the best of them and priced most reasonably against the giants. A transceiver that matches the manufacturer's high spec, and can be expanded to other bands. Phone for details.

FAIRMATE HP200E

Now with full coverage from 500KHz to 1300MHz, absolutely no breaks whatsoever, 100 programmable memories, No back up batteries required, protected against accidental mains input, scan speed 20 channels per second. Call for more details and price **0674 84312**

Other products

Alinco, Azden, Diamond, Revex, Welz, Sagent, Jaybeam, Datong, Bnos and quite a few more.

£ + BONUS

NEW NEW NEW ICOM IC W2

Handheld Transceiver with simultaneous dual band receive on 144 and 430 MHz and... (will it all go in this space?). Dual RX function and display, separate volume and squelch for each band, built in pager and code squelch, 60 mems and 2 call channels. Mono or dual band by choice, FULL DUPLEX, speaker jack for each band, 5 watts out, DTMF for auto dial, CLOCK, Variable tuning steps, Auto power saving, power off timer. NO we didn't make it . . . There IS much more ! ! !

Call for details 0674 84312

FINALLY

We are bulging with second-hand bargains, if you want a good one we have used equipment right across the main ranges including Kenwood 940/440/430++, Yaesu FT101ZD's, FT902DM, FT757, FT1, FT107++, Icom IC720/735/725/781+++. An HF Collection All in super condition with long guarantees and competitively priced. A good quantity of VHF and UHF multi mobiles, and base stations such as IC780, FT225RD, YAESU 480, TS9000/9130 and all the usual handhelds. Send SASE for the latest AMCOMM FLYER, IT IS FUN AND THERE ARE SOME BARGAINS EVERY PRINT.

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We can offer you probably the best trade-in price on really good condition equipment. If it is working and clean you can be sure of a ***top price for your gear.*** *CALL ALEC GM5VS*

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TOPICS

PAT HAWKER G3VA

SAD STORY OF AN ELECTRONIC HOBBYIST

AS RADIO AMATEURS WE are still, if only on a much reduced scale, survivors of the golden age of electronic do-it-yourself. It *is* still possible to experience the satisfaction of making a unique piece of equipment or trying out your own antenna ideas, even if most gear now comes from the factory in black boxes. Other electronic hobbyists, who were once avid constructors, are less fortunate. Robert W Lucky in the *Reflections* column of *IEEE Spectrum* (July 1990, p6) tells a sad story of lost glory:

"Electronics used to be fun. Maybe it still is, but sometimes I have doubts. When I was a youngster, I discovered *Boy's First Book of Radio*. Each chapter told how to build an ever more complicated radio, starting with a crystal set and ending with a superhet . . . . I found that miracles could be wrested from vacuum tubes. All you had to do was to wire them up in endlessly possible configurations, and you could pull voices out of the ether . . . .

"Transistors came along, but no matter, they were just like little tubes, and by wiring them together with resistors and capacitors, you could do neat little things. I concentrated on kits. See my great hi-fi system? Built it myself, saved a bundle, and if anything ever goes wrong I can fix it . . . .

"Then something changed. Integrated circuits came along, and all those transistors and resistors got scrunched into little chips. Worse yet, all the wires were in there, too, with the external wires etched onto a printed-circuit board . . . . They still sold kits, but now all you did was stuff the parts onto the board and solder the connections . . . . I began to wonder why I was doing this.

"Just about the time most of the fun had gone, personal computers came along . . . . The microprocessor was a fantastic engine, but it was only a single chip. Lots of other stuff had to be designed and wired, and hardly any software existed. I was more proud of my home-designed computer than any of those hi-fi kits.

"Now my third-generation (factory-built) computer is humming quietly while I write this on one of those ubiquitous word processors. There is still something wrong with the computer, but I haven't the chance of the proverbial snowball of fixing it myself . . . . The VSLI chips have only cryptic markings. There is no circuit diagram for this clone without a brand name. Nothing is socketed.

"I never see ads for kits anymore. It costs more to package a kit than to build the finished product . . . . When you see PC boards go through the factory, you realize why it makes no sense to wire or solder things yourself. Ever try to buy the parts? Forget it. They cost a lot more than the finished and tested board. If something goes wrong, buy a new board.

"Software seemed the salvation of the hobbyist. Everyone could do his own thing. I wrote operating systems, compilers, editors . . . . it was more fun, it was educational.

"The golden age ended. I looked around for some program to write. Anything I could think of had already been packaged and worked far better than one I could write. There was no excuse for building either hardware or software. I went to a computer flea market that has been a source of experimental junk . . . . I found myself looking at 500 stands all selling the same two dozen commercial products. What was I doing there?

"I hear that enrollment in electronic engineering has been dropping steadily. I'm looking at my keep-your-hands-off clone, do you think there is any connection?"

[Though the point is taken, this pessimistic view is not entirely supported by the number of ads in RadCom *for kits - see page 24 Ed]*

END FEEDING A WINDOM AND RELATED TOPICS

LES MOXON, G6XN, IN *TT*, February 1989, pp111-112, introduced the radical concept of end-feeding a Windom-type antenna by inserting a specific capacitive reactance a given length along a resonant wire element, preferably keeping reasonably short the length of the single-wire feeder connected to the end of the antenna: **Fig 1**.

He has now provided an up-date on this concept, including showing a means of end-feeding the element from co-axial cable with counterpoise, showing also the potential of this approach for other antennas, including arrays.

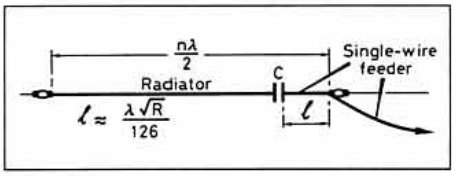


Fig 1: G6XN's end-fed Windom antenna with single-wire feeder as described in *TT*, February 1989). λ is wavelength in feet. R is radiation resistance (referred to a current loop). A value of 500Ω is assumed for the impedance of the single-wire feeder. Reactance of capacitor C is 1/λC approximately equal to 70λ/l. Values found in practice:

At 7MHz, l = 12ft for n = 2 (C = 27pF).

At 29MHz, 1 = 2ft for n = 1 (C variable and not measured but estimated to be about 5pF).

Principle of operation: From a point of maximum RF voltage on the antenna, one moves a short distance outwards to find an impedance (from a Smith Chart) equal to R + jx, where R matches the single wire feeder, X being tuned by the capacitor. Since l is short and current in it small, its virtual removal from the radiator has negligible effect on field strength.

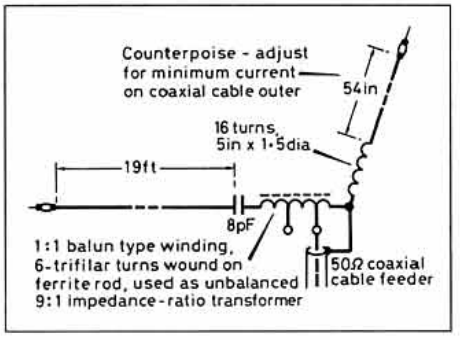


Fig 2: The G6XN Windom with 'zero-length' single wire feeder arranged for end-feeding from coaxial cable feeder with short resonant counterpoise.

G6XN writes: "As described in February 1989, the end-fed Windom has the same defects as the ordinary Windom, ie radiation from the feeder and losses in the ground return path, but nevertheless derives interest from the defects of *other* forms of end-fed antennas (despite their convenience at typical sites). Suppose, however, that we shorten the single-wire feeder so that the matching unit (complete with the artificial ground) gets dragged up towards the antenna followed by the 50Ω-ohm line connecting it to the transmitter (akin to the FD4 form of Windom described in the December *TT* - G3VA).

"Let's go all the way. We now have an antenna end-fed with a co-axial cable feeder as in **Fig 2**. The single-wire line, shrunk to zero length, cannot radiate. My work on ground planes provides proof that the antenna current will return directly to the counterpoise (except at very low heights) instead of via the ground. (Nor should the co-axial cable radiate unlike the situation with an off-centre-fed antenna - G3VA).

"Incidentally we can do anything we like with the antenna proper, subject to the conditions outlined in February 1989, without any change to the (matching) transformer since its impedance ratio is given by Z_o(wire)/Z_o(cable), ie about 11:1 with R not involved. We can shorten the antenna by loading its further half capacitively or inductively, it can be any number of half-waves (minus a little bit) long, or you could replace it with one of the 'inverted ground planes' (resonant T-antennas) described on many occasions in *TT* and *Amateur Radio Techniques.*

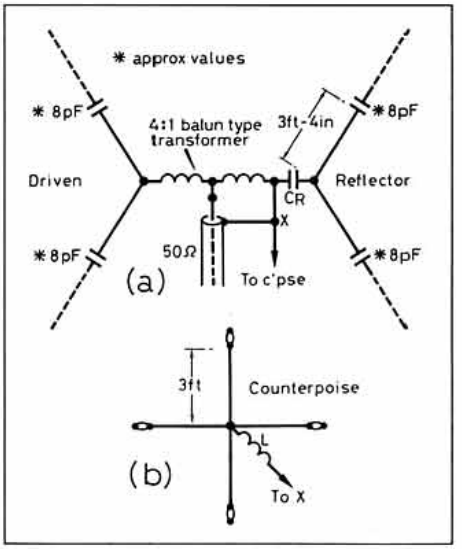


Fig 3: (a) Single-pole-mounted, switchable four-quadrant directional 21MHz array modified for end-fed Windom-type feed. CR tunes reflector by resonating with the single-wire feeders (which in the reflector case are "inductive connections to ground" so the inductance has to be removed.

(b) Counterpoise details. Four radials (each 3ft long) are used for reasons of symmetry. L is 8 turns, 2.75-in diameter, 6-in long, wound over fishing rod extension.

"Different again, and possibly much more important, is the *nearly* zero-length version which can be used to push points of high RF voltage away from places where they are causing problems such as inside the shack, or on switch contacts. This opens the way to what I believe to be a major breakthrough in

the design of directionally switched arrays based on vertical dipoles (eg Fig 162, p333 of *Amateur Radio Techniques*; 7th edition out-of-print, or Fig 13.9b of my book *HF Antennas for all Locations*). These arrays, in which four dipoles are held up by a single pole, have attracted a lot of interest in spite of the difficulty of switching them remotely. One or two people have succeeded in this, but hitherto it has not been easy. By inserting capacitors at 0.075λ from the bottom ends of the dipoles they can become 'single-wire, end-fed' elements in pairs as in **Fig 3(a)** which shows some details of a 21MHz array I have just completed. This achieves four-quadrant directional switching by means of a pair of 'ordinary' double-pole reversing relays. Thin wire elements are used (20SWG) held up by a 17ft fishing rod with its base 4ft off the ground.

"Earlier experiments, at 14MHz, disclosed an important new aspect of this type of array: the very wide bandwidth which results from the use of two widely-spaced wires in parallel. Hitherto, this characteristic had been masked by the very *narrow* bandwidth of the Zepp-type feed, especially when using the (essential) G6CJ balancing stub. The change in SWR over a 2% band was barely detectable, and in one case the null depth exceeded 30dB over more than 100kHz without retuning. Less useful was the discovery of a small horizontally-polarised *low-angle* mode associated with *low* antenna heights. If one considers the top and bottom halves of the antenna separately, there is a small horizontal component resulting from the phase-difference between reflector and driven elements; this has a figure-of-8 pattern at right angles to the main beam. The 'top' and 'bottom' contributions should cancel each other out, but if the height and the angle of radiation are low enough the 'bottom' is less effective than the 'top' so cancellation is incomplete.

"Unfortunately at my present QTH, because of sandy soil and lots of trees, vertical antennas are very poor low-angle radiators (though quite useful at medium angles). The upshot of this was that in tests with VK5MS, towards the end of a path-opening, the horizontal mode actually took over! These 14MHz tests were discontinued when a faulty relay coincided with realisation of the need for a less cluttered environment. Not being able to expand the environment, I am contracting the antenna by changing to 21MHz instead!

"The result does little for popular beliefs about vertically-polarized antennas. On the other hand, in a good location they can give consistently good DX results with very modest structures *which do not need planning consent*!"

In a postscript to his report, G6XN adds some further relevant information: "I have found it impossible to design broadband (several octave) transformers for 550-600Ω impedance despite the ease of doing so for 200Ω. The trouble is self-capacitance, but for monoband operation all one needs to do is partly withdraw the core from the winding so that a GDO indicates resonance (with the transformer isolated) or if everything else is correct one can tune it for minimum SWR when *in situ*.

"Earlier references to this type of array have pointed out that the four wires of the beam can be arranged in either a 2- or 3-element configuration, but 3-elements can no longer be recommended as one loses the broadband feature, and there is an overcoupling problem with 2-elements which is cured by the new feed system (another plus). Attempts to apply this to the 3-element case proved a dismal failure in line with experience with a 3-element Claw antenna, emphasising the general problem of having 'too many variables', whereas *given a proper understanding* of the principles, optimisation is easy with two elements. One has to concede an advantage of 1.5-2dB (half an average S-point) to three elements but only if one has a long boom and can get it up equally high! (NB 'trapped tribanders' are a different case)."

MORE ON OFF-CENTRE-FED (WINDOM) ANTENNAS

FURTHER TO THE ABOVE, G6XN writes to clear up a potentially misleading comment that I made in the discussion about the family of off-centre-fed (Windom/VS1AA) antennas in *TT*, December 1990. He points out that "far from being non-radiating, the two-wire (300Ω) feeder, especially as shown in Fig 3(d) of the December issue, can be quite efficient as a radiator of vertically-polarised signals, which may well account for its apparent success."

The reason is that, for a twin-wire feeder line to be non-radiating, the voltages and current need to be balanced throughout its length, a condition that does not apply when the feedpoint to a dipole element is not balanced about its centre.

G6XN writes: "Using my 'square-counting' method (see 'Radiation from a conductor' *HF Antennas for all locations*, p9). I have calculated that for a feeder length of one half-wave, total radiation from the antenna will have identical vertical and horizontal components. This, admittedly, ignores any change in impedance (Z) at the feed-point, which could change the balance between vertical/horizontal components, but seems unlikely in practice to make much difference."

To explain his conclusions, G6XN has sketched the current distribution starting from each end of the dipole element where current is zero: **Fig 4**. He writes: "There is (current) balance at the feedpoint, but below this (in the feeder) the maximum current in the right-hand wire nearly coincides with minimum in the other. For the arrangement of December's Fig 3(d) a likely consequence, apart from radiation from the 300Ω line, could be lots of current on the outer of the braid of the co-axial cable section, but this will depend on other factors as well."

It must be stressed that the radiation of a vertically-polarized component, resulting in mixed-polarization is not necessarily a bad thing, as users of inverted-L type antennas have long found. Indeed it can be an advantage for HF ionospheric propagation, not only because of the potentially low-angle radiation (over good ground) of the vertical component but also in reducing fading (polarization diversity) so perhaps we should not worry overmuch (and possibly in some cases even welcome) the radiation from the feeder in this form of Windom-type antenna.

In fact, Bill Wright, G0FAH reports finding a 66ft (half-size) version of the Fig 3(d) type of multiband Windom/VS1AA a useful antenna that can be arranged to be used, without an ATU, on 21MHz as well as on 7, 14 and 28MHz simply by using a resonant length of 300Ω ribbon feeder and then swapping on 21MHz a different ratio balun transformer.

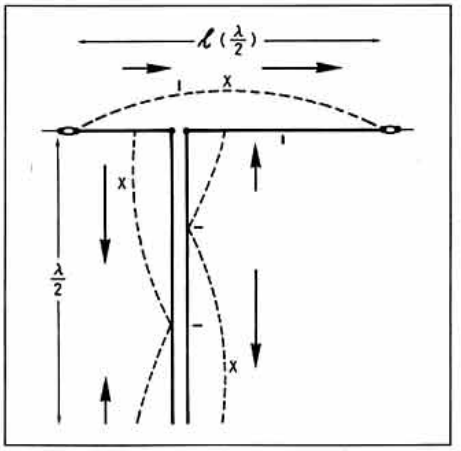


Fig 4: Using his 'square-counting' procedure (760 squares for both horizontal and vertical portions) G6XN considers that with the one-third off-centre-fed Windom/VS1AA of the dimensions shown, vertically-polarized radiation from the 300Ω twin-wire feeder would be about equal to that from the horizontal element.

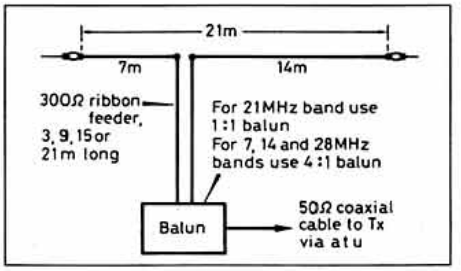


Fig 5: G0FAH's multi-band Windom/VS1AA antenna which on 21MHz uses the 300Ω ladder feeder as a quarter-wave impedance transformer to provide a match to the coaxial cable with a 1:1 balun, but is used on 7, 14 and 28MHz with a step-down balun. Without an ATU it should be possible to obtain a VSWR of 2:1 or better on each of the four bands, although a simple non-critical tuner (eg T or L network) can be used to adjust the VSWR to unity. Adjusting the feeder length a few centimetres may be required for optimum match on 21MHz. Best results were obtained using toroid-type coax baluns as described in *RadCom* March 1982, using two TVI ferrite rings taped together and then wound with RG58 cable. G0FAH advises coating the ribbon feeder with car polish to waterproof it since this reduces VSWR changes in wet weather.

G0FAH writes: "I have, like many experimenters, tried all manner of bits of wire in the search for that elusive 'all-band' antenna, but feel we need to consider just what we mean by 'all-band'. Given that most of what we call 'wire antennas' (ie ignoring quad-type and VK2ABQ-type arrays) are non-rotatable and, for the lower HF frequencies well under a half-wave above ground, we seldom have much control over where signals from it will be directed. 'Gain' is only worthwhile if it happens to be directed towards the distant station which we wish to contact. We do, however, have some control over how well the antenna system matches our transmitters and make it easier to do away with the need for an ATU - or at least not have to put up with critical ATU adjustments in order to meet the

requirements of fussy black-boxes as well as operating convenience.

"Thus virtually all multiband wire antennas concentrate more on attempting to achieve a good 50Ω match on as many bands as possible, taking 'pot-luck' on the question of radiation lobes. My version of the Windom is no different in this respect. It presents a good match on four bands, and with the use of a wide-range ATU could be made to function on at least some of the other HF bands.

"As shown in **Fig 5**, it is a 'half-size' Windom of the December Fig 3(d) type, fed one-third from the end with balanced 300Ω slotted feeder. With a 4:1 balun this can be transformed to 75Ω unbalanced co-axial cable, providing a reasonable match on 7, 14 and 28MHz regardless of the length of the 300Ω line.

"On 21MHz the 'top' is three half-waves long and the feedpoint is at the junction of two of these half-waves, in other words a high-impedance point which can be transformed down to a low-impedance by making the feeder an odd number of electrical quarter-wavelengths. With slotted ribbon feeder having a velocity factor of about 0.85 this means the feeder can be 3, 9, 15 or 21m long, using a 1:1 balun on 21MHz.

"I put up this antenna using 9m of feeder and measured 2:1 or less VSWR on each band, swapping baluns when changing to the 21MHz band. A simple L-network ATU was used to get spot-on matching without restricting the good bandwidth. A useful solution to the multiband problem, although as a true experimenter since superseded with a bi-directional Lazy-H 21MHz antenna giving some 5.5dB gain towards the USA (though also to Italy)."

DANGER HIGH VOLTAGES

IN THESE DAYS OF 12V solid-state rigs, there exists the problem that many of the present generation of radio amateurs have never worked with valve equipment having a DC HT rail of anywhere from about 250V up to possibly 2kV, or even 3kV for the full-legal-limit-plus linear amplifiers, and with 240V AC mains and the transformed-up AC voltages all within the 'works'. It is rightly the practice in most articles describing valve amplifiers to draw readers' attention to the risks involved when working on or adjusting such equipment when not fully enclosed.

Since the most serious risks arise from current (of even a few mA) flowing near the heart and causing fibrillation, it has traditionally been the practice to advise those working on high-voltage equipment to keep one hand in their pocket and not to wear headphones or personal jewellery such as rings (equally important with 12V vehicle battery supplies since a short-circuit of such a battery through a ring or metal watch strap etc can cause very serious burns). As ancient doggerel lore puts it: "Volts jolts, mils kills". High RF voltages, which will be present in an ATU, tuned feeder, antenna etc even if the rig is only fed from 12V or nicad batteries, can produce painful skin burns from quite low power transmitters.

So prudence and safety precautions are always in order, particularly if other people (or pets) have access to any 'live' parts of an installation. But, nevertheless, it would surely be a sad day if amateurs came to believe that all high-voltage equipment is 'too hot to handle'. Most of us who grew up in the valve era have known the painful experience of getting a finger or hand across 350V, 500V or even 750V DC. I can vouch for the fact that the experience, particularly if your skin is at all damp, leaves one extremely shaken and most reluctant to repeat the experience. *[Me too - Ed]*

But I cannot help feeling that one author in *Practical Wireless* (April 1991), in describing his reconstructed version of a 1953 *PW* design of a transmitter-receiver using a 6V6GT valve as a crystal power-oscillator, and 6K7GT/6SJ7/6V6GT 'straight' 1-V-1 (one RF stage/regenerative detector/one AF stage) receiver, with both transmitter and receiver powered from a 250V HT line, goes rather over the top, in respect of a rig giving an RF output of only about 3-4W. He states: "A potentially hazardous problem is that **VERY HIGH VOLTAGES** (sic) are present in the unit. Under certain conditions RF voltages of up to 1000V peak-to-peak may be present."

Not much to argue with that, but then he goes on to write: "This level of voltage and frequency can 'jump' *several centimetres* (my italics) to 'earthed' fingers and knuckles. This is a particular hazard if you are wearing a ring. I'm speaking from experience, and I know this type of RF burn can take many months to heal."

Yes, very unwise to wear a ring, but can

WIDE-TUNING-RANGE VXCO

THE ITEM 'Variable ceramic-resonator oscillators' in the February *TT* showed that it is possible to shift frequency by up to about 70kHz with a 375pF variable capacitor and a 3.58MHz low-cost resonator. But, as noted then, such an oscillator, although capable of giving a good, clean and stable output, will not have the same low temperature-coefficient that can be expected from an AT-cut quartz crystal with a suitable zero-temperature-coefficient turn-over point.

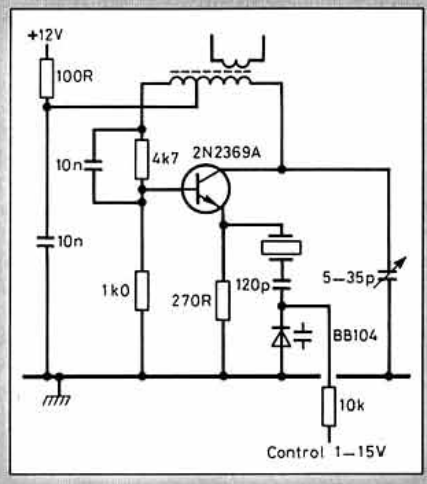


Fig 6: Series-resonant voltage-controlled crystal oscillator. Two similar oscillators are used by G3MEV at 20MHz and 21.4MHz.

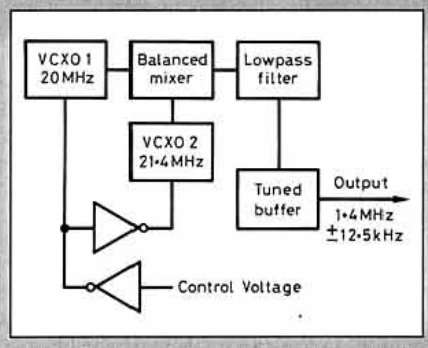


Fig 7: Block diagram of G3MEV's heterodyne VXCO providing an output at 1.4MHz +/- 12.5KHz.

Crystals, which are designed to work into a specific capacitance loading (usually about 30pF), oscillate at a frequency that can be pulled only a modest amount by means of a variable capacitance; mechanical or electronic tuning diode. This can be extended by adding inductance, but even so this tends to degrade the signal after a few kHz. In the March *Radio Communication*, PA0KSB showed how, by using a VXO as a timing reference for a huff and puff type stabiliser, it is possible to achieve a highly stable oscillator working over several hundred kHz; but this is undoubtedly a rather complex approach.

Chris Cory, G3MEV, has devised a much simpler 'heterodyne' VCXO which, in his prototype model, achieves a required frequency swing of 25kHz (1.4MHz +/- 12.5kHz). He writes: "There are many occasions when an oscillator is required having the conflicting requirements of crystal stability and VFO tuneability. My solution has none of the disadvantages of synthesizers or VFOs, providing a wide-tuning-range voltage-controlled-crystal-oscillator (VCXO):

"The basic concept is an old one, using two high-frequency oscillators mixed together, to produce a much lower output frequency. For my particular application, one crystal frequency is nominally 20MHz and the other 21.4MHz, producing a required frequency of 1.4MHz.

"**Fig 6** shows the standard series-resonant circuit configuration used for both oscillators. This permitted pulling either crystal by 12.5kHz with a variable 3-35pF capacitance. By simultaneously pulling the two crystals in opposite directions, a range of more than 25kHz can easily be realised. Pulling is achieved by using varicap diodes (BB104), driven from opposing polarity voltage sources. A pair of 741 op-amps provide the required swings of 1-15V and 15-1V, with the advantage of keeping the varicap control line at low driving impedance. A block outline of the complete arrangement is shown in **Fig 7**.

"A suitable differential capacitor might do the job equally well, but bear in mind that stray capacitance is the biggest enemy of crystal-pulling. I have not attempted to explore an ultimate design and it is quite possible that the tuning range could be extended by a significant factor."

anybody seriously believe that 1000V p-p from a 3-5W transmitter can really 'jump' several centimetres? This is in an equipment with a pi-network tank circuit having a receiver-type 350pF variable capacitor with plates less than one millimetre apart?

An old rule-of-thumb figure given in Reference Data for Radio Engineers suggests that (at sea level) it takes about 30kV (up to 300MHz) to break down a spark gap of 1cm. Even with a needle gap 1kV would 'jump' less than 1mm and much less than that between smooth or rounded surfaces! If one accepted the author's statements at their face value, the variable capacitors for high-power linears would need to be truly gigantic!

Don't get me wrong though, his 3.5MHz simple valve rig makes an interesting project for anyone wishing to try their hand at valve equipment similar to what many of us once cut our teeth on. Though old-timers may smile at the apparent surprise of author or editor in finding that "valves still produce good results on 3.5MHz". It would be even more surprising if they didn't! More relevant though is the difficulty these days for those without well-stocked junk boxes is finding high-voltage components and high-value variable capacitors.

THE MYSTERY OF THE DAH50

AN OBITUARY IN *Nature* (21 February) following the death on 30 January of John Bardeen who, late in 1947 at the Bell Labs, with W Brattain, discovered and named the transistor (he was twice the recipient of the Nobel prize for physics as he was also the 'B' of the BCS theory of superconductivity) commented: "It is impossible to overstate the importance of the transistor and the semiconductor physics which flowed from it. The developments far overshadow both nuclear fusion and fission and have unquestionably had the largest economic and social impact of any idea in modern physics."

It may seem oddly perverse that so many remain fascinated by the history and lingering applications of the pre-transistor thermionic valve with its wasteful filament or heater and the high voltages applied to the anode. I can offer no theory why this should be so - but there is plenty of evidence that, like the enthusiasm for steam trains, it exists.

Not all valves were designed to run from high voltages, at least for small-signal applications. In the late 1950s both Mullard (Philips) and Brimar marketed multi-electrode valves that could run directly from 12V car batteries. They were used in a number of 'hybrid' car-radio receivers with an early power transistor (usually OC16) as audio output stage. The Mullard series included ECH83, EBF83 with 6.3V heaters that could be wired in series-parallel and served as frequency changers, IF amplifiers, AF amplifiers etc. The Brimar range included the 12AC6, 12AD6, 12AE6 with 12V heaters. By combining these low-voltage valves with a transistor output stage, there was no requirement for vibrators or any other form of DC-DC inverter. The reducing cost of transistors, however, soon made 'hybrid' designs unnecessary, and I cannot recall anybody using these low-voltage valves for amateur radio, although some conventional valves would oscillate or provide voltage-amplification with an HT of around 15V.

Recently Dr Tom Going, in connection with his interest in the history of radio, has raised a question about an earlier low-voltage valve - the Philips diode-heptode type DAH50 with 1.4V 25mA twin filaments: Who was it intended for? Who used it?

He has discovered that this diode-heptode "with space-charge grid" was included in a 1943 wartime Philips (Dutch-language) data book, appearing also as "obsolete" in Vol III of the English-language *Philips Industries Data & Circuits of Receiver and Amplifier Valves* (1st supplement, 1949). Yet he cannot trace anyone who remembers this valve or knows whether it was ever used in portable receivers, or ever got beyond prototype development stage. It was not a 'miniature' like the later D-series valves.

The space-charge grid apparently allowed the valve to operate effectively with an HT rail of just 15V and it is claimed that it performed satisfactorily up to 50MHz. The data book includes details of a two-valve receiver covering the medium-waveband (200 - 600 metres) for headphone use with the filaments (one diode not used) consuming 75mA at 1.4V, and HT consumption 6mA at 15V. The circuit diagram (**Fig 8**) shows a 'reflex' arrangement with the first heptode used for both RF and AF amplification and with regeneration applied to the RF amplifier giving a sensitivity such that a 30μV input signal could give satisfactory reception, enabling the listener to receive a large number of broadcast stations even when only a few yards of wire was used as an antenna.

With broadcast receivers largely impounded in Holland during the German occupation, such receivers would have been extremely useful for clandestine listening, broadcast or HF CW or even for two-way working, if supplies were ever smuggled out of the Philips Eindhoven factories. Valves and components were smuggled out of Philips by the Underground but I have never seen any reference to the use of the DAH50 in this, or indeed any other connection. If anybody knows anything about this valve, I would be happy to pass the information to Dr Going.

Tom Going has also pointed out that in *TT*, September 1989, in describing the interesting history of the classic EF50 that played an important part in wartime radar receivers, I inadvertently misinterpreted two successive paragraphs of M Cosgrove's paper "The Contribution of Pye to Television History" with the result that I wrongly stated that the EF50 valves were made in the UK by up to 14,000 'out-workers' in local villagers and individual homes to minimise possible disruption from air raids. Re-reading Cosgrove's paper it is clear that it was Pye equipment that was assembled by out-workers. Production of the EF50 in the UK was, in fact, begun by Mullard at Mitcham and subsequently also at Blackburn, both large plants and decidedly not 'home-brew'.

HERE AND THERE

NEVILLE PAUL, G3AUB, has been quite surprised to hear the Australian HF beacon AUS1MLB (see *TT*, January) on all five frequencies quite regularly morning and after-

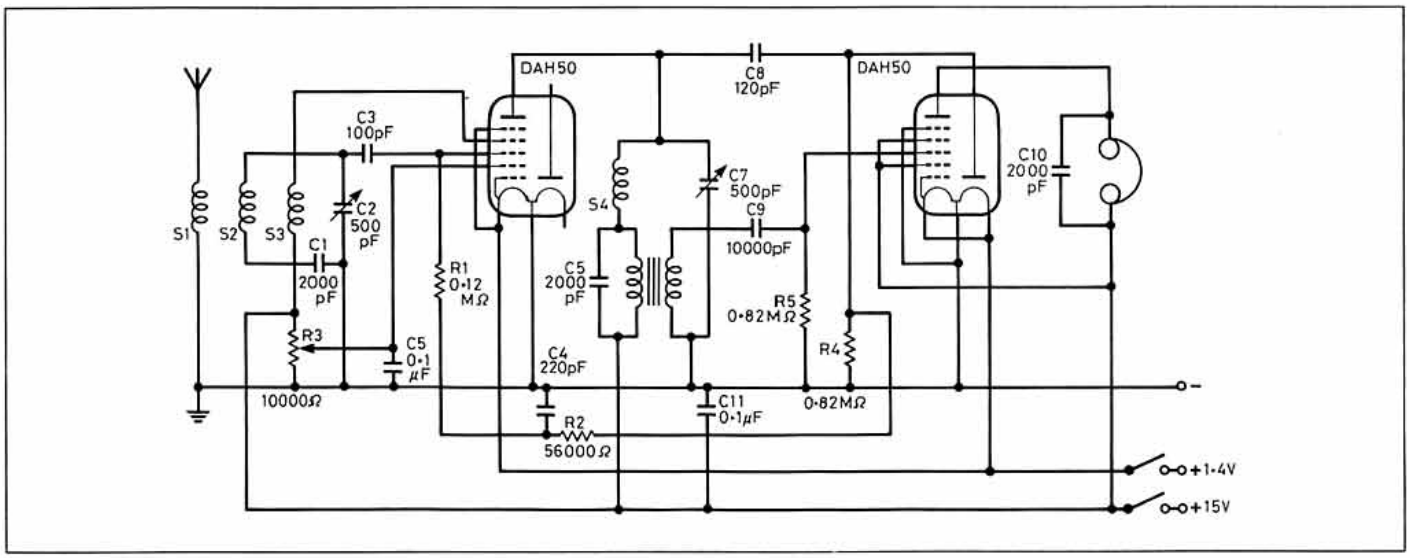


Fig 8: Circuit diagram of the reflex-type, two DAH50 medium-wave battery receiver with 15V HT. The first DAH50 is used for both RF (regenerative) and AF amplification, with the diode of the second DAH50 forming the demodulator as shown in Philips application data book. The DAH50, unlike the later D-series valves, was not a 'miniature' valve and had an octal-type base.

AN UP-GRADE FOR THE SIMPLE SUPERHET

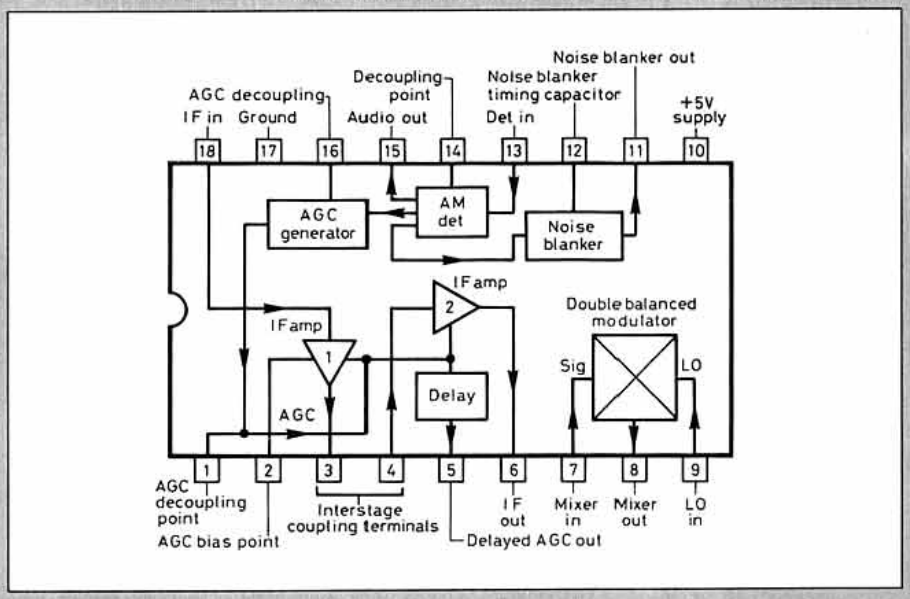


Fig 9: Block diagram of the Plessey SL6700 subsystem IC used as the heart of both the G3TSO simple superhet and the high dynamic range 3.5MHz receiver designed by G3RZP and described by W1FB in *QST* (April 1981).

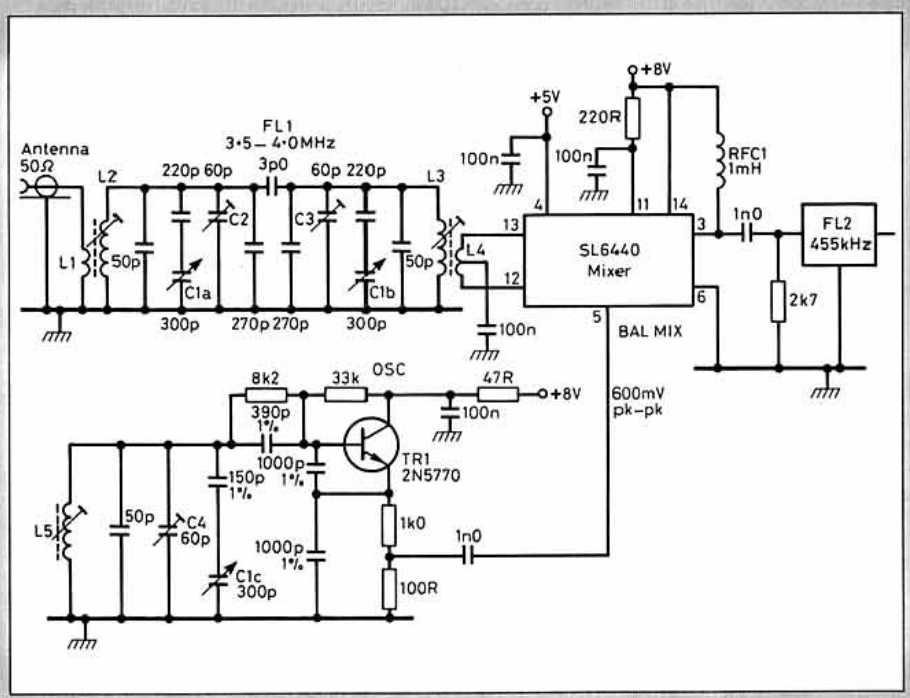


Fig 10: Circuit diagram of the front-end of the high-dynamic range receiver which was based around the then new Plessey complex ICs type SL6440 (doubly-balanced mixer) and SL6700 subsystem IC.

THE LOW-COST, simple-to-build 3.5MHz SSB/CW superhet receiver outlined by G3TSO (*TT*, November 1990, pp28-29 with feedback correction in the January issue) uses a Signetics/Philips NE602 IC frequency-converter with in-built local oscillator and buffer stage as front-end, with a band-pass RF fixed-tuned input filter. While there is no doubt that such an arrangement can provide a most useful simple receiver/transceiver, the dynamic range will inevitably be less than that of the latest generation of factory-built receivers/transceivers, although capable of superior results to the usual simple direct-conversion receivers.

One of the key components of the G3TSO design is the Plessey SL6700 subsystem IC which includes two IF amplifiers, a double-balanced modulator (as product detector), noise blanker, AM detector and AGC generator: **Fig 9**.

The G3TSO design reminded Peter Chadwick, G3RZP of a receiver that, with Doug De Maw, W1FB, was developed and described in *QST* ('Receiving with Plessey ICs' April 1981) almost a decade ago. It also used the then new SL6700, but featured a high dynamic-range front-end based on the SL6440 doubly-balanced mixer with separate 2N5770 bipolar transistor as the local oscillator, and a ganged-tuned 3.5 to 4.0MHz RF input filter. This resulted in a rather more complex and higher-cost arrangement than the G3TSO design, the complete receiver using four ICs and three bipolar transistors. Like the G3TSO design, a 455kHz ceramic SSB filter was followed by the SL6700, in this case with an external 455kHz IF transformer coupling between the two IF amplifiers. A second 455kHz transformer, rather than a ceramic resonator, was used for BFO.

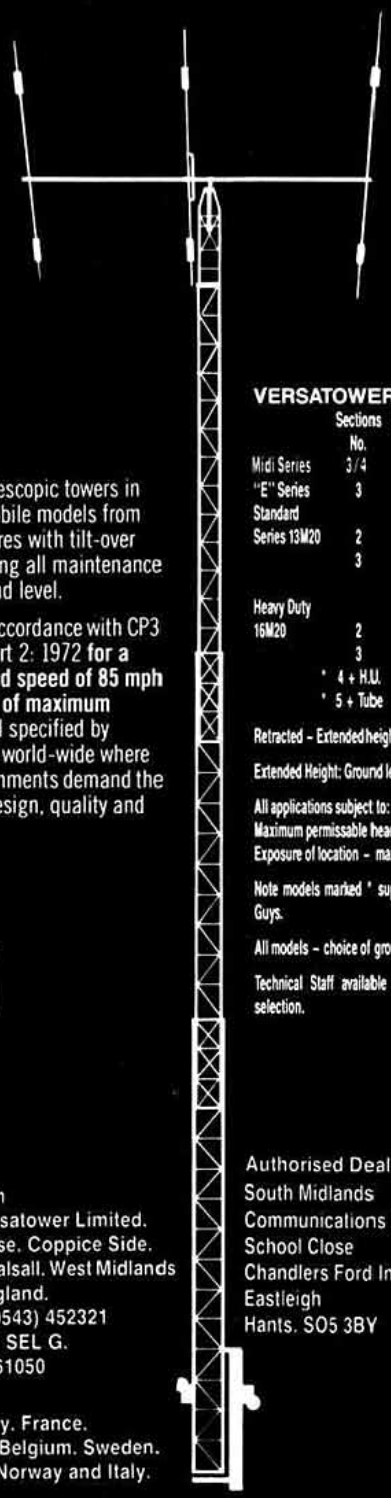
Fig 10 shows the G3RZP/W1FB front-end capable of much higher dynamic range performance than the NE602/bandpass RF filter approach. W1FB reported that he was able to copy an RST569 CW signal only 5kHz away from the ARRL's 1kW W1AW station about 'two blocks' (about a quarter-mile) distant. Substitution of this front-end in the G3TSO design should result in a high-performance 3.5MHz receiver.

noon. His antenna is an untuned 250ft wire about 35ft above ground running East/West, but he finds the 14.4MHz transmission often "impossible" due to a very strong multitone transmission. He points out that there appears to be a keyer fault with the result that the 'dash' of the 'U' in the callsign is not transmitted so that it appears AI S1MLB.

Ian Hamilton, GM3CSM, was stirred by the *TT* (March) item about G5PQ's unfortunate experience with 90° coaxial elbow connectors to check his own stock of PL259 adaptors and was relieved they all showed continuity of 0.1Ω or better, even after mistreating them by dropping them about 2m onto the floor. His bear the legend "M359 CQA49192" and have given many years of trouble-free use, although he has found that the pins do require wiping now and then with Electrolube or similar cleaning solvent/lubricator. Before putting them in service, he cleans the threads of both male and female ends with some Electrolube on a stiff brush.

He also considers it pays to check that the mating serrations are actually in mesh by backing off the locking ring about half a turn, then turning the plug/socket adaptor body by hand. If it moves it is not 'in mesh' (seated) and when it does it will be possible to screw the locking ring tighter and then the body will not move! A final check with a ohmmeter results in peace of mind, since he is not prepared to attack any of his stock with a hacksaw! John W Rhind draws attention to an item in *IEE News* concerning the colour coding of protective earths (PE) and functional earths (FE) such as those used for telecommunications and radio communication equipment. This notes that the provision of FEs is discussed in BS6701, Part 1, 1990 *Installation of apparatus intended for connection to certain telecommunication systems, Part 1: General recommendations*. This recommends that FE wires and cables should be coloured cream so that installers do not mistake an FE for a PE as described in the *IEE Wiring Regulations (15th edition)*. A new 16th edition of the Wiring Regulations is due soon.

Versatower: XXV+ Still first choice



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	3	8.0	18.0
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THE HF-225 GENERAL COVERAGE RECEIVER

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What ever you want to hear, wherever you want to hear it, the HF-225 will give you that gateway to the world.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser which gives 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 popular low-cost options ; like a key pad for direct frequency entry which plugs into a rear panel socket, an active whip aerial, a rechargeable battery pack for portable use and an attractive carrying case which protects the receiver whilst in 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 affected by selective fading distortion. The same option also gives narrow band (communications) FM.

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 while still listening to the frequency he is using. Alternatively, in the "Channel" mode, he 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. Great for checking BBC World Service frequencies in a hurry.

Unlike most HF receivers on the market, the HF-225 comes complete with 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 used. True versatility and all built in - at no extra cost.

At the end of the day, what can the HF-225 offer you as a user? Let me quote Chris Williams who wrote from Massachusetts:

"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 ICF-2010 and Grundig Satellit 650 and 500, I must say that none compares to your Lowe HF-225. Without question, for hour after hour listening, nothing compares. I especially like the Genie keypad. Why more receivers do not incorporate such intelligent ergonomics is beyond me."

That just about says it all, but on top of all the praise from users, the HF-225 was voted "Receiver of the Year" by World Radio and TV Handbook.

Why don't you find out why the HF-225 opens that gateway to the world.

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The TR-751E gives you full coverage of 2 metres in FM, USB, LSB and CW modes. Tuning steps are available to suit each mode; from 50Hz on SSB to 12.5kHz for channelised FM. Power output is 25W on all modes with switched reduction to 5W available. The receiver is an excellent performer with GaAsFET devices to give high sensitivity and good dynamic range. In use, the TR-751E is a revelation because it incorporates all of Kenwood's expertise in making complex equipment simple to operate. The test of this is to sit in front of the rig and try to use it without reference to the handbook. If it's Kenwood, you can.

Further features include dual VFOs, memories, programmable band scan, memory scan, repeater and true reverse repeater operation, all-mode squelch, noise blanker, semi-BK CW keying with sidetone, RIT and an optional VS-1 voice synthesiser which tells you the operating frequency - great for mobile use.

All operating information is carried on a bright easy-to-read LCD with a traditional analogue S meter alongside. Small enough for the car but big enough for the home, the TR-751E is a remarkable transceiver for all your 2 metre operating needs. Comes complete with all accessories including power cord, up/down microphone and a mobile mount.

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RADCOM CONSTRUCTION FEATURE

First Steps in Home Construction

by John Case, GW4HWR

PART ONE: SOLDERING

ARE YOU THINKING of trying your hand at home construction? This series is designed to help get you started. Practical experience is not required as the articles are aimed at the absolute beginner. Readers will be led through the various techniques in easy stages, shown how to avoid pitfalls and how to take the easy way when a problem appears difficult. A wide variety of simple skills will be covered so that the reader will be able to make an early start on a simple but very useful project.

A FIRST PROJECT must not be too complex, must be easy to get working with no complicated setting-up procedures and must be useful. It is most important that the first effort works, as an early failure may put the would-be constructor off forever. With the above points in mind, the project chosen is a small power supply (PSU) which will provide any voltage between 4.5 and 13 Volts, at a current of up to 1 Amp. A commercial item of this type can cost as much as £70. It uses individual components rather than one of the custom-built integrated circuits (ICs) as it is felt that more experience will be gained. In any case this avoids the noise that many PSU ICs generate. The unit will drive a hand-held radio at 12V or a domestic radio at 9V or, if you wish to experiment with TTL logic ICs, will provide the very stable 5V needed for these devices.

Current limit has been incorporated so that no damage will occur in the event of an accidental short-circuit. The current limit is switchable to be either 100mA or 1A. The stabilisation is excellent, better than 1%, which means that if the output is set to 10V at zero current, the voltage will not fall below 9.9V when the output current rises to 1A.

The unit is housed in an attractive box which can be made with the minimum of tools and expense, but if box-making seems too difficult, a commercial box the same size is available.

SOLDERING

THE VARIOUS TECHNIQUES will be described as and when they are required, so a start will be made with soldering. This is not at all difficult once the basic idea is appreciated, but soldering skill can only be developed by practice. The materials to be joined are heated, usually by means of a soldering iron until the temperature is above the melting point of the solder.

This is an alloy made of 60% tin and 40% lead which melts at about 190° Centigrade. Unfortunately, when metals are heated to high temperatures, they oxidise which prevents the solder flowing correctly, and some metals like aluminium will not solder at all using ordinary techniques. The items to be joined must be clean, free from grease and oxides and must stay that way until the joint is made. This is the function of the solder flux; it keeps the air away from the material and so prevents oxidation. Modern solders normally contain the flux in one or more cores running through the solder. For radio work, the solder needs to be in the form of thin wire and a size of 18SWG (Standard Wire Gauge), or better still 22 SWG, is ideal. Remember, the soldering iron is used to supply heat - not solder.

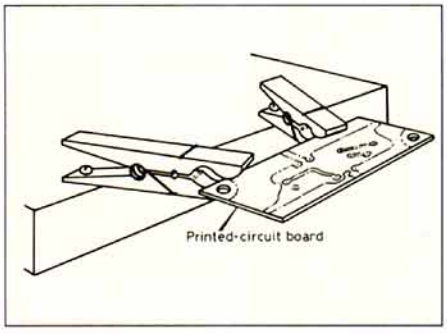


Fig 1: A simple but effective jig can be made from a block of wood and two clothes pegs.

SOLDERING IRONS

THERE IS A VERY WIDE RANGE to choose from. The general rule is to buy the best you can afford. An iron with interchangeable bits and a powerful heating element is most desirable so that it can be used for a variety of soldering jobs. An element of about 25 Watts, and a fine pointed bit of about 1.2mm (ideal for Printed Circuit Boards containing ICs where the pins are close together), a 3.0mm bit for normal use and a wide bit of 6.0mm for heavy duty work, should form a useful combination.

If possible, the iron should be thermostatically controlled. It can then be left switched on indefinitely without danger of over-heating, and the element can be of high power; 60W is quite common in this type of iron. However, a non-controlled iron will be quite satisfactory, provided it is switched off when it is not going to be used for more than a few minutes. If left on for long periods without use, the bit will overheat and burn away quickly.

One common mistake is to use an iron with a bit that is too small. Best results are obtained by using the largest practical bit. This will result in the temperature of the parts to be joined being raised above the melting point of the solder quickly, and so give less time for oxidation to take place.

PRACTICE

IF YOU HAVE NOT DONE any soldering before, it is most necessary to practice before starting work on the PCB. First, a little time must be given to the problem of holding small panels while they are being soldered. Trying

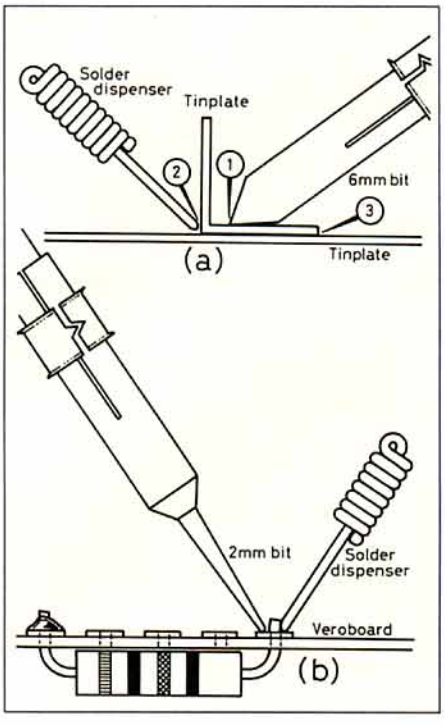
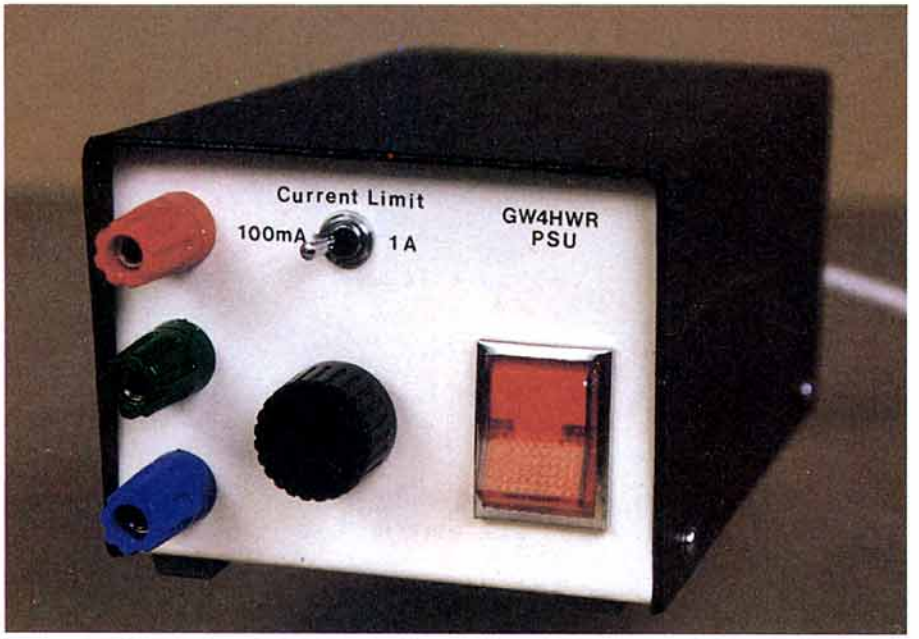


Fig 2: (a) Using a large bit to solder tin plate; (b) Using a small bit for components. Note the handy solder dispenser.



The project itself — a power supply capable of providing one amp at 4.5 to 13 volts.

to solder a small PCB while it slides about on the bench is likely to cause both frustration and very poor soldered joints. Of course, if money is of no object there are some excellent jigs available, but a very good substitute can be made from a block of wood and two wooden or plastic clothes pegs. **Fig 1** shows the general idea.

The block needs to be big and heavy enough to make it stable. About five inches (125mm) square and one inch (25mm) thick would be fine. Chip board will do instead of wood. Drill each peg about half an inch (12mm) from the ends and screw them to the board using round-headed self-tapping or chip board screws so that the pegs will swivel away from the board over a range that will allow the PCB to be held at two points.

Now try the following simple exercises in order to get the feel of the process. Cut some strips of thin tin-plate about one inch (25mm) wide. There is no need to buy this; a dis-used can could be used and can be cut with tin-snips or an *old* pair of scissors. Take *great* care as the edges can be very sharp. Hold a piece of tin-plate with the pegs and, using the largest bit available, try flowing solder over the plate. It should flow easily and, when the iron is removed, the surface ought to remain shiny and bright. If the solder does not flow, or collects in small pools, the surface is probably greasy; clean it with wire wool or a Brillo pad and try again.

When you have succeeded in spreading the solder fairly easily, try again but this time use the smallest bit in the iron. You will probably find that the solder is now reluctant to flow and tends to build up in lumps; this is undesirable. Now try to solder a second piece of tin-plate to the first. Bend a piece into an L-shape and solder it to another held in the pegs. Hold the iron to the inside of the foot of the L while applying solder to the join as shown in **Fig 2a**. A little solder under the bit will increase the heat flow into the job. After one or two attempts you will be able to make a joint that is fairly difficult to tear apart! This is an excellent test.

COMMON SENSE SAFETY POINTS WHEN SOLDERING

1. Keep hot solder away from your eyes. Preferably wear safety goggles.
2. Never touch the metal parts of a soldering iron - it may be hot!
3. Keep a hot soldering iron away from your clothes.
4. Never flick solder from an iron — wipe with a wet cloth instead.
5. Between soldering operations, always store a hot iron out of harm's way on a hook, on a metal tray, or in a proper holder.
6. Warn your family or visitors that the iron is hot.
7. Never leave a soldering iron switched on unattended.
8. Always solder in a well ventilated room. Do not breathe in the fumes.

A LITTLE MORE DIFFICULT

NOW TRY SOMETHING a little more difficult. Bolt a small solder tag to an odd piece of metal, the material and size does not matter except that aluminium or brass will take the heat away from the work quicker and so make a soldered joint more difficult. Pass a piece of tinned copper wire (such as the lead of a resistor or capacitor) through the hole in the solder tag and attempt to solder the join.

Again, the larger bit will be required to make the solder flow. Try a variety of exercises similar to the above, be critical of your work and persist until a joint which is totally covered in solder is produced. The hole in the tag should be filled, the solder surface shiny and the outline of the materials still visible under the solder. This indicates that the correct amount of solder has been used. If the joint appears grey and crystalline, either the job was not hot enough or it moved as it cooled.

If you can obtain some small pieces of Vero-board, try mounting some components on the board, bend the ends a little to stop them falling out when the assembly is turned over, clip the wires so that they just stick out from the board and solder to the copper strips. With the board held securely in the jig (or 'clothes peg' vice), apply the soldering iron and the cored solder to the end of the wire and the part of the copper strip surrounding it at the same time. This is a two-handed job making the use of a jig almost essential.

Fig 2b illustrates the operation. Note the simple solder dispenser. If the solder is supplied in coils or on reels, this avoids having to cut off short lengths which can be wasteful, or trying to work with the reel itself. Use a small bladed screwdriver and wind an even layer of solder (about 30mm long) on the blade. Cut it, leaving a tail about 50mm long, slide the coil off the blade and thread the tail back through the coil. You can now pull on the tail to keep a convenient length of solder available.

Temperature is *most* important. If the solder is not made hot enough, it does not flow correctly and a 'cold' or 'dry' joint will occur. If the temperature is too high or the iron is held in position too long, the tin content of the solder will 'burn' and again a dry joint will be made. Too much solder may cause a short circuit to an adjacent pad or track on the PCB, etc, forming a 'solder bridge'.

Some components, especially semi-conductors, may be damaged by high temperatures - this is the reason for completing the joint quickly. When soldering an IC to a PCB, do not solder along the row but use a staggered pattern and allow time for joints to cool before proceeding to the next.

Some constructors may advise the use of solder heatsinks between the component and the soldered joint. This means, for example, holding the lead-out wire of a transistor on the component side of the board with the jaws of long-nosed pliers while the joint is made on the copper side. The process is quite difficult and is rarely necessary if the joint is made quickly.

Be critical of your work - a joint which looks good is usually good electrically. Examine the work on commercial boards and try to reproduce the same standard.

Removing excess solder or a component incorrectly placed is best done with a solder-sucker. This is a simple spring-loaded piston in a cylinder with a plastic nozzle which is placed over the area while the solder is melted. When the plunger is released, the solder is drawn up into the device and is ejected when it is reloaded. An alternative is solder braid. This is like the wire mesh outer of co-axial cable which is placed over the joint and a hot iron applied. The braid will soak up the solder rather like sponge.

. . . to be continued

Next month John Case describes how the power supply works, and what components you will need.

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* KITS *

continued from page 25

C M HOWES COMMUNICATIONS

HOWES IS A VERY well established provider of kits with a huge range of transmitters, receivers, test equipment and add-ons. The Novice can achieve world-wide communication on two bands with the VFO10-HTX10-HPA10 transmitter combination and the DRX10 receiver at around £150 all in. Also of appeal to Novices is the AT160 Top Band transmitter which includes phone (DSB) at £35 for crystal control (ideal for local club nets) and an extra £20 for a matching VFO. CW operation is available on 80m for as little as £30 for both transmitter and receiver!

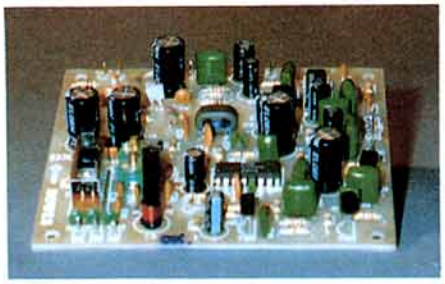
Howes kits are also most suitable for Class A licensees, and the single band transmitters are very popular with QRP operators in conjunction with the DcRx series. The kits come with full instructions and are easy to set up. The DcRx, in particular, is designed to be a first construction project.

All kits are available as ready built PCBs, though cases, knobs and so on have to be bought separately (complete hardware packs are usually available).

C M Howes Communications, Eydon, Daventry, Northants, NN11 6PT. Tel 0327 60178.

C M HOWES COMMUNICATIONS

Cat no.	Description	Price (kit)	Price (Assembled PCB)
HPA10	10/15m 3-10W o/p power amp	£29.90	£44.90
HTX10	10/15m 50mW Exciter	£49.90	£74.90
VFO10	VFO for HTX10	£16.50	£28.80
AT160	80/160m AM/DSB/CW 10W PEP xtal Tx	£34.90	£53.90
VF160	80/160m VFO for AT160	£19.90	£34.20
CTX40	40m 3W CW xtal Tx	£13.80	£19.90
CFV40	VFO for CTX40	£10.40	£16.90
CTX80	80m 5W CW xtal Tx	£13.80	£19.90
CVF80	VFO for CTX80	£10.40	£16.90
MTX20	20m 10W CW xtal Tx	£22.90	£29.90
CVF20	VFO for MTX20	£10.40	£16.90
DXR10	10/12/15m SSB/CW Rx	£24.90	£36.90
	Hardware pack for DRX10	£14.00	
DcRx	DC SSB/CW single band (20, 30, 40, or 80m) Rx	£15.60	£21.50
	Hardware pack for DcRx	£15.50	
TRF3	SW AM Broadcast Rx (5.7 - 12.8MHz)	£14.80	£20.20
	Hardware pack for TRF3	£14.00	



Howes' DXR10 10/12/15m Rx.

TANDY

TANDY IS THE ONLY kit supplier with a large high street presence. All kits are by Science Fair and, unlike the others listed in this feature, do not involve soldering. They are therefore ideal for the absolute beginner to electronics and radio, including young children. Most can be re-wired time and time again into many different configurations and therefore represent very good value for money.

See Yellow Pages for details of nearest store. There are over 500 nationwide.

TANDY

Name	Scope	Price (kit)
200-in-1 Electronic Projects	Burglar alarm, telegraph, digital timer, electronic organ, radios, and much more including OR, AND, NOR and NAND gates for teaching computer fundamentals. 108 page manual.	£39.95
130-in-1 Electronic Projects	Radio, electronic organ, kitchen timer, logic circuits. Built in speaker and 7-segment LED display.	£29.95
60-in-1 Electronic Projects	Computer circuits, morse code systems, magnetic noise detector. Inc earphone.	£19.95
30-in-1 Projects	Radio, alarm, timer etc. Inc earphone.	£12.95
AM/Shortwave Project	AM radio covering 520-1625kHz, 6-8MHz, 12-17MHz. Inc earphone.	£12.95
AM/VHF Aircraft Monitor	Medium wave (520-1620kHz) crystal set and VHF (108-170MHz) super-regen Rx.	£12.95
Crystal Radio	Medium wave crystal set with earphone.	£4.99

Tandy supply a range of solderless educational kits for the beginner and more experienced.

RADCOM'S PULL-OUT SECTION FOR YOUNG FAMILY-MEMBERS OR FRIENDS

LAKE ELECTRONICS

Cat Ref	Description	Price (kit)	Price (built and tested)
DTR1	160m VFO CW transceiver: 2W Tx, DC Rx	£87.50	£140.00
DTR3	80m VFO CW transceiver: 1.5W Tx, DC Rx	£81.00	£130.00
DTR7	40m VFO CW transceiver: 2W Tx; DC Rx	£84.50	£135.00
Carlton	Three band DC receiver (80, 40 and 20m)	£66.50	N/A
TUA1	HF SWR Meter	£17.00	N/A
TU2	Antenna tuning unit with built-in SWR meter	£48.50	£68.50

Lake's power meter/dummy load (kit £19.50; ready built £28.75).

LAKE ELECTRONICS

LAKE CONCENTRATES ON amateur radio kits and provides an advice service if things go wrong in construction. The kits include all hardware, including case, knobs, screws and wire. Unusually, prices include UK carriage.

The Novice will find the 160m or 80m transceivers useful at £80-ish in conjunction with the inexpensive SWR meter or ATU kits.

Lake Electronics, 7 Middleton Close, Nuthall, Nottingham, NG16 1BX. Tel 0602 382509.

JANDEK

JANDEK KITS INVOLVE modular construction so it is possible to build and test in easy stages. Each module is available separately so it could provide a way of buying a complete transceiver on a pocket money budget without having to save up. The 160m, 80m or 30m kits are suitable for use by Novices.

Some parts are not included, such as the tuning capacitor, though tuning diodes and potentiometers are sold as extras. Full instructions are included with each kit.

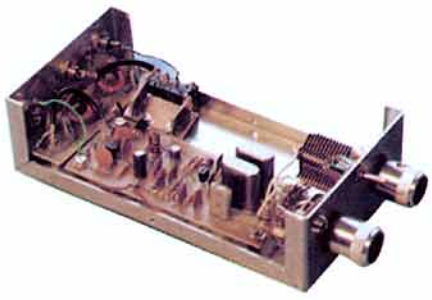
The complete list of kits includes a crystal marker, a VOGAD and a 10W audio amplifier. Ready-built kits are not supplied.

Jandek supports the introduction of the Novice licence and will be working towards the production of kits to complement the course and help encourage an interest in the technical side of the hobby.

Jandek, 6 Fellows Ave, Kingswinford, West Midlands, DY6 9ET. Tel 0384 288900.

JANDEK

Modules needed	Description	Price (Kit)
JD001-JD002C-JD002S-JD003-JD004-JD007	Single band (160, 80, 40, 30 or 20m) CW/SSB DC Rx	£30.00
JD004-JD005-JD009-JD010	Single band (160, 80, 40, 30 or 20m) 1.5W CW Tx	£20.00
All of above plus JD011, JD012, JD014	Complete single band transceiver	£50.00



Crystal controlled CW Tx.

MARCO TRADING

MARCO TRADING ARE agents for the enormous range of Velleman kits. These are mostly electronic and audio, rather than radio. A couple are shown in the table. Several kits can be put together to produce equipment with a professional specification and finish.

Marco Trading. The Maltings, High Street, Wem, Shrewsbury, SY4 5EN. Tel 0939 32763; Fax 0939 33800.

One of Marco Trading's audio kits. Full instructions are provided.

MARCO TRADING

Cat no	Description	Price
K2637	Supermini 2.5W Audio amplifier	£8.80 + VAT
K2653	Digital voice record/playback module	£29.50 + VAT

COMPLETING THE JOB

SEVERAL KITS REQUIRE to be boxed. One box supplier which has come to our notice is H J Morgan Smith of Unit 3, Vernon Building, Westbourne St, High Wycombe, Bucks; tel 0494 32421. As for tools, Maplin Electronics does a Starter Tool Kit comprising (in a cloth roll) a snip cutter, a pair of long nose pliers, a light duty flat blade 75mm long screwdriver, a No:1 crosspoint 75mm long screwdriver, a desoldering tool and a soldering kit containing a CS iron, a stand and a 5m pack of 18SWG solder. All this for £19.95.

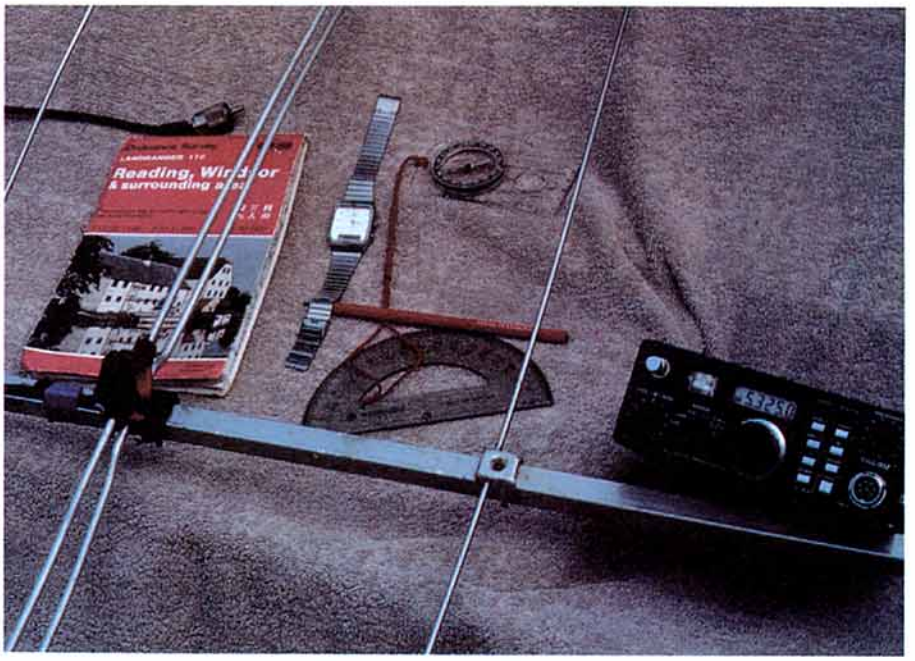
144MHz Amateur Radio Direction Finding

An introduction by Pete Swynford, BSc, G6ZYT

MANY AMATEURS who regularly read *Radio Communication* have probably noticed a few paragraphs each month in *Contest News* on Amateur Radio Direction Finding (ARDF) competitions, particularly those that occur on the 160m band. This article is aimed at encouraging Amateur Radio clubs and individuals who have not tried ARDF to have a bash at the 144MHz (2m) variety.

Foxhunting, as it is often known, has been around since the very early days of Amateur Radio. Its presence in national and regional competitions is well established on Top-band. Its occurrence on VHF has been, up to now, limited to apparently only a few clubs who hold several local events each year.

The objective in most foxhunts is to locate one or more fixed hidden radio transmitters in the quickest time possible. This will combine a number of skills including map-reading, the ability to operate a portable receiving station and quite often some nifty footwork, hopefully resulting in the transmitter being found before any other competitor. At club level, the rules will depend on the abilities and experiences of the competitors. Guideline rules are given opposite.



All you need to achieve success with 144MHz ARDF.

THE FOX

IT IS SUGGESTED that clubs initially run their foxhunts with just one hidden transmitter. This station ideally should be manned by one licensed amateur only and is usually FM. It is the fox's (or vixen's) job to research the area where the transmitter is to be located and hide the station before the start time. 144MHz stations are considerably smaller than those used on 1.8MHz as the need for long wire aerials is removed. The ERP required of the fox will depend on the size of the hunt. Typical power levels used are shown in the accompanying table. Polarisation may be vertical or horizontal, depending on preference.

The fox should also prepare himself for a long wait by taking a spare battery and any necessary comforts with him (eg. flask of coffee). Some cunning foxes have in the past operated automatic stations. This is generally frowned upon but can make an interesting competition if your club rules permit it.

"River banks are a commonly used hiding place."

THE HOUNDS

COMPETITORS NEED NOT hold a licence, so ARDF is ideal for SWLs. The receiving equipment used can be home-brewed, modified PMR or commercial amateur gear. In all situations, a signal strength meter is essential, preferably using an analogue display. The Yaesu FT290R has such an S-meter and makes a good DF receiver.

The hound will also require a lightweight directional antenna; an HB9CV or 4-element Yagi is commonly used. A method of attenuating the received transmission is highly desirable. This can range from a set of attenuators fitted between the radio and the aerial, to reducing the volts to the receiver. These are not essential for beginners but are a must for anyone who really wants to maximise their chances of winning.

Hounds may participate individually or as part of a small team. A team should always stick together for the whole contest.

THE HUNT

THE DETAILS OF THE time, location and frequency should be published well in advance. Sunday mornings (1000-1200) are common; the pubs open at 1200! Alternatively, an evening after-dusk hunt makes an interesting challenge for the experienced. The starting position for the Hounds may either be at a fixed location or at the whim of the hounds themselves. This will depend on whether your club requires registration of competitors. A random start location is more suited to a hunt in which the hounds have a varied range of DF experiences.

The principles of triangulation and cross-bearing are similar to those used on 160m DF. However, the propagation properties of VHF are considerably different. Unlike 160m, the time of day will not affect reception. Radio waves at 144MHz (normally) travel by line of sight. Trees, valleys, hills, buildings, telephone and power cables can all greatly affect the signal by either blocking or creating reflections. A good fox will choose his location to take advantage of the propagation. The bottom of a hill at the edge of an O/S map is a typical well-hidden spot, the RF being unheard or very weak in most of the hunt square. River banks (with few crossings) are another commonly used hiding place. This

Typical Power levels used on 144MHz

Size of Area	Power
Less than 5 x 5km	1W into a quarter-wave
10 x 10km	3W into a quarter-wave
25 x 25km & larger	10W into a five-eighths

144MHZ ARDF - GUIDELINE RULES FOR USE BY CLUBS

LOCATION

1. The Fox will transmit a 144MHz FM signal from a fixed location in an area 25km by 25km square which will lie on a single Ordnance Survey Landranger Series (1:50000) map. The location will be on public or common land not requiring permission for access.

NOTICE

2. The date, start time, area, frequency and any alternative rules will be publicised in advance. [Also see rule 6 and alternative rule 10a].

DURATION

3. The Hunt ends after 2 hours, or when all Hounds have either found the Fox or conceded, whichever is the earlier. Hounds without a licence or transmitting capability should make their participation known in advance. The Fox will transmit the location at the end of the Hunt.

FOX'S OPERATION

4. The Fox will transmit from a vehicle which will be accessible without risk by any normal road vehicle. The Fox will transmit for 2 minutes at the start of every 10 minute period.
5. The Fox will transmit a horizontally polarised signal.
6. If a directional antenna is used, the Fox will beam towards a previously publicised location (eg. Club premises).
7. The Fox will declare the transmitter power and antenna during the first transmission and during subsequent scheduled transmissions on request from a Hound. The Fox may reduce transmitter power with the Hounds' consent as they close in, but it should remain constant at all other times. (As a guide, 3W into a dipole or quarter-wave antenna should be sufficient in a 10km by 10km square, and 10W into a low-gain antenna for a 25km by 25km square).
8. The Fox may issue clues to the location.

HOUNDS' OPERATION

9. A Hound may have an assistant or assistants. Only the Hound may use direction-finding equipment, however, and any assistant(s) must stay with the Hound or remain in or by the Hound's vehicle.
10. The Hounds may start from any location. Taking bearings from home is not permitted.
11. The winning Hound is the first to find the Fox.
12. The Hounds may transmit BETWEEN the Fox's transmissions but should take care not to divulge their location or mislead others and should not transmit once they have found the Fox.
13. Any Hound not adhering to the Rules is disqualified.

RESTRICTIONS

14. Participants should adhere to the terms of their transmitting licence, the RSGB Band Plan, the Highway Code, the Countryside Code and local Byelaws.

ALTERNATIVE RULES

1a. The Fox will transmit a 144MHz FM signal from a fixed location in an area 10km by 10km square which will lie on a single Ordnance Survey Landranger Series (1:50000) map. The location will be on public or common land not requiring permission for access.

4a. The Fox will transmit as a pedestrian. The Fox will transmit for 1 minute at the start of every 5 minute period.

5a. The Fox will transmit a vertically polarised signal.

10a. The Hounds will all start from a common location, publicised in advance.

11a. The winning Hound is the Hound who finds the Fox having travelled the shortest distance in a vehicle.

[Note - Rule 10a should also be used and odometer readings logged at the start].

11b. A Hound's score will be the sum of vehicle miles travelled plus 0.1 times the time taken in minutes. The winning Hound is the Hound with the lowest score. [Note - Rule 1a should also be used and odometer readings logged at the start].

"An after-dusk hunt makes an interesting challenge for the experienced."

makes use of the anticipation of hounds homing in from the other bank! Transmissions should be regular. Your rules should indicate how frequent transmissions are and the duration of the hunt, taking into account the experience of the majority of the hounds. A typical schedule is to transmit for 2 mins every 10 mins, or 1 min every 5 mins, for a total of 2 hours.

During transmissions, hounds should ascertain the likely direction of the fox by moving the beam around, checking for nulls and peaks. A number of bearings taken from different locations will give the hound a smaller location to home in on, typically a square kilometre. Introducing attenuation allows the process to be iterated on a smaller scale.

Hounds may observe other competitors' activities, but on no account should they interfere with them as this is considered to be cheating. Hounds should also move quickly and quietly so as to avoid revealing their location to the fox and other hounds. Eventually a hound will locate the fox, and after a brief confirmation from the fox that he has been found, the hound should leave the area.

CONCLUSIONS

THE AVAILABILITY OF 2m equipment makes VHF ARDF an easy activity for a club to run. It has a competitive component which appeals to many people and uses and develops many outdoor skills. It is an ideal activity to run as part of Project YEAR, giving youngsters hands-on experience of one facet of Amateur Radio.

The RSGB ARDF Committee is proposing that regional 144MHz ARDF competitions are introduced into the UK from 1992. Perhaps your club might take part.

"Skills include some nifty footwork."

"Hounds may participate as part of a small team."

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Prices and specifications subject to change without notice. FT-736R shown with 220-MHz option installed.

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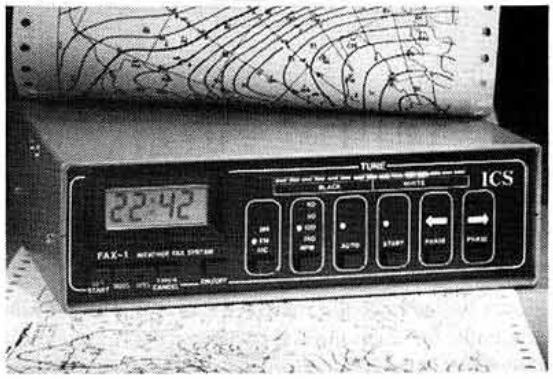

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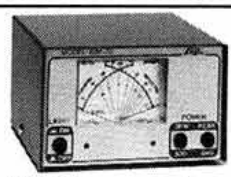

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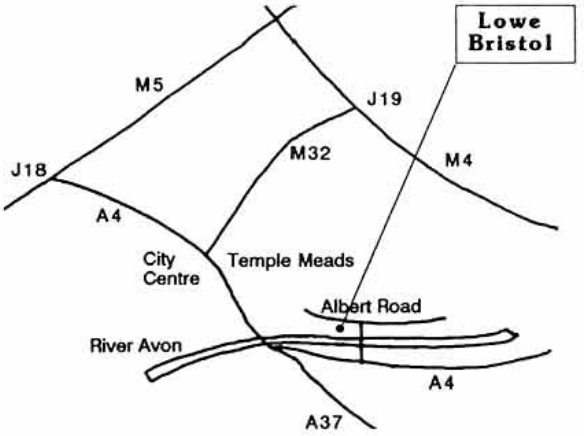

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Raynet

RONALD M COWAN, GM4SRL
516 Clarkston Road, Netherlee, Glasgow
G44 3RT

Banbury Raynet Group taking part in a display of emergency service providers in Banbury during July 1990. The photograph shows Deputy Controller Ted Pascoe, G4DKD, explaining the role of Raynet to members of the public.

AS I WRITE this column, nine RAYNET members (seven licensed and two unlicensed) are preparing to leave for Rumania where they will provide communications during an eighteen-day relief expedition. They will be based in Turnv Severin and will be travelling with, and working for, a team from the Yorkshire Dales. All licensing formalities have now been completed, and the team, under the leadership of Paul, G6FMP, are ready to leave. Communications with the UK will be on AMTOR. A full report will be given in a future edition of *Radio Communication.*

CW PROCEDURE NOTES

THE CONTROLLER OF the Bolton RAYNET Group, Eric, G4FSN, has prepared a set of procedures for handling messages sent by CW. These cover the preparation of messages sent for transmission, offering and accepting messages, relaying, multiple addressing, repeats and corrections, and punctuation signs. There are also general operating notes and suggested working frequencies. These procedures have been accepted by the RAYNET Committee Chairman, and will be incorporated into the new RAYNET manual. Copies of the notes are available free of charge by sending a large stamped addressed envelope to G4FSN who is QTHR.

Eric would also like to hear from Raynet members or Groups who are willing to help trial the procedures on air and to join in, say monthly or quarterly, exercises using CW. It is hoped that the adoption of these procedures by all groups will provide a common and practical basis for the exchange of traffic across the UK on the occasions when CW is the most appropriate mode.

JOINT EVENT FOR THE SCOUTS

HERTFORDSHIRE RAYNET joined with Central Gwynedd Raynet to provide essential safety cover for Hertfordshire Scouts' 'Peaks Assault' on 2 and 3 March. The annual event is usually covered by the army, but this year, owing to the Gulf conflict, Raynet was asked to help instead.

The main purpose of the event was to give the Scouts a taste of wild country with only short notice of a course in which they collected stamped cards, a sort of walking orienteering. Raynet was used to provide communications for the medical and rescue teams, and for the roving marshals.

Planning started in October 1990, but it was not until January 1991 that Raynet was sure of the location. Originally, Hertfordshire Raynet was involved, and the help of a local group was quickly sought. Dave, GW1EGQ, controller of the Central Gwynedd Group, then became involved.

Prior planning included accommodation for those travelling to the area, and engineering decisions were made to use talkthrough with 8 element 2m beams to ensure a good signal in the difficult terrain. Handhelds with plenty of battery capacity were chosen.

On the weekend itself, the weather started favourably, but quickly deteriorated to rain, sleet and snow. The ground was extremely wet and muddy underfoot, and without proper boots, waterproofs and clothing the field teams would not have been able to operate.

Traffic passed consisted of medical information, insulin availability etc, and dealing with a case of exhaustion.

A good debrief was held in the local pub after the event, with 16oz steaks putting back what the event had taken out! A total of fifteen Raynet members spent 381 man-hours (home to home) on the event, with an additional 20 planning hours being used before the event.

Following the weekend, several contacts have been made by members of the Scout Association, thanking Raynet for the assistance given, and indicating pleasure at the help given and the professionalism shown. (Similar reports have been received by other groups in other parts of the country).

Martin Green, G4PMG, (tel: 0442 828678) would like to hear from any member, well equipped for working in the hills, who would like to help with next year's event, which will be held during the first weekend of March.

RAYNET TALKTHROUGH

RAYNET CONTROLLERS are reminded that a current talkthrough permit must be held before engineering tests or events can be undertaken using talkthrough. There are three types of permit, Engineering, Single event, or Period permit, and these are issued by Ian Jackson, G8RWH, 60 Hunting Gate Drive, Chessington, Surrey, KT9 2DD, on behalf of the Raynet Committee.

To qualify for a period permit, a group must have held both an engineering and an event permit and have submitted the required reports. Applications must be in writing, and at least two weeks notice should normally be given. Unless previous arrangements have been made, the permit will only be sent to the Group Controller, no matter from whom it is received. Please enclose a stamped addressed envelope with all applications.

CAIRO INTERFACES

THERE CAN BE FEW RAYNET members who have not heard of the CAIRO unification scheme, even if there are some who have yet to encounter it at first hand and discover its benefits in the multi-operator environment which is characteristic of so many RAYNET operations.

To keep the endeavour progressing, Peter, G8CQH, has now published a comprehensive manual which combines the experience of existing CAIRO users with the recent contributions from some professional collaborators. The 73-page booklet covers talk-though, fixed-site installations, and packet radio as well as a thorough explanation of basic CAIRO for those who now wish to get started.

Each topic is supported with simple diagrams of tried and tested circuits for practical implementations and there is a quick reference appendix which lists all the components alongside sources from where they may be obtained.

Further information about CAIRO and the manual may be obtained from Dr P J Best, Dept EE & AP, Aston University, Aston Triangle, Birmingham, B4 7ET, telephone: 021-359 3611, extension 4274.

ITEMS FOR THE RAYNET COLUMN.

ITEMS FOR THE NEXT RAYNET column should be sent, as soon as possible, to me at the above address. ❑

Satellites

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

THIS MONTH'S *RADIO COMMUNICATION* is a special edition devoted particularly to the RSGB's Project YEAR, to the Novice Licence and to the needs of Youth and what amateur radio can contribute to their hobby needs.

The page you are reading now is devoted to one of the specialities of amateur radio - Communication by Satellites!

If you are a newcomer to amateur radio it may surprise you to know that this is possible. It is, and has been so for twenty years or more. I believe it is quite the most fascinating of the many aspects of amateur radio.

If you would like to know more about amateur satellite communication, write to the Secretary, AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 5EQ for a Satellite Introductory Pack. Or if you decide to join the RSGB and thus become involved in the hobby, look out for this bi-monthly feature in this monthly magazine, where you will get the latest information about what is going on in this field.

CUT BACKS

REGULAR READERS WILL recall that, last August, the *RadCom* Editor carried out a survey of RSGB members on what should and should not appear in the magazine. Not surprisingly, 'Satellites' came well down the list! Being a minority interest, we hardly expected much else! The practical result of the survey, as far as readers who are interested in satellites is concerned, is that we now have one page every other month. Hence the non-appearance of this feature in April.

This is not quite such a disadvantage as it might at first appear as often there is not enough 'news' to justify a page every month, but it just happens that this time the satellite scene is bursting with news. Since this feature last appeared, there have been two new launches with a further possible one in the offing, QSO's with MIR (see this month's News feature), and the re-entry of Salyut 7 amongst other news-worthy items.

NEW LAUNCHES:

Russian Satellite RS 12/13

This satellite, which has been in storage for over a year awaiting an opportunity for a launch, had a further holdup when the intended launch was stopped during the final preparations. No reasons were given for this delay.

Finally, it was launched on 5 February at about 0236UTC as a 'piggy-back' on the COSMOS-2123 NAVSAT launch rocket, and its initial testing was quite successful.

It has a good CW beacon signal on 29.408MHz, but at the time of writing the transponder has not been turned on, apart from short periods of testing. There have been reports that there may be some trouble with interaction between it and the main payload COSMOS 2123.

Russian Satellite RS 14

Also designated AO 21/Rudak, this was successfully launched on 29 January at approximately 1200UTC. There have been problems with it.

On orbits 80 and 89, the payload was powered up for some short tests when the current protection device automatically cut off the power supply. This may have been due to a wrong command being sent from the ground command station resulting in both transponders being turned on at the same time. The satellite was designed for only one transponder to be used at a time, the second one being kept as a spare.

The resulting high power consumption during switch-on triggered the current protection system. In order to switch off one of the transponders, some changes were needed to the command procedures at the ground station. This took several days during which AO 21 was off.

At the time of writing, it is on again with a very strong CW signal on 145.822MHz. It is interesting to note that it gives its callsign as RS 14, not AO 21, so we should presumably use this in future.

Both RS 12 and RS 14 have similar orbital parameters with a period of 105 minutes, an increment of 26° and an inclination of 83°.

QSOs WITH MIR.

THE JANUARY ISSUE of *AMSAT Educational News*, edited by Richard Ensign, of 421 N Military, Dearborn, Michigan, 48126, USA, has a lot of interesting news on amateur contacts with the Mir space station.

Amateur radio on Mir has been a bit sporadic, but there are reports of numerous contacts with this spacecraft. Way back in December last, Gerald Klatzko, ZS6BTD, had a three-minute QSO with Mir Astronaut Musa, U2MIR. He told Gerald that he was able to make QSO's while putting data into an onboard computer.

He remarked that U9MIR, another amateur radio astronaut, was very busy at that time and could not be active on 2 metres as he had hoped. Musa hopes to operate on packet and expects to be on board Mir until this month. Several other South African amateurs also worked Musa.

The same morning at 0342 North American time, Richard Ensign was awakened by the sound of Musa's voice as he made a series of QSO's whilst the space station arched high over Northern USA and Canada. He has also been heard active on voice on 145.550MHz.

Recently, Musa has managed to activate packet operation from Mir. He is using a laptop IBM compatible computer, a Pac-Com TNC and an Icom FM radio. Over Europe, he has been active on 144.675 and 145.625MHz simplex. Over the USA, he has been on 145.55 and 145.50MHz simplex. He uses two calls, U2MIR and U2MIR-1. The latter is a personal mailbox system.

Austrian radio amateurs are building a project to go on Mir called AREM - Amateur Radio Experiments on Mir. It is to be a 2-metre automatic beacon transmitter which will broadcast information in packet radio and synthesized voice. Messages will be in English, Russian and German. The frequency to be used is thought to be 145.99MHz and the system is hoped to be in operation towards the end of September or early in October.

SALYUT 7 DECAY

SALYUT 7's ANTICIPATED re-entry occurred on 7 February 1991 at 34°9' south, 63°8' west in the foothills of the Andes at 0347UTC, after nine years in orbit. As with previous spacecraft decays, speculation was rife as to when and where it would come down.

A competition organised by Pat Gowen, G3IOR, for the nearest prediction sent in was won by Mike Bilow of Rhode Island, USA, with Mrs Hazel Kerrison of Norwich, England, runner up. She predicted 0419UTC with Mike Bilow's prediction being 0330. The event attracted quite a good coverage in the media - good publicity for AMSAT!

SOFTWARE

PG. EXE-BBS

Ron Broadbent, G3AAJ, in his 'Waffle Page' feature in the February last issue of *OSCAR NEWS* (Number 87) writes as follows:-

"On the subject of PG.EXE-BBS and the new BBS system being operated on UoSAT 3 (Oscar 14), I said last month that I would be pleased to send anyone a copy of PG.EXE-BBS for Oscar 14/16 when I received a Master copy from Jeff at the University of Surrey. This has been done, and a few copies have gone out.

Let me stress this point. The software is from the Master copy, not from the packet system. Now that the packet system has many copies of this programme I suggest you get it from that medium. If perchance you really cannot find it on your local BBS, then it is £6.00 plus a postal packet and postage to your home. We will not be doing a free upgrade service on this software".

COLLOQUIUM

THE AMSAT-UK SATELLITE Colloquium will be held again at the University of Surrey, from 25 to 29 July. Due to the usual factors nowadays which are beyond our control, costs may have to be up a bit this year, though with some negotiation between AMSAT-UK's Secretary (who organises this event) and the University Conference Officer, it is hoped to keep costs to a minimum.

It is going to be necessary this year to make your application as soon as possible. So book early. If you intend going, please let the AMSAT-UK Secretary know (before 14 May, please) by sending him your QSL card with the words "Colloquium Yes" on the back. This will help with the planning and will ensure you get an early copy of the booking form. His address is:- 94 Herongate Road, Wanstead Park, London E12 5EQ. ❑

Microwaves

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

CONTINUING THE THEME of portable microwave operation, here are a couple more photos, to show different degrees of involvement in portable operation, sent to me by G4FRE some long time ago. The first shows some of G4FRE's operation with his microwave dish and 70cm talkback antenna on a short mast overlooking the North Sea.

Note that the operating 'shack' is the open back of a Mini Estate - unlike the photo of G8KQW's Range Rover and large dish used as the cover of *RadCom* earlier this year!

Dave's second photo shows a rather more ambitious antenna system which might be used by a group, rather than an individual operator, in serious contesting such as VHF NFD or one of the many international (Region 1) contests. Judging by the relative antenna sizes, this looks like a Yagi for 432MHz (70cm), a 'box' of four loop-Yagi antennas for 1.3GHz (23cm) and a dish for 2.3GHz (13cm).

NEWCOMERS CORNER

LAST MONTH I OUTLINED some transmitter and receiver block diagrams which, if you look at them carefully, will show you that even in the microwave bands, the basic building blocks (modules) for such essential bits of gear are not greatly different to those for the LF and HF bands - at least until you start looking at the detailed circuits. Then the differences start to become apparent!

For instance, the block diagram of the typical low power 1.3GHz (23cm) transmitter shown last month can be further broken down into sub-units or individual circuits contained on the one board.

In the simplest transmitters (or receiver local oscillators) microwave frequencies are produced by multiplying the output from a crystal oscillator, using a crystal typically in the region of 83 to 108MHz, in several stages, up to the final wanted frequency. This is often called a 'multiplier- chain'.

More complicated transmitters might involve mixers and amplifiers as well as multipliers, but since this outline is intended for newcomers, I'll concentrate on the simpler, multiplier-chain approach!

Let's start by visiting (for those of you who are new and missed this circuit first time round) or re-visiting the G4DDK-001 1.3GHz source design. The circuit was first described in this column by Sam Jewell, G4DDK, about four years ago.

Since then, several hundred boards have been built for use in transmitters, receivers and transverters, and as signal sources or beacons. Although it was designed as a local oscillator source for a transverter (hence the two outputs), it is, in fact, a low power transmitter with an output of 20mW divided to give two outputs of 10mW suitable for the receive and transmit mixers of a transverter.

It should be noted that the circuit will cover the range from about 1000MHz to about 1400MHz. It is quite typical that modern microstrip PCB designs cover a wide frequency range such as this.

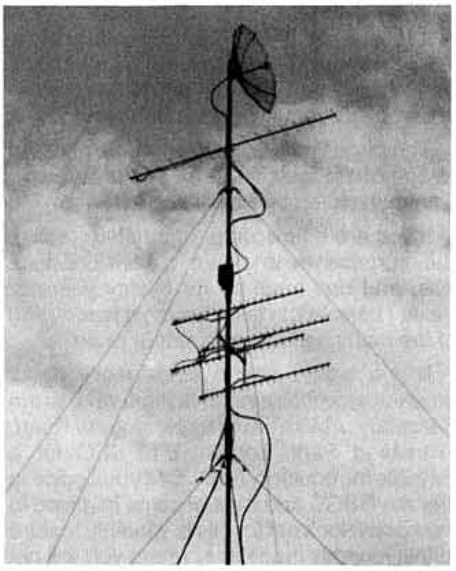
The circuit is shown in block form in **Fig 1**. The G4DDK- 001 1.3GHz printed circuit board (PCB) source is available from the Microwave Committee components service (note the new address for this service - see page 75) and is suitable for Novice construction, given a little help and guidance, as mentioned in the last column - your soldering technique should be good, too! The early stages of the design follow 'ordinary' construction techniques with ordinary coils (inductors) and capacitors used for tuning. The later stages use 'printed' inductors on the PCB: these are known as 'microstrip' lines.

The oscillator stage uses a crystal near 108MHz (for output at 1296MHz, in the 'communications' part of the band) in a two-transistor circuit, with wound coils, and provides an output at three times the crystal frequency. This is then multiplied by two, twice, in two further transistor stages, these stages using special 'stripline' transistors and printed microstrip inductors or lines, together with very small tuning capacitors to tune to the right frequencies.

The tuned circuits also act as bandpass filters, between stages, which help to get rid of (or greatly reduce) unwanted harmonics which are produced at the same time as the wanted harmonics by the multiplier stages.

With the exception of the transistors, a few special lead-less capacitors, the microstrip lines printed on the PCB and the small trimmers, all the remaining components are 'normal' types.

The transistors and most of the other components are obtainable from several sources (some addresses given later) and



the leadless capacitors and trimmers, together with the board (described as a 1152MHz source, RC 0287), from the components service (see the *Bookshelf* price list pages).

Fig 2 gives the circuit diagram and **Fig 3**, the approximate layout of the components on the board. **Fig 4** is the circuit of a simple FM modulator, suitable for either frequency shift keying (FSK), audio modulation (FM) or audio frequency shift keying (AFSK).

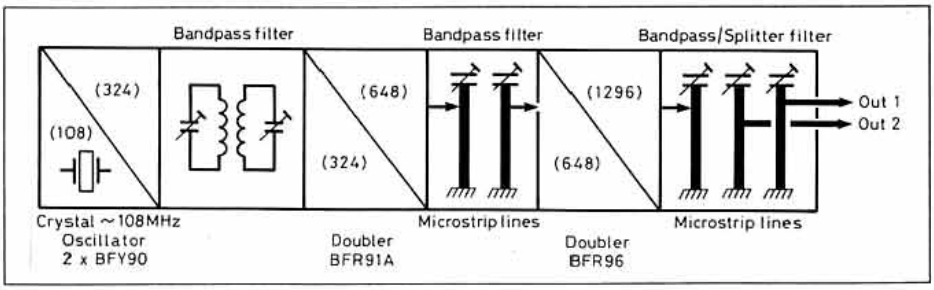


Fig 1: Block diagram of the G4DDK-001 1.3GHz source.

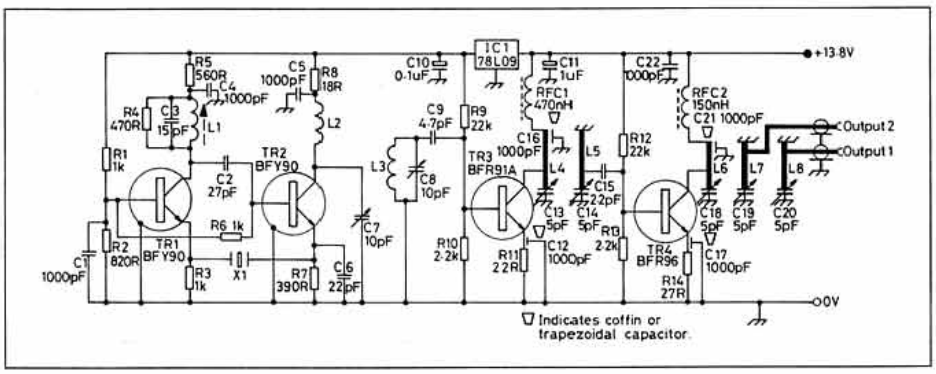


Fig 2: G4DDK-001 1.3GHz source circuit.

The components to the right of the dotted line should be wired *directly* to L1 in the oscillator circuit on the PCB; those to the left can be either 'suspended' or soldered to, say, a small piece of Veroboard mounted *inside* the screening box, close to the main PCB.

Alignment is quite easy, provided that you have the use of an analogue (moving coil) multimeter, suitable absorption wavemeter(s) and some way of measuring power. Briefly, the oscillator stage is checked using an absorption wavemeter, the multimeter is used to check the voltage across resistors R11 and R14 (see the circuit diagram) as each stage is tuned up.

Each stage frequency is checked by means of a suitable wavemeter during tune-up and the power output is peaked using a simple power meter connected to the output. If you don't have suitable wavemeters and power meter - and a beginner is unlikely to - what do you do? Either find someone locally who does and is willing to help you, or be prepared to buy or make your own test equipment.

You'll certainly need a wavemeter (maybe more than one) to satisfy the licence requirements, some form of power meter is always useful and a multimeter is an essential part of any amateurs' shack.

Next time, I'll outline some ideas for simple power measurements and wavemeter designs before moving on to considering amplifiers to give more power output from the transmitter board, antenna ideas and, of course, receiver ideas.

A very full description of this design, and several other similarly useful general purpose microwave designs, is given in the *RSGB Microwave Handbook*, Volume 2 [available from RSGB Sales - see pages 74/75].

Finally, here are some suppliers' addresses for components for this design (see their catalogues for details of stock and prices):

Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts EN10 7NQ.Tel. 0992 441306.

Bonex, 12 Elder Way, Langley Business Park, Slough, Berks SL3 6EP Tel. 0753 49502.

Maplin Electronics, PO Box 3, Rayleigh, Essex SS9 8LR Tel. 0702 552911.

Piper Communications, 4, Severn Road, Chilton, Didcot, Oxon OX11 0PW Tel. 0234 834328.

TECHNICAL CORNER

THE G3WDG-002 10GHz to 2m receive converter mini-kit has now been launched and is available from the components service. In starting to build the unit, using one of the first 'production' boards, I came across one or two very slight difficulties which, if you are aware of them, are not really difficulties!

First, the positions of the filter-locating PCB pins are not indicated in the construction booklet. Once you have determined where these are and fitted them, you will find that the locating pins for the LO filter (FL1) are rather a tight fit around the circumference of the filter. ie the filter is difficult to locate between the pins, especially when ready for soldering!

The solution is to file *a little* off the heads of the three locating pins *before* you fit them to the board and solder them in place. The earthing pin for C3 and C19 is also very close to the circumference of the filter: the solder fillet on the earth-plane side of the PCB might, if the pin is fitted before the filter as suggested in the booklet, also interfere with fitting the filter. Thus, I would suggest that this particular earth-pin should be fitted *after* the filter is in position and soldered to the board.

Otherwise, the rest of the construction is as straightforward as the G3WDG-001 multiplier/amplifier - although there are a lot more components to go on the same size of board. The only other thing you might get wrong, is the length of the filter coupling pins: note the different lengths for the two filters and be sure you fit them in the right places!

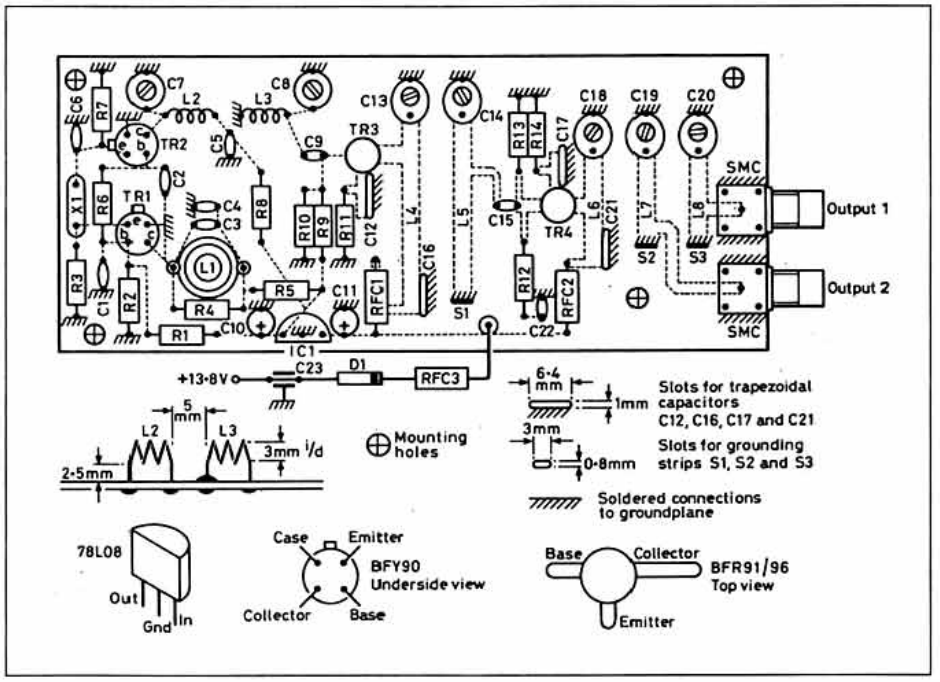


Fig 3: Board layout for the G4DDK 1.3GHz source.

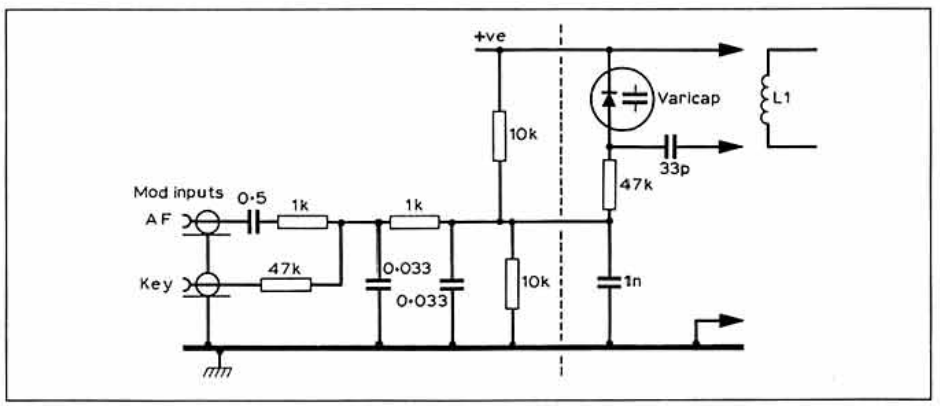


Fig 4: Simple FM modulator for FSK, FM or AFSK.

BEACONS

THREE NEW BEACON proposals have been received, one for 1.3GHz and two for 10GHz. All are somewhat unusual. The 1.3GHz proposal, (GB3ESB?) from the Hastings Group, is designed to beam west along the south coast in order to investigate coastal (part water, part land) propagation phenomena.

The first 10GHz proposal, from G3WFK, (GB3JET) is for a beacon situated on a good site in north-east Cheshire and covering both the urban area of Greater Manchester, parts of Merseyside and Cheshire, towards North Wales. This would be directional coverage because of severe shielding to the north and east by the main mass of the Pennines. What is interesting about this one is that it is crystal controlled but is F1A modulated and is at 10,435MHz, rather than the more usual 10,368 (narrowband) or 10,400MHz (wideband) frequencies. The reason for this is to allow beginners to use cheap satellite LNBs modified by simply changing the local oscillator dielectric resonator for one at 10GHz and then using a 70cm 'handy' or scanner Rx as the receiver. This might, the designer hopes, encourage new recruits to the band without going through the traditional 'in-line mixer, Gunn oscillator wideband' stage.

The second 10GHz beacon proposed is to be sited in South Wales, near Port Talbot, with the callsign GB3RPE, in memory of the late Dain Evans, G3RPE, who was a native of Swansea and, was for many, many years the moving spirit of UK microwaves. The project appears to be well advanced with local effort and the assistance of G3KEU. It is likely to consist of the DDK-004/WDG-001 combination mentioned earlier. the output being fed to a slotted waveguide antenna. This should be a particularly interesting beacon, since its main take-off will be across the sea to the south and south east, enabling quite long sea-paths to be investigated.

IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

In ***Electron*** (NL) Oct'90, **Herbert L Rutgers, PA0SU** explains the *directional characteristics* of communication microphones with emphasis on ***noise cancelling microphones***. Some suggestions for experimentation are included; the only instruments you will need are your ears.

SPEECH FREQUENCY fidelity is very important for a communication microphone, but so is its directional pattern. If you use an omnidirectional mike, it often picks up noises other than your speech. That is why some mikes are made *directional*, ie their sensitivity depends on the direction from which sound arrives.

Fig 1 shows three common directional diagrams. They look similar to antenna patterns, reasonably so as the same mathematics apply to both microphones and wideband antennas. **Fig 1a** needs little explanation. This omnidirectional mike consists of a capsule in a closed tube stuffed with sound damping material. The lowest frequency to which this mike responds is determined by the diameter of the capsule's membrane and the volume of the tube.

Fig 1b shows a figure-8 pattern which applies to now-obsolete condenser and ribbon microphones. The pattern of **Fig 1c** is called *cardioid* (heartshaped). It is obtained by also admitting sound to the back of the membrane. The way this is done, and especially the shape of the housing, determine the *front-to-back ratio*, which is never more than 2:1. Cardioid mikes are used in PA systems in halls, where they help to avoid the howl caused by sound from the speakers feeding back into the microphone.

FREQUENCY RESPONSE

UNFORTUNATELY FOR AMATEUR use, the frequency response of directional microphones depends on the distance between source and mike. We generally speak with the mike less than 30cm (12") from our mouth and the closer we come, the more the bass frequencies are favoured. Bass roll-off in the mike amplifier helps, but the voice quality remains a function of the mike-to-mouth distance.

With spurious noise sources in the shack, eg fans in power amplifiers, there are two approaches: use a directional mike and keep it at least 30cm away, or use an omnidirectional mike within a few cm (an inch or two) from your mouth. In either case, transmission of background noises will be limited.

Did you say you had no background noise? Even your own voice generates some due to echoes within your shack. That is most noticeable if a speech processor is used. Of these two approaches I prefer the closely held omnidirectional mike, but if a microphone could reject sounds from all sources further than, say, 15cm (6") away, that would be ideal.

NOISE CANCELLING MICROPHONES

POP SINGERS' MICROPHONES need to reject the ear-splitting noises from other members of the group; megaphones, those mike-amp-speaker combinations used to address large crowds, need them to avoid howl. I use one in my shack because of the noisy fan in my linear amp. If I switch from an omnidirectional to the noise cancelling mike taken from a megaphone, either held about 3cm (1.2") from my mouth, background noise drops by 15dB.

How is this done? By mounting two omnidirectional mike capsules typically 3.5cm (1.4") apart in a common housing so that the two capsules and the mouth are in line (**Fig 2**). Note that the two capsules are connected anti-parallel, ie in opposite phase. We now apply the law that the output from a microphone capsule is inversely proportional to the square of its distance from the source of the sound. If the source comes twice as close, the output voltage from the capsule goes up four times. Apply this to the two-capsule assembly. Sound from a far-away source has to travel practically the same distance to either capsule; their outputs are almost equal and opposite, so they largely cancel.

The voice of an operator who holds the microphone 3cm from his lips has to travel about twice as far to the furthest capsule than to the nearest; only the four times smaller output from the furthest capsule subtracts from that of the nearest, and little cancellation occurs. This assumes that the two capsules are identical. My megaphone mike has two dynamic capsules in housings so small that only frequencies above 300Hz are reproduced.

PHASE PROBLEMS

THE ABOVE REASONING assumes a sound wave arriving at the two capsules with equal phase. This is not true, however, if the distance between the capsules, typically 3.5cm, is a significant fraction of a sound wavelength (λ). If that distance were $\lambda/2$, the two outputs would be of opposite phase and, being connected anti-parallel, would add rather than subtract.

Sound travels through air at 340m/s, so λ=340/f (m). Accordingly, 3.5cm is $\frac{1}{2}\lambda$ @ 5kHz. This, fortunately, is outside the SSB voice frequency range. At 3kHz, the upper limit of that range, deterioration of noise cancellation is noticeable but in practice is not too bad.

TRY IT YOURSELF

FIND TWO SMALL, identical microphone capsules. Miniature dynamic capsules are suitable and so are electrets. The latter are inexpensive and have smooth frequency characteristics, but even supposedly identical ones have a wide spread of sensitivity which must and can be equalized further down the chain. Connect them, *not* in antiphase, to the L and R inputs of a stereo amplifier, which must be suitable for the chosen capsules.

Combine the amplifier *outputs* in anti-phase, eg by connecting monaural headphones between the 'hot' L and R output terminals. Stereo headphones can be used by connecting only to the 'tip' and 'ring' of their plug and leaving the 'barrel' floating. Adjust the stereo balance control for minimum background noise in the headphones.

If your noise cancelling microphone is to be used on the air, all the usual measures must be taken to keep RF out of the audio inputs.

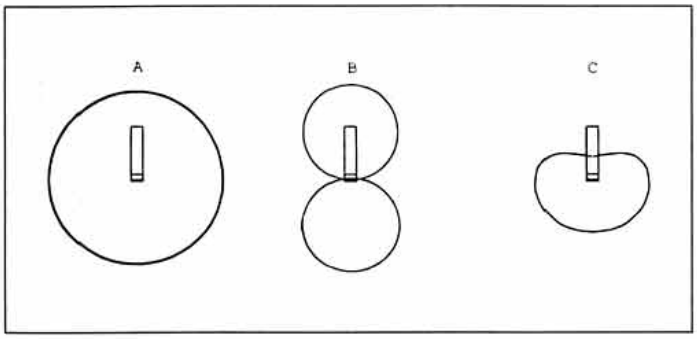


Fig 1: Three common directional patterns: a) omni-directional, b) figure-8, c) cardioid

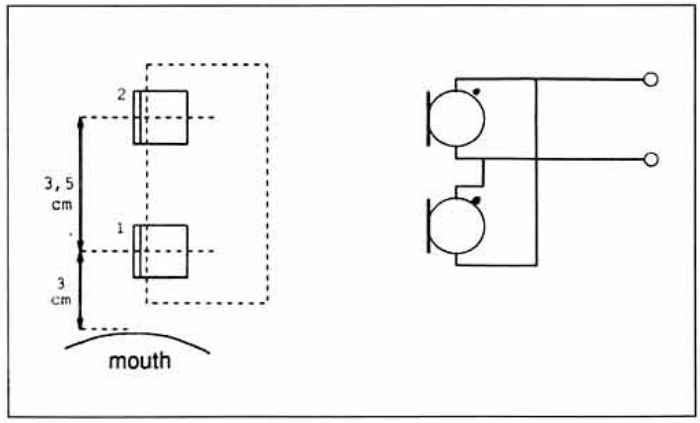


Fig 2: Location and hook-up of capsules for noise cancellation.

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Jaycee Electronics Ltd, 20 Woodside Way, Glenrothes, Fife KY7 5DF. Tel: 0592 756962.

Lee Electronics Ltd, 400 Edgware Road, London W2. Tel: 071-723 5521.

Leeds Amateur Radio, 34 New Briggate, Leeds, LS1 6NU. Tel: 0532 452657.

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A.R.E. Communications Ltd, 6 Royal Parade, Hanger Lane, Ealing, London W5A 1ET. Tel: 081-997 4476.

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S M C (Northern), Nowell Lane Industrial Estate, Leeds. Tel: 0532 350606.

S M C (Midlands), 102 High Street, New Whittington, Chesterfield. Tel: 0246 453340.

S M C (Birmingham), 504 Alum Rock Road, Alum Rock, Birmingham. Tel: 021 327 1497.

Waters & Stanton Electronics, Spa House, 22 Main Road, Hockley, Essex SS5 4QS. Tel: 0702 206835.

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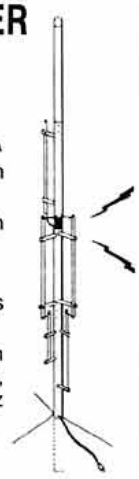

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CONTEST NEWS

All rules should be read in conjunction with the General Rules published in December 1990 (VHF/UHF/Microwave) and January 1991 (HF)

HF RULES

LOW POWER FIELD DAY 1991 RULES

This contest is intended to encourage portable HF operation using QRP CW rigs powered by batteries or natural power sources.

1. The General Rules for RSGB HF Contests, published in January 1991 *RadCom* will apply.

2. When: Sunday 21 July 1991, 0900-1200 and 1300-1600 GMT.

3. Sections: (A) 10W RF output maximum. (B) 3W RF output maximum. Single- or multi-operator entries will be accepted in both sections.

4. Mode & Frequencies: 3510-3560kHz + 7010-7040kHz CW only. Both bands may be used during each session. Any stations (including Overseas) may be contacted once on each band for points.

5. Special conditions:

(i) The power for all parts of the station must be derived from batteries or natural sources such as solar cells or wind driven generators. Float charging batteries from petrol, gas or diesel driven generators is not permitted.

(ii) The transmitter or outboard PA must not be capable of RF output power in excess of 15W.

(iii) Antennas must not exceed 35 feet (10.66m) above ground level and may have no more than 2 elevated supports.

(iv) The station must be 'Portable' as defined in the General Rules.

6. Exchange: RST, serial number, county code (as published in January 1991 *RadCom*) and RF output power in Watts. Serial numbers commence at 001 and continue through both sessions. Output power should be expressed as one or two digits plus 'W' in place of the decimal point, eg '10W', '1W', '1W5' (1.5W), '0W1' (100mW). Participants using more than 10W may send 'QRO' instead (QRO stations are not eligible to enter the contest but are welcome to 'give away points').

7. Scoring: 15 points for each QSO with a QRP Portable or Mobile station; 10 points for a QRP Fixed station; 5 points for all other QSOs. For the purposes of scoring, 'QRP stations' are those using 10W RF output or less.

8. Address for entries and posting date: As in General Rules.

9. Awards: The Houston-Fergus and Southgate Trophies to the winners of sections A and B respectively. Certificates to the first 3 entrants in each section and to the QRP Fixed station (submitting a checklog) giving the most points to entrants.

SUMMER 1.8MHZ CONTEST 1991 RULES

1. The General Rules for RSGB HF Contests (as published in January 1991 *RadCom*) will apply.

2. When: 2100GMT Saturday 22 June - 0100GMT Sunday 23 June 1991.

3. Sections: (a) British Isles **(b)** Overseas (including Eire). Single- or multi-operator entries will be accepted in both sections.

4. Frequency & Mode: 1820 - 1870kHz, CW only.

5. Exchange: RST + serial number commencing with 001. British Isles stations must also send their County Code as published in January 1991 *RadCom*.

6. Scoring:

Overseas stations work only British Isles stations for points.

Section (a) Three points per QSO plus a bonus of five points for (i) the first QSO with each British Isles County worked and (ii) the first QSO with each Country (outside the British Isles) worked.

Section (b) Three points per QSO plus a bonus of five points for the first QSO with each British Isles County worked.

7. Address for entries and posting date: As per General Rules.

8. Awards: Certificates of Merit to the winner and runner-up in each section.

HF RESULTS

2ND 1.8MHZ CONTEST 1990

The HFCC thanks those who entered or submitted checklogs, and congratulates the leaders, especially Vic Lundgren G4BYG, who wins the Victor Desmond Trophy as the operator of G0NAA. GM3YEH, the leading Scottish station, is well placed after the first leg of the Maitland Trophy and it will require a determined effort to unseat him should he produce a similar performance in the 1st 1991 event. A special mention goes to OK1PRR, who was running only 1.6W input.

In total, 46 counties appear in the logs, most surprising amongst the rarities being LDN and KNT, areas usually well represented. Stations in 28 countries outside the UK were also worked. There were some minor problems involving the new County Codes (HBN, BUX) and also the German and some of the USSR prefixes. Logs were rescored where necessary, resulting in extra points for a number of entrants.

Apart from this, there were substantial numbers of logging errors resulting in deduction of points. Any operator with a query over the number of points he has lost, or any other aspect of the checking is welcome to contact the adjudicator (QTHR).

Finally, thanks to all those who included letters and notes with their logs - these are always welcome even if not printed in the write-up, so don't forget to let us have your comments next time.

G3MCX

BRITISH ISLES TRANSMITTING

Posn		CallSign	Locn	Bonus QSOs	QSOs County	Country	Score
1		G0NAA + @	HBN	186	38	23	854
2		G3WGV *	BRK	159	37	22	768
3		G3TBK *	LCN	167	33	20	766
4		G4PIQ	ESX	179	29	25	759
5		GM3YEH	SCD	143	35	22	706
6		G4RFR @	DOR	137	38	18	688
7		G3YAJ	ESX	108	34	17	573
8	=	G3SYM	HPH	108	31	20	567
8	=	G0JFX	DVN	109	34	16	567
10		G3JJG	GLR	108	35	14	563
11		G3VYI	SRY	108	32	15	558
12		G0JNZ	DVN	105	31	13	522
13		G2MJ	LNH	103	33	10	518
14		G4OGB	HBS	90	34	13	494
15	=	GD4UOL	IOM	94	30	18	484
15	=	GM3NCS	GRN	103	30	15	484
17		G4CZB	NHM	82	34	12	470
18		G3KZR	SRY	92	35	11	469
19		G3MRC	HWR	89	26	13	462
20		GM3UM	LTH	77	32	14	457
21		GU4YOX	GUR	89	26	11	432
22		G3ULN	DVN	74	35	8	430
23		G5MY	LEC	71	30	11	416
24		G0IDE	LNH	69	32	9	412
25		G2AFV	YSS	72	29	9	405
26		G3YLC	BKS	69	31	8	392
27		GW3JI	CWD	64	33	6	380
28		GM4SID	GRN	61	26	9	351
29		G3SKC	DVN	54	28	6	332
30		G3GMM	CHS	48	23	7	288
31		G3BPM	SOM	40	27	5	280
32		G3JSR	ESX	49	24	5	265
33		G3ZRZ	LNH	40	23	4	251
34		G2HLU	DOR	40	22	4	250
35		G3FVW	YSN	43	22	3	235
36		G3NKS	GLR	37	21	2	225
37		GW4KVJ	GNM	30	18	4	196
38		G3ZGC	BRK	21	12	1	128
39		G4HVC	LCN	15	11	1	104

@ G0NAA operated by G4BYG, G4RFR operated by G3SQX

BRITISH ISLES RECEIVING

1	BRS1066 *	GLR	71	30	12	413

OVERSEAS TRANSMITTING

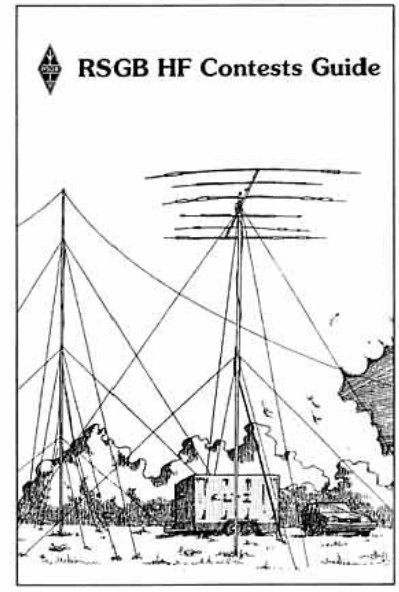
Posn	Callsign	QSOs	Counties	Score
1	DJ3KK *	49	31	301
2	OK1DRO *	52	30	300
3	OK1PRR *	45	29	282
4	ON6BR	44	24	249
5	Y22PE	41	27	248
6	OK1KYY	43	24	239
7	OK1DRU	38	24	193
8	LA1IE	25	19	167
9	Y25ZN	22	17	150
10	EA6ZY	20	14	120
11	Y25II	15	11	100

+ Trophy Winner; * Certificate Winner
Checklogs received with thanks from: GW3SB,OK2PMA,G3MCX.

The typeface in *Contest News* has been reduced at the request of the HF Contests Committee in order to do justice to the large amount of contest information requiring publication, whilst retaining the same page allocation.

RSGB HF CONTESTS GUIDE

Published by the RSGB's HF Contests Committee, this 19-page A4 booklet is a boon to newcomers to contesting as well as to the more experienced.



It includes an introduction to HF contests, a beginners' guide, a description of RSGB HF contests and some major overseas ones, an International Contests Calendar, an explanation of log-checking and hints and tips. Copies of all contest forms are included and these may be photocopied to use for your contest entry.

The *RSGB HF Contests Guide* is available from the HF Contests Committee, either at their NEC or HF Convention stands, or by post at £2 from Chairman Dave Lawley, G4BUO, 'Carramore', Coldharbour Rd, Penshurst, Tonbridge, TN11 8EX.

HF CONTESTS CALENDAR - 1991

May 8	28MHz Cumulative (Feb 91)
May 11/12	*CQ-M (CW/SSB) (May 91, p 17)*
May 16	28MHz Cumulative (Feb 91)
May 18	County Roundup SSB (Mar 91)
May 19	County Roundup CW (Mar 91)
May 25/26	*CQ WPX (CW) (May 91, p 17)*
Jun 1/2	NATIONAL FIELD DAY (Feb 91)
Jun 15/16	*All Asia DX SSB*
Jun 22/23	Summer 1.8MHz (May 91)
Jul 1	*Canada Day (CW/SSB)*
Jul 6/7	*YV DX SSB*
Jul 13/14	IARU HF Championship (CW/SSB)
Jul 13/14	RSGB SWL Contest
Jul 13/14	*SEANET CW*
Jul 21	Low Power Field Day (May 91)
Jul 27/28	*YV DX CW*

VHF RESULTS

432 MHZ LOW-POWER AND SWL 1990 RESULTS

Conditions for the event this year were most politely described as flat to very flat, with activity to match. Logging standards varied from very good to absolutely appalling, with an average points loss of 12%, and one station loosing 32% of the claimed score. Those who asked for MOTs should have had their feedback through that route. Remember that in a contest with multipliers and a small QSO total, the loss of a couple of contacts which were multipliers soon knocks a big hole in your score! However, congratulations to G1LSB, G4NPH, GW8GSQ/P and G7FOX for their perfect logs.

Suggestions were made for the contest to be shortened, for the power limit to be raised to 25W, and for a joint 2m and 70cm Low-Power results table to encourage more people into this event. Next year we should return to the normal format of fixed single-op and 'everyone else' sections to give the fixed single-ops more of a fighting chance. What do you feel about these possible changes? Write and let us know, or we will do what we think you want! Thanks to G0EIY for his useful check-log, and congratulations and certificates go to G8VOI/P, G4ERG/P, G3UAX/P, G0KYW/P, PE1EWR and BRS28198 - and how about some competition for these last two.

G4PIQ

SINGLE OPERATOR SECTION

Pos	Callsign	Total	QSO	Mults	Loc	Ant	Best DX	km
1	G8VOI/P	19734	76	39	90JO	4X19Y	G1GEY	482
2	G4ERG/P	16320	64	34	93PX	21Y	FC1LJA	497
3	G4LDR/P	14868	62	36	80WX	17Y	PA3AEF	486
4	G0CLP/P	12600	76	35	93AF	48Y	GI8AYZ	302
5	G1DVU/P	11704	65	28	90WV	17Y	G0MTV/P	393
6	G1LSB	9472	42	32	02CT	21Y	PA3AEF	327
7	G4NBS	9176	53	31	02AF	21Y	PA3AEF	323
8	G8HHI	9083	54	31	91OH	21Y	G1GEY	407
9	G4NPH	7320	46	30	02BI	4X17Y	FC1LJA	
10	G4DEZ	6162	49	26	01IN	18Y	G6WVG/P	340
11	G8IZR	5668	43	26	83RM	21Y	G8VOI/P	336
12	G0MTV/P	4906	37	22	94MJ	88Y	G4LDR/P	429
13	GW8GSQ/P	3486	28	21	81FP	17Y	G0MTV/P	351
14	G0EHV	1988	17	14	94FW	21Y	G0GJV/P	462
15	G5UM	988	18	13	92MP	14Y	PA3AEF	462
16	G3YDY	174	12	6	01FQ	18Y	G8DQK	133

MULTI-OPERATOR SECTION

Pos	Callsign	Total	QSO	Mults	Loc	Ant	Best DX	km
1	G3UAX/P	16758	90	38	91GI	2X48Y	PA0FRE	413
2	G0KYW/P	12408	55	33	81UC	18Y	PA3AEF	491
3	G4XOM/P	11418	70	33	82NN	24Y	PA0FRE	503
4	G0GJV/P	10560	51	30	80ST	2X21Y	PA0FRE	496
5	G8ARC/P	10404	65	34	92FM	21Y	PA0FRE	413
6	G3GXI/P	8970	61	30	93AO	24Y	G1DVU/P	325
7	G6CTU/P	7644	73	28	91XG	27QLY	G1GEY	419
8	G1SAS/P	6272	49	28	02BA	21Y		
9	G4WKN	5400	41	25	92OG	4X21Y	PA3AEF	380
10	G6WVG/P	4876	43	23	84VB	17Y	G1DVU/P	380
11	G1VDF/P	4700	35	25	82LB	88Y	PA3AEF	531
12	G4DDC/P	2610	42	18	91RU	21Y	PA3AEF	361
13	G8DCZ	1170	27	15	90VW	2X19Y	G4ERG/P	340
14	G7FOX	648	14	12	92NS	21Y	G1GEY	244

LISTENER SECTION

Pos	Callsign	Total	QSO	Mults	Loc	Ant	Best DX	km
1	BRS28198	6	1	2	00HX	48Y	G6CTU/P	55

FOREIGN SECTION

Pos	Callsign	Total	QSO	Mults	Loc	Ant	Best DX	QRB
1	PE1EWR	3904	25	16	11SL	21Y	G0GJV/P	425

432MHZ CUMULATIVE CONTEST (OCT-DEC 1990)

Despite over 280 stations, from 9 countries taking part, many entrants remarked about low activity. Reasons put forward for this included poor publicity, TVI problems and general decline in activity on the band. Most thought that period 4 was the best scoring evening, however normalisation will be restored for next year's contest. Congratulations to GW8TFI/P who won the 'All Other' section and to GD4IOM who won the Fixed Station single operator section. Certificates also go to G8NEY/P, second in the All Other section; and to G4WKN second in the single operator section. There was just one entrant in the SWL section and Mike Toms, BRS31976, will duly receive his certificate. Our thanks go to Frank Laanen, PE1EWR, who continues to support RSGB contests and who will get a certificate as the highest scoring overseas entrant. Check log gratefully received from G0AHQ/P. Unfortunately the entry from G8ATD was not accompanied by a cover sheet and had to be used as a check log.

G4OUT

SINGLE OPERATOR FIXED STATION SECTION

Pos	Call	Pts	QSO	Loc	Ant	dBw	Periods	Best DX	Km
1	GD4IOM	1288	116	IO74	4X21	20	3,4,5	G3GIM	513
2	G4WKN	833	145	IO92	2X19	20	1,3,4	EI4CL	382
3	G4TZM	817	126	JO01	4X17	20	3,4,5	G3UVR	325
4	G6HKM	712	117	JO01	23	20	1,2,3	GI4OPH	499
5	G8HHI	685	104	IO91	21	26	3,4,5	GI4OPH	478
6	G3WHK	643	107	IO91	24	20	1,2,4	GD4IOM	427
7	G4ERG	566	78	IO93	21	26	2,4,5	G8NEY/P	325
8	G4NTY	473	88	IO83	21	19	1,3,4	G1NMF	297
*	PE1EWR	393	35	JO11	21	10	1,3,5	GW0MGR	490
9	G4LDR	374	64	IO93	17	17	1,3,4	G3RSD/P	273
10	G1NMF	281	52	JO01	88	17	1,4,5	GD4IOM	464
11	G3UBX	244	51	IO82	88	17	3,4,5	GD4IOM	242
12	G0FKY	241	46	IO80	18	15	2,3,4	G1GEY	465
13	G1XJO	206	63	IO92	24	10	2,3,4	GD4IOM	300
14	G3XWZ	194	52	IO93	4X26	20	1,2,4	GD4IOM	251

ALL OTHER SECTIONS

1	GW8TFI/P	1319	168	IO81	4X16	26	2,3,4	PE1GHG	521
2	G8NEY/P	1042	144	IO80	2X21	23	2,4,5	DJ9DL	646
3	G4DSP	913	136	IO92	88	26	1,3,4	DL2KBB	481
4	G3RSD/P	684	127	IO93	12	20	1,3,4	GD4IOM	272

SWL SECTION

1	BRS31976	59	12	JO01	19	—	4	GD4IOM	452

1990 24GHZ CUMULATIVE CONTEST RESULTS

It is good to see that the growing interest in 24GHz has resulted in some entries to this contest. At least 11 stations were known to have made contacts this year. Conditions were described as generally poor, apart from October when low humidity brought better propagation. Both entrants used the Plessey GDHM32 in line module, and G3PHO wonders what has happened to all the other ones sold by the Microwave Components Service. Perhaps they will be active in 1991.

Congratulations to G3PYB and G3PHO both of whom will receive certificates.

G4KGC

NARROWBAND SECTION

Posn	Callsign	Pts	QSOs	Loc	Pwr (mW)	Best Dx	km
1	G3PYB/P	539	7	IO93	7	G3PHO/P	116
2	GPHO/P	395	5	IO94	7	G3PYB/P	116

1990 144MHZ TROPHY/IARU CONTEST

IARU contests always bring out a lot of Continental activity, and the larger UK contest groups choose sites appropriate to maximise contacts. Good DX is always available as the results table shows. G3CKR/P, Warrington CG, managed to work HG7B/P at 1574km in a 20 second MS burst! With a high band occupancy and high power, some RX problems were noted due to QRM and possible equipment deficiencies. Many groups are happy to run legal power into large antenna arrays but do not pay attention to the receiving side, with overloaded pre-amps! Congratulations to the Northern Lights CG in winning the Trophy (subject to RSGB ratification), and all section winners and runners-up. [Please when will somebody beat NLCG - it really is getting embarrassing. (G4DEZ)]

G8HHI

RSGB VHF CONTESTS CALENDAR - 1991

4/5 May	432MHz to 24GHz (Feb 91)
18/19 May	144MHz and SWL Single/All Others (Feb 91)
2 Jun	1.3GHz Trophy (Feb 91)
2 Jun	2.3GHz Trophy (Feb 91)
22 Jun	432MHz FM Fixed and Open (Feb 91)
22 Jun	432MHz CW Single/Multi Op (Feb 91)
23 Jun	432MHz Trophy/SWL (Feb 91)
6/7 Jul	VHF Field Day
27 Jul	144MHz Low Power/SWL (Mar 91)
28 Jul	432MHz Low Power/SWL (Mar 91)
25 Aug	432MHz Fixed/SWL (Mar 91)
4 Sep	144MHz CW Cumulatives (Mar 91)
7 Sep	144MHz CW Cumulatives
7/8 Sep	144MHz Trophy/SWL (Mar 91)
20 Sep	144MHz CW Cumulatives

A full list of 1991 RSGB VHF Contests appears on page 65, December 1990 *RadCom*. Dates of publication of rules in *RadCom* are shown in brackets.

144MHZ TROPHY/IARU OPEN SECTION MULTI-OPERATOR

Pos	Call	Pts	QSO	Loc	Best DX	Km
1	GU4APA	16228	1066	89VR	Y67QG/P	929
2	GJ3XBY	15093	962	89WG	GM7FTI	1090
3	G4LIP	12448	898	03BF	FC1BMI/P	911
4	G8LNC	10499	763	90JO	Y2/DL0CG	853
5	G3CKR	9857	731	93AD	HG7B/P	1574
6	G6CMS	9480	704	01PU	FC1EPB/P	862
7	G3EFX	8813	682	90XV	Y23SB/P	855
8	G4BWG	7892	613	01JP	DK0JK/P	836
9	GW4GFX	7324	576	81NV	Y67QG/P	926
10	G8EVY	6765	536	02EB	DK0JK/P	883
11	G4ERG	6310	512	94PH	HB9SAX/P	973
12	G0MCG	6240	560	93EC	DK8SG	855
13	G4DEZ	5624	442	01IN	DL0NF	787
14	G4CRA	5243	415	01IT	HB9LU/P	775
15	G0FBB	4756	479	01EH	GM3WOJ	774
16	G3WRS	4395	425	94MJ	FD1NWK/P	807
17	G8SMR	4236	436	93EH	HB9S/P	935
18	G0CCC	3474	311	02NW	HB9SAX/P	779
19	GI4KSO	3124	236	74BI	PA3FOC	738
20	GM0GMD	3063	229	86EE	DK0JJ	897
21	G6XRS	2617	323	92MO	DC1EDJ/P	663
22	G6CTU	2206	325	91XG	FC1FRU/P	636
23	G4SRS	2198	295	81WT	DL0EJ/P	—
24	GW7GXV	1991	228	83AB	PI4DEC	597
25	G3CMH	1861	223	80LV	DJ8UV/P	716
26*	G7FDC	1858	192	80FJ	FD1NBX/P	679
27	G0NYL	1852	232	93QO	FD1NWK/P	720
28	G1VDF	1737	214	82LB	FF6KSL/P	723
29	G7EAR	1585	205	91RK	HB9SAX/P	724
30	G 8NJA	1497	165	80FN	DF0RE/P	784
31	G8BKL	1171	171	82UK	HB9SAX/P	887
32	GI1VHT	1028	86	74BU	F6CTT/P	716

SINGLE OPERATOR - PORTABLE

Pos	Call	Pts	QSO	Loc	Best DX	Km
1	GW8TFI	5684	551	81LQ	FC1BMI/P	911
2	GM8ORG	1464	130	74TQ	F6IFR	—
3	G8PHN	912	76	70KA	PA3FNE	798

SINGLE OPERATOR - FIXED

Pos	Call	Pts	QSO	Loc	Best DX	Km
1	G4PIQ	8329	653	01MU	FC1BMI/P	747
2	G6HKM	3721	362	01FT	DK0HA	766
3	G4WKN	2707	326	92OG	HB9SAX/P	800
4	GW3JXN	1371	136	72SC	GM3WOJ	631
5	G3YDY	1055	121	01FQ	GI4KSO/P	517
6	G0MYE	957	71	70GE	G4ERG/P	605
7	G4DFI	891	85	01BL	DJ0EJ/P	565
8	G8ZRE	748	96	83NE	F6HPP/P	610
9	G1HSK	717	102	93MQ	F6GYT/P	654
10	G0JDL	592	61	02UL	GI4KSO/P	544
11	G3MEH	438	50	91QS	DL0EJ/P	603
12	G7GAB	398	66	92IJ	—	—

SWL SECTION

Pos	Call	Pts	QSO	Loc	Best DX	Km
1	BRS31976	1265	139	01HO	HB9SAX/P	680
2	BRS32525	801	99	01AL	HB9SAX/P	698
3	BRS25429	632	70	93FX	F6HPP/P	620
4	BRS25543	580	61	83LT	PA3FNE	628
5	BRS28198	160	23	00HX	LX/ON7RB/P	380

Checklogs gratefully received from GM0FRT, G6ARC/P, G7APD/P, G0CLP/P.

1990 10GHZ CUMULATIVE CONTEST RESULTS

This contest continues to be a very popular event although activity and entries were somewhat down on last year. For the first time the narrowband section had more entries than the wideband, although more contacts took place on the latter mode. G3ZME/P operated for the first time this year on narrowband and they noted a significant increase in average distance worked (70 to 98km) and best DX (160 to 248km) using narrowband. Comments from logs were mainly about the weather, but several noted reduced activity on wideband. Amalgamating the contest with the IARU event was generally not thought to be a good idea.

The G3RPE Memorial Trophy (for highest combined narrowband/wideband scores) goes to the Telford and District ARS G3ZME/P operated by G3UKV and G8UGL. Congratulations also to the section leaders and runners up who receive certificates, and to G8IFT as leading fixed station. Thanks to all stations who sent in logs and checklogs.

G4KGC

NARROWBAND SECTION

Posn	Callsign	Pts	QSOs	Loc	Pwr (mW)	Best Dx	km
1	G(U)8BJG/P	2920	33	IO80/IN89	200	G8CUX/P	245
2	G4JNT/P	2448	24	IO90/IO91	10	F6DPH/P	220
3	G3ZME/P	2435	25	IO82	200	G8LSD/P	248
4	G8LSD/P	2341	20	IO90/IO91	125	G3ZME/P	248
5	G3JMB/P	2240	22	IO90	200	G3ZME/P	248
6	G8BKE/P	1037	11	IO80/IO90	30	GU0FDZ/P	161
7	GW8IFT/P	842	7	IO91	200	G0KZP/P	165
8	G8IFT	681	11	IO81	200	GW3ATM/P	89

WIDEBAND SECTION

Posn	Callsign	Pts	QSOs	Loc	Pwr (mW)	Best Dx	km
1	G3ZME/P	2340	33	IO82	200	G3NKL/P	160
2	GW3ATM/P	2155	28	IO81	2/20	G8AYY/P	159
3	G8AYY/P	1357	17	IO93	5	GW3ATM/P	159
4	G2DSP/P	1289	27	IO90	8	GU4EFT/P	205
5	G8LSD/P	857	23	IO90/JO00	8	G3KEU/P	103
6	G8BJG/P	639	15	IO90/IO80	10	G8GKV/P	101
7	G3JMB/P	607	22	IO90	5	G3IW/P	71

DIRECTION FINDING

SLADE QUALIFYING EVENT

Date: 9 June

Map: 138 (Kidderminster)

Assembly: 1300 for start at 1320 BST

Location: Hartlebury Common, NGR 826713.

Competitors requiring tea should notify John Drakeley, 186 Conway Road, Fordbridge, Birmingham, B37 5LD; Tel: 021 772 2278 (home), 021 770 3474 (work), no later than 2 June.

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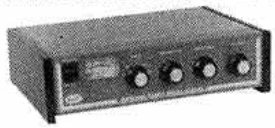

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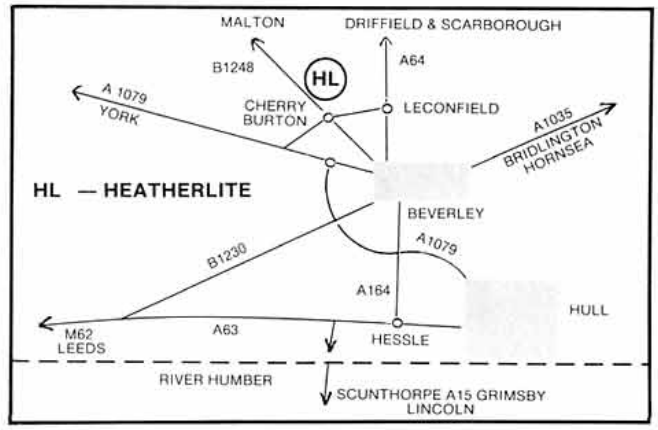

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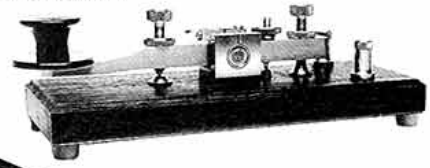

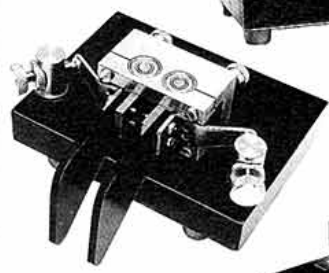

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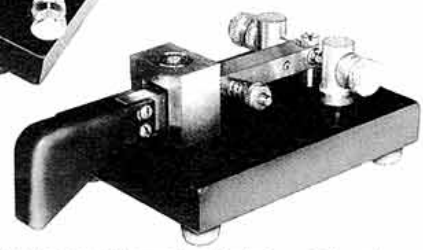

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KENWOOD TS140S: £675. Yaesu 736R, 70cm, 2m, 6m: £1000. MD1 base mic: £50. Icom IC725: £675. Warranty. G0LFF QTHR (Burgess Hill) 0444/248423.

KENWOOD TS530S with 500Hz filter, external VFO DFC230 + memories, mint cond: £575. Daiwa CNW418 500W cross needle ATU: £85. Yaesu FF501 **50omega** LPF: £25. Jaybeam 6ele 144MHz quad aerial: £30. All

above bxd, manuals. G4PEY QTHR (Horsham) 0403 69835.

KENWOOD TS530S with 500Hz, 1.8KHz narrow filters, MC10 mic and h/book, near mint condition, prefer buyer collects: £550ono. G0KDJ QTHR (Cheshire) 051 4245197.

KENWOOD TS830S C/W filter, new valves: £525. 6m linear 25W: £20. Chris, G4TKH QTHR (Potters Bar) 0707 43879 (evenings) 081 440 1112 (daytime).

KENWOOD TS940S, mint, little used, my log proves this, bxs, mic etc: £1400. 0566 773010 (evenings) 0837 53131 (daytime).

KEYER electronic ETM-2b, as new: £30. G3AAZ QTHR (Huntingdon) 0480 456781.

KR500 elevation rotator and controller: £85. Dragon 32K computer with PSU, books, leads: £30. **PNP** communications AMTOR RTTY CW terminal with built-in 230V AC PSU leads for Dragon and all circuit diagrams and instructions, requires only your call S/W from G4BMK: £30. 10-ele crossed Yagi 2m Jaybeam: £20. 19-ele crossed Yagi 70cm Tonna: £15. AMT1 AMTOR TU book BBC Rom S/W and book, keystrip: £90. (Kidderminster) 0562 777209.

M/M LINEAR power amplifier 144/3/25 with receive preamp: £45. Datong D70 Morse Tutor, bxd: £45. P&P included. G0OPG (Wilmslow) 0625 531154.

MARCONI Marine Falcon Tx/Rx with AC PSU. Tx range 1.6 to 3.8MHz, power output 150W SSB, 100W CW. Rx range MF and HF marine bands. Crystal controlled channels. TT100 PA, technmical manual,gd cond: £175ono. Pye M4000 carphone BT System 4 (VHF): £30ono. GW4GCB Colwyn bay) 0492 531760.

MICRON QRP HF Tx/Rx ATU digital display, fair cond - offers. J-beam VR3 vertical Mk3 complete, unused: £60. G0HWA QTHR (Stafford) 0785 52693.

MICROWAVE modules MML144/100-LS 100W output for 1 or 3W input. Preamp, vgc, bxd. New rig makes it redundant: £105. Paul G7GUC (Cranwell) 0400 62245.

MKII Microreader, decodes Morse and RTTY on screen, built-in Morse Tutor, complete with tape and instructions, perfect: £120. G0BWF QTHR (Seascale) 09467 28438.

MUTEK TVVF50C 144/6m: £120. MML 6m 50W linear: £75. Tonna 6m ant: £25. G3WBN QTHR (Croydon) 081 654 2761.

PK232 m/mode data controller plus BBCB with twin disk drives and terminal program, or VDU terminal: £250. G0HZG QTHR. (Leicester) 0455 824238.

PMR Westminster W15FM C/S 25KHz channel fitted S8S9S20-S23 Raynet channel o/p low with tone burst: £50. Europa MF5U T Band 3 channel RBO Raynet channel: £50. G1NOL QTHR (Bishops Stortford) 0279 506996.

PORTABLE 52ft tubular alloy mast. Ideal for contest operation. 4ft sections. Complete with base, gin pole, stakes, guys, carry boxes and spare sections: £70. John G4BVE (Cheshire) 0606 48880.

PRACTICAL Wireless 1951-1969. Practical Mechanics 1934-1950. RadCom 1973-1991. Wireless World 1948-1982. Practical Television 1952-1966. Practical Electronics 1964-1991. Newnes Wireless Constructors Encyclopaedia, other magazines sae list. G0ENF, 51 Templeway West, Lydney, Glos GL15 5JD 0594 842917.

PYE Pocketphone PF2 UHF batts. info: £9 each. SPY Rx/Tx Mk 123 box info: £160. Scanner HP100 Fairmate new box batts: £195. (Anglesey) 0248 713776.

RACAL RA17 gen cov rcvr in mahogany veneered cabinet with folding front panel, C/W, manual, ATU: £150. GW0ONU not QTHR 0443 400616.

RADCOMS 1973 to 1990: £5 per volume. G3GSZ QTHR (Nr Durham) 0429 838089.

SCANNER AR1000 only few hours use by OAP, nicads, charger: £195. (Penzance) 0736 871285.

SHACK clearance. H/helds IC04E 70cm: £100. CTE 2m: £100. Comax CD670 comms decoder with LCD display: £135. Yaesu FC707 ATU: £95. M/modules trnsvtr 2m in 70cm out: £95. Datong FL3 audio filter: £85. IC735 HF tcvr: £695. Realistic PRO2022 scanner: £135. (Pulborough) 07982 3214.

SILENT KEY sale G0FKB. Icom 740 HF tcvr PSU P515 spkr SP3: £525 complete. Trio 913D 2m m/mode 5/25W: £320. Adonis desk mic: £45. SWR/PWR Meter: £25. PSV 13.8V 6A PP1336: £50. Pac-comm TNC220 Kenpro KR400RC Welz m/unit AC 38m Welz dummy load - offers? G0HYK QTHR, G4PJW QTHR (Crewe) 0270 663419; 0270 661971.

SILENT Key sale G4HTA. FTONE filters/FM: £950. Linear FL7000: £1000. Collins KWM380: £1000. 30LI: £500. BP30MNI versatower: £275. FT480R: £300. Mic MDI; £50. Icom IC28E: £210, unused. TTC SWR PWR meter: £15. Turner Landcom mic: £40. All pristine cond. G3MJK QTHR (Basingstoke) 0256 87439.

SPECTRUM Plus 3 128K with J&P Eprom and RMS3 filter: £115. G2CKI QTHR (Evesham) 0386 881155.

TENTEC Argonaut 509 QRP tcvr in daily use, external AF filter and Tx digital frequency readout, mic, h/book: £250. Heathkit SW7800 communications Rx, digital readout manual: £175. Realistic Dx160 communications Rx, spkr, h/book, ideal for SWL/Novice: £50. G8QM QTHR (Nr Newcastle upon Tyne) 091 4881070.

TL120 linear and mobile bracket for TS120/130V, mint, orig packing, leads, manual, not required as QRP!: £110ono. Frank G3YCC (Hull) 0482 650410.

TOYO coax relays (2) CX520D 50**omega** 12VDC 1KW PEP to 30MHz, 300WDC at 1GHz. Max f 2.5GHz. "N"-SKTS. As new in makers cartons with spec leaflets: £30 each. Welz SP425 144/430 SWR/PWR meter, remote head, twin meters, mint cond, instructions and orig packing: £75. G3GPB QTHR (Ringwood) 0425 471677.

TRAP dipole and VHF/UHF aerials cabled to upstairs shack part of 3 bed semi plus granny annex. Long gardens with greenhouse. Drive leading to car port and garage will hold four cars. Located quiet Close easy access M25 and main railway service. Good shopping centre nearby. Two excellent radio clubs within easy reach: £125,000. G8FSZ QTHR (Addlestone) 0932 348307.

TRIO 120V HF Tx/Rx + PS20 DCPSU, bxd: £350. Drake TR4 250WT Tx/Rx remote VFO: £300. Atlas 180 solid state HF mobile 100WT: £275. G4BNH QTHR (Shipley) 0274 593153.

TRIO TL-120 100W linear amplifier. Intended for TS120V. Would suit any QRP rig. Mint cond. Manual and leads: £100. G4IYI (Chorley) 0257 273976.

TRIO TS-711E 2m m/mode, vgc, bxd: £575. BNOS 144MHz linear 25/160, bxd: £175 with pre-amp LED meter. G7FHV QTHR (Sussex) 0444 417509.

TRIO TS520 Tx/Rx fine rig in gwo. Excellent value at £350. (Haverfordwest) 0348 881346.

TS440S with CW filter: £800. TR9130 2m m/moode with BO-9A base: £300. MML 144/100S 2m linear with preamp: £80. Daiwa CN620A meter: £40. Diamond X500 2m collinear: £80. LAR/VHF ATU: £20. All mint, bxd. Mark (Belfast) 0232 795783.

TS530S 9 bands, as new, one owner: £500. 2 prs 6146B 2 prs 12BYYA valves MC50 desk mic: offers. Shure 401B mic new, carr extra. G4BAV not QTHR (Ipswich) 0473 749139.

YAESU FRG7700 C/W FRT7700 ATU and FRV7700 convtr for 2m 6m Air Band. Mint, bxd: £260. MMC435/600 ATV cnvtr: £25. MMT 432/144 trnsvtr: £80. All little used and with boxes and manuals. Peter G4PNF (Ipswich) 0449 741251.

YAESU FT1000 latest super HF tcvr 230W - offers. Dewsbury Star masterkey CMOS memory keyer, mint: £50. G3RCE QTHR (Portsmouth) 0705 752618.

YAESU FT101Z, as new, fan, manual: £400. Simon (Kenilworth) 0926 55210 (evenings).

YAESU FT102 AM/FM board CW filters fitted: £450. FV102 digital VFO: £150. Mint condition. Spare set brand new valves: £30. (Worcester) 0905 359333.

YAESU FT107. Everything needed to make AUX positions 12m and 17m, genuine Yaesu parts: £40 or fitted: £80. G4TRN QTHR (Bristol) 0272 741781.

YAESU FT480R 144MHz m/mode FM SSB CW 10W output: £260. G8HXE not QTHR (Manchester) 061 747 5099.

YAESU FT680R, mint, hardly used, bxd: £260. 40ft pneumatic mast: £190. Aerials, 17ele Tonna 144MHz, 5ele Tonna 50MHz, Collinear 144MHz, all bxd. New price £173, sell: £120. Will split. (Stoke on Trent) 0782 394666 (after 6pm wkdays, anytime wkends).

YAESU FT73R h/h FNB10 FNB11 two chargers spkr mic soft case bxd manual: £225. Free delivery UK. Peter G7EGU (South Benfleet) 0268 757619.

YAESU FT757GX DRAE 24 amp power supply: £600. G4HPV QTHR (Scarborough) 0723 366086.

YAESU FT980 HF tcvr, vgc, mic manuals bxd: £850. AEA AT300 ATU 80-10m 300W cont coax balanced end fed Xmeter: £125. Icom IC740 HF tcvr FM unit, vgc, mic manuals bxd 12A PSU: £525. GW4RLP QTHR (Caernarfon) 0286 5264 (evenings).

YAESU G-600RC antenna rotator, as new: £165 + carr. Datong Morse tutor: £30. LAR SWL omni match: £15 + carr. Spectrum Communications 6m preamp: £20ono. Wall mast base plates and winch plus 40ft of extension poles, as new: £120. TET HB 34D 4ele beam 14-29MHz: £120. (Newtown, Powys) 0686 626551.

YAGI two ele Sandpiper beam for 6/10/15/20m, as new: £120 plus carr. (Nr Chester) 0244 541303.

T100/VT220 terminal: £95. TRS80 MkIII twin disc, V24 i/f, s/ware: £95. Four 23cm 28ele loop Yagis: £12 ea. Double screened 10mm coax: 50p/metre. Geared motors: £5 ea. G4NVA QTHR (Cheshire) 0477 33011.

HELP LINES

BELCOM LINER 2

Chris Jordan, G0NGN, recently purchased a Belcom Liner 2 144MHz SSB rig at a club junk sale and would be grateful of any information/circuit diagrams etc, on this unit. He would like to modify it for 50MHz and would be interested in hearing from anyone who has tried this. Chris can be contacted at Poundgate Farm, Beguildy, Knighton, Powys, LD7 1UW.

HONEYWELL R32

Basil O'Brien is looking for a manual for a Honeywell R32 printer, any assistance would be appreciated. Basil, G2AMV is QTHR.

WANTED

£5 still offered for Ceramic Hammarlund UX 5 6 and 7 prong valve holders. G4IMT QTHR (Bath) 0225 891254.

940 Rx (Eddystone) with no mods, must be good condition. (Glasgow) 041 649 4345.

BUTTERNUT HF6VX 80-10 HF vertical plus 20 and 30m kits. Must be mint. Tony G4KHT QTHR (Hull) 0482 843457.

CIRCUIT for Eddystone 990R Rx. Plug-in elements VHF UHF for Bird Thruline RF/IF gain knobs for above Rx. G4AJE (March, Cambs) 0354 741168 (5pm - 7pm).

COMMAND Receivers, complete sets, spares, accessories, incl mounting racks. Unmodified sets preferred but good cond receivers considered regardless, working or otherwise. All models required. FT-260-A front panel adaptor units also needed. WHY? Complete dynamotor assembly for BC348 wanted. G3FIK QTHR (Lichfield) 088922 319.

CW FILTER SBA-301-2 for HW100 circa 1968 3.395MHz IF 400Hz wide. Duncan GM0KAE QTHR (Alva, Clackmannanshire) 0259 60700.

DEAD Tx or tcvr for spares or rebuild, anything considered if cheap. Also 2m h/h. Don G0MDO QTHR (Bradford) 0274 567570.

EDDYSTONE 870A offset mains plug required. Also circuit diagrams literature (original or copies). GW0KLY QTHR (Mid Glam) 0443 681720.

HEATHKIT CW keyboard, must be very well built and working. G0HIN QTHR (Camberley) 0276 24482.

HELP. 227R only operates when "5UP" is pressed. When released displays 0. Used to cure itself after half-an-hour, not now. Any genuis contact 27 Copperfields, Lichfield WS14 9YQ or 0543 417146. Leave message, will call you back. G4MPG.

HF MULTIBAND vertical or CAPCO/Isoloop magnetic loop antenna. Also mobile G-whips. Distance no object. G0OPG (Wilmslow) 0625 531154.

HF Tx/Rx C/W all accessories in good working second hand condition. G3MEG QTHR (Welling, Kent) 081 312 0639.

ICOM SM5 mic required, fair to mint condx, reasonable. GI3HNM QTHR (Belfast) 0232 483460.

INFORMATION required Belcom LA-106 144MHz linear. Manual in English diagrams etc. Only manual I have is Chinese! (Newark) 0636 74362.

MAG LOOP 40/80 or 80/160 vswr + power bridge HF up to 2KW - MFJ ATU 1.5 or 3K ATU. 0704 880345.

MARINE Radio Manual by Danielson and Mayoh published 1964 Newnes Press. Manuals for RA217 Rec. RA66 Panadaptor. (Mansfield) 0623 641709.

McELROY Mac Key. Also commercial sideswiper. John (Taunton) 0558 685214 (evenings).

PK232 + mailbox or Kantronics KAM all mode. TNC preferably KAM. G0DRG (Southampton) 0703 666133.

TEN-TEC Model 263 remote VFO for Corsair II. Up to £200 paid for good sample. G3TSN QTHR (Bradford) 0274 498783.

TRIO SM220 station monitor with pan display BS-8, must be in gwo, operating manual. Dennis 0407 830182 (after 6.30pm).

URGENTLY require manual panadaptor EP17R also valve holder for 8122. G3ICB QTHR (Thatcham) 0635 64345.

WIRELESS set No 22 in any condition. WS22 ancillaries. Also WS19 RF amp, R107, R209 for small private collection. Please check your garage, loft, shed etc. Cash waiting. Exchange C42 for WS22 possible. WHY? Martin G4NCE QTHR (Birmingham) 021 3576139.

YAESU FL-7000 HF solid state linear, new cond. (Nr Chester) 0244 541303.

SILENT KEYS

WE HAVE BEEN NOTIFIED of the deaths of the following members:

G0ACS	Mr WC Taylor	
G0HJF	Mr RG Clark	09.03.91
G0IUX	Mr CR Laurie	12.03.91
G1RZY	Mr B Laughlin	
G2FWX	Mr WP Air	12.02.91
G3EGJ	Mr RC Hotter	05.03.91
G3VRI	Mr AR Reynolds	25.02.91
G4DCS	Mr HJ Paice	08.03.91
G4EBD	Mr SH Pond	07.02.91
G4FWO	Mr BD Jackson	
G4PTM	Mr W Tuke	09.02.91
G4UMC	Mr GJ Fox	Sep 90
G4USU	Mr C Foster	21.12.90
G5SY	Mr WB Sydenham	18.02.91
G6NK	Mr RJ Denny	06.03.91
G6SX	Mr VC Slight	21.02.91
G6XDJ	Mr RT Percival	30.01.91
G8FNM	Mr LG Miller	02.07.90
G8JEX	Mr RG Ayley	
G8WFH	Mr M Weatherby	02.02.91
GM0CXA	Mr A McGill	12.02.91
GW4LQK	Mr CK Wilson	03.03.91
GW4NBV	Mr A Hansford	
GW4VCR	Mr WL Grundy	Dec 90
GW4WCZ	Mr TF Sheldon	02.02.91
GW8IH	Mr NTJ Bevan	05.10.90
RS25931	Mr FW Wilson	Apr 90
RS46040	Mr FE Clayton	Jan 91
RS88368	Mr AJG Brand	

EXCHANGE

FT727R dual band h/held spkr mic FNB4 SW mobile adaptor, soft case, spare nicad case charger, all bxd. Wanted TR9130 or FT290II or £300. vgc. (Birtley) 091 4100305.

STANDARD C58 m/mode 2m portable plus sentinel 40 linear/preamp for recent 2m mobile or sell both for £275. G7IJP (Langport) 0458 250124.

TRIO TS780 for HF mobile txr or sell for £650ono. GM0LYH QTHR (Kilwinning) 0294 54141.

OUR NEW STYLE 2 ADVERTISEMENT

THIS IS our new style 2 advertisement. It comprises a line of white space with a rule, top and bottom of the advertisement. The cost of choosing this advert is an extra £1. If you would like your advertisement to look like this, tick the appropriate box on the form when filling it in.

The above example represents a style 2 advertisement. The cost is £1 above the price of the ordinary (style 1) advert. If you would like your advertisement to look like this, tick the appropriate box when filling in the advert form.

CLUB NEWS

DEADLINE - Items for inclusion in the July 1991 issue must be sent to HQ marked "Club News - DIARY", to be received by 15 May latest. If news is received by the published deadline, it should 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.

NOTE: This is primarily a service for clubs affiliated to the RSGB, to whom priority will be given.

AVON

BRISTOL ARC - 2, construction clinic; 9, discussion night; 16, HF on air evening. Details 0272 583441.

SOUTH BRISTOL ARC - 1, Anecdotes; 8, computer activity evening; 15, talk "Linear Amplifiers"; 22, talking brick; 29, contest & logging teach-in; June 5, QRP workshops; 12, exhibition of Calligraphy. Details Whitchurch 832222 on Wednesday evenings.

THORNBURY & DARC - 1, talk "Power Supplies" by Bob, G8SPC; 15, HF activity night; June 5, Fox Hunt John G6RAZ.

BEDFORDSHIRE

BEDFORD & DARC - 7, operating night; 14, social - committee meeting; 21, talk - J.W. Armstrong - A.K.D; June 4, talk by John Allen, G4PDP.

DUNSTABLE DOWNS RC - *NEW SECRETARY* Wendy Jefferson, 125 Telscombe Way, Stopsley, Luton, Beds LU2 8QP. - 3, club station, Dunstable Downs 7.30pm start; 17, preparing for Car Boot Sale, May 19th - 8th Car Boot Sale. Details 0582 451057.

SHEFFORD & DARS - 2, constructors contest (ake 21); 4&5, contest: 70cm and Up; 9, mobile DF hunt; 16, club equipment testing; June 6, VHF NFD Taster. Details 0763 71149.

BERKSHIRE

BRACKNELL ARC - 8, DF 2 - The voyage home - A chance to try out and sort out the DF kit and techniques ready for the big one. Details 0344 572329.

MAIDENHEAD & DARC - 2, talk "HF Communications in Africa" by John, G3VLH; 21, preparations for HF NFD. Details 0628 25952

NEWBURY & DARS - 22, talk "Weather Fax" by Mike Adams, G0AMO. Details 0635 63310

READING & DARC - 9, HF NFD planning; 11, Scouts foxhunt; 18, assisting Christian Aid walk; 23, alignment evening; June 13, VHF NFD planning. Details 0734 476873.

BUCKINGHAMSHIRE

MILTON KEYNES & DARS - 13, talk and demonstration "Amateur TV" by Dave, G4NJU; June 10, MKDARS construction contest - viewing and judging. Details 0908 316435.

CHESHIRE

CHESTER & DARS - 14, Entertainment!! WDYK RAAQN; 21, Outside operation on the YELD; 28, talk "Up and Beyond" by G4YCA. Details 051-608-3229.

MACCLESFIELD & DARS - 14, talk "Magnetic Loop Antennas and Associated Equipment" by Tony Johnson of Capco. Details 0625 424304

CLWYD

DELYN RC - 8, preparation for monitoring of the Annual Delyn Walk across Halkyn Mountain; 13, monitoring of the Ninth Delyn Walk across the Halkyn Mountains; 22, talk "Abroad in the USA" by Derek Rogers, GW3UOO; June 5, talk "The Work of the Animal Rescue Service". Details 0244 819618.

RHYL & DARC - 6, talk on "6 Metre"; 20, talk and demonstration "Model Steam Engines" by GW0DFY; June 3, film night. Details 0745 336939.

WREXHAM ARS - 7, field evening and barbecue; 21, talk "Digital Logic". Details 0978 261482.

CORNWALL

CORNISH RAC - 2, talk "Spectrum Analyser" by G3IGV; 7, activities night; 13, computer section; June 6, talk "Papua New Guinea" by G4ZUI. Details 0209 820836.

DERBYSHIRE

DERBY & DARS - 1, May Day junk sale; 8, illustrated talk "PACSATs" by Jonathan, G4KLX; 15, 2m direction finding practice - Allestree Park; 22, illustrated talk "The GD6CW Expedition" by G0FOG and G0IXR; 29, talk "The Joys of QRP Operation" by Alan Lake, G4DVW; June 5, junk sale. Details 0773 852475.

DEVON

EXETER ARS - 13, talk "Repairing Rigs"; June 10, surplus sale. Details 0392 78710.

PLYMOUTH RC - 7, talk by Peter Chadwick, G3RZP; 14, talk "RSGB" by John Forward, G3HTA; 21, PRC Rally briefing; 26, PRC Rally Radio & Electronics Fair; 28, Rally de-brief. Details 0752 363607.

TORBAY ARS - 17, talk "The Probation Service"; June 1/2, National field day contest. Details 0803 526762.

DORSET

PLESSEY CHRISTCHURCH ARS - 9, home construction contest. Details 0425 621982.

ESSEX

BRAINTREE & DARS - 20, Annual General Meeting. Details 0376 27431.

GRAMPIAN

ABERDEEN ARS - 3, junk sale; 10, talk "Digital Audio" by GM0CIT; 17; talk "Magnetic Resonance Scanner (Magiscan)" by Jim Hutchison; 24, NFD preparations; 31, NFD site preparations; June 1/2, NFD. Details 0224 780519.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK ARC - 21, talk "Home Constructed Equipment" by G3IGM.

COULSDON ARS - 13, talk "Colossus and the Code Breakers" by Pat Hawker, G3VA; June 10, talk "500kHz and Below" by Tom Mansfield, G3ESH. Details 01-684 0610.

CRAY VALLEY RS - 2, surplus sale; 16, talk "A Trip to VK2" by G3VLX; June 6, talk "EMC" by G4JKS.

CRYSTAL PALACE & DARC - 18, HF on the air evening. Details G3FZL.

DORKING & DRS - 14, informal Falkland Arms; 28, talk and demonstration "RF Measurements - Basic Techniques" by John Greenwell, G3AEZ - Friends Meeting House; June 11, informal The St Ashtead at Leg of Mutton & Cauliflower. Details 0306 77 236.

EDGWARE & DARS - 17, straight key evening GB2SKE; 23, constructors contest: NFD briefing; June 1/2, national field day. Details 081 205 1023.

HAVERING & DARC - *NEW SECRETARY* I.D. Reid, G4LMQ, QTHR, tel: 04022 23310.

SOUTHGATE ARC - 9, talk "Early Radar" by the celebrated Marconi historian, Stan Woods. Details 081 361 2048.

SUTTON & CHEAM RS - 16, Annual General Meeting. Details 081 644 9945 (general), 0737 355271 (membership).

WIMBLEDON & DARS - 10, quiz with Couldson ATS; 31, talk "Safeguarding Electrostatic Sensitive Devices" by Jim Todd, G4XLM; June 14, talk "Linear Amplifiers" by John Stockley, G8MNY. 081-397 0427.

GREATER MANCHESTER

ECCLES & DARS - 7, talk "Packet Radio" by G6FEI; June 4, talk and demonstration "Measuring Sproggies" by G8ZZF. Details 061-773 7899.

STOCKPORT RS - 15, visit to Jodrell Bank; 22, pre-NFD night on the air; June 12, talk "War Surplus Equipment" by Peter Kirsop, G4WCE. Details 061-439 3831.

GWYNEDD

DRAGON ARC - 6, surplus equipment sale; 20, talk and demonstration by John E. Parry, GW3VVC; June 3, Grand debate "It is proposed that in future on all bands below 430MHz that relative to I watt the maximum power level be reduced to 9dBW (carrier) and 15dBW (pep). Details 0248 600963.

MEIRION ARS - *CHANGE OF VENUE* now meets first Thursday of each month at the Royal Ship Hotel, The Square, Dolgellau at 7.30pm for 8pm. Visitors always welcome - something different each month. Details from Lee Roberts, GW0MMW, Secretary, tel: 0766 85298.

HAMPSHIRE

HORNDEAN & DARC - 2, talk "Air Traffic Control"; June 6, talk "Space Exploration Hubble Telescope". Details 0705 472846.

ITCHEN VALLEY ARC - 10, RSGB video; 24, talk "Cellular Radio". Details 0703 736784.

THREE COUNTIES ARC - 8, talk "High Tech Industrial Locations in the Three Counties" by R.E.J. Seymour; 22, construction night; June 5, talk "The Changing Pattern of Pubs and Breweries in the Three Counties". Details 0420 489847.

WINCHESTER ARC - *CHANGE OF SECRETARY* Malcolm Butler, G0IMD, 44 East Stratton, Nr Winchester, Hants SO21 3DU, tel: 0962 89550. 17, talk on RAYNET - Bob Bloodworth, G4VWP and Peter Baxter G4EOW.

HEREFORD & WORCESTER

BROMSGROVE ARS - 14, Annual General Meeting; 28, night on the air. Details 0527 503024

BROMSGROVE & DARC - 10, talk "Heyday of Wireless" by Chris Price - old wireless sets with demo. Details 0527 33173.

HEREFORD ARS - 3, talk and demonstration "RTTY" by Bob Canning, G0ARF; 17, National Field Day preparations. Details Hereford 354064.

HERTFORDSHIRE

HARPENDEN ARC - *NEW SECRETARY* - R.J. Harry, G3NRT, 22 Grasmere Ave, Harpenden, Herts AL5 5PS, tel: 0582 713970. Informal meetings are changed to the 1st and 3rd Thursday of the month. 8pm. 'Marquis of Granby', Crabtree Lane.

HIGHLAND

INVERNESS ARC - 1, key night; 15, talk "Test Gear" by Don Anderson, GM0BFT; 29, construction night; June 12, key night. Details 0349 61783.

HUMBERSIDE

GRIMSBY ARS - 9, HF and Direction Finding Antenna forum. Details 0472 825899.

NORTH FERRIBY UNITED ARS - 3, night on the air; 10, The Way Ahead meeting, with Ken G4VKK; 17, Sky High - Chris, G6KIA; 24, RSGB video - Frank, G3YCC; 31, RSGB Matters - Norman, G3NJP (RLO); June 7, Topic of the Day - Ken, G4VKK, 14, HF Happenings - Ken, G4JIO.

KENT

BROMLEY & DARS - 21, RSGB video "Amateur Radio for Beginners". Details 081-462 2689.

DARENTH VALLEY RS - 8, talk "Microwave signals" by Chris Whitmarsh, G0FDZ; 22, on the air at the Village Hall; June 12, 5th construction night. Details 0689 876733.

EAST KENT RS - *NEW VENUE* Parkside Youth Centre, King's Road, Herne Bay. Meetings held at 7.30pm on the first and third Thursday of each month.

LANCASHIRE

BURY RS - 14, talk "RF Synthesisers" by P. Jones, G8OVT; June 11, Fox hunt. Details 0204 883212.

FYLDE ARS - 9, equipment browse sale; 23, NFD preparation; June 13, DF Fox hunt. Details 0772 635464.

PRESTON ARS - 2, talk with slides "Bolton Mountain Rescue Team".

WIGAN & DARC - 9, DX Chasing; 23, Annual General Meeting; June 2, Antenna feeders - general discussion. Details 0942 47416.

LEICESTERSHIRE

LEICESTER RS - 6, HF/VHF activity night; 13, committee meeting, HF/VHF activity night; 20, talk "Amateur Radio Observation Service" by G3STG; 27, HF/VHF night on the air; June 3, quarterly progress, open meeting and HF NFD final arrangements; 10, committee meeting, HF/VHF activity night. Details G3TQF.

LOUGHBOROUGH & DARC - 7, DF; 14, Reunion - The Belfry Oaks in Charnwood at 7pm - all amateurs and friends are welcome; 21, talk by Jandek; 28, visit to Ratcliffe Power Station. Normal meetings held at 7.30pm Tuesdays, Hindleys Shepshed.

LINCOLNSHIRE

LINCOLN SWC - *NEW SECRETARY* Patrick Markham, G1UBP, QTHR, tel: 0522 522715. 8, Annual General Meeting; 29, talk "Kit Cars" by Alec Truman, G4OIP.

LOTHIAN

LOTHIANS RS - 8, Triple meeting. "Safety and the Amateur, Construction Competition and DF Tune-up"; 22, DF hunt; June 12, AGM.

MERSEYSIDE

WIRRAL ARS - 1, pre-NFD meeting. Details 061-644 6094.

NORFOLK

ARC OF FAKENHAM - 7, EGM (details by post); 21, Police Videos (Traffic Orientated) - Roger, G0MJM; 26, Second 10th anniversary station GX4LSF on 2m (venue TBA); June 4, Video of G5RV talk (postponed from 15th January). Details East Rudham 633.

NORFOLK ARC - 1, "Where are you?". . . calculating QRA/QTH/NGR etc; 8, first HF NFD briefing; 15, GB3NB repeater AGM; 22, talk "Working Es" by Jim Bacon, G3YLA; 29, final HF NFD briefing. Details 0632 850591.

YARMOUTH RC - 9, Caravan Maintenance Party Bradwell; 23, NFD contest planning session; June 1/2, National Field Day. Details Yh 721173.

NORTH YORKSHIRE

YORK ARS - *NEW SECRETARY* K. Cass, G3WVO, 4 Heworth Village, York.

NOTTINGHAMSHIRE

MANSFIELD ARS - 2, Annual General Meeting. Details 0623 755288.

SOUTH NOTTS ARC - 3, club preview of RSGB video. 1) AR Hobby of the Space Age, 2) How to Become a Radio Amateur; 10, talk in/open forum; 17, construction; 24, on air night. Details 0509 672734.

SHROPSHIRE

SALOP ARS - 9, junk sale 7.30pm Beauchamp Hotel; 23, 2nd fox hunt; June 6, talk "Tropo Scatter Station for Oil Fields" by G3CSS. Details 0743 790457.

TELFORD & DARS - 1, LF station on air. Details Bridgnorth 761203.

SOMERSET

TAUNTON & DARC - 3, talk "Operating from a DX Station " by Bob Joll, G30SY; 17, talk "Soldering Techniques" by Stan Foulds, G4OPG. Details 0823 680778.

YEOVIL ARC - 2, talk "Multiband Antennas" by G3MYM; 9, RSGB video; 12, 7th Yeovil QRP Convention. Venue - The Preston Centre, Yeovil; 16, talk "Ny Milliwatt Machine" by G3MYM; 23, talk "The Two Driven Element Beam" by G3MYM; June 6, talk "OST This Month" by G3AIK. Details 0935 26341.

SOUTH GLAMORGAN

CARDIFF RSGB GROUP - 13, talk "Army Radio 50 Years Ago" by Bill Andrews, GW2DHM; June 10, talk "Welcome to the Novice Licence" by John Case, GW4HWR. Details 0446 773212.

SUFFOLK

FELIXSTOWE & DARS - 6, night on the air; 20, ESWR planning; 26, East Suffolk Wireless Revival providing Talk-in and Bring & Buy. Details 0473 642595 (daytime).

LOWESTOFT RC - 9, video; 23, treasure hunt - G4KDL. Details 0502 566289.

SURREY

HORSHAM ARC - 2, homebrew evening. Details 073784 2150.

SURREY RCC - 13, constructional contest. Details 081 647 9301.

TAYSIDE

DUNDEE ARC - 7, talk "North Pole 90" by Morag Howell, GM0MUV; 14, construction evening; 21, John Martin Memorial Award Evening; 28, talk by S. Hutcheson, GM3WPA, RAE Course Tutor Dundee Coll of FE. Details from George Millar, GM4FSB, QTHR.

WARWICKSHIRE

MID WARWICKSHIRE ARS - 14, Antenna Analysis with Glen, G8MWR; 28, Homebrew. Bring along your project; June 11, 2m DF Foxhunt. 7pm TX. 145.350 horiz FM. Details 0926 513073.

STRATFORD-UPON-AVON RS - 13, talk "Propagation" by Kurt Feldmesser; June 10, visit to Mercury Satellite Communications, Whitehill, Earth Station. Details 060 882 495.

WEST MIDLANDS

BARR BEACON RC - 6,17, Morse tuition 7pm - 7.45pm. Speakers to be arranged on the air. Details Walsall 36162.

STOURBRIDGE & DARS - 13, on the air evening; 20, talk "Electric Motor Design"; June 3, on the air evening.

WOLVERHAMPTON ARS - 7, committee meeting; 14, homebrew competition; 21, night on the air.

WORDSLEY RC - 9, film cartoons - Paul, G6YKT; 23, pre-expedition planning with Andy, G4JGM; 24,25,26, Radio HF, VHF, UHF and ATV weekend, Broadway Tower Country Park, Broadway, Evesham. Harry, G4VJU; June 6, on the air - HF. Details 0384 873666.

WEST YORKSHIRE.

DENBY DALE & DARS 1, talk "Radio Direction Finding"; 8, surplus sale; 15, discussion "Club Rally 1991"; 29, foxhunt. Details 0484 532371.

HALIFAX & DARS - 21, talk "CW Operation & Operating Practices" by Steve, G3VMW; June 18, talk "WAB". Details Halifax 202306.

KEIGHLEY ARS - 9, night on the air G0KRS; 16, alignment evening G3TQA; 30, talk "Amateur Radio on a Shoestring" by Rev. Dobbs; June 13, foxhunt. Details from Kathy, tel: 0274 496222.

NORTHERN HEIGHTS AR&ES - 1, talk "America's First 25 Years in Space" by Jack Birse; 15, junk sale; June 5, planning VHF Field Day. Details 0274 673116.

SPEN VALLEY ARS - 2, surplus sale; 16, foxhunt 2m DF; June 6, evening barge trip. Details 0274 875038.

WILTSHIRE

BLACKMORE VALE ARS - 14, talk "Wadley Loops" by Mr. Paul Reeves; 28, construction evening; June 11, talk "House Security" by Mr. Dave Roberts. Details 0935 442319. (9am to 5pm).

DEVIZES & DARC - 3, committee meeting and on the air; 10, on the air; 17, talk "Bandwidth of Indian Smoke Signals"; 24, on the air; 31, on the air; June 7, committee meeting and on the air.

TROWBRIDGE & DARC - 1, club quiz; 15, social and open evening. Details 0380 830383 (evenings and wkends). New Club callsign G2BQY.

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'.

5 MAY

BATC Rally - Harlaxton Manor, Nr Grantham, just off the A1 (signposted). Usual traders, bring & buy, refreshments and bar, lecture programme, talk-in, demonstrations, flea market and craft corner. Details from Paul, G8MJW; tel: 0522 703348.

KELSO ARS 8th Anglo-Scottish Rally - Tait Hall, Kelso. doors open 11am, usual attractions. Details from GM4UIB, tel: 0573 24654.

6 MAY

DARTMOOR RC Rally - St. Annes Church Hall,

Yelverton, Devon (A386). Doors open 10.30am, trade stands, bring & buy, refreshments and parking. Talk-in on S22. Details from Dave, G1YPD, tel: 0752 703101

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.

12 MAY

DRAYTON MANOR Mobile Radio Rally - Drayton Manor Park, Nr Tamworth. Details from Norman, G8BHE, tel: 021 422 9787 or Peter, G6DRN, tel: 021 443 1189.

YEOVIL ARC 7th QRP Convention" - Preston Centre, Monks Dale, Yeovil. Doors open 9am, admission £1.50 to include programme. Usual traders, plenty of refreshments available, lectures. Details from Mr. David Bailey, G0NMM, QTHR as G1MNM.

18 MAY

SWINDON Radio Rally - The Oasis Leisure Centre, North Star Avenue, Swindon. (Leave M4 at jnct 16). Doors open 10.30. Trade stands, grand bring & buy, Repeater Group etc, ample free parking, talk-in by Raynet on S22 from 5am. Details from Jim, G7GEA, tel: 0793 611859 or John, tel: 0793 619014.

19 MAY

DUNSTABLE DOWNS Eighth National Car Boot Sale - Stockwood Park Luton, just off junction 10 on the M1. Starts 10am. Talk-in on S22. For details telephone: 0582 451057.

MID-ULSTER ARC "Parkanaur" Rally - Silverwood Hotel, Lurgan, Co. Armagh. Doors open 12 noon. Usual trade stands, bring & buy, bookstall, QSL Bureau etc. Talk-in on S22 145.550. The proceeds of this Rally go to the Stanley Eakins Memorial Fund at Parkanaur near Dungannon. This is a very worthy charity, and we hope to see a really good turn-out of everyone interested in all aspects of radio and electronics. Details from Jim Lappin, GI1YGS, tel: 0762 851179.

26 MAY

EAST SUFFOLK WIRELESS REVIVAL (the Ipswich Rally) - Maidenhall Sports Centre, Ipswich (Note new venue) (Send sae to G4IFF QTHR for free maps). Doors open 10am, entrance £1, car boots £5 (including driver and one passenger), ample free parking. Talk-in on S22 GB4SWR. Details from Paul Whiting, G4YQC QTHR.

MAIDSTONE YMCA Radio Rally. Opens 10.30am (10am admission for severely disabled). Entry £1 per adult. Route: M20 junctions 4, 5, 6 or 7 - then A229 Loose Village, 2 miles south of Maidstone. QSX G8TRF (S22) and G3YSC (10FM & SU22). Exhibition station GX3TRF (on HF). All day video show, etc. for juniors. Refreshments, snacks & ale bar available; diy; bring & buy tables for hire. YMCA sports centre. Details: 0622 743317 for pre-rally camping/caravan facilities. Trade bookings etc 0622 750709. (Alan Judge, before 9.30pm).

PLYMOUTH Radio & Electronics Fair - Plymouth Radio Club Plymstock School, Church Road, Plymouth, Devon. Doors open 11am. Usual traders, Morse tests, bring & buy, refreshments, licensed bar, bookstall, Raffle. Talk-in on S22. Details from Jan Fisher, G0IVZ, tel: 0752 340946 evenings/weekends, 0752 262826 (daytime).

27 MAY

BIRCOTES Radio Rally - Bircotes Sports Centre. 10m south Doncaster off A1. Doors open 11am (10.30 for disabled visitors). Details and booking forms Raynet c/o 23 Florence Ave, Balby, Doncaster, tel: 0302 857526.

2 JUNE

NORTHAMPTON RC Car Boot Sale - (CHANGED FROM 26 MAY) rear of the Red Lyon public house on the A45 400 yards from jnct 16 of the M1 (Northampton turn). There will be parking for over 500 cars; entrance fee will be 50p per car or 25p per person. Licensed bar open from 12 noon; food all day long; bring & buy; many radio/computer/electronic stalls. If you are selling the fee will be £6.50 in advance or £9 on the day. Bookings to Paul G0HWC on 0327 41267 (evenings).SPALDING & DARS Mobile Rally - Springfields Arena Spalding. Also car boot sale. Details from T. Kettlewell, G4TWR, tel: 0775 722940.

9 JUNE 1991

22nd ELVASTON CASTLE Mobile Radio Rally - Elvaston Castle Country Park, near Derby. More than 150 trade stands. Technical Bookstall. Grand bring & buy. Flea market. Craft marquee. DTI Exhibit. Children's entertainments. Full on-site catering. Talk-in on 144 and 432MHz. Car parking £1.20 - coaches £5. Admission to rally activities is free. Details from John, G4PZY, tel 0332 767994 - Trade enquiries to Peter, G3WFU, tel 0332 700265 (evenings)

MID LANARK ARS Annual Open Day - Mid Lanark ARS club premises, Newarthill C.E. Centre, High Street, Newarthill, ML1 5GU. Doors open 11am, usual traders plus some new ones, bring & buy, catering facilities, raffle. Talk-in on S22. Morse tests (applications through RSGB HQ). Details 0698 732403.

NORFOLK Raynet Rally & Car Boot Sale - Barford (B1108) Norfolk, OS map 144, Ref TG113078. Car Boots £5; trade stands, refreshments etc. Talk-in on S22 by G4GLI. Details from Pat Bates, G0IYD, QTHR, tel: 0692 404593 (evenings only).

ROYAL NAVAL ARS Annual Mobile Rally - HMS Mercury, Nr Petersfield, Hants. RSGB, RAIBC, BARTG and RAYNET stands, bring & buy, flea market and car boot sale. Large Arts & Crafts exhibition, radio-controlled power boats, cars and trains, amusements for youngsters, refreshments, two Grand Raffles and many other attractions. Talk-in on 2m and 70cm. Ample space for picnicking and parking, including free buses to and from the Rally site from the car park. Details from Cliff Harper, G4UJR, tel: 0703 557469.

SOUTHEND & DRS Annual Rally and Boot Fayre - Rocheway Centre, Rochford, Southend-on-Sea, Essex. Details from Steve, G1XGP, tel: 0702 712595.

16 JUNE

DENBY DALE & DARS Rally - Salendine Nook High School, Huddersfield. Doors open 11am. Details from J.D. Chappell, Secretary.

NEWBURY & DARS Car Boot Sale - Cold Ash Playing Field. Less than 10 minutes from A34/ Junction 13 M4, 10am - 3pm. Free parking and entrance for buyers. £6 per pitch for sellers, no pre-booking. Refreshments and children's play area. Talk-in S22. No entrance to field before 8am. Details from N. Jaques, G0HFU, QTHR tel: 0635 63310 or R. Jolliffe, G3ZGC, QTHR, tel: 0635 46241.

30 JUNE

LONGLEAT Amateur Radio Rally. Longleat House, near Warminster, Wiltshire. Over 120 traders and exhibitors; craft fair; camping and caravanning facilities next to the Rally all weekend; extensive catering on site, licensed bar, fast food etc; the largest Amateur Radio Bring & Buy sale in the UK; all the attractions of Longleat near at hand; plenty of free parking; Talk-in on 2m. More details from Shaun, G8VPG, tel: 0225 873098.

7 JULY

KINGS LYNN ARC Radio Rally - The Corn Exchange, Tuesday Market Place, Kings Lynn. Opens 10am, entrance fee £1. Details from G4PYB, tel; 0553 761995 or 0553 306.

NEWPORT ARS Junk Sale - Brynglas Community Centre, Newport. Opens 10.30am (10 for disabled visitors). Talk-in on S22 from 0900. Light refreshments will be available. Details from Kevin, GW7BSC, QTHR, tel: 0633-270727 (W) or 0633 262488 (H).

YORK Radio Rally - Tattersall Building at York Racecourse. Doors open 11am (10.30 for disabled visitors). All the usual favourites; bring & buy; licensed bar and cafe; Morse Tests; Amateur Radio; Electronics and Computers; Arts & Crafts. Ample free parking. Talk-in on S22. Entrance fee 50p. Details from Dave Moreland, G7FGA, tel: 0904 790079.

13 JULY

CORNISH RAC. Rally - Penair School, St Clement, Truro. Usual attractions; refreshments; free parking; doors open 10am (9.30 for disabled visitors). Talk-in on S22. Details from Rolf Little, G0NDC, St. George's Hotel, St. George's Road, Truro, Cornwall, TR1 3JE, tel: 0872 72554.

21 JULY

COLCHESTER RA Mobile Rally - Highwoods Sports & Leisure Centre, Brinkley Lane, Colchester. 10am - 4pm. Talk-in. Ample free car parking. Bring & Buy. Details from Frank Howe, G3FIJ, QTHR, tel: 0206 851189.

McMICHAEL Rally and Car Boot Sale - Haymill Youth and Community Centre, Burnham Lane, Slough (near Burnham railway station). Opens 10.30am, admission £1. The car boot sale is £6 per pitch on the day. Free parking on site and Talk-in on S22 (145.550MHz). Details from Neil, G8XYN, tel: 0628 25952.

RAIBC Romsey Picnic - Broadlands, Romsey. Super junk sale and bring & buy. Refreshments; grand draw; all RAIBC members, families and friends welcome. Talk-in on S22.Details from John Compton, G4COM, tel: 0703 693017

28 JULY

RUGBY AR Car Boot Sale - venue to be advised. Opens 10am. Talk-in on S22 by GB8CBS. Details from either Kevin, G8TWH, tel: 0203 441590 or Peter, G0JEW, tel: 0455 552449.

SCARBOROUGH ARS Radio, Electronics & Computer Rally - The Spa, South Foreshore, Scarborough. Many trade stands; large bring & buy; tombola; licensed bar and refreshments. Morse tests followed by a demonstration by the North Yorkshire Morse Test team. Entrance 50p incl a prize draw. Details from Ian Hunter, G4UQP QTHR, tel: 0723 376847.

4 AUGUST

WOBURN National Rally - Woburn Abbey, Bedfordshire. Trade stands housed in marquee 20,000 sq.ft. Talk-in by Dunstable Downs RC. Usual Woburn Abbey attractions. Trade stand enquiries to Norman Miller, G3MVV, QTHR, tel: 0277 225563. Organised by RSGB Exhibition & Rally Committee.

11 AUGUST

DERBY Mobile Rally - Littleover Community School, Rykneld Road, Littleover, Derby. Details from Martin Shardlow, G3SZJ, QTHR, tel: 0332 556875.

FLIGHT REFUELLING ARS Hamfest 91 - Flight Refuelling Sports and Social Club Grounds, Merley, Wimborne, Dorset. Details and booking forms from John, G0API, tel: 0202 619649 or Rob, G6DUN, tel: 0202 479038.

18 AUGUST

WEST MANCHESTER RC Red Rose Rally - Bolton Sports & Exhibition Centre, Silverwell St, Bolton. Details from G1IOO, tel: 0204 24104.

25 AUGUST

TORBAY ARS Annual Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Doors open 10am. Talk-in on S22. Details from W. Hipwell, G3HTX, QTHR, tel: 0803 526762.

1 SEPTEMBER

PRESTON ARS 24th Annual Rally - University of Lancaster. Details from Godfrey Lancefield, G3DWQ, QTHR, tel: 0772 53810.

TELFORD Radio Rally - Telford Exhibition Centre, Telford. Details from Martyn, G3UKV, tel: 0952 255416 or John, G0GTN, tel: 0743 249943.

8 SEPTEMBER

MADLEY SATELLITE EARTH STATION ARG AR & Electronics Car Boot Sale - Madley Communications Centre, Madley, Hereford. Details from David Butler, G4ASR, tel: 087 387 679.

MILTON KEYNES & DARS 5th Annual Car Boot Sale - Cranfield Airfield. Details from Tony, G6WXM, tel: 0908 316435, Mike, G0FMC, tel: 0908 566796 or Ray, G1LRU, tel: 0908 660798.

VANGE ARS Annual Rally - The Laindon Community Centre, Laindon High Road/Aston Road, Laindon, Basildon, Essex. Details from Doris Thompson, tel: 0268 552606.

14 SEPTEMBER

BALLYMENA Annual Rally - Ballee High Community School. Details from GI4HCN, 154 Galgorm Road, Ballymena.

WIGHT Wireless Rally - Wireless Museum, Arreton Manor, Nr Newport, IOW. Details from Douglas, G3KPO, tel: 0983 67665.

15 SEPTEMBER

BARTG Rally - Surrey Hall, Sandown Park Racecourse. Details from Ian Brothwell, G4EAN, tel: 0602 595261. (This is a provisional date).

BRISTOL Radio Rally - Brunel's Great Train Shed, Temple Meads Station, Bristol. Details from David Farr, G4WUB, tel: 0272 839855.

EAST OF ENGLAND RADIO RALLY (Peterborough R&ES) - ICI Building, The East of England Showground, Oundle Road, Peterborough. Details from Nigel, G1ARV, tel: 0733 78685 or Mike, G0CVZ, tel: 0733 222588.

PAKEFIELD Radio/Electronics Rally and Car Boot Sale - Pakefield Middle School, Kilbourn Road, Pakefield, Lowestoft. Details from G3WDN, tel: 0502 565986 or 715537.

22 SEPTEMBER

CENTRE OF ENGLAND Autumn Amateur Radio Rally will be held at the British Motorcycle Museum, Bickenhill nr The NEC, Jct 6 M42. Details from Frank Martin, G4UMF, tel: 0952 598173.

29 SEPTEMBER

HARLOW AR&E Mobile Rally - Harlow Sports Centre. Details from - weekdays: Alf, G7FNY on 0279 418392; evenings & weekends: Mike, G7BNF on 0279 722569.

7TH NORTH WAKEFIELD RC Rally - Outwood Grange School, Potovens Lane, Outwood, Nr Wakefield. Details from Dick, G4GCX, tel: 0532 622139 or John, G4RCG, tel: 0924 362144.

6 OCTOBER

GREAT LUMLEY Radio Rally - The Community Centre, Great Lumley, Nr Chester-Le-Street, Co Durham. Details from Barry, G1JDP, tel: 091 388 5936.

13 OCTOBER

ARMAGH & DUNGANNON Rally - Gosford House Hotel, Markethill, Co Armagh. Details from T.E. Hall, GI0MSJ, QTHR GI6UMR, tel: 0861 523454.

HORNSEA Rally (ELHOEX Electronic Hobbies Exhibition) - The Floral Hall, Hornsea, East Yorkshire. Details from Jeff, G4IGY, tel: 0964 533331.

OTHER EVENTS

12 MAY

VINTAGE RADIO CIRCLE 5th Swapmeet - Nr Swindon, Wilts. Details from M. Williams, tel: 0285 885725.

17 MAY

EDGWARE & DARS Straight Key Evening 1991. Band 3.5MHz, around 3.550, Time 1900BST onwards. Call CQ SKE. Details 081 204 1034.

20 MAY - 1 JUNE

FAREHAM & DARC will be holding an Exhibition of Radio Equipment circa 1890-1939 on board HMS Warrior 1860, at HM Naval Base, Portsmouth. Details from Ray Maclean, G0JVE, QTHR, tel: 0329 238642.

14 JULY

SUSSEX AR and Computer Fair - Brighton Racecourse. Details from Ron Bray, G8VEH, QTHR, tel: 0903 763978 or 0273 415654 (office hours).

25 - 28 JULY

1991 AMSAT-UK Colloquium - University of Surrey. Details from G3AAJ QTHR.

23 - 26 AUGUST

OSCAR VICTOR Activity Group (WAB) Family Fun Weekend - Bent Rigg Farm, Ravenscar, North Yorks. (Midway between Scarborough and Whitby). Details from Peter Austin, G7BXA, QTHR, tel: 0532 563462 or Steve G. Bryan, G1SGB, QTHR, tel: 0709 543747.

8 SEPTEMBER

LINCOLN SWC 10th Lincoln Hamfest - Lincolnshire Showground. Details from Sue Middleton (XYL G8VGF QTHR), tel: 0522 525760.

28/29 SEPTEMBER

RSGB HF Convention - Penguin Hotel, Daventry. Details from Bob Whelan, G3PJT, 36 Green End, Comberton, Cambridge CB3 7

19 OCTOBER

G-QRP CLUB Mini-Convention. Details from G3RJV.

25/26 OCTOBER

LEICESTER ARS Show - Granby Halls, Leicester. All usual facilities. Details from Frank Elliott, G4PDZ, tel: 0533 871086.

GB CALLS

The list below shows all special event stations licensed for operation up to 31 May. It was taken from the HQ computer on 2 April. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

1 MAY

GB0SGC	Scout Groups of Crewe
GB50ATC	Air Training Corps

3 MAY

GB1ATC	Air Training Corps
GB2SIB	Scottish Tourish Board
GB4EDS	East Dorset Scouts

4 MAY

GB0CDK	Coastal Defence 'K'
GB2LOW	Low Power

5 MAY

GB0DRM	DRUM
GB0RN	Royal Navy - HMS Fearless
GB0SLC	Shifnal Lions Club
GB4PCC	Potton Cricket Club

6 MAY

GB2BCF	Bristow Church Fete

8 MAY

GB8OWD	Old Wellingborough District

9 MAY

GB0NLP	Norfolk Low Power

10 MAY

GB2SEM	Southern Electric Museum
GB4HSC	Himley Sailing Club

11 MAY

GB2LOW	Low Power
GB4BPC	Back Packers Club

12 MAY

GB4YCS	York Cub Scouts

14 MAY

GB2ECR	Elvaston Castle Rally

15 MAY

GB50ATC	Air Training Corps

16 MAY

GB2RA	Railway Amateurs

18 MAY

GB2COA	Cubs on Air
GB4OGG	Ormskirk Girl Guides

19 MAY

GB50ATC	Air Training Corps

22 MAY

GB2DOE	Duke of Edinburgh
GB2RCC	Radio Caravan Camping

24 MAY

GB0WFX	World Prefix
GB6MX	WPX Week End
GB8GC	Glamis Castle

26 MAY

GB4SWR	Suffolk Wireless Revival
GB50ATC	Air Training Corps

30 MAY

GB5AT	51st Anniv of Air Training

31 MAY

GB5ASC	All Saints Cubs & Scouts

ICOM OPEN DAY — SATURDAY MAY 18th

AMDAT is pleased to host an ICOM open day on Saturday, May 18th. ICOM (UK) will be on hand with an extensive display of ICOM equipment. So come along and look at the best range of amateur radio equipment.

ICOM RADIO EQUIPMENT

IC 735 HF transceiver	IC R7000 multimode receiver
IC 726 HF + 50MHz	IC R72 HF receiver
IC 2400 144 + 432 mobile	IC R100 wideband receiver
IC 3220 144 + 432 mobile	IC R1 pocket receiver
IC 32E 144 + 432 handheld	IC 24E 144 + 432 handheld

Ring for the latest prices on the above

PACKET RADIO EQUIPMENT

Tiny 2 VHF	**POA**	TNC320 HF + VHF	**POA**
PK88 VHF/HF	**POA**	KPC 2 HF/VHF	**POA**
KPC 4 dual VHF	**POA**	Handi Packet	**POA**
KAM multimode	**POA**	DSP-12 multimode	**POA**
DRSI PC TNC	Single port **£139**		Dual port **£169**

SATELLITE MODEMS

PAC COMM PSK-1 1200 PSK ..... **POA**
G3RUH 1200/9600 PSK kits and built ..... **from £35**

SATELLITE TRACKING SYSTEMS

The Kansas City Tracker will operate with most azimuth and elevation rotators. It will also tune the radio for you. KCT PC cards ..... from **£179**

JUNGHANS RUGBY MSF CLOCKS

Black or white digital **£42.95** Analogue mantle **£63.95**
Rugby MSF wrist watch in stock ..... from **£149**

BOOKS & MAGAZINES — We keep a good range of amateur radio books, maps and monthly magazines in our Bristol shop.

All the above can be seen operating in our new Bristol shop where we also have a large range of computer equipment and other amateur radio accessories

All prices subject to review due to VAT change. Ring for latest details.

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PACKET RADIO FROM THE SPECIALISTS!

Siskin Electronics have a policy of supplying the best range of packet radio equipment available for the radio enthusiast. We have examined the products of many manufacturers and are pleased to be able to offer what must be the widest range of equipment available from just one UK supplier. All prices include VAT and were valid when going to press.

AEA

PK-232/PK-88 Real Time Clock	£29.95
AMT3 AMTOR/RTTY	£179.95
PK-232+MAILBOX	£306.48
PK-88 VHF/HF TNC + new MBX	£132.77

PACCOMM

Real Time Clock fits BSX etc. too!	£ 29.95
STATE MACHINE DCD (3105)	£ 19.95
HANDIPACKET *(LeTNC)*	£199.00
PSK-1MICROSAT MODEM	£ 189.00
PC-320 dual port PC card	£189.00
TINY-2 with PMS version 3.0	£129.00
TNC-320 dual port.HF/VHF	£179.00
9600 baud modem	£ 95.00

KANTRONICS

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The Last Word

COMPULSORY MEMBERSHIP

In reply to Mr Boland's letter (*Last Word*, March) I feel that he has a point and compulsory membership of the RSGB should be considered. Apart from the financial benefits to the Society, it would mean that the RSGB would truly represent the whole radio amateur community rather than the few who support all you do for us.

Perhaps another level of membership would not go amiss, ie a basic membership excluding such services as the monthly copy of *RadCom* for those not wishing to receive it.

MPG Gregory G0JYQ

I also would like to see a workable system, where subs could be included in the licence fee. It's about time these passengers were made to contribute something towards the fare.

Also, I would stop immediately the use of the QSL Bureau, a privilege they get for nothing. If they wish to receive cards, then they should get them through the post office.

N Stanley G3UBC

Of course you won't get any letters against the idea; the people who would object are not members and don't get *RadCom*!! (Not a bad idea though).

Jon Hall G0MYW

I was astounded to see that no letters had been received against the above proposal. I assumed the original proposal was not intended seriously; apparently it was.

I joined the RSGB because I felt that a group of individuals with a common interest benefit by national representation. For this reason I am also a member of the BSAC (the governing body for Sports Diving in the UK). Both societies do good work by representing the interests of their members at national level and improve the conditions under which the hobby can be enjoyed by all.

The prospect of compulsory membership, however, I find abhorrent and more like a 'Union Closed Shop' than a Society. Any time I disagree with anything the RSGB do upon my behalf, I can vote with my feet and cancel or not renew my membership. I remain a member because *I choose* to be. I strongly and fully endorse any amateur's choice not to be. That is his or her choice. The day I am forced to be a member I will send back my licence to the DTI and take no further part in Amateur Radio.

Paul Martin G4AZC

In your March issue you were rash enough to ask members what they think of compulsory membership of the RSGB. I think it is the worst idea since the Council attempted to introduce a 5-year qualifying period both for standing for and nominating members Council.

Further, I think it stems from the same notion - a belief that the current Council reign by divine right. If you do a good job this will be reflected by a growing membership; if not, a falling membership will draw this fact to your attention. Don't shoot the messenger just because you don't like the message.

Mr Price thinks that we are already a closed shop because we (apart from SWLs) have taken an examination, pay an annual fee, and are governed by licensing regulations. May I point out that motorists also take a test, pay an annual fee, and (sometimes) observe the Road Traffic Acts. Does that make them a closed shop?

J S Linfoot G0CPP

I imagine most members felt, as I did, that it was too impractical a suggestion to be worthy of comment.

Do you think that the members would really want such a large group of new members annoyed at being dragooned into the Society, and would those members do anything but cut activities to reduce the (to them) unnecessary subscription?

Do you really think this would improve the Society or its standing when it had to rely on compulsion to have members?

Do you think there is the remotest chance of the necessary legislation to make compulsory membership? Do you want the Society to have to operate within the strict terms of a controlling statute merely as a tool of Whitehall?

Why waste paper on impractical suggestions?

D E Jones GM4SXD

[In case there is any confusion, it should be stressed that the suggestion of compulsory membership came from a member's letter, and not from RSGB Council - Ed]

NEPCON 91

Congratulations to RSGB for the decision to take stand space and put on a special event station at the International Electronics Exhibition, NEPCON, held at the NEC from 19 to 21 March.

The aim was to obtain industrial sponsorship for the YEAR project and, in particular, help to get the Novice Licence running. The scale of the success of the efforts of the team will be apparent in the coming months. The presence of RSGB at the show was welcomed by countless industry persons. A terrific level of interest in the schemes was registered, and in the other activities of the RSGB.

The stand welcomed many surprised members and regained many lapsed members as well as yester-year amateurs who had drifted away from amateur radio.

I can truthfully say that I have never worked at an amateur radio publicity event where so much sustained interest was evident. A good word would be 'inspiring'. The stand was never empty, like some nearby!

The video was continuously shown and was acclaimed by all. The message that came back to us was that the RSGB has been welcomed into the professional electronics world as a full member - "why haven't you been here before?" was a common query.

RSGB was at the show because of the generosity of David Topham of Cambridge Interconnection Technology Ltd. The stand was built up by Hilary Claytonsmith, support organised by Warwick Hall and we were aided and supported by Hilary with David Evans from RSGB and a faithful band of Novice Licence Instructors. Icom provided a transceiver; Strumech a beam and tower.

To summarise, there will be considerable industrial help for both the Novice Licence and YEAR project in the future. RSGB did itself a great deal of good. As a measure of our acceptance by the industry, Maplin sent their spare freebies around to the stand as the show closed down! Thank you all at GB2NEI.

Mike Webb G3OOQ

TRICK OR TREAT?

May I draw your attention to a paragraph in April's *Technical Topics* regarding lack of space in the magazine for interesting material that had been submitted by readers.

Why then, may I ask, that on pages 36 and 52 you have deemed to take up 1.5 pages for a pathetic 'April Fool'. Ha ha.

Mark Rogers G4RGB

[We did make April's Technical Topics one page larger than usual - Ed]

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.

SATISFIED CUSTOMER OF ICOM . . .

I just thought I'd write a short letter in praise of the excellent service recently received from Icom in Kent. As the owner of an R7000 receiver which, incidentally, wasn't bought from Icom (UK), I was hoping to link up with a computer through the interface which is available. I wrote to Icom asking for some information and didn't get a reply for a few weeks so thought that they had discarded my enquiry because I wasn't actually buying anything.

How surprised I was then to receive a huge wad of literature from them providing all the information I could possibly need to complete the link-up. All useful technical stuff on hardware, software, how to produce programs to control the rig, as well as details of various mods to improve the performance and facilities of the receiver. Not a hint of a sales brochure in sight - just dozens of sheets which someone had gone to great trouble on my behalf to photocopy, so I'd like to say a big 'thank you' to Icom for their excellent service. By the way, is there anyone out there who has a program to control the R7000 using an Atari ST?

Joe Loughridge G1ZDL

. . . AND RSGB

As I am a pensioner of 82 years, I have had good service from all aspects of radio. This I may add is because of all the hard work of RSGB. Those amateurs and radio operators who say the fees are too much and have no wish to join the Society, must look to what is offered - a magazine each month, and people who negotiate with DTI for the different bands. This does not cost those who are members of the Society anything.

The society cannot run without support and this day and age progress has to be paid for. So those who say the fee is too high think again, and I am sure they will realise that it is worth that little extra. I wish good luck to the RSGB - keep the good work going.

RE Freeman G0JCW

QSL COLLECTION

As the QSL Bureau Sub-manager for the G7 series of callsigns, I have over the last year analysed some of the reasons why there are so many QSL cards uncollected from the Bureau and also why so many letters are received from stations asking why I have not sent them any QSL cards.

With the G7 series of callsigns now having reached the G7J**'s, allowing for the fact that some of the callsigns will be taken up by GD7's, GI7's, GJ7's, GM7's, GU7's and GW7's, a rather low number, 602 stations currently have envelopes deposited with me for the collection of cards. 39 stations who did have envelopes deposited have not sent further envelopes when the last one was sent to them with QSL cards. Whilst nearly twice that number of stations, 1157, have had QSL cards sent into the QSL Bureau for them, but have never sent in any envelopes to collect them.

Quite a number of stations only have a few cards, but there are many stations who have had many QSL cards sent in for them, including a number with over 100 uncollected. Of these only one has never sent in any envelopes (this station appears to be acting as a Sub-manager for a station operating under many overseas callsigns often /MM, who I suspect is either in the Royal Navy or Merchant Navy), the others did at one time collect their QSL cards, but have not bothered to send any envelopes for a long time.

Equally there are quite a number of stations who have sent in envelopes, yet have never received any QSL cards, or have requested me to await a specified number of cards, still not reached. Others seem to only have 2nd rate postage paid, which will be underpaid on the first postal rate increase, but additional postage is never sent.

J D Hudson G6OVO

FIFTY THANKS

Congratulations. Well done to the RSGB for negotiating the latest UK Licence changes (p6 April), These changes will encourage the use of the 50MHz band as the solar cycle declines, clarify the position of working in nets, and improve the DX potential of all non-SSB modes. Though I trust that this higher power will be used with caution, particularly on FM; we should be encouraged to use high power only when absolutely necessary in order to establish contact.

David Mann G8ADM

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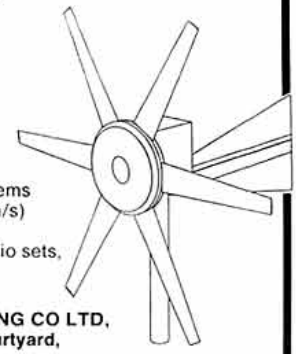

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