# Radio Communication

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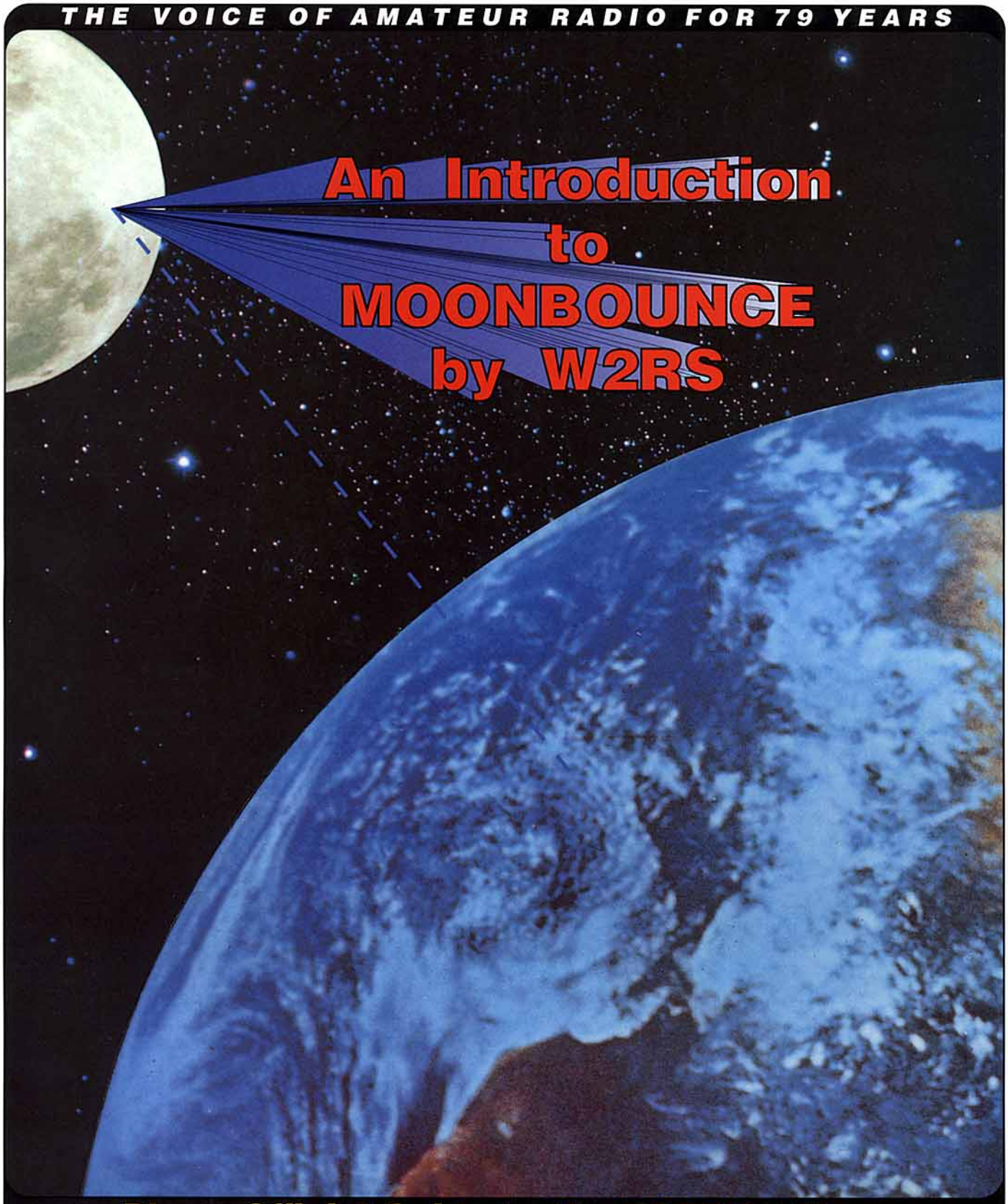
THE VOICE OF AMATEUR RADIO FOR 79 YEARS



## An Introduction to MOONBOUNCE by W2RS

Plus – Official Guide to the RSGB'92 Show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All contributions and correspondence concerning the content of *Radio Communication* should be posted to:

**The Editor**
**Radio Communication**
**Lambda House, Cranborne Road**
**Potters Bar, Herts EN6 3JE**

**Tel: (Editorial *only*): 0707 59260**
**Fax: (Editorial *only*): 0707 49503**
**E-mail (Telecom Gold) 87:CQQ083**

***N.B. for all other RSGB telephone numbers see page four.***

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# Radio Communication

## RSGB'92 - The Official Guide:

**This month's extra sixteen pages start at p43 and include:**



## NEWS AND REPORTS



## TECHNICAL FEATURES




**COVER PICTURE:**
Now that the CW power has been increased, moonbounce is a more practical proposition for the 'average' station. W2RS reveals the secrets of his success. Page 65.

## REGULAR ARTICLES

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THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS
Founded in 1913 incorporated 1926. Limited by guarantee
Member society of the International Amateur Radio Union

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Headquarters and registered office:
**Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE**
**Telephone: 0707 49855 - Members Hotline and book orders**
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## The Radcom Leader

# THE YOUNG AMATEUR OF THE YEAR AWARD 1992

NOW ENTERING ITS FIFTH year, the Young Amateur of the Year Award (YAOTY) is again being generously sponsored by the Radiocommunications Agency of the DTI, and by the communications industry. This reflects the close cooperation which exists between the Agency and the RSGB.

In this month's *RadCom* you will find the special YAOTY application form. Please read the rules carefully and if you know of any youngster (perhaps a Novice Licensee) whom you think is worthy of this prestigious Award, please encourage them to enter. Obviously the award is an achievement which will be beneficial to any youngster and will stand him or her in good stead in later life.

How are the applications processed? When the RSGB receives the forms, the members of the Training and Education Committee (TEC), in conjunction with RA staff, judge the quality of the entrants from the nomination forms. The finalists are then chosen and asked to come to RSGB Headquarters for an afternoon; during which time they have informal interviews with members of the RA and the TEC. The final decision rests with the RA.

The winner and runner up will be invited to receive their prizes at the RSGB HF Convention at the ICL Beaumont Conference Centre, Old Windsor on Sunday 27 September.

## The Prizes

Apart from the prestige, there are worthwhile prizes to be won:

- The winner will be presented with a cheque for £250 by Stephen Spivey, Head of the **RA**'s R2 Division. Mr Spivey will also issue an invitation to visit the DTI Monitoring Station at Baldock.
- The **RSGB**'s prize, a Sony general coverage receiver will be presented by our President Terry Barnes, GI3USS.
- Ian Laybourne of the **Mobile Radio Users Association** will award the winner a week's course at Wray Castle College in the Lake District.
- Lloyd Arrow of **Siskin Electronics** has kindly donated as a prize a Pac Comm Tiny 2 packet radio modem.

The runner up does quite well too.

- Dennis Goodwin of **Icom (UK)** will be presenting a hand portable transceiver and no doubt the legendary 'goody bag' too.
- There is also a £25 book token from the Mobile Radio Users Association, and a 5315B multimeter kindly donated by **Cirkit Distribution Ltd**.

**Applications should be sent to RSGB HQ to arrive no later than 31 July 1992.**

***Hilary Claytonsmith, G4JKS,***
***Project YEAR Coordinator***

**How an international team braved the stormy South Atlantic to remove VP8S from the Most Wanted lists.**

# Flying South to a Cold Sandwich

PHOTOGRAPH: G3ZAY

**The expedition team (l to r): Martti Laine, OH2BH; Terry Dubson, W6MKB; Ralph Fedor, K0IR, Hiroyuki Kozu, JE3MAS; Al Hernandez, WA3YVN; Tony Deprato, WA4JQS; John Vugtevee, W7KNT and David Schmoker, KJ9I.**

PICTURED ON 9 March at RAF Brize Norton are the eight members of the South Sandwich Islands Antarctic DXpedition - VP8SSI. The multi-national team was seen off in style by members of the Chiltern DX Club.

They arrived in Port Stanley on the Falklands twenty hours later and travelled on the *Abel-J* to South Sandwich, arriving on the 20th. During the journey several crew members suffered sea-sickness but recovered in time to spend three days unloading the equipment by dinghy. Five operators got wet when a dinghy capsized just 15 metres from shore. Plans were made to leave some equipment behind to reduce loading time on departure.

Whilst on the Island atrocious weather prevailed, causing tents to collapse several times in storm force winds. Bad weather also led to problems with the generators, reducing the number of stations the group could put on simultaneously. Nevertheless, there was plenty of activity on all bands (including WARC) and big signals were put into Europe, especially on 28MHz. About 40,000 contacts were made.

From South Sandwich, the team travelled in more appalling weather to South Georgia where they operated mainly on CW and RTTY for some 36 hours. At the time of writing, the expedition was returning to Port Stanley.

Thanks to the *RSGB DX News Sheet* (editor Brendan McCartney, G4DYO) and the RSGB's HF Manager Martin Atherton, G3ZAY, for the above.

Now turn to page 25 for a personal account by South Sandwich DXpedition member Martti Laine, OH2BH, on his part in starting up amateur radio in Albania.

MORE NEWS AND REPORTS ON PAGE 8

- STOLEN FROM the Wirral in February: Ten Tec Corsair II Model 561, S/N 2643; Ten Tec PSU/speaker S/N 1401; Ten Tec mic and keyer (KR1B); home brew Noise Bridge with distinctive large knob and flashing LED; KW Vespa MkII + KW PSU, KW EZmatch and Heathkit Power Meter. Information to G3VVA, QTHR, please.

- STOLEN FROM the ICOM showroom in Herne Bay in March: IC-R1 S/N 890013168; IC-W2E S/N 951001697; IC-X2E S/N 93500007; IC-2SET S/N 835001106. Information to Dennis Goodwin, AR Sales Manager, at ICOM (UK) Ltd (0227 741741).

- OFFICES OF the Japan AR league have switched to a five-day week in accordance with a recent trend in Japan for a shorter week which is aimed at improving efficiency by keeping staff in good health. *[Good idea, I am typing this on a Sunday - Ed]*

- AS THE General Manager's contract finishes at the end of June, Council has decided that the post shall be advertised and the present incumbent be invited to apply.

- THE TENTH anniversary of the Flight Refuelling ARS will be celebrated on 15 May. GB2FRA will be on HF throughout the day. For details of FRARS, contact G2BDV, QTHR.

- STOLEN FROM Brighton in February: Icom IC-2E, S/N 11914112. Information to Brighton police or to G3YY, QTHR.

- SWINDON & District ARC will operate GB4SRC 1800 14 May to 1800 15 May to raise money for the ITV Telethon. Details from G0DMZ, QTHR.

- NEW SCOUT National Adviser for Amateur Radio is Paul Bateman (24), G1ZOV, from London.

- DISNEY FANS will have noticed that "Donald Duck" (*News and Reports*, April) was in fact Goofy.

## Were you Fooled?

LIKE MANY other publications, it is traditional for *RadCom* to run a spoof article in the April edition. Did you spot it? Was it the Bermudan lavatory rescue, the Morse/door key, or the voice mailbox in *Eurotek*? Turn to page eight for the answer.

## A Different Ball Game

IT SEEMS that my *Leader* last month was misinterpreted by some. Whilst explaining that *RadCom* was tailored to the needs of a 100% subscriber readership, how it was good value for money and how it had improved in recent years, I had absolutely no intention of knocking the 'bookstall' amateur radio magazines

It is my belief that, instead of fighting for bigger slices of the same cake, we should all be working towards making the cake bigger by encouraging more newcomers into our hobby.

Apparently this was not made as clear as I had intended.

***G3XDV - Ed***

## Don't Cancel

IF YOU have a licence renewal standing order with the RALU, you will need to you cancel it and set up a renewal arrangement with the new licensing agancy SSL.

Beware, in some cases, your bank will use your callsign as a reference for both the RALU payment *and your RSGB sub.* It is important to specify RALU as the payee of the cancelled order to avoid inadvertantly 'resigning' from the Society as well.

- THE SOCIETY has appointed EVERSHEDS Daynes Hill and Perks to act as its legal advisers.

- BEDFORD and Dist ARC will use G3WTP on 2m and HF at the Bedford River Festival 23/24 May.

## Repeater Franchises

### Important Update

Following discussions with the RA, it has been decided to extend the date by which payments for the franchise must be made, to 1 July 1992. However, the RA has stressed that it is still essential that the necessary documentation is completed and returned to RSGB HQ at Potters Bar in time to enable the Letter of Authority to be issued by 1 May as defined in the renewal document.

RADCOM NEWS FEATURE

# The 1992 ITU World Administrative Radio Conference

**by David Evans, G3OUF (UK delegate)**

FROM 3 February to 3 March some 1400 delegates from 127 countries met in Torremolinos, Spain, to discuss vital radiocommunications issues which will affect the world over the next few decades. The International Telecommunication Union (ITU), which called the conference, is an agency of the United Nations and its conferences are formal meetings of government representatives adhering to a strict agenda and procedures. WARCs can make changes to the Radio Regulations annexed to the International Telecommunication Convention, which includes changes to frequency allocations; hence the interest of the Amateur and Amateur Satellite Services.

The agenda was published in June 1990 by the ITU's elected governing body, the Administrative Council, and administrations were then able to make proposals. These dealt with a very wide range of topics including new communications facilities requiring frequencies for their future operation and growth.

The 1992 WARC was not a 'general WARC' like the 1979 conference; it was to deal only with "frequency allocations in certain parts of the spectrum". The amateur bands, in general, were not at risk and there was no mention in the 1992 Conference agenda of any amateur bands as such. However, as discussions with administrations commenced and proposals from countries were received, it became apparent to the International Amateur Radio Union (IARU) and its member Societies, including the RSGB, that some amateur bands could be affected. Of particular interest to the amateur community were a number of proposals to extend the HF broadcast bands, especially the 41m band, and proposals for new satellite based services between 1.5 and 3GHz which could impact on the 2.3GHz Secondary amateur allocation. Also of concern were proposals to find frequencies around 50MHz, 400MHz and 1000MHz for Wind Profilers and (from the Russian Federation) for the Space Research Service in the Primary amateur allocation at 75.5GHz.

## The Amateur Services Represented

THE AMATEUR Services were represented at the Conference in two ways. Firstly, twelve countries had an amateur radio representative as a member of its national delegation supported by its IARU Member Society or the IARU. The representatives, some part time, were: UK (David Evans, G3OUF - RSGB), New Zealand (Fred Johnson, ZL2AMJ - NZART), USA (Paul Rinaldo, W4RI - ARRL), Japan (Shozo Hara, JA1AN and Masa Fujioka, JM1UXU - JARL), Korea (Young Soon Park, HL1IFM and Lee Young Ho, HL1AKF - KARL), Malaysia (D D Deven, 9M2DD - MARTS), Indonesia (Ben Samsu, YB0EBS - ORARI), Australia (David Wardlaw, VK3ADW and Ron Henderson, VK1RH - WIA), Yugoslavia (Mirko Mandrino, YT7MM - SRJ), Nigeria (Oyekunle B Ajayi, 5N0OBA - NARS), Italy (Marino Miceli, I4SN - ARI) and Sweden (Peter Hall, SM0FSK and Sigge Skarsfjall, SM5KUX - SSA).

Secondly, the IARU, as one of the 31 observer organisations present, had its own team led by Dick Baldwin, W1RU, its President. The other team members were; Larry Price, W4RA (Secretary), Dave Sumner, K1ZZ (Secretariat), Dan Bergeron, KB4IYK (Secretariat), John Allaway, G3FKM (Region 1 Secretary), Wojciech Nietyksza, SP5FM (Region 1 Vice-President), Al Shaio, HK3DEU, (Region 2 President), Tom Atkins, VE3CDM (Region 2 Secretary), and David Rankin, 9V1RH (Region 3 Chairman). In addition, there were over 100 other licensed radio amateurs present either as delegates, advisers or representing other organisations.


## The ITU way

TO BEGIN to understand how decisions are arrived at it is essential to describe briefly the way ITU conferences operate. The 1992 WARC was divided into six main committees. Of prime interest to radio amateurs was Committee 4, responsible for frequency allocations. This committee worked in conjunction with Committee 5, dealing with regulatory matters such as the procedures for coordinating frequencies between countries.

At the start of the WARC it was necessary to split Committee 4 into three working groups. WG4A dealt with proposals covering frequencies up to 137MHz, WG4B covered 137MHz to 3GHz and WG4C frequencies above 3GHz. These main Groups were later divided into sub-groups each charged with examining major topics and reporting back to a WG, which in turn makes recommendations to the main Committee.

After the work of Committees has finished, their output papers are reviewed by an Editorial Committee which tidies up agreed texts and makes sure that the translations into the ITU working languages of English, French and Spanish all say and mean the same thing. Proposals are then submitted to the Plenary meeting of the Conference for two readings. This pyramid way of working is designed to enable the smaller delegations to take part in the final decision making process.

Of course, even after the Final Acts of the conference are signed, every nation has the sovereign right to make its own internal frequency arrangements. However, by and large, most ITU member nations adhere to the frequency framework agreed at ITU Conferences. Certainly there is a desire to arrive at decisions by consensus, rather than by vote as a means of providing as much unity as possible. A recognised and essential feature of ITU conferences is 'corridor diplomacy' and it was much in evidence at WARC-92.

## The Heavy Side

SOME 750,000 man-hours of meetings took place during WARC-92. Before turning to the detail of the amateur radio matters, here is a brief look at some of the major issues which were discussed at WARC-92.

**Broadcast Satellite Service (sound)**, BSSS, differs from existing satellite television, because it is intended to serve mobile and portable sound radio receivers. BSSS utilises Digital Audio Broadcasting (DAB) and is to be implemented together with a 'Terres-

trial Broadcast Service' to fill any gaps in coverage. The UK and 17 other CEPT countries proposed a 50MHz-wide allocation for the BSSS down-link at around 2.6GHz. The outcome was to make three separate allocations:

1) 1452 - 1492MHz on a Primary basis in all three ITU Regions. However, many countries, mainly in Europe and including the UK, added their names to a footnote which stated that in these countries BSSS will be on a Secondary basis until April 2007.
2) In the USA, Primary 2310 - 2360MHz, which is within the world-wide amateur Secondary band 2300 - 2450MHz.
3) The third band, 2535 - 2655MHz, will be for BSSS in some Region 3 countries.

The second battlefield was the **Mobile Satellite Service**, which involves geostationary satellites and low earth orbiting satellites (LEOs). There are two types of these; 'big LEOs', such as those proposed for the Motorola Iridium network (voice quality to hand held equipment) which will operate in bands above 1GHz and 'little LEOs' (low data rate/low cost) operating in bands below 1GHz. As a result of WARC-92 the ITU Table of Allocations has been modified to accommodate little LEOs in Primary bands around 137MHz, 150MHz and 400MHz and Secondary bands at around 312MHz and 387MHz. Big LEOs will operate in several bands near 1.5, 1.6, 2.0 and 2.5GHz.

**High Definition Television** (HDTV) direct to your home via satellite is another sophisticated technique for the future which ideally requires a world-wide allocation. However, WARC-92 decided otherwise because no compromise agreement could be reached. With effect from 1 April 2007, viewers in North and South America (Region 2) will use frequencies between 17.3 and 17.8GHz, while those in Regions 1 and 3 will use 21.4 - 22.0GHz.

The **Future Public Land Mobile Telecommunications Service** (FPLMTS) is a high technology system, proposed mainly by European countries. The idea is for each individual to have a low-power (say 25mW) hand-held communicator for voice, data or image communication with a range of about 60 metres - cellular radio but with tiny cells. Mobile units would use more power and have a greater range.

FPLMTS has two parts, terrestrial and space. During the Conference it became obvious that this system is for further study and it was not yet possible to allocate it distinct frequency bands. The result was the creation of a footnote which indicated that the bands 1885 - 2025MHz and 2110 - 2200MHz are intended for use by the administrations wishing to implement the FPLMTS.

**The main conference hall.**

# WARC 92 Amateur Issues

### The 7MHz Band

A number of countries including the USA and 21 of the CEPT countries (of which the UK was one), proposed extensions to the HF broadcast bands. These included an expansion to the 41m broadcast band and a consequential world-wide realignment of the 7MHz amateur band. In Region 1 this could have resulted in an allocation from 6.9 to 7.1MHz.

WG4A had to address the difficult issue of HF broadcast expansion. It soon became apparent that many African, South American, Middle East and Asian Countries did not wish to see any HF band broadcast expansion. However, the Chairman of WG4A stressed the need for compromise and asked the group to consider a 'package' of proposals. Slowly a package was developed but there was intense opposition to any expansion below 10MHz. Of course, if one radio service is expanded others must either contract, share with the new service, be rationalised or be relocated. In the third week, the Chairman of WG4A again urged the need for compromise and proposed a total of 300kHz of broadcast expansion below 10MHz. A small group was set up to discuss this critical issue and the next day a compromise was put to WG4A.

The total compromise package of 'new broadcast bands' was: 5.900 - 5.950MHz, 7.300 - 7.350MHz, 9.400 - 9.500MHz, 11.600 - 11.650MHz, 12.050 - 12.100MHz, 13.570 - 13.600MHz, 13.800 - 13.870MHz, 15.600 - 15.800MHz, 17.480 - 17.550MHz and 18.900 - 19.020MHz. These were ultimately agreed by the conference and will become operational in 2007 on a planned world-wide basis for SSB, reduced-carrier transmissions only.

Only 200kHz of broadcast expansion had been agreed below 10MHz which fell far short of the 700kHz proposed by the majority of CEPT countries. The 41m band was only expanded by 50kHz at its top end. Because of this there was no consequential change required to be made to the 7MHz amateur band. Switzerland regretted that no alignment of the amateur band had been possible and this sparked off some most positive comments about the amateur service from Malaysia, Sri Lanka, Mexico and Indonesia. The "thank you" from Mexico for the help provided by the Amateur Service after the 1985 earthquake was especially warm and it was noted how fragile modern high technology could be at times of natural disaster.

As a result of a proposal from Mexico, the possibility of aligning the Amateur Service allocations around 7MHz is likely to be considered at a future competent WARC. This is a positive outcome of the 1992 WARC for the Amateur Service at HF.

**K1ZZ (pictured) and G3OUF operated /EA7 during the contests.**

### The 2.3GHz Band

The 2300 - 2450MHz world-wide amateur Secondary allocation is unchanged (2300 - 2310MHz is not allocated to the Amateur Service in the UK). In this band, however, the Mobile Service has been upgraded from Secondary to Primary status in Region 1. Since this may well be used for 'low density' mobile applications, such as Electronic News Gathering, sharing with the Amateur Service should be possible.

As has already been mentioned, BSSS will operate in the USA from 2310 - 2360MHz. While this does not affect the rest of the world, some rethinking of the 2.3GHz amateur band plan might need to be considered.

### The 75.5 - 81.0GHz Band

In the ITU International Table of Frequency Allocations there are two entries which permit amateur operation between 75.5 and 81.0GHz. 75.5 - 76.0GHz is an Amateur Primary allocation in the ITU table, and is allocated on a Primary basis to the Amateur Service in the UK. As a result of a proposal from the Russian Federation there is an additional Secondary allocation for Space Research (Earth to Space) in this band. The 76 - 81GHz band, which permits amateur operation on a Secondary basis, is not allocated in the UK. Again Space Research has been added here on a shared Secondary basis. Radio Location is the prime user in this band.

### Wind Profilers

These radar devices, used to measure wind speed and direction at varying heights above the ground, are considered essential for more accurate weather forecasting and the safety of aircraft. Several different frequencies are required at one site. Interest was expressed because frequencies 50, 400 and 1000MHz were being considered. The Conference discussed the matter but has referred it back to the CCIR, the ITU's technical advisory committee, for further study.

# The Conclusions

AT HF THE alignment of the 7MHz band on a world-wide basis did not materialise because there were no consequential changes necessary. However, this problem needs to be solved at a future WARC and is now likely to happen as a result of the adoption of the proposal from Mexico. Since neither the retention of Fixed Services nor Broadcast expansion has caused any detrimental changes to the HF amateur bands, the IARU and its member Societies can be satisfied with the outcome of WARC-92.

At VHF/UHF the Wind Profiler issue has been referred back to the CCIR and no decisions on frequencies were made. The amateur community needs to monitor this issue carefully.

The Secondary amateur allocation at 2.3GHz is unchanged, but in the future there will be more services operating within the band. Whether sharing will be possible remains to be seen. At 75.5 - 76GHz the Russian Federation plans to use frequencies within the Primary amateur band. However, since the proposed project is many years off it is too early to predict the likely effects on amateurs. In any event protection for the primary Amateur and Amateur Satellite Services will be required.

# GB2RS Survey Result

THE *GB2RS* news bulletin of 24 November contained a request for listeners (or readers in the case of the datacomms services) to send in a card saying which broadcast they were receiving. In order to make the response more representative, three lucky participants chosen at random would win a small prize.

This Council-commissioned survey was carried out by the Membership Liaison Committee which is responsible for the GB2RS service. The MLC Chairman at the time of the survey was Ian Suart, GM4AUP. He reports:

"427 replies were received, some of them well after the closing date. As expected, the 2m FM service appears to be the most widely used. This is undoubtedly because it has the most number of readers.

"The relatively low response from the data community may be seen as a surprise. This could be because replies were asked for by mail. Many more would probably have been received if a reply by data modes was allowed. Three replies were received from the USA, the GB2RS script is obviously passed by packet to the USA.

"One major surprise is the very low response from users of the service via repeaters - I have been asked on numerous occasions to consider having the service available on more repeaters yet the response does not seem to warrant it.

"The 6m response is good probably because the service has only been available for a few months.

"The MLC will consider these results in more detail along with any comments written on the cards. My initial reaction is that the service is well received and a number requested us not to consider withdrawing it."

The three cards drawn out (by Ian's boss) were for G3DXB, G0EYX and G4OPT. All are members of the Society. They will receive vouchers for £20-worth of RSGB books.

| | | |
|---|---|---|
| G3BA | 2m FM | 57 |
| G2MI | 80m | 37 |
| G0AVY | 2m FM | 27 |
| G3MEH | 2m FM | 17 |
| G2CVV | 80m | 14 |
| G3LEQ | 2m FM | 12 |
| GI3WEM | 2m FM | 12 |
| G3LEQ | 40m CW | 11 |
| G3XVN | 2m FM | 10 |
| G4OLK | 2m FM | 10 |
| G8CKN | 2m FM | 10 |
| G8LVC | 2m FM | 10 |
| G8SC | 2m FM | 9 |
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| G8VPG | 2m FM | 8 |
| G2FKZ | 2m FM | 7 |
| GM3TCW | 80m | 7 |
| UNKNOWN | 2m FM | 7 |
| G5VO | 80m | 6 |
| GI3GGY | 40m AM | 6 |
| G4JGJ/MM | 2m FM | 5 |
| G3ZNU | 2m FM | 4 |
| G4AFJ | 2m FM | 4 |
| G6HZU | 2m FM | 4 |
| GM4DQJ | 2m FM | 4 |
| GM4EHO | 2m FM | 4 |
| G3LEQ | 40m SSB | 3 |
| G3LEQ | 6m | 3 |
| G3MEH | 6m | 3 |
| G4ZNZ | 2m FM | 3 |
| G8QZ (PM) | 80m | 3 |
| G8VPG | 2m FM | 3 |
| GI8AYZ | 2m SSB | 3 |
| GM4HCO | 2m FM | 3 |
| GM4ILS | 2m FM | 3 |
| G3AVJ | 2m FM | 2 |
| G3EHM | 2m FM | 2 |
| G3SMT | 2m SSB | 2 |
| G4ODC | 2m FM | 2 |
| GI3TLT | 80m | 2 |
| GI8AYZ | 6m | 2 |
| GM0JKF | 2m FM | 2 |
| GW8TVX | 2m FM | 2 |
| UNKNOWN | 80m | 2 |
| G3LSD | 80m | 1 |
| G2ABC | 2m FM | 1 |
| G3ZNU | 2m FM | 1 |
| G3ZYY | 2m FM | 1 |
| G4AFJ | 6m | 1 |
| G4LAA | 6m | 1 |
| G4NVD | 2m FM | 1 |
| G4YBB | 2m FM | 1 |
| G6HXV | 6m | 1 |
| G8HVV | 2m FM | 1 |
| G8QZ (AM) | 80m | 1 |
| GJ0JSY | 2m FM | 1 |
| GM0DQT | 2m FM | 1 |
| GM0ILB | 80m | 1 |
| GM3VEY | 80m | 1 |
| GW3KJW | 2m FM | 1 |

| | |
|---|---|
| 2m FM | 252 |
| 80m SSB | 75 |
| DATA | 45 |
| 40m | 20 |
| 2m SSB | 13 |
| 6m | 11 |
| REPEATERS | 11 |
| TOTAL | 427 |

## Were you fooled?

**continued from page five**

This year we decided to double-bluff you by including several stories which sounded unlikely but were *absolutely true*; yes, even the Bermudan lavatory rescue!

● THE SOUTH DUBLIN RC is interested in twinning with other clubs and having skeds on Tuesdays 8pm to 10pm. Write to Pat Murray, EI7HK, S Dublin Radio Club, Ballyroan Community Centre, Marion Rd, Rathfarnham, Dublin 14, Ireland.

● ISRAEL IS to introduce a code-free licence, 'Technical Class' (similar to our Class B), in 1992.

## RSGB Groups are Different

RSGB GROUPS are different from our other 700 or so Affiliated Societies in that *all* members of each Group must be RSGB members. Prospective members can in most cases attend a couple of meetings as guests but they are encouraged to join the Society as these are groups of RSGB members as distinct from clubs which belong to the RSGB.

Known RSGB Groups (please let us know of any omissions) are: Aberystwyth, Belfast, Bristol, Cardiff and Ilford. Each will be featured in forthcoming editions of *RadCom*.

## RadCom Label Numbers

HAVE YOU ever wondered what those three or five-digit numbers are on the top left hand corner of your *RadCom* address label?

They are to do with Mailsort, a Royal Mail service we (and others) use to keep down the cost of bulk mailing by pre-sorting them into some 1500 numbered post-code areas.

To help our packers we have recently started putting this number on the label. If you see this on other items of mail, there is no connection with the RSGB, it's just the Post Office's own sorting codes.

PHOTOGRAPH: G0OXX

**The South Foreland Lighthouse atop the 300ft White Cliffs of Dover overlooks the busiest shipping lanes in the world. From there, Marconi made pioneering attempts in 1897 to use radio communication as an aid to navigation, and two years later made the first cross-channel transmissions to Boulogne. The South-East Kent (YMCA) RC has been issued with a permanent special event callsign for the site, GB2SFL, and will operate from there every weekend and Bank Holiday from April to October, coinciding with the public visiting hours of the lighthouse. Pictured is Club PRO Eileen Berridge.**

## RSGB VHF/UHF Awards News

THREE SHORT wave listeners, Bob Treacher, BRS32525; David Whitaker, BRS25429 and Michel Monteil, F11ATZ, recently received RSGB awards. Bob got the 6m 50 countries and the 6m 100 squares award, David received the 6m 150sq award and Michel got the 2m 80sq/countries award. Ela Martyr, G6HKM, who updated her confirmed 6m countries (2-way) total to 70 and 6m squares total to 225, was awarded the first RSGB 6m DX 75 countries certificate.

Activity on two lesser-used bands was represented by Gordon Emmerson, G8PNN, with a 4m 25sq/6c certificate and Dr Malcolm Franks, G4MKF, with 70cm 50sq/13c. Two transmitting awards were issued: the first a Senior 2m award to Derek Green, G7DKX, and the second a 2m standard award to John Rogers, G0LAK/P. The Civil Service ARS, G1CSR, was awarded the 6m 20c award and the 6m 25sq award.

Congratulations to all RSGB VHF/UHF award recipients who include:-

**50MHz:** 10 countries (2-way) - G0ISW & G1AVE. 20c (2-way) - G8MIA/P, G1WSY & G7GMD. 30c (2-way) - G1EHJ, GU7DHI & G8BFL. 50c (2-way) - PE1MHO & GM8MBP. 70c (2-way) - VK3OT & G3VYF. 25sq - G1AVE. 50sq - G1UGH & G3KPT. 75sq - GU7DHI. 100sq - G1EHJ. DX 25c - G1WSY, G1EHJ, G8BFL & G3KPT.

**144MHz:** 40sq/10c - G0ISW & G0LAK/P. 60sq/15c - GW0HOL. 80sq/18c - G6DBX & GW6ZUQ. 125sq/20c - G8PNN.

***Ian Cornes, G4OUT, VHF/UHF Awards Manager***

# PAY A VISIT TO SUPER HAMSTORES

## AVAILABLE AT SUPER HAMSTORES THIS MONTH; A FULL RANGE OF WIDEBAND, HF, VHF, UHF, BASE-STATION, MOBILE & HANDPORTABLE RECEIVERS.

**Whatever your requirements we will help you make the right choice.**

**WIDEBAND RECEIVERS**

| | |
|---|---|
| R9000.....100kHz - 2GHz All Mode | £4080.00 |
| R100.....100kHz - 1856MHz AM/FM | £ 510.00 |
| R1.....100kHz - 1300MHz AM/FM | £ 349.00 |
| AR3000A.....100kHz - 2036MHz All mode | £ 765.00 |
| AR2000.....500kHz - 1300MHz AM/FM | £ 269.00 |
| MVT7000 ....8MHz - 1300MHz AM/FM | £ 289.00 |
| DJX1 .....500kHz - 1300MHz AM/FM | £ 269.00 |

**HF RECEIVERS**

| | |
|---|---|
| R5000.....100kHz - 30MHz All mode (VHF OPT) | £ 925.00 |
| R71.....100kHz - 30MHz All mode (FM OPT) | £ 875.00 |
| R72.....30kHz - 30MHz All mode (FM OPT) | £ 659.00 |

**HF RECEIVERS CONTD.**

| | |
|---|---|
| R2000.....150kHz - 30MHz All mode (VHF OPT) | £ 549.00 |
| HF225.....30kHz - 30MHz All mode (FM OPT) | £ 429.00 |
| HF150.....30kHz - 30MHz SSB/AM/CW | £ 329.00 |

**VHF/UHF RECEIVERS**

| | |
|---|---|
| R7000.....25MHz - 2GHz All mode | £1012.00 |
| R7100.....25MHz - 2GHz All mode | £1100.00 |
| FRG9600 ....60MHz - 905MHz All mode | £ 520.00 |

**AIRBAND RECEIVERS**

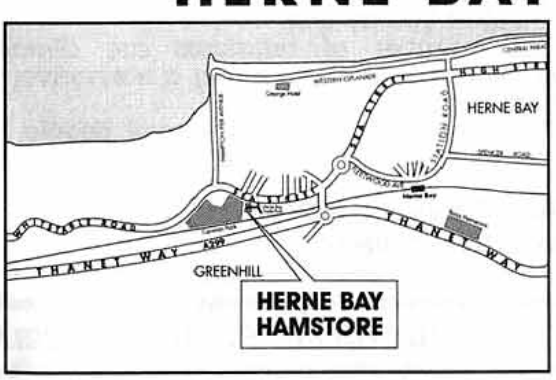
| | |
|---|---|
| WIN108 .....108MHz - 142.975MHz AM | £ 178.00 |
| MVT125 .....108MHz - 142.00MHz AM | £ 169.00 |

**In addition, HAMSTORES stock a wide range of new transceivers plus a large selection of second-hand and ex-demo gear including; BARENCO, DIAMOND, COMET, SONY, AOR, LOWE, DRAE, CUSHCRAFT, AKD, KANGA KITS, MFJ, DEECOMM, CDR, ALLGON, TOYO, AEA, MET, ICOM, YAESU, KENWOOD, ALINCO, JRC ETC. Watch this space for more news,**

**73's, Chris G8GKC, Gordon G3LEQ and John G8VIQ.**

**Opening times for both stores: 09:00 - 17:00 Tuesdays to Saturdays**

## HERNE BAY

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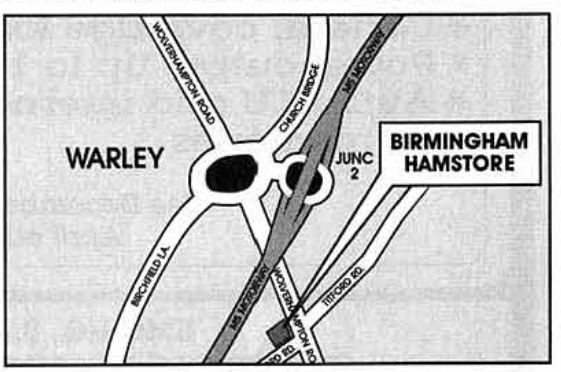


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# SMC South Midlands Co

**Southampton** (0703) 255111 **Leeds** (0532) 350606 **Chesterfield** (0

## FT890 MOBILE/BASE HF

*Available from stock*

The FT890 is an exciting new all band multimode HF mobile/base transceiver from Yaesu. Designed to replace the very popular FT757GX and FT757GXII, the FT890 is a worthy successor.
Direct digital synthesis combined with a magnetic encoder provides silky smooth tuning, pure signals and as the digital synthesisers are driven from a single master oscillator both frequency accuracy and stability are guaranteed.

*Optional accessories include:-*

| | |
|---|---|
| **FP800** | **Power supply.** |
| **ATU2** | **Internal automatic ATU** |
| **FC800** | **External automatic ATU** |
| **DVS2** | **Digital voice storage system** |
| **SP6** | **External speaker (base).** |
| **SP7** | **External speaker (mobile).** |
| **TCX03** | **Temperature compensated oscillator unit.** |
| **MMB20** | **Mobile mounting bracket.** |
| **XF455K** | **250Hz CW filter.** |
| **YF100** | **500Hz CW filter** |
| **YF101** | **2kHz SSB filter.** |

## RAVE REVIEWS

### FT990

- **Amateur bands Tx 160-10m**
- **General coverage Rx**
- **Power output up to 100W P.E.P.**
- **Auto ATU and internal P.S.U.**
- **50 memories**

Since its arrival in the UK the Yaesu FT990 has been hailed as a resounding success in both performance and ergonomics.

Central to the success of the FT990 is the many hours of extensive development by the engineering team at the Yaesu factory which ensures that all the very latest in circuit techniques are employed to benefit the operator. By the use of more sophisticated designs the actual operation of the transceiver can be made very easy and logical, whilst retaining the superb electronic performance expected from modern transceivers.

Almost all the people who have reviewed the FT990 agree that it is hard to beat at the price and they all suggest you try one.

A large number of amateurs are already enjoying the pleasure of operating a transceiver in a class of its own.

So why not join this group of happy people by trying one today at your local dealer!

***See December 91 edition of P.W. for Rob Mannion's review***
***April edition of Radcomm for Peter Harts review***

**SMC HQ, S.M. HOUSE, SCHOOL CLOSE, CHANDLERS FORD INDUSTRIAL E**

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Through ***AMCARE*** you can now insure for breakdown and/or loss/damage for your amateur radio equipment. Optional cover is available for loss/damage from unattended vehicle. Breakdown cover on its own is the best way to extend the warranty after the initial twelve month period at a very reasonable cost.

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Scheme administered by Communications Support Ltd.

See us at RSGB '92

### DAIWA POWER SUPPLIES

The Daiwa range of power supplies is proving very popular for all types of applications, both for the professional user and the hobbyist alike.

From the smallest 9A continuous PS120MkII, via the extremely popular 24A PS304, to the top of the range 32A continuous RS40X. All the Daiwa range of PSU's feature variable voltage from at least 3-15V and switchable voltage 1 current metering. Both the PS304 and RS40X have a cigar ligher socket, convenient for powering your handheld.

Also available from Daiwa are some good quality SWR/PWR meters and coax switches.

### POWER SUPPLIES

| | | | | |
|---|---|---|---|---|
| PS120 M2 | 3-15v Variable | 9A/12A max | £69.95 | C |
| PS304 | 1-15v Variable | 24A/30A max | £129.95 | D |
| RS40X | 1-15v Variable | 32A/40A max | £189.00 | D |

### COAX SWITCHES

| | | | | |
|---|---|---|---|---|
| CS201 | 2 Way SO239 | DC-600MHz 1kW | £13.95 | A |
| CS201G2 | 2 Way N | DC-2GHz 1kW | £27.50 | A |

### SWR METERS

| | | | | |
|---|---|---|---|---|
| CN101 | 1.8-150 MHz | 15/150/1500W | £59.95 | B |
| CN103N | 150-525MHz | 20/200W N | £69.95 | B |

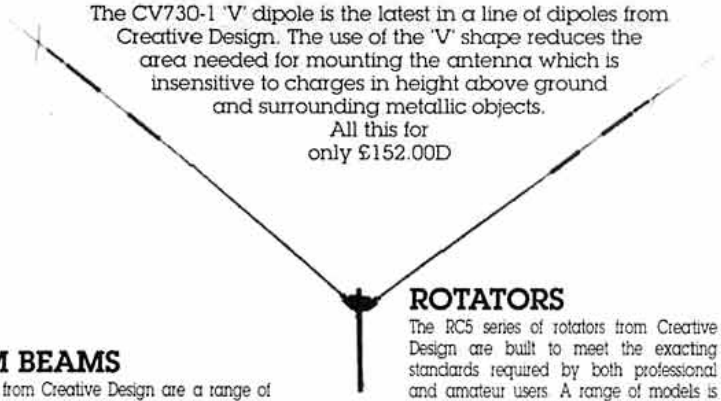
### LINEAR AMPLIFIER

| | | | | |
|---|---|---|---|---|
| LA208H | 2m 1.5-5W in | 30-80W out | £159.95 | C |

CREATE CREATE CREATE CREATE CREATE

The CV730-1 'V' dipole is the latest in a line of dipoles from Creative Design. The use of the 'V' shape reduces the area needed for mounting the antenna which is insensitive to charges in height above ground and surrounding metallic objects.

All this for only £152.00D



The CREATE company has, for the past twenty years, been the leading manufacturer of amateur and commercial antennas (mainly HF) in Japan.

Now available to customers in the UK through South Midlands Communications, the appointed distributor are the popular CREATE HF beams to cover the 10/15/20 metre bands, HF baluns up to 10kW PEP and te exciting 10/15/40V dipole which has elements of only 19ft and is designed in such a way that it can be mounted in particularly awkward places. SMC also stock what must be one of the largest amateur antennas available, the 40 metre full sized beam, as well as 6 and 7 element and six metre yaragis and professional quality log periodic antennas for 50-1300 and 105-1300MHz. CREATE also manufacture rotators to exacting levels of precision and these have virtually no back lash, quiet gears, variable speed and large torque. All are now available from SMC stock. Please contact us NOW for full details.

### 6M BEAMS

New from Creative Design are a range of 6m beams, the CL6DX 6 element, CL8DXX 7 element and CL6DXZ 8 element.

All these antennas are the result of long and continued research to achieve the best possible performance wilst remaining both cost effective and extensely robust.

| | |
|---|---|
| CL6DX 6 ele 13dB | £117.50D |
| CL6DXX 7 ele 14.3dB | £172.65D |
| CL6DXZ 8 ele 14.5dB | £235.00D |

*Manufacturers figures

### ROTATORS

The RC5 series of rotators from Creative Design are built to meet the exacting standards required by both professional and amateur users. A range of models is available designed to cater for medium to large sized antennas. All the rotators are manufactured with high quality components allowing continued and reliable operations.

| | |
|---|---|
| RC5-1 | £223.75C |
| RC5-3 | £280.00C |
| RC5A-3 | £434.00C |
| RC5B-3 | £689.00C |
| CK46 Rotary bearing | £35.75B |

### HF BEAMS

Introducing the NEW 316 series of DX Tribanders from Create which offer outstanding efficiency with High Q traps especially designed) for 14, 21, & 38MHz. High grade materials are used to ensure long life, maximum reliability and fight weight with no compromise in performance.

All beams supplied compete with balun

| | |
|---|---|
| CD318JR 4 ele 10-15-20M 750W PEP Gain 7:7:5.8dB F/B 18dB | £305.00D |
| CD318 4 ele 10-15-20M 2kW PEP Gain 7.8:8:5dB F/B 18:20:20dB | £357.00D |
| CD318B 5 ele 10-15-20M 2kW PEP Gain 7.5:9.95dB F/B 20:18.20dB | £459.00D |
| CL40B-4 3 ele Yag 40m 4kW PEP Gain 8dB F/B 22.18dB | £1120.00E |
| CL10 5 ele 10m 2kW PEP Gain 120dB F/B 24dB | £219.00D |
| CL15 5 ele 15m 3kW PEP Gain 125dB F/B 24dB | £325.00D |
| AFA40 2 ele 40m 2kW PEP gain 60dB F/B 20dB | £383.00D |
| 714X-3 3/4 ele 15-20-40m 3kW PEP gain 7:9:10dB F/B 20:23:20dB | £815.00E |
| CV48 40M vertical 2kW PEP 500W PEP Radial wvbs included suitable for ground or roof mounting. | £214.50D |
| AD385 matching network 40780M for CV48 remote switchable | £50.00B |
| CV730V-1 V dipole for 10-15-20-40 1kW-2kW PEP 19' ele capable of being mounted anywhere | £152.00D |

**A=£1.95 B=£4.75 C=£6.60 D=£11.00 E=£16.50**

*UK appointed agents for:-*

**Yaesu, Daiwa, Comet, Create, Tokyo Hy-Power, Hokushin & Telereader.**

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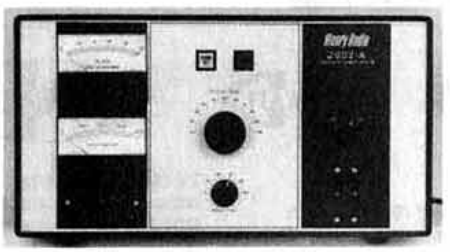
# LINEAR AMPLIFIERS

**SMC have built up over many years a vast experience of linear amplifiers. We have seen many different models and manufacturers come and go during this time and many inferior products.**

**We at SMC feel we have possibly the best selection of the most popular high quality linear amplifiers, all available at very reasonable prices.**

**We are able to service all of these items in-house and have a comprehensive range of spares should anything go wrong. Listed below are details of the linear amplifiers we keep in stock.**


HL2K



2002A


SAGRA -600

### Henry Radio

| | | | |
|---|---|---|---|
| 2002A | 2m 3CX800A7 800W out PEP (typical) 13dB gain | £1495.00 | E |
| 2004A | 70cm 3CX800A7 700W out PEP (typical) 13dB gain | £1495.00 | E |
| 3002A | 2m 8877 1600W out PEP (typical) 10dB gain | £2750.00 | POA |
| 3K Premier | HF 3CX1200 1800W out PEP (typical) 13dB gain | £3059.00 | POA |
| 5K Classic | HF pair 3CX1200 3kW out PEP (typical) 14dB gain | £3950.00 | POA |

### Tokyo Hy-Power HF

| | | | |
|---|---|---|---|
| HL100B/10 | 21-28MHz 10W-100W out | £182.00 | C |
| HL100B/20 | 14MHz 10W-100W out | £182.00 | C |
| HL100B/80 | 3.5MHz 10W-100W out | £182.00 | C |
| HL1K | 160-10m 1kW PEP input 2×4CX250B | £899.00 | D |
| HL2K | 160-10m 2kW PEP input 2×3-500Z | £1450.00 | E |

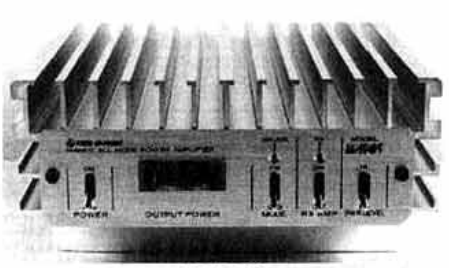
### Tokyo Hy-Power VHF

| | | | |
|---|---|---|---|
| HL37V | 2m 3W-32W pre amp | £90.95 | B |
| HL62VSX | 2m 5/10/25W in 50W out pre amp | £169.00 | C |
| HL110V | 2m 2/10W in 100W out pre amp | £220.00 | C |
| HL180V | 2m 3/10/25W in 170W out pre amp | £299.00 | C |
| SAGRA600 | 2m 15-25W in 600-700W PEP output 2×4CX250B | £839.00 | E |
| HL66V | 6m 10W in 50-60W out pre amp | £131.75 | C |
| HL166V | 6m 3/10W in 80/60W out pre amp | £255.00 | C |
| HL1K/6 | 6m 10W in 500W PEP output 2×4CX250B | £899.00 | D |
| HL36U | 70cm 6/10W in 25-30W out pre amp | £138.00 | B |
| HL63U | 70cm 10/25W in 50W out pre amp | £220.00 | C |
| HL130U | 70cm 3/10/25W in 120W out pre amp | £397.00 | C |
| HL1240U | 23cm 2/10W in 40W out MGF 1202 pre amp | £529.00 | C |

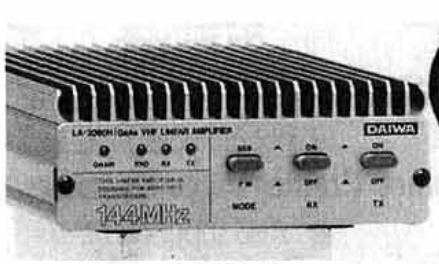
### Daiwa

| | | | |
|---|---|---|---|
| LA2080H | 2m 1.5-5W in 30-80W out pre amp | £159.95 | B |
| DLA80H | 2m/70cm 0.5W-25W in 80W out<br>2m 60W out 70cms in MGF 1302 pre amp | £339.00 | C |

***"Ideal for dual band handie or mobiles"***



HL110V




LA2080H

See us at RSGB '92

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*Hants SO5 3BY*
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*9am-1pm Sat*

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*Leeds LS9 6JE*
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*9am-1pm Sat*

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*Chesterfield*
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*Tues-Sat*

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*Alum Rock*
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*9am-4pm Sat*

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| | |
|---|---|
| 40-2CD | 40m 2 element Beam |
| 20-4CD | 20m 4 element Beam |
| 20-3CD | 20m 3 element Beam |
| 15-3CD | 15m 3 element Beam |
| 10-4CD | 10m 4 element Beam |
| TEN-3 | 10m 3 element Beam |
| A4S | 20-15-10m 4 element Beam |
| A3S | 20-15-10m 3 element Beam |
| A3WS | 17-12m 3 element Beam |
| D40 | 40m Rotary Dipole |
| D4 | 40-20-15-10m Dipole |
| D3 | 20-15-10m Dipole |
| D3W | 30-17-12m Dipole |
| R7 | 40-10m H/W Vertical |
| R5 | 20-10m H/W Vertical |
| AP8 | 80-10m Vertical |
| AV5 | 5 Band HF Vertical |
| AV3 | 20-15-10m Vertical |
| A50-6S | 6m 6 element Beam |
| A50-5S | 6m 5 element Beam |
| A50-3S | 6m 3 element Beam |
| AR-6 | 6m Ringo Vertical |
| 17B2 | 2m 17 element Beam |
| 13B2 | 2m 13 element Beam |
| 124WB | 2m 4 element Beam |
| A144-7 | 2m 7 element Beam |
| A144-11 | 2m 11 element Beam |
| A144-20T | 2m 10 element X Oscar |
| AR-2 | 2m Ringo Vertical |
| ARX-2B | 2m Ringo Ranger II |
| AR-270 | 2m/70cm Vertical |
| 424-B | 70cm 24 element Beam |
| A430-11 | 70cm 11 element Beam |
| 416TB | 70cm 8 element X Oscar |
| ARX450B | 70cm Ringo Ranger II |

### MIRAGE/KLM

COMMUNICATIONS EQUIPMENT

| | |
|---|---|
| 40M-2 | 40m 2 element Beam |
| 20M-4 | 20m 4 element Beam |
| 15M-4 | 15m 4 element Beam |
| 10M-4 | 10m 4 element Beam |
| KT34-A | 20-15-10m 4 element Beam |
| KT34-XA | 20-15-10m 6 element Beam |
| 6M-7LD | 6m 7 element Beam |
| 6M-5 | 6m 5 element Beam |
| 2M-20LBX | 2m 20 element Beam |
| 2M-16LBX | 2m 16 element Beam |
| 2M-13LBA | 2m 13 element Beam |
| 2M-22C | 2m 11 element X Oscar |
| 2M-14C | 2m 7 element X Oscar |
| 432-30LBX | 70cm 30 element Beam |
| 432-20LBX | 70cm 20 element Beam |
| 435-40CX | 70cm 20 element X Oscar |
| 435-18C | 70cm 9 element X Oscar |

**LINEAR AMPLIFIERS**

| | |
|---|---|
| A1015G | 6m 10-150w g/f rx |
| B3030G | 2m 30-300w g/f rx |
| B3016G | 2m 30-160w g/f rx |
| B1016G | 2m 10-160w g/f rx |
| B108G | 2m 10-80w g/f rx |
| B215G | 2m 2-150w g/f rx |
| D3030N | 70cm 30w-100w |
| D1010N | 70cm 10w-100w |
| D15N | 70cm 2w-20w |

**GASFET PRE-AMPLIFIERS**

| | |
|---|---|
| KP-1/2M | 2m Indoor unit |
| KP-1/70 | 70cm Indoor unit |
| KP-2/2M | 2m Masthead unit |
| KP-2/70 | 70cm Masthead unit |

### TELEX hy-gain

| | |
|---|---|
| 7-2 | 40m 2 element Beam |
| 7-1 | 40m Rotatable Dipole |
| 205CA | 20m 5 element Beam |
| 204BAS | 20m 4 element Beam |
| 203BAS | 20m 3 element Beam |
| 155CA | 15m 5 element Beam |
| 153BAS | 15m 3 element Beam |
| 105BAS | 10m 5 element Beam |
| 103BAS | 10m 3 element Beam |
| TH7DXS | 20-15-10m 7 element Beam |
| TH5MK2S | 20-15-10m 5 element Beam |
| EXP14 | 20-15-10m 4 element Beam |
| TH3JRS | 20-15-10m 3 element Beam |
| TH2MK3S | 20-15-10m 2 element Beam |
| DX88 | 8 Band HF Vertical |
| 12AVQS | 20-15-10m Vertical |
| 14AVQ | 40-10m Vertical |
| 18VS | 80-10m Vertical |
| 66DX | 6m 6 element Beam |
| 64DX | 6m 4 element Beam |
| 215DX | 2m 15 element Beam |
| 216SAT | 2m 8 element X Oscar |
| 7031DX | 70cm 31 element Beam |
| 7030SAT | 70cm 15 element X Oscar |

**ROTATORS**

| | |
|---|---|
| T2X | Windload 1.9m² |
| HAM IV | Windload 1.4m² |
| CD45 II | Windload 0.79m² |
| AR40 | Windload 0.28m² |

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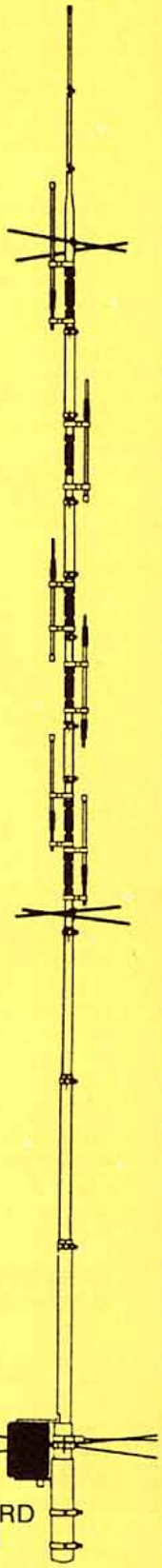
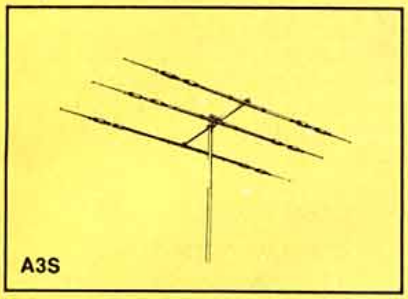
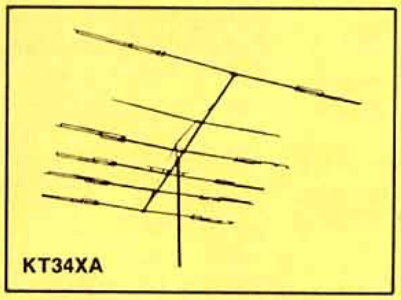
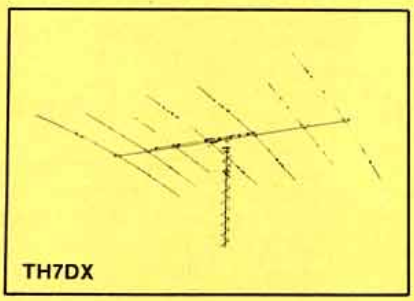




A3S



KT34XA



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# HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

WELL IT *didn't* happen! Unfortunately(?) the broadcasters did not get the slice of spectrum they sought in the region of 7MHz and that meant that there was no need to re-align the amateur band. However, during the course of the discussions it became clear that we have many friends and in fact Mexico has proposed that the question of the 7MHz amateur band be discussed properly at the next competent WARC.

G4HLN has sent a list of the new frequency allocations to coast stations which came into effect on 1 April 1992. It shows that Stonehaven now transmits on 1.856 and 1.946MHz, Humber on 1.869 and 1.925MHz, Portpatrick on 1.883MHz and Hebrides on 1.866MHz. Wick is now using 1.9237MHz for radiotelex transmissions. These frequencies are important to us because even though we now have enhanced privileges between 1.830 and 1.850MHz, in other parts of top band we are still Secondary users and must not cause interference to the Primary services.

Changes everywhere just now - David, G3TQQ, reports the arrival (with help from UW9LA) of the very last P-15-P certificate to be issued.

Congratulations to Alan Birch, G4NXG. His contact with the Aves Is expedition gave him 300 countries worked as G4NXG/M. Does anyone else come anyway near this total?

## DX NEWS

9L1US HAS MOVED to **Botswana** and promises to be very active on all bands with his new A22US call. I had the pleasure of meeting Kofi Jackson, 9G1AJ, at WARC. It seems that good progress is being made towards the restoration of amateur radio in **Ghana**. V51JM, in **Namibia** is reported by the *Long Island DX Bulletin* to be a frequent inhabitant of 21.310MHz from 1900. The same source mentions 9X5NH in **Rwanda** as being on 24.945MHz daily at 1430.

FD1PJQ is in **Ethiopia** for three years and has been heard on 14.121MHz around 1930. It is not known if he is properly licensed. JE3LZG is in **Malawi** for two years and has been very active on CW as 7Q7XX.

*Lynx DX Bulletin* says that ST0YD, in **Southern Sudan** has been worked on 14.256MHz at 0850, on 21.157MHz at 1100, and on 28.490MHz at 1400.

G0NKZ reports that an international group which includes UA6LQ, UT4UX, UA3LU, N3CBW, RA3AA, KC3VO, and Ken himself will be on the air from Rostov on Don as 4L6CH from 1 to 3 May. The operation aims to draw attention to the problems facing the area affected by the Chernobyl disaster. The same operators used the callsign US6CH between 25 and 30 April. UV3AAC will be in **Franz Josef Land** this month signing 4K2/UV3AAC; 4K2/UA3ADR will also be there.

Stations in **Anguilla** will be prefixing their calls with VP25/ until the end of this month. This to celebrate the 25th anniversary of independence. G4SMC/8R1 should be on the air again from **Guyana** at the present time.

According to *RSGB DX News Sheet*, VS6CT has reported that licences are now being issued in Hong Kong with VR2 prefixes. This was used by Fiji some years ago.

The same news source says that N0PMF/KH8 has been worked from Europe on 28MHz SSB and that the operator says that he will be there for a year but only has permission to 28MHz SSB. G3ZSS is now in **Brunei** for a two year stay and is on the air as V85PB. Peter has a tri-band beam on a 60ft tower.

Two other new societies are in the process of formation - one of which is the Namibia Amateur Radio League, a representative of which I met recently. The second may well result in more activity from Qatar. This is excellent news for all of us because the more countries which officially recognise the value of amateur radio the better when the chips are down at frequency allocation Conferences . . . .

David Pilley, VK2AYD/G3HLW/N3AFU, has recently visited Taiwan where he was allowed to operate as VK2AYD/BV - but not allowed to make QSOs with the USSR or the PR China. He used the station of Feng, BV2DA, who is on 28.010MHz most days. Feng has fairly basic equipment with a dipole on top of the apartment block were he lives. 500 people recently took the radio examination but most will probably not be on the HF bands due to language problems.

## NORTH KOREA

THE FOLLOWING statement was released by IARU on 27 February. "It was announced today that the International Amateur Radio Union will participate in an international project aimed at establishing amateur radio in the Democratic People's Republic of Korea. The announcement was made in Torremolinos, Spain, site of the 1992 World Administrative Radio Conference. The project is based on preliminary discussions held in Pyongyang earlier this year, where the authorities of the DPRK indicated their positive attitude toward such an initiative. Several amateur radio groups and IARU member societies are offering their cooperation and support. The Project Group is led by Dr Seppo Sisatto, OH1VR. The coordinator for IARU is IARU President Richard L Baldwin, W1RU. Detailed discussions are underway and the Project is tentatively scheduled for May 1992."

## OVERSEAS NEWS

STEVE, P29DX (G4JVG), was due to operate as P20A during the CQ WPX SSB contest. He particularly asks those who want a QSL not to apply to G3LQP or via the bureau but *direct only* to the address in *QTH Corner*, together with a self-addressed envelope and return postage - one new-style IRC or three old ones for airmail. Those enclosing one or two old-style IRCs will receive surface mail replies and no IRCs means his reply will be via the bureau. Normal QSOs with P29DX should be dealt with in the same way but *Europeans only* may send cards to G3LQP. Cards sent to Steve via the PNG bureau experience severe delay because there are not many amateurs there and societies wait until they have a worthwhile batch to forward to the PNGARS QSL bureau. This can take years and many temporary P29s have already left before their cards catch up with them!

## CONTESTS

IN THE **1991 European DX Contest (SSB)** G6QQ scored 18,500 points and GI0NWG 9,570 in the single-operator category, and in the multi-op single transmitter section GM0ECO scored 598,614 points and G0CCH 93,583.

Results of the **1991 SP DX Contest (CW)** have also been received. In the single-operator multi-band class GM3MHG scored 19,404 points, G0LZL 11,514, G4OKN 10,374 and GM0GNT 2,325. On 7MHz G5LP 4,293, GW4HBK 3,525 and GI0MMZ 2,277, and on 14MHz GM0EFH 7,776, G3URA 7,772, G4KSJ 5,460, GI0BEY 4,131 and G3XWZ 882. The only listener listed is RS27662 with 8,400 points.

### CQ-M CONTEST

**2100 9 May - 2100 10 May.**

1.8 to 28MHz (no WARC) phone and CW. Send RS/T plus serial QSO number. The rules are a


**Brendan, G4DYO, (Editor of *DX Newssheet*) and Henry, G3GIQ (left) giving each other XYORR, QSL cards – both now have all DXCC countries confirmed.**

little complicated and if you are really interested I suggest sending me a SASE for what will prove to be a rather poor photocopy!

Results of the SSB section of the **1991 CQ WPX Contest** have appeared. In the world listings are **GW4BLE** who came 12th in the single-operator all band category, **GB8FX** who was fourth on 14MHz, and **GB6BT** seventh in the multi-operator category. Congratulations specially to these because what they did was no mean achievement. Full scores are:- (All-bands) **GW4BLE** - 6,308,224 points, **GW0RK** - 3,932,052, **GM3BCL** - 1,102,977, **G4BUO** - 567,466, GW0AJI - 225,502, and G3PRI - 64,575. (3.5MHz) **G4PKP** - 337,824, G4LRP - 18,000. (7MHz) **G5LP** - 134,890. (14MHz) **GB0FX** - 4,025,478, **GW4OFO** - 1,609,041. (21MHz) **GM4WEW** - 208,571, GM3YTS - 173,317. Those listed in bold type receive certificates. The total of UK entries seems to have been 13. There were over 60 from Spain and over 70 from Germany . . . .

### QTH CORNER

| | |
|---|---|
| **FO0CI** | N7QQ, 5327 Carol Av, Alta Loma, CA 91701, USA. |
| **KP5/K0BJ** | (see below). |
| **KP5/N1DX** | Bruce Frahm, K0BJ, Box DX, Colby, KS 67701, USA. |
| **P20A** | **(direct only)** S.Telenius-Lowe, PO Box 1783, Port Moresby, New Guinea. |
| **ST0YD** | F6AJA, 515 Rue du petit Hem, F-59870 Bouvignies, France. |
| **YA5MM** | LZ1HA, P.O.Box 321, Sofia 1000, Bulgaria. |
| **US6CH** | Kenn Everard, G0NKZ, Glebe Cottage, Glebe Close, Southwick, Sussex, BN42 4TF. |
| **V85KGP** | YASME, PO Box 2025, Castro Valley, CA 94546, USA. |
| **V85PB** | Peter Bacon, PO Box 715, Seria 7082, Brunei. |
| **VP8SSI** | G.Branson, AA6BB/7, 93787 Dorsey Lane, Junction City, OR 97448, USA. |
| **YX0AI** | (SSB) ARV Secc Santiago de Leon, Box 3636, Caracas 101, DF Venezuela. |
| | (CW) YV DX Club, Box 75458, Caracas 10070A, Venezuela. |
| **4L6CH** | (see US6CH). |
| **7Q7MC** | Box 139, Mzuzu, Malawi. |
| **7Q7XX** | Shinya Takenaka, Box 21, Katano, Osaka 576, Japan. |

### BAND REPORTS

Thank you this time to G2VJ, G2HKU, GM3CSM, G3's GVV, KKJ, G4DJC, GW4GR, G4's MUW, NXG/M, OBK, GW4RGT, G4XQV, and GM0KMJ. Calls listed in italics were using CW:

**10MHz**

**0500** *KP5/K0BJ*
**0800** *FO0CI*
**1900** *SU1HV*
**2000** *FY5FR, OD5/LA4GHA, VK3MR, ZA1TAC*
**2200** *FM5WD, V47UY, 9M2AX, 9Y4NW*

**14MHz**

**0700** FO0CI
**0800** KC4USB, ZA1TAG
**0900** *FO5FQ*, T20AA, *T30BW, T30RE, ZK1BU*
**1000** FO0CI, *HS1CDX*
**1100** *AL7LM*, VU2DAG, 4S7VK, 9M2AB
**1400** *DL2UU/KH8*
**1500** *FO5JR (LP), V85AA, 3D2UU*
**1600** EP2MHB, KH0/KB4TXM, *UA0YO*, 9M8FH
**1700** *KC6/WV5S, KH6s, KK6RT/KH0*, XW1QL
**2000** *FK8WD, KH6AK, KL7UR*, YA5MM
**2100** S92LB, YX0AI, ZD7KT
**2300** FO0CI, 9V1XQ

**18MHz**

**0800** *ZL1BM*, 3D2UU
**1300** *JW0C*, VS6CT, XX9AW, YX0AI
**1800** C31YA, *FR5GC*, TA2ZA, YB0MCA, 6W1QJ
**1900** *KP5/K0BJ*, P40MR, *5H3RA*, 7Q7XX
**2300** A61AD, J8/G0GPX, *PJ9JT, VK9XN, ZD8LII*

**21MHz**

**0700** FO0CI, *P229RB*, ZL4JO
**0800** VK9LH, 5X5WR, 9L3BM
**0900** BV2AR, *C56/GM3YOR*, HS0E, 3D2AG, *4J4GMK*
**1000** H44AP, HZ1MM
**1100** JT1BG, KH3AF, P29WK, V63OM
**1400** BVs 2CR, JA, VA, 5AP, WA4DAW/KP5, XW1QL
**1500** EP2MHB, V63AO, VS6CS, XV7TH, XX9AS, ZS9A
**1600** TJ1FI, YA5MM, 3B9FR
**1700** A71BS, C9RTT, CE0YFL, FR5ZN, KH6CD
**1800** FR5ZU/T, KH6/DJ1WM, YX0AI, 7Q7MC
**2100** *FO0CI*, HC8/HC1XF, VK4DMP

**24MHz**

**1000** *JT1CDA*, TA1AL, XT2BW, 5V7JG
**1100** *KL7U, VP2E/DK7UY, VK9XM*, YA5MM
**1200** *FS4PE, J77UY*, ZA1TAG, *7Q7XX*
**1400** *FO0CI*, KP5/N1DX, VK9CL, XX9AW, 7Q7MM, *9K2MU*
**1500** A92BE, HK3JJA, VS6CT, *ZA1TAE*, ZB2BI
**1600** *FR5GG,FS4PL, V2/VE5RA*, VP5/WA2BOT, YB0MCA, YX0AI, *9M2AX*
**1700** EA9UA, *FR5GL*, VE7CVM, Z21S, *ZD8OK*
**1800** A42ZX, J42MAC, P40MR, PY0FZ, T77J
**1900** NH6C, S79KMB, VP2EST

**28MHz**

**0800** BY4AA, TR0D, YA5MM
**1000** BY8AC, BZ9AAC/5, YA5MM
**1100** A71CH, JT1/RB5LUK, XX9AS, 9L1MR
**1200** JT1BG, TL8NG, XT2BW, ZF2RW/ZF8, 9N1MM
**1400** TU2ZC, XX9's AW, MD, 7Q7JWL
**1600** FO0CI, TY1DX, *ZA1FD*, 5U7M
**1900** NH6XM, ZX0MXK, 7Q7XX

## EXPEDITIONS

W1/G4DZC, KC1YR, KA1USL, and N1BRM will again activate Nantucket Is (IOTA NA-46 Massachusetts group) during the weekend of 29-31 May. Most operation will be on the HF bands (including WARC). Some 50MHz operation is possible and if you have questions please fax these to Martin, W1/G4DZC, at 508 435 0564.

JA2ECL expected to be in **Micronesia** as V63YK last month. He will be near the end of his trip but should still be on Pohnpei Is (IOTA OC-010). He has an IC-760 and most likely will be on 21.350 or 28.530MHz SSB only.

If you hear RN8A this will be a joint special activity from Shuj-Ostrov Is (EU-147) in the White Sea by a group of Finnish and Russian amateurs.

The VP8SSI expedition to **South Sandwich Is** was completed at the beginning of April, and reports indicate that it was very successful, despite atrocious weather conditions and unscheduled visits by penguins. Operation took place on all HF bands, including 1.8MHz and WARC allocations, at various times. Some problems with the generators meant that only two stations were operational for much of the time. However contacts using SSB/CW/RTTY were established, including a number with European stations. Equipment included four Kenwood transceivers, three linears and two Cushcraft A4S triband antennas. There were also beams for 18 and 24MHz, add-on rotary dipoles for 7 and 10MHz, and verticals for 1.8, 3.5 and 7MHz. The ten operators (who contributed to the cost) included WA3YVN, WA4JQS, KO1R, W6MKB, W7KNT, JE3MAS and K5VT.

### 1992 WARC BANDS TABLE

| | 10MHz | 18MHz | 24MHz | Total |
|---|---|---|---|---|
| G4OBK | 37 | 71 | 109 | 217 |
| G2VJ | 41 | 74 | 85 | 200 |
| G3ING | 34 | 30 | 28 | 92 |
| G3KKJ | 24 | 23 | 24 | 71 |
| G4NXG/M | - | 38 | 17 | 55 |
| GW4RGT | 13 | 21 | 16 | 50 |
| G4XRV | 36 | - | - | 36 |
| G4MUW | - | - | 35 | 35 |

## PROPAGATION

AN ERROR appeared in last month's commentary - in the first paragraph "solar flux had been above 200 sfu for more than *200 days*" should have read *50 days*. Apologies to Smithy whose report this month goes as follows: "The period from mid-February to mid-March saw HF band conditions varying from very good to rather poor. Early in the period conditions were stable and MUFs very high with the higher bands opening early and closing late. For the last ten days of February, however, although solar flux passed through a peak of 255 sfu there were several magnetic storms and the average A index was high (over 30 in Europe) which meant that conditions were often disturbed though with a few good spells.

"In the first weeks of March the geomagnetic field settled down while solar flux levelled off at values around 165 sfu giving a spell of settled conditions though with MUFs significantly lower than in February. A provisional monthly sunspot number of 159.6 for February (provisional monthly solar flux 232 sfu) is further evidence of the unexpectedly high second peak of Cycle 22. It is too early to say whether or not this peak has passed but it should be noted that by the middle of March the 27-day average solar flux had fallen below 200 sfu for the first time in 80 days and was still falling steeply."

## AWARDS

THE SCOTTISH Tourist Board (Radio Amateur) Expedition Group sets out to publicise Scottish events via amateur radio and it issues a number of awards. Events normally run from 0800 to 2200 on Saturdays and from 0900 to 1500 on Sundays. Frequencies usually used include: 3.510, 3.765, 7.010, 7.065, 10.140, 14.010, 14.140, 14.240, 18.130, 21.010, 21.250, 24.905, 24.950, 28.010, and 28.400 - 28.600MHz. The 10MHz frequency will look specially for Novice contacts.

*continued on page 19* ▶

# VHF/UHF NEWS

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

WHAT A DIFFERENCE a month can make. In March, solar activity declined significantly and DX on the 50MHz band was largely confined to a few openings to southern Africa. Longer distance tropospheric propagation disappeared once Atlantic lows began again to dominate the British Isles weather from the last third of the month. Weak auroras were reported by northern stations.

## VHF CONVENTION

### TRADE SHOW

This year's VHF Convention at Sandown Park on 14 March attracted over 2,500 visitors. As usual, the main trade exhibition was accommodated on the ground floor. Shortly after the doors opened around 1030, it was packed with bargain hunters and the RSGB stand did a brisk business selling books, membership and dealing with queries.

In spite of the Picketts Lock show the previous weekend, trade support was most satisfactory. There was a great variety of gear on offer ranging from small components for simple projects, through antennas and low-loss feeder for ambitious systems, to expensive transceivers. By lunch time the crowds had thinned out somewhat so it was easier to get at the stands.

Several RSGB committees had booths on the first floor, as did the special interest groups. The latter included AMSAT-UK, the UK 6m Group, the BATC and the WAB group. The Remote Imaging Group had a superb display of weather satellite reception systems, much of it in colour. These seemed every bit as good as that seen on national TV produced by the professionals.

The man with the funny hat and TV camera wandering around the halls was John Stockley, G8MNY. He built his CCD colour camera from components bought at a rally. The transmitter runs one watt FM on 24cm using hi-fi sound and the antenna on his hat is a skeleton Alford slot. He told me he built the whole lot for under £200.

Last year he accessed the High Wycombe TV repeater from within the building using this system, enabling ATV addicts to watch live transmissions from Sandown Park. This year the repeater was installed at the convention and it relayed John's signals to the BATC stand. I suggest this was an impressive example of amateur ENG - Electronic News Gathering.

Throughout the day there was a steady stream of visitors to the VHF Committee stand including some of the regular contributors to this feature. The computer database for the frequency registration scheme was on display. There was a continuous slide presentation of Society VHF awards certificates. It seems that you are satisfied with both the venue and form of the convention, although most thought mid-March was a bit too early.

### THE LECTURES

RSGB President Terry Barnes, GI3USS, formally opened the Convention at 1330. In his address he reviewed some of the more significant happenings of the previous year, including the 144MHz packet radio proposals and repeater charges. He announced new 50MHz Transmitting awards; the Standard award requires confirmation of contacts with stations in 40 counties and 12 countries, the Senior version 60 counties and 20 countries. The starting date was 1 June 1987.

After the presentation of the trophies, the three lecture streams commenced. I was on duty on the VHF Committee stand so did not attend any talks this year but understand they were well received. The VHF Contests Committee Forum was reportedly quite lively.

Sandown Park is now a very popular venue for this kind of event so it is becoming more difficult to book a preferred date. We have to avoid clashing with other nearby events and major contests, so the choice becomes very narrow. Next year we hope to get a later date on a Sunday; watch this space.

## PUBLICATIONS

ON THE VHF Committee's stand at Sandown Park copies of the first, pilot issue of the new *VHF-UHF DXer* newsletter were available. In his introduction, editor Dave Hardy, G8ROU, stated that it ". . . . is intended to cater for all those who are interested in DX, contests etc on the bands above 50MHz". Six further issues are planned for 1992. The subscription is £5.00 and cheques should be made out to D Hardy. Dave's QTH is: Thorntree House, Wensley, Matlock, Derbys, DE4 2LL.

Mike Wooding, G6IQM, is again handling the subscriptions for the English language edition of *VHF Communications* magazine, now in its 24th volume. This is a quality, quarterly publication featuring excellent technical articles. A range of PCBs and components is advertized for those wishing to build equipment described. The subscription is £12.00. Send it to KM Publications, 5 Ware Orchard, Barby, Rugby, Warks, CV23 8UF.

## REPEATERS

THE CENTRAL Scotland FM Group manages six VHF repeaters and TV relay GB3GT (IO75UU) on channel RT2 in the 1.3GHz band. The Spring *Newsletter* comprises 28 pages and a Stop Press item mentioned that GB3CS (R6) was to be taken out of service for some minor hardware and software changes. It has given good service since 1977 and was due back on 21 March.

Treasurer Stan McQueen, GM8MRW, records his disappointment that the target of 300 members has not been reached, adding: "It should have been, judging by the number of freeloaders still frequency-jumping between the two metre repeaters under our jurisdiction!" The membership list indicates the group is 12 short of that figure. For details of the CSFMG contact secretary Alistair Fraser, GM3AXX, who is QTHR.

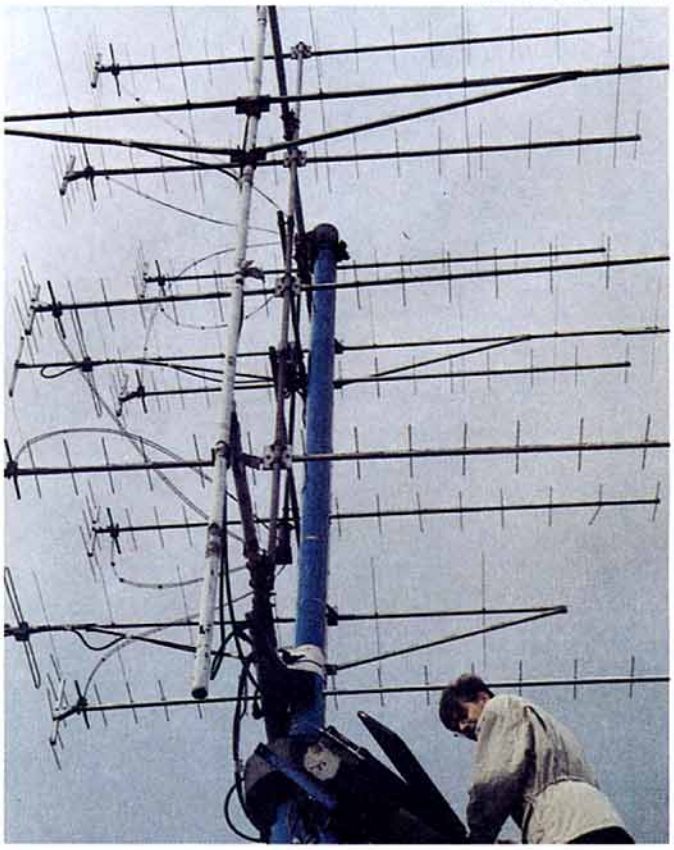
## SOFTWARE

MOST AMATEURS now have a computer in the shack. Uses include log keeping, distance calculating, satellite position finding, TNC driving, propagation predicting and EME power link budget calculating, to list but a few. There is a wealth of software available, much of it in the Public Domain (PD).

Authors place programs in the PD for the benefit of others but retain their copyright. The programs may be freely copied for personal use but must not be sold for pecuniary gain. Documentation is often minimal and the software is not usually supported, ie, if you find a bug don't expect the author to spend time correcting it.

Shareware is neither PD nor free. Authors make copies freely available so you can try before you buy. If you find the programs useful you are honour bound to support the authors by paying a

PHOTOGRAPH: REG WOOLLEY, GW8VHI



**Maintenance work on the impressive antenna array at DK0TU, the club station of the Technical University in Berlin. The 144MHz array comprises six Yagis and the 430MHz group consists of eight Yagis. The club experiments with EME and other esoteric modes.**

registration fee. Shareware is usually supported with an upgrade service for a modest fee. It is better documented than PD software.

Rod Smith, G4DQY, sent the latest edition of the Public Domain and Shareware Library's *IBM PC Software Reference Guide, Major issue 12a*, together with *Supplement 2*, showing new releases. These total about 170 pages listing disks covering topics from agriculture to word processing. The ham radio section includes new offerings of interest to VHF-ers, on packet radio, propagation and satellite tracking. The address of the PDSL is: Winscombe House, Beacon Road, Crowborough, E Sussex, TN6 1UL; tel: 0892 663298; fax:0892 667473.

Roland Brade, G3VIR, is the General Manager of Venus Electronics which claims to be ". . . . the largest distributor in the UK of amateur radio and technical shareware/PD programs for the IBM and clone computers." Their shortform catalogue lists about 100 disks of amateur radio software. Their address is: 26 Pevensey Way, Frimley Green, Camberley, Surrey, GU16 5YJ; tel/fax: 0252 837860.

In his April 'The World Above 50MHz' column in *QST* Bill Tynan, W3XO, mentioned W5UN's SKYMOON program written for IBM-compatible machines. As well as the usual az/el predictions, it displays where in the world the Moon is rising and setting; very important when trying to work smaller EME stations unable to elevate their antennas. For more details, send an SAE with IRC to Skymoon, 9102 Kings Drive, Manvel, TX 77578, USA.

I hope to have upgraded my office computing and communications systems by the time you read this but will keep the Amstrad PCW8512 as a back-up. Although slow by today's standards, it has proved utterly reliable. I will continue to copy programs from my modest library of Mallard Basic files so, if you want a copy of the latest PROGLIST, send me an SASE. *Please note, these programs will only run under CP/M and are on three inch disks.*

## METEOR SCATTER

FIRST A reminder about the Eta Aquarids meteor stream; see page 17 in the April *RadCom*. A shower worth a try is the Omicron Cetids, a daylight stream, which is predicted to peak this year on 20 May, according to the Internation Meteor Organization's *1992 Meteor Shower Calendar*. The IMO states: "So little is known of it that almost any observations secured are important, and the Radio Commission urges an especial effort this year".

At maximum, the solar longitude (LS) is 59.3°, the radiant's Right Ascension (RA) 28° and its Declination (DEC) -4°. My MSD1 program suggests the following times when reflection efficiencies should exceed 50%: NE/SW 0630-1100; E/W 0730-1300; NW/SE 0930-1400 and N/S, not a very good direction, around 0700 and 1300. The radiant is above a mid-UK horizon from about 0430 to 1530GMT.

## MOONBOUNCE

W3XO REPORTED what is probably the first 50MHz EME QSO between North America and Europe. On 22 Jan 1992 W7HAH, who runs 1kW to a single 11-ele Yagi at 20m AGL, completed at his moonrise with OH2BC, who uses four such Yagis with elevation. The path loss at 50MHz is 9.5dB less than on 144MHz, by the way.

### 144MHZ

Bill mentioned the first EME contact from Cuba, between CO7KK and KB8RQ. The former was running just 25W to two 5-ele Yagis - however KB8RQ does have a rather big array. Nevertheless, it does illustrate once again that small stations can work the biggest stations, given a bit of luck and a following wind!

John Regnault, G4SWX (SFK), tail-ended G3LQR's sked with AA4FQ at 2216 on 8 March, his 171st station, or 'initial'. A sked at 2030 on the 13th with KK4NO brought No. 172. He had a go in the REF contest on the 14/15 March weekend. Between 1546 and 1720 on the 14th he completed with eight stations, F6KSX being new. A sked at 2244 with W8WN was completed for No. 174 and a couple of other Ws were worked in the North American window before moonset.

From moonrise on Sunday afternoon till midnight, another 19 QSOs were completed. These included EA2LU, who was RST549, UA9SL, RA6HHT, RA6AAB (No. 175) and LA9NEA. For the last few hours, Faraday rotation was a problem. New initials during the evening of the 16th were LA0BY and DL8SCL. Others heard included UG6AD, UA9FAD and IW5AVM.

### MICROWAVES

Stuart Jones, GW3XYW (GNW), operated on 1.3GHz on 14 March and completed with 15 stations in eight countries between 1745 and 2310. These were, on CW: OK1KIR, EA3UM, IN3HER, F1ANH, ZS6AXT, OE9ERC, F2TU, IK3GHY, N2IQU, OZ4MM, K9KFR, F1AQC, F1CGJ and AA6WI. K2UYH was worked on SSB. The IK3, OZ and AA6 were new initials. His main effort now is to generate enough power on 2.3GHz to hear his own echoes. He has already copied some stations on the band.

The weekend 9/10 May is a perigee one. At 00GMT on the 9th the declination is 14.7° and by 24GMT on the 10th it will be 4.0°. As usual there will be useful Asian windows at moonrise and North American ones at moonset. The maximum elevation in the London area, according to the WA1JXN program, will be about 54° in the late afternoons.

## 50MHZ

### PROPAGATION

In the commentary to his February report, Ray Cracknell, G2AHU(HWR), wrote: "February 1992 provided many surprises including the best transatlantic F-layer propagation and the best openings to Australia for February during Cycle 22, as well as the highest number of auroral openings for any month in this solar cycle. Although . . . . it has frequently been pointed out that the best F-layer conditions and the maximum of the geomagnetic cycle often occur after sunspot maximum, nobody expected them to occur together in the same month."

Unfortunately all good things come to an end and from the beginning of March the Sun seems to have run out of puff. GB2RS news broadcasts in March spoke of: ". . . . a big decline in solar activity . . . ." on the 15th; ". . . . little solar and geomagnetic activity . . . ." on the 22nd, and ". . . . a major decline in solar activity with no flare activity reported" on the 29th.

Charlie Newton, G2FKZ, who writes the solar factual data section of these broadcasts, suggested: "The major decline in flare activity recently could herald the collapse of Cycle 22." However the NOAA in Boulder predicted another period of high solar activity in April – see page 17, March *RadCom*.

### NEWS

From Ted Collins', G4UPS (DVN), *6m Information* pages news that RA3TES's (LO15JW) QSL address is: Andy Kamaev, Box 13-A, Arzamas 607220, Russia. He has been QRV since mid-Jan. The QSL route for Ray Schenkweiler, 7P8SR (KG31), is: PO Box 333, Maseru 100, Lesotho. Cedric Rourke, GI3IVJ, has been QRV from Madeira as CT3FT (IM13) and was due home on 1 May. He should return in November and his QRA there is Box 86, Porto Santos Is, Madeira, P-9400 Portugal.

Mike Berry, ex-ZD8MB, is now resident in Germany and hoping for his DA2AB licence to arrive in time for the Es season. His QTH is: Karl Millockerstr 10, Wickende, D-4600 Dortmund 13, Germany. He wrote that 600 50MHz permits have been issued including five to members of the British forces. They are for 50.080-

**ANNUAL VHF/UHF TABLE**
**JANUARY TO DECEMBER 1992**

| | 50MHz | | 70MHz | | 144MHz | | 430MHz | | 1.3GHz | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Callsign | Cty | Ctr | Cty | Ctr | Cty | Ctr | Cty | Ctr | Cty | Ctr | Points |
| G4FCD | 16 | 12 | - | - | 72 | 20 | 46 | 17 | 18 | 210 | |
| G6HKM | 40 | 26 | - | - | 39 | 16 | 20 | 12 | 3 | 6 | 162 |
| G1SWH | 8 | 20 | 17 | 5 | 38 | 10 | 21 | 9 | 2 | 1 | 131 |
| G8ESB | 7 | 3 | 15 | 2 | 37 | 9 | 14 | 3 | 7 | 2 | 99 |
| GW6VZW | 60 | 33 | - | - | - | - | - | - | - | - | 93 |
| G3FIJ | - | - | 13 | 2 | 31 | 8 | 19 | 4 | - | - | 77 |
| G3FPK | - | - | - | - | 52 | 15 | - | - | - | - | 67 |
| GW0PZT | - | - | - | - | 44 | 16 | - | - | - | - | 60 |
| G7EWL | 3 | 2 | 3 | 1 | 34 | 12 | - | - | - | - | 55 |
| G7JAF | - | - | - | - | 32 | 10 | 4 | 1 | - | - | 47 |
| GU4HUY | - | - | - | - | 24 | 8 | - | - | - | - | 32 |
| G7CLY | - | - | - | - | 11 | 6 | 1 | 1 | - | - | 19 |
| G6AJE | - | - | - | - | 8 | 2 | - | - | 3 | 2 | 15 |

British counties are those listed on page 65 in the January 1992 *RadCom*; 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. Deadline for the next appearance is **28 May**.

50.400MHz, 25W ERP, horizontal antennas and A1A and J3E only.

A new Caribbean beacon came on in March, PJ2/OH1ZAA in Curacao on 50.006MHz, locator FK52KG, 20W CW to two crossed dipoles. Its keeper is PJ2BR. Eric Jamieson, VK5LP, who writes the VHF column for the Wireless Institute of Australia's journal, *Amateur Radio*, sent me the latest VK beacon list. There are six in the 50MHz region and ten in the 52MHz section and I have passed the details to John Wilson, G3UUT, for his database.

### ACTIVITY

G4UPS reported Arabic FM all over the band at 1015 on 24 Feb. Next day at 0935 TU2OJ was S9+ working Gs for over an hour and at 1137 Ted heard PT7FH working into the UK. There was high Sun noise on the 27th and next morning TU's 4DH and 2OJ were strong till midday. From 1615 on the 29th the GB3RMK and GB3NGI beacons were auroral and he worked GD3AHV at 1625. The event faded by 1730 in Devon.

For the first week in March the band was very poor with little DX. At 1246 on the 9th, beacon ZS2SIX (KF25UX) was S9+ sending Vs and a few ZS5s and 6s were heard/worked. Propagation was mediocre again till the 16th when assorted ZSs were contacted, the V51VHF beacon, 3DA0BK and A22BW were heard 1200-1750.

Ela Martyr, G6HKM (ESX), worked ". . . . the usual stations plus SM, OZ, LA and EI" in the auroras on 26 and 29 Feb. TM6CHU (IN98) on Chausey Is was a new square on 3 March; QSLs should be sent to home QTH of the operator, F6IXI. Shane Hogarth, G7EWL (NHM), had rotator problems but contacted GJ4ICD on 4 March for a new square, county and country. He should have a new Yaesu G400 rotator and an HB9CV antenna aloft by now.

GW4LXO's report was sent in an E-mail message by GW8JLY. Jon has done well so far this year and worked JA4MBM (PM64) for his first JA on 23Feb at 1034. Paul Baker, GW6VZW (GWT), contacted GMs and GIs in auroras on 27 and 29 Feb, some by using CW. He also worked TM6CHU on 4 March.

## 70MHZ

JOHN LEMAY, G4ZTR (ESX), reported on the Cumulatives. Because of neighbour problems at home, he operated portable with unspecified friends, but infers that the 0900 start time probably discourages /P entries. In the first four sessions around 35 QSOs resulted, the second leg being the best. He wrote: "It is a complete fallacy to think that the same stations will be contacted each session."

75 different stations were worked, and in the fourth leg, nine had not been contacted in the first three sessions. Surprisingly in the first two sessions they ran out of time, rather than stations. Best DX was GM4AFF at 593km and EI was worked on each occasion. The station ran 75W to two 5-ele Yagis at 35ft. They missed the final leg on 15 March.

Paul Martin, EI2CA, confirmed that the beacon EI4RF on 70.130MHz is now QRV again from its old site in County Meath, just north of Dublin. There is lots of interest in the 1992 4m Activity Award - see page 18 in the December *RadCom*. If you are keen to work Irish stations there is an activity period on the first Sunday each month from 1100 local time. EI4MTR and EI6O are special event calls that will be heard from time to time this year.

At the VHF Convention Ian Galpin, G1SMD (DOR), gave me a copy of a comprehensive four page article on 4m matters written for *DUBUS* magazine. It comprises a beacon list, licence details for the UK, Irish Republic and Gibraltar, propagation notes and a list of stations in Europe known to be QRV for crossband work. Unfortunately the UK band plan he included does not conform to the current one devised by the VHF Committee and published on page 46 in the March *RadCom*.

## 144MHZ

RICHARD BARRETT, G1VFV (CNL), discovered the good tropo conditions to the south on 7 Feb and ended up working six EAs from his self-styled "Black hole for RF" in Bude, on the north Cornish coast. His FT-290 Mk 1 with home built speech processor and 7-ele X/YZL Special antenna; ". . . . became the stuff that legends are made of." This opportunity to work DX in a difficult direction arose because his rotator was stuck to the south.

On 19 March, Richard Girling, G4FCD (OFE), found some nice tropo to Spain and western France; F6HRE (IN93) and EA2AGZ (IN91) were new squares. G6HKM worked into EI, GM, OZ and SM in the aurora on 29 February. On St Patrick's Day, 17 March, Ela contacted EI2WRC/P (IO62) and EI4DQ (IO51). On the 19th she had QSOs with assorted EAs in IN53, IN73 and IN91. FC1CDS (IN77) was another new square.

On 2 March, G4SWX contacted OZ1DOQ/P (JO64) and OZ5DD (JO55) but John described conditions as "really naff" with the Germans doing much better. G7EWL found GU4XGG on 4 March and FE1OGG (IN78) was a new square for Shane. On the 19th he worked FD1MQB (JN08), EA2AGZ, F6DBB (IN96) and F6IZZ (JN18) in spite of big pile-ups. Andrew Lambert, G7JAF (BUX), contacted a couple of EAs on 8 Feb and GU3EJL on 2 March. On the 19th he worked three new squares; EA1TA (IN53), F6APE (IN97) and FD1MQB (JN08).

Arlen Pardoe, GM0HUO (FFE), reported on auroral activity on 24-27 Feb and on the 27th he heard OH9SC (KP25GR) at 1,779km. The event on the 29th brought eight QSOs between 1513 and 1631 with stations in DL, LA, OZ and Y. There were more auroras on 9, 16 and 17 March but only the GB3LER and OY6VHF beacons were heard. There was a better event on the 21st with LAs and SMs heard.

Edward Allely, GW0PZT (GDD), worked lots of EAs on 6 and 7 Feb and many Germans on the 7th. On 19 March, EAs and Fs were very strong from 1100 to 1800 but activity was low. However, the packet radio frequencies were very lively with 18 stations heard and EA1RCA-1 was easily accessible. His father, GW3KJW, had a real-time packet exchange with an EA.

He enclosed a copy of the weather map for noon on 20 March and pointed out the similarity with Fig 36 in Jim Bacon's Es article on page 50 in the August 1989 *RadCom*. The latter pattern produced Es propagation on 9/1/89. Edward noticed a packet message about an Es event on 70MHz about 19/20 March, hence his comments. But this is puzzling as G4UPS did not report any 50MHz Es activity between 1 and 20 March.

Lyn Leach, GW8JLY (GNS), found the band open to central and southern France on the evening of 3 March and the whole of the next day, but activity was low. Conditions in the contest on 7/8 March were not good, best DX being FF6KSL/P (JN28) on the Sunday. On the 19th, EA2AGZ had a huge pile-up. He heard a bit of the 26 Feb aurora from switch on at 2000 and only worked EI2DNB (IO63). Another weak event was detected on the 27th and on the 29th he contacted DL, G and GM.

## 430MHZ

LAURIE BRADSHAW, G0MRL (MCH), wrote to correct a report on page 18 in the April issue that GJ4ICD worked G0MOK on the band on 30 Jan. The QSO was on 145MHz FM although Geoff's report did not make this clear. G4FCD had a look at the band on 19 March and was rewarded with QSOs with F6CCH (IN96) and EA2AGZ for new squares.

G6HKM was on for the 7/8 March contest just to give away a few points. On the 19th Ela contacted EA1TA, EA2AGZ and FC1CDS. John Hill, G7CLY (HBS), wrote that his transverter was being serviced, so he hopes to be QRV shortly. G7JAF is also on the band using a vertically polarized HB9CV antenna. He monitors SU20 most evenings.

## 1.3GHZ

G4FCD ADDED F6CCH, FC1BJD (JN08) and FC1ANH (IN98) for new squares on 19 March. Richard wrote that EA2AGZ is the first EA he has found with 23cm equipment but he failed to make a QSO with him. G6HKM had a contact with G6YXT (DVN) on 3 March. In the contest on the 8th Ela worked ON7EG (JO10).

## DEADLINES

THE ABSOLUTE deadline for the **July** issue is **Thursday 28 May**, earlier if you wish as I'd like to enjoy the holiday weekend. The **August** date is **Thursday 25 June** by which time let's hope there is some nice Es to report on 144MHz. My BT Gold mailbox number is 76:MSX021 and the telex number is 9312111074(CN). I now have a fax machine. The number is 081-668 5582.

**RADIO AURORAS**

**Charlie Newton, G2FKZ**

This new book gives a technical account of the latest research into how auroras are caused, how they can be forecast, and how best to use them to work DX.

Members price: **£5.95** plus p&p

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

# QSL

RSGB QSL Bureau,
PO Box 1773, Potters Bar,
Herts, EN6 3EP

● The Bureau staff receive a large number of calls from 'card hunters' asking for QSL routes or whether a particular call is genuine. They are always willing to help but a much better source of such information is the *RSGB DX News Sheet*. Not only does it provide weekly information on all the latest exotic calls being used, but the editor - Brendan McCartney, G4DYO - is an authority on QSL routes. A subscription to the news sheet ensures that you will be up to date every week with what is going on regarding the HF bands and, if it isn't covered, then Brendan, in my experience, will do his level best to help.

● The Editor of *DX news sheet* tells me that no QSL bureau facilities exist on the Falkland Islands. PO Box 260 is only for the use of club members all of whom have a three letter callsign (eg VP8CQR) VP8 stations with two letter callsigns (eg VP8KO) are not members of the club. The only methods of QSLing VP8 two letter calls are:

(a) Via a known QSL manager
(b) As a last resort, via the Postmaster, Port Stanley.

Brendan does not recommend that the RSGB bureau send cards in bulk to the Postmaster. That being the case, cards destined for the Falklands will only be forwarded by us if they bear routing instructions to a QSL manager.

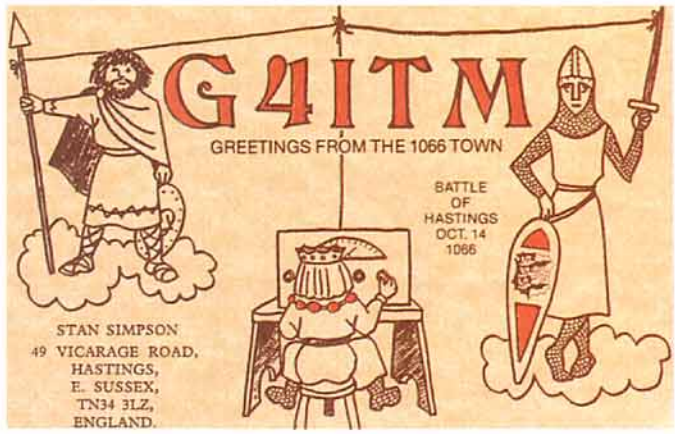
● The Danish National QSL Bureau handles QSL cards on behalf of about 4500 EDR members although there are about 10,000 hams in Denmark. The cards are sorted by hand and one paid part-time worker is employed.

Cards are despatched monthly from the bureau and about 2100 amateurs get there cards sent direct to them from the bureau after paying postage costs and supplying envelopes in much the same way as we do. The remainder obtain their cards through a division, which is similar to our sub-manager, and receives the cards from the central bureau in bulk. There are 73 of these divisions. The division makes a token payment each year to the central bureau to help with running costs. The bureau manager tells me that his biggest problem is getting Danish hams to write clear routing instructions on cards.

● When I visited my daughter in the Cayman Islands two years ago she took me to a village on Grand Cayman called Hell! It has a Post Office and one can buy picture postcards of the location and have them postmarked as coming from that place. The area is volcanic and was formed millions of years ago. Since that visit I have harboured a wish to take a rig out there and 'work' a few from that location. Now that really would be somewhere to get a QSL card from!

● Due to misleading information received in the *RadCom* office, incorrect details were printed previously regarding the Novice QSL Sub Manager. The Sub Manager is really Mr Shand, GM6TAN, 2a Seatown, Gordenstown, Banffshire AB45 3YQ.

***John Hall, G3KVA***




**Remember the poem about 'Mad Carew' (Dec 90)? G4ITM was the author!**

# HF NEWS

*continued from page 15*

Events include 16-17 May - Crathes Castle (GB400CA), 20-21 June - Glamis Castle (GB8GC), 18-19 July - Scottish Museum of Communication (GB2SMC). Much more information is available from the address given below (SASE please).

### THE SCOTTISH THISTLE AWARD

For contacting or hearing four separate Scottish Tourist Board special event stations operating in Scotland. Send log extract plus £2.00, US $6.00, or equivalent (cheques/postal orders payable to STB(RA)EG) to Awards Manager, GM4UDG, P O Box 59, Hamilton, ML3 6QB, and please write name of award on the back of the envelope.

### THE SUPREME TARTAN BANNER AWARD

Available to those holding the previous award for contacting/hearing six different stations as above. Fee £2.50 or US$8.00. Single event awards from the same group: May 16/17 - Castles event. British stations need six contacts, others three. September 19/20 - National Trust event. Same conditions. These awards cost £1.00 or US $4.00.

**Al, G3FXB (right) comparing notes on rare DX with Ken Miller, K6IR.**

## THANKS

TO THE editors of the following for items copied: *DX-NL* (DL1HBT), the *Ex-G Radio Club Bulletin* (WA8GTA), the *Long Island DX Bulletin* (W2IYX), the *RSGB DX News Sheet* (G4DYO), the *Lynx DX Group Bulletin* (EA2KL), and *DX'press* (PA3DZN).

For **July** issue please send everything to reach me by **15 April**.


**HATELY ANTENNA TECHNOLOGY GM3HAT**

**1 Kenfield Place, ABERDEEN AB1 7UW, Scotland, U.K.**

**Credit Card Orders may be telephoned any day from 8.30am to 9.30pm on 0224 316004**

**PHOTOGRAPH of our WIRE ANTENNAS**

We have been told that many readers of our advertisements would be happy to order one of our unique CAPACITOR DIPOLES if they could see a photograph. Prospective purchasers can be assured that our antennas are indeed NEAT and TIDY. Where multiple wires are employed (e.g. the MP DD 7/14/21/28L) these are contained within a single white sleeve.

Were we to show a PHOTOGRAPH we would require a full page advertisement and the antenna would be barely visible as a line across the background, with the CAPACITOR BALUN and the in-built COAX SOCKET seen as just a small artifact in the centre. The full power versions (e.g. DD 7/14/21/28L) have a slightly larger capacitor balun which is only 20 cm square (8" x 8") comprising the six capacitors of the balun etched on double-sided circuit board.

**FEED ARRANGEMENTS**

The coax cable we recommend for all powers up to the legal limit is the 5mm (quarter inch) 50 ohm type which due to the excellent match can always carry the energy within its rating. Our antennas are so well balanced that in order to preserve balance we recommend the feeder be led away from the antenna at right angles to the nearest "RF Earthy" structure before being bent to travel towards the shack; e.g. down to the ground and then along the edge of the lawn to the house, or into a tree down the trunk and away, or to a garage roof and thence to the house, or to a wall-coping and off to the operating position.

Our monoband antennas have such low SWR values (e.g. 1.05 to 1) when the feeder falls away properly that one can easily check the truth of the above statement, by raising the feeder by hand whilst observing the SWR bridge. The value will rise to the kind of value that other users consider "excellent" such as 1.3 to 1. Considering the DD antennas do not need an ATU one can see that the average semi-conductor transceiver works superbly well with an HAT wire antenna.

For PRICES see January RADCOM, or send 4 First Class stamps, or 3 IRC's to above address.

**Proprietor:— Maurice C. Hately, M.Sc, FIEE, Chartered Electrical Engineer. Licenced since 1950. Now GM3HAT.**

# Novice NEWS

MRS ESDE TYLER, G0AEC
43 Nest Est, Mytholmroyd, Hebden Bridge, W Yorks, HX7 5BH

ARNOLD L Feldman, WB3DAO, 4385 Crestheights Road, Baltimore, Maryland 21215, has written. He would like to hear from some Novices with a view to arranging a sked. His own rig will not tune to our Novice frequencies, but he can visit a friend and work from there.

I don't know how old Arnold is, but not very old I think. He would like to exchange QSLs, photos, details of equipment and of course make contact. After all, amateur radio is all about making friends!

## KIDLINK 92 CONTINUED

AS PROMISED last month, here is more information about this forthcoming event on Monday and Tuesday, 18 and 19 May.

Kidlink is sponsored by companies around the world, with the aim of linking children from all countries and cultures by means of all forms of Information Technology. Many schools are already well versed in the various means of communication, and this year it is hoped to extend into amateur radio.

It is hoped that as many youngsters as possible will make direct contact. Although, due to the constraints of the amateur licence these will be brief, a start will have been made, and contact could then continue by other means.

The idea is that four statements are made by the children answering:

1. Who am I?
2. What do I want to be when I grow up?
3. How do I want the world to be better when I grow up?
4. What can I do now to make this happen?

I am sure that with a little ingenuity, the statements can be fitted into the time allowed for unlicensed youngsters to speak, under the conditions that prevail for club callsigns. More detailed information could, of course be given by the licensed operator.

After the initial personal contact, I am confident that many young people will want to take the matter further. I am certain that I would have found geography more attractive if I had heard *real* people from other lands and maybe received letters from them. The project was started in Norway last year, and has now extended to many countries.

Mike Burleigh at Oldfield House School, Oldfield Road, Hampton, Middlesex, TW12 2HP is the UK Director for Kidlink. He can give you more information about the organisation itself if you would like to know more.

The latest information to hand says to look for:

| | |
|---|---|
| VE3DOA/KH6 | Hawaii (including Packet) |
| KD4ABZ | Florida (possibly including packet) |
| N2LMF | Buffalo |
| KA7GQB | Washington |
| N8PCR | (may not be operating HF) |

Others will no doubt join this list, and a letter to Mike will bring you a more recent update. I hope to report on your experiences at a later date.

## NOVICE ACHIEVEMENTS!

DAVID, 2E1ADH, (12) lives in Derbyshire. He worked the German station, DG6LAW on 30 August last year. He can be found on either 433.50 or 51.51MHz - unless he is now looking for Emma, 2E0AAX, on 51.26!

A joint letter from Hugh, 2E0AAA, and Matthew, 2E0AAE, McNeill, who live in Preston. Their first contact was with their Instructor Nigel, G4XNS, but for the second, they found another Novice, Derrick, 2E1ACT. (That in itself must be a record - a Novice at the first real attempt!)

They have borrowed a converted CB set, and, using an ATU, run it into their 6m antenna. USA, Russia, Croatia, Poland, Italy, Ukraine, Finland, Rumania, Serbia, Lithuania, Hungary, Canada and Zambia constitute the list of countries worked by the time they wrote. Now they are looking for the Manchester net on Sundays on 51.530MHz.

Lincoln, 2E0ABE, (13) was one of five successful candidates instructed by Dave, G0MLU. He received his callsign in January and put it to good use during half-term. He logged 62 contacts in one day, using a 'G0MLU surplus' shortened 5λ/8 collinear antenna and worked exclusively on 10m SSB with 5W. He has

## REPORT OF THE CITY AND GUILDS OF LONDON INSTITUTE ON THE DECEMBER 1991 NOVICE RAE

(Reproduced by authority of the Institute)

### OVERALL RESULTS (UK CANDIDATES)

| Examination | No of candidates completing exam | Candidates qualifying for NRAE certificate No | % |
|---|---|---|---|
| June 1991 | 185 | 153 | 82.7 |
| September | 256 | 196 | 76.6 |
| December | 256 | 196 | 76.6 |

### REPORT ON MULTIPLE CHOICE QUESTION PAPER

| Syllabus Topic or Objective | No of Items | Comments on Performance of Candidates |
|---|---|---|
| **Receivers and Receiving Techniques** | 4 | The questions on receivers were generally well answered but candidates did not know the purpose of the squelch circuit. Less than half the candidates knew that SSB was a form of amplitude modulation; a third of candidates thought that it was frequency modulation. |
| **Components, Applications and Units** | 2 | There was some difficulty with the unit of capacitance and many candidates thought that 0.0001μF was less than 10pF. There was also confusion with the multiplier of a resistor coloured Brown-Black-Black. A large proportion of candidates answered 100Ω, rather than 10Ω. |
| **Measurements** | 4 | Questions on measurements were well answered. There was one question showing the circuit of a simple ohmmeter which caused difficulty with many candidates. After consideration, the examination working group agreed that the question should be withdrawn and not included in the scoring of the paper. |
| **Propagation and Antennas** | 5 | Questions on this section of the syllabus were not well answered. When selecting the most suitable feeder to connect directly to the centre of a half wave dipole, most candidates did not appreciate that a dipole is a balanced antenna with a centre impedance of approximately 75Ω. Over a third of candidates thought that the overall length of a half wave dipole for the 144MHz band should be 2 metres. A quarter of all candidates thought that an antenna tuning unit should be adjusted for maximum standing wave ratio, rather than minimum. In another item, a third of the candidates considered the 433-435MHz band to be in the VHF, rather than the UHF, part of the frequency spectrum. |
| **Transmitters and Transmitting Techniques** | 10 | A quarter of the candidates did not understand the purpose of the mode control on a transceiver, and thought that it was to select the frequency band in use. From the answers to a question about the bandwidth of a double sideband AM signal, many candidates did not appreciate that the bandwidth would be twice the modulating audio frequency. Only half the candidates answered correctly a question on the purpose of a low pass filter connected between a transmitter and an ATU; a quarter of the candidates thought that it was to reduce audio frequencies above a given frequency. A question on the action a neighbour should take if there was a breakthrough on a BT telephone was badly answered. Only half the candidates correctly said that the neighbour should contact British Telecom, while the others would have referred their neighbour to the Radio Investigation Service. |
| **Operating Techniques** | 6 | Questions on operating techniques were generally well answered. The only item requiring comment was one about procedure when ending a Morse code contact. Only 8% of the candidates answered the item correctly as VA, while the other candidates were almost equally divided between BK and AR. |
| **Station Layout** | 4 | There was some doubt among many candidates on the position at which to connect a standing wave ratio meter. Other items on station layout were well answered. |
| **Construction** | 0 | No questions on construction are included in the written paper. |
| **Safety** | 2 | Both questions on safety were well answered. |
| **Licensing Conditions** | 8 | In one item on the station log, a quarter of the candidates thought that the log should include the time of all transmissions expressed in local time. All other questions were very well answered. One question on the designation of the classes of emission was withdrawn from the paper and not included in the scoring. A detailed knowledge of classes of emission is not required; these are given in note (t) of the licence which is excluded from the examination syllabus. |
| **General Comments** | | As explained above, two items were withdrawn from the scoring of the paper giving a total of 43. Areas of difficulty are outlined above. In general, candidates performed well in the examination, but greater attention needs to be given to propagation and antennas. Of the 256 candidates attempting the paper, 196 were successful. The percentage of candidates passing was 76.6%. |

now worked around 30 countries, including Japan more than once and also Paraguay! He will take both the RAE and the 12WPM Morse test this summer. Good luck, Lincoln.

## A LESSON FOR LIFE

YOUNG NOVICES - you are in the same position as I used to be. All future Novices will be judged by your behaviour in the early days. So here are a few 'dos' as a reminder.

DO - Remember the procedure for a QSO that you were taught. From finding a frequency, to initial CQ call, to the accepted format of a contact. Remember, your conduct on the air is heard far more widely than you may realise.

DO - Stay strictly within the frequency bands of your licence.

DO - Keep within the power limits that are allowed to the Novice.

DO - Take pride in the quality of your Morse. No-one expects perfection from a beginner, whether a Novice or a newly licensed Class 'A' licensee. There is nervousness to overcome, an unfamiliar method of communication, shyness - apprehension at entering a world peopled by the very experienced, for starters. Most amateurs will be so pleased to work you that they will make allowances for you and work within your limitations - and only practice makes perfect.

In a QSO, the gist of what you are saying will be read even if some words are poorly sent or mis-spelt, but that does not apply to your callsign. You would like a QSL card after a contact? If your callsign is incorrectly read, how can that be achieved? Practice sending the things that occur in contacts in general, - especially your callsign.

## JUST A SUGGESTION

GERALD, G3MCK, has a suggestion for both the Novice and the new Class A licensee who is understandably rather nervous - and also for those who have not used Morse for some time. Why not look for others in the same boat as yourselves on the Novice section of 80m, and practice on one another?

Firstly, you will not feel that your contact will be over-critical, and secondly, you will be in contact with someone as nervous as yourself! Also you will get that practice you were looking for *and* make friends through meeting other novices.

Gerald adds a few simple rules:

1. Only modest power to be used.
2. Slow speed sending to be the norm.
3. Novices to be given special consideration.

Some amateurs have let the skill lapse, so this could raise your confidence enough to dip a toe into more adventurous use of the key.

## MORE SCOUTING NEWS

FOUR YEARS ago, Geoff, G0PMF, and Robin, G0PMG, realised that many Scouts in their area who were interested in amateur radio wanted more than one chance a year with the JOTA event. So they formed the Stourport and District Scout Amateur Radio Group.

Seven members of the Group took the December NRAE exam with four joining the Novice ranks - Stephen, 2E1AJD; Nathan, 2E1AJV; Daniel, 2E1AJW, and Assistant Leader Richard, 2E1AMQ. The others took the exam again in March.

Apart from following normal Scouting activities with his own group, each youngster goes to the Scout ARG every other Saturday morning to pursue his radio hobby. The group has sixteen members - Scouts, Cubs, a Beaver and four Leaders. The newer members will be taking the NRAE later this year. Good luck to all.

## ANOTHER RECORD?

VERONICA HARRINGTON of Long Beach, California, gained the callsign KC6TQR in April last year and immediately began working towards the next stage. She wanted to join the local Kid's Net under her own steam. By the end of May, she had her Technician Class licence. Veronica is just *five* years old!

Mum, Ann, N6YGP, taught Veronica theory, and Dad, Curt, N5HMR, taught her the 5WPM Morse and the maths part of the theory. She likes to operate phone on 10 metres and would like to contact young people outside America. Ghost stories and vintage horror films feature among her other interests, so a contact with any licensed Novice with similar interests would be much appreciated.

## A QUICK REMINDER

FROM LETTERS received, I gather the name and address of the Novice QSL sub-manager has been misplaced. He is: Michael G Shread GM6TAN, 2a Seatown, Gardenstown, BANFF AB45 3YQ. Only too happy to help!

## ATC CONNECTIONS?

THE RSGB IS interested in attracting as many ATC instructors as possible into the Novice Licence Training Scheme. If you already instruct ATC members and are a licensed amateur, we would like you to consider becoming a Novice Licence Instructor. Many cadets are keen on 'communications' and the Novice Licence may be a natural extension of their interest, as well as providing them with an important civilian qualification.

An explanatory booklet entitled 'The RSGB Novice Licence Training Scheme' is available from Hilary Claytonsmith, G4JKS, 115 Marshalswick Lane, St Albans, Herts AL1 4UU, marking the front of your envelope 'ATC'. Please enclose an A5 SASE. When filling in the application to become an instructor (in the centre of the booklet) please make it clear that you are involved with the ATC.

Take my word for it, the course is fun for teacher and student alike and the personal satisfaction gained is enormous. There are lots of youngsters out there needing help - please give this your consideration. Come to think of it - leaders in other Youth organisations may like to do the same.

## THE RIPPLES ARE SPREADING

IN SCROOGE'S Corner, a little while ago (*RadCom*, December to be precise) a small flashlight bulb was suggested to check the antenna, removing it before transmitting.

From Stan AG4S, in Florida (an expatriate of this village), comes a further comment. In 1926 Stan had fitted one in the flat top section of a 40 metre 'Windom' antenna.

Fine when making the adjustments, but if left in place when transmitting it caused 'chirps' on CW - be warned!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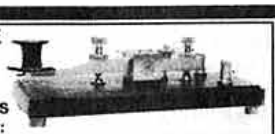

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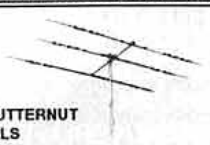

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# SWL NEWS

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

DUE TO A typographical error in the March column, I only congratulated Ann Hague on assisting with mobile operation from 300 WAB squares, when the reference should have been to 3,000. Apologies, Ann, and well done!

The White Rose Society has asked me to mention that its 1992 SWL Contest attracted 17 entries. The society is very pleased with the level of participation and hopes to have the results out soon. The committee are so delighted with the turn out, that they have resolved to continue with it in 1993. Details much later.

Listeners interested in HAB will wish to know that up-and-coming contests include the LF Phone on Sunday 17 May and the 144MHz Phone on 28 June. Note your diaries. Further information can be obtained from Mr G D Horsfield G4SKQ at 2 Linden Road, Ecclesfield, Sheffield S30 3XL.

Roland, G3VIR, the General Manager of Venus Electronics, has sent the firm's catalogue. They are the largest distributor in the UK of amateur radio and technical shareware/public domain programmes for the IBM and clone computers. Those interested are invited to write to Roland at 26 Pevensey Way, Frimley Green, Camberley, Surrey GU16 5YJ for more details.

Mike, G3IGW, wrote following mention in the March column about 7MHz long path DX. He thought listeners would be interested to know that this year's was a better season than I suggested. He worked 38 different W/VE stations, all on CW. He hopes to test the 3.5MHz long path next season. All the stations noted on that path in the March issue were heard on SSB.

## FOR THE BEGINNER

IT SOMETIMES crosses my mind that the column might be pitched at a level which is fine for the more established listener, but is 'over the heads' of those who are new to the hobby, or who are a little less experienced. So this month I shall kick-off with an item aimed at the more inexperienced listener. I shall be interested in comment, contribution or question. The starting point? - where to listen and what you will hear.

I will concentrate on the five main amateur bands - 3.5, 7, 14, 21 and 28MHz. Perhaps I will return to 1.8MHz, the 'new' bands and the VHF spectrum in a later issue. Signals on the five main bands propagate in different ways at different times of the day and night, and at different times of the year. A very general rule is that the higher frequencies will work better during the day; the lower frequencies will work better at night. I will assume for the purpose of this piece that the Sunspot Cycle is just on the decline, as it is at present. Let us pursue this a little further.

Many listeners when they switch on, go straight to their favourite band, which in most cases tends to be 14MHz. This is because listeners tend to think this is where they will hear the most exotic callsigns, and because it is the most active of the HF bands. However, there are enough established listeners around to disprove this theory. It might well be the case that 14MHz opens up for the DX earlier than the other bands. Indeed, much of my Pacific DX on the band has been logged between 0500 and 0800, and most people would agree that because of certain nets which take place on the band in the early mornings, which are geared to provide Pacific DX for the Europeans, it is very much the case that the first Pacific stations which you log tend to be on 14MHz.

It is a mistake to spend all your listening time on one band. Indeed, 21 and 28MHz may be even better, and it does no harm before settling down on one band to check the others. This will undoubtedly improve the amount of DX you hear. Many of the country's most successful listeners spend much of the their time on 28MHz, when the band is open.

Going back to 14MHz, listeners will probably agree that the band loses its appeal as the day progresses. There may be lots of European activity, but that is not the same as hearing a choice piece of DX, or wall-to-wall JAs or Ws. This is where it pays to look around. By the time 0900 arrives, 21 and 28MHz are probably providing good DX from the Near and Far East. If you are not an early riser, the first band you should check is 28MHz. If it is having an 'off day', you can always revert to 21 or 14MHz, but if like me, you like chasing DX and your eventual aim is to hear all 323 DXCC countries, you have got to look at each band in turn to see which is producing the best signals from the part of the globe you want. It is extremely difficult predicting exactly what you will hear on any particular band at any particular time but as a general guide, 28MHz could provide a daily DX diary something like this: 0700 - 1200: the Near East, 0800 - 1000: the Far East, around 1000: the Pacific, from 1200: the Caribbean, 1300 - 1500: Africa and Indian Ocean, from 1700: Central and South America. Stations from North America can be found on 28MHz from as early as 1100, and at the time of writing the band was still good for the Caribbean and Central and South America at 2100.

Please do not blame me if the day you want to catch the Far East at 0800 there is no propagation but this will, I hope, help the less experienced listener get the most out of 28MHz while the band stays good. The important thing is not to simply switch the rig to 14MHz and thinking propagation is poor, switch off, when half the world is audible on 28MHz.

**Bob, BRS32525, in his new shack in the loft. Shown here are his Icom ICR700 and Yaesu FRG7000 receivers.**

The same can be said for 21MHz. The band is capable of providing some very good DX, and it can be logged, generally, at similar times to 28MHz. Looking a little closely at 14MHz, I have already commented on the Pacific openings early in the mornings. Apart from this slot, I have always found the band to be at its most rewarding during the late afternoons, when propagation might allow a good 'long path' opening to the American West Coast (that is signals arrive from the South East), as well as propagation to the Far East and Africa.

## VHF HAPPENINGS

BEFORE I look back, a quick look forward to what we can hope for in the way of DX this summer on VHF. Apart from the hope that this year will see some decent tropospheric openings, the main hope of anyone who chases DX at VHF is that there will be some good Sporadic E openings. Last year, Es propagation on 144MHz was virtually non-existent. In fact it was the worst year for Es that I have experienced in 13 years listening to VHF DX. To demonstrate how poor 144MHz was for Es, I will mention that I am part of a 'DX warning chain'. Last year the chain was not activated once! For 1992, I hope that there will be several good events. Being greedy, an opening to central EA after 1900 will do fine!

In the last month, 50MHz has provided some very good DX. Unfortunately, the main reporters on this band have been at their offices when the best DX has been around. Saturday 22 and Sunday 23 February did, however, result in stations from 4X, ZC4, PY0, PY, TR8 ZS, 5V7, ZD8 and VK being heard. Unfortunately, much more was missed, as I understand that over 40 countries were heard from the UK during the 48 hours.

However, at the time of writing, David Whitaker has 68 countries heard on the band, Mick Toms, BRS31976, has 66, while I have 86. If any other 'serious' 50MHz listeners read this, perhaps they could get in touch.

## HF NEWS

THE MAIN excitement was in the FO0CI and YX0AI DXpeditions. Most reporters mention hearing both stations on at least one band.

The deadline for the **July** issue is **13 May**. Please make sure you send your news in good time, and please try to find me some photographs that I can submit for publication.

# HF F-LAYER PROPAGATION PREDICTIONS FOR MAY 1992

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.. | ....1111221. | ..1344445541 | 213566667874 | 656666667898 | 875333334689 | 652111.11367 | 42.....35 |
| MALTA | ......1111.. | ...12222231. | 1.1455555652 | 323677777875 | 867776667899 | 998544345689 | 886311112478 | ++3.....4+ |
| GIBRALTAR | ..........1.. | ...122233431 | 1..354555763 | 644776667898 | 998654445689 | 886422112478 | ++3.....4+ |
| ICELAND | .......... | .......... | .....11. | ....12222331 | 311245555775 | 866654445678 | 776422122346 | 443.....3 |
| ** ASIA | | | | | | | | |
| OSAKA | .......... | ....11112... | ...132234231 | ...142234452 | ....2...2673 | .....351 | .....12. | ..... |
| HONGKONG | ....111111.. | ...12323332. | ..1244345652 | 1.1133235774 | 2.....3686 | .....364 | .....142 | ..... |
| BANGKOK | ...12222221. | ..123434443. | 112334446763 | 311123235885 | 5.....3688 | 3.....367 | .....145 | .....2 |
| SINGAPORE | ...22322331. | ..1344445531 | 112344456763 | 311123235886 | 5.....3688 | 3.....367 | .....145 | .....2 |
| NEW DELHI | ...22332321. | ..1344445431 | 112334456763 | 432112235886 | 73.....3689 | 51.....368 | 3.....146 | .....3 |
| TEHERAN | ..133443442. | ..2445556642 | 325433457875 | 655211235898 | 873.....3689 | 851.....478 | 62.....146 | 3.....3 |
| COLOMBO | ..133443442. | ..2445556642 | 323335457875 | 542113235898 | 84.....3689 | 61.....478 | 4.....146 | .....3 |
| BAHRAIN | ..1344444431 | 113555566653 | 435433457886 | 766211236898 | 973.....3689 | 851.....478 | 62.....146 | 4.....3 |
| CYPRUS | ..1334444431 | 112556666753 | 435777778886 | 767766678998 | 987533346799 | 98521..13578 | 762.....257 | 43.....24 |
| ADEN | 1.1445656543 | 323555667765 | 656533457888 | 877311235899 | 985.....2689 | 862.....378 | 74.....146 | 4.....3 |
| ** OCEANIA | | | | | | | | |
| SUVA/S | .......... | .......... | ....1111222. | ..1222123531 | ..242...264. | ..12.....31. | .....1.. | ..... |
| SUVA/L | 3213.....64 | 43351.....75 | 44573....185 | 236741...373 | ..462...1551 | ..13.....32. | .....1.. | ..... |
| WELLINGTON/S | .......... | ......1..... | ...12222..21 | 1.2332221142 | 114521..1363 | ..22.....34. | .....11. | ..... |
| WELLINGTON/L | 3112.....13 | 4324.....25 | 66571.....57 | 567721...177 | 23662....374 | .133.....341 | ..1.....1. | ..... |
| SYDNEY/S | ...1111..... | ..123331.... | ..25543221.2 | 113653223314 | 1.152...2555 | ...2.....363 | .....14. | ..... |
| SYDNEY/L | 1.........2 | 31111.....14 | 53344.....37 | 434641....67 | 21263....285 | ...3.....262 | ...1.....3. | ..... |
| PERTH | ..13344..... | ..245551.... | 22356542.... | 53234322111. | 62.12...244. | 3.....464 | 1.....145 | .....2 |
| HONOLULU | .......... | .......... | ....1111221. | ...121123311 | ..332...22.. | ..33..... | ..1..... | ..... |
| ** AFRICA | | | | | | | | |
| SEYCHELLES | 1.1444556333 | 323555667565 | 656434457888 | 876212235899 | 984.....2689 | 861.....378 | 73.....146 | 4.....3 |
| MAURITIUS | 2.1445666643 | 4.3656667876 | 716535457898 | 947313235899 | 975.....2689 | 862.....378 | 74.....146 | 4.....3 |
| NAIROBI | 211445666654 | 533656678876 | 866634457999 | 988411235899 | 9971....2689 | 884.....378 | 761.....146 | 43.....3 |
| HARARE | 31.445777755 | 632656778877 | 875744557999 | 997622225899 | 9984....2689 | 8861.....378 | 763.....146 | 43.....3 |
| CAPETOWN | ...345777862 | 1..666778985 | 4..865457998 | 72.753235899 | 96.52...2689 | 8833.....378 | 763.....146 | 44.....3 |
| LAGOS | 32.344677864 | 642565678987 | 875764447999 | 997741125899 | 99861...2689 | 8863.....368 | 763.....146 | 44.....3 |
| ASCENSION Is | 211.44556751 | 443165567873 | 776375446897 | 998553124899 | 99852...1689 | 8863.....368 | 773.....146 | 44.....3 |
| DAKAR | 211244566763 | 532465666885 | 876674434898 | 998752112799 | 99862....489 | 8863.....168 | 774.....36 | 44.....3 |
| LAS PALMAS | 1..132344531 | 211255566763 | 533577778887 | 866787777899 | 998765445799 | 997532112479 | 88521....157 | 552.....24 |
| ** S. AMERICA | | | | | | | | |
| Sth SHETLAND | ......57776. | ......677882 | .....2456895 | 1....2225897 | 512.1...2689 | 8752.....367 | 774.....35 | 44.....2 |
| FALKLAND Is | 2....1566753 | 4....2677875 | 822..3446898 | 954112224789 | 99741...1579 | 8863.....258 | 7741.....25 | 44.....2 |
| R DE JANEIRO | 21...4565652 | 432115566775 | 865325444798 | 988543222589 | 99862....279 | 8863.....58 | 7741.....26 | 44.....3 |
| BUENOS AIRES | 21.1.3465652 | 4223.5566775 | 7656.5445688 | 987713223589 | 99862....269 | 8863.....37 | 7741.....15 | 44.....2 |
| LIMA | 1...1.233332 | 31.131454454 | 643353444457 | 875553232248 | 998631....16 | 8863.....3 | 6641.....1 | 34..... |
| BOGOTA | 1....2222232 | 2...23343454 | 632244443356 | 864453221137 | 997631.....6 | 7863.....3 | 5641..... | 23..... |
| ** N. AMERICA | | | | | | | | |
| BARBADOS | 1...12233332 | 31.124344454 | 642355433467 | 865553211258 | 998631....27 | 8863.....4 | 6641.....2 | 44..... |
| JAMAICA | .....1111221 | 2....2232343 | 521123332246 | 753333221127 | 88753.....5 | 6863.....2 | 4631..... | .3..... |
| BERMUDA | .....1111121 | 2....2222343 | 521123332356 | 753333221147 | 88753.....16 | 7863.....3 | 4631.....1 | 23..... |
| NEW YORK | .........11 | 1.....111122 | 31...2222245 | 6321122221236 | 78642.....15 | 5863.....2 | 3631..... | .3..... |
| MEXICO | .........11. | 1.....111222 | 31..1.232233 | 5321212211113 | 67642.....1 | 3763..... | .531..... | .2..... |
| MONTREAL | .........1. | 1.....111122 | 31...1222244 | 6311121222246 | 77542.....15 | 5863.....2 | 2531..... | .2..... |
| DENVER | .......... | .........1 | 2.....112 | 4211...11112 | 46431.....1 | 2563..... | .231..... | ..... |
| LOS ANGELES | .......... | .........1. | 1.....11112 | 2111...12112 | 25431...1... | .463..... | .13..... | ..... |
| VANCOUVER | .......... | .......... | 1.........1 | 21.....1111 | 24431...1... | .353..... | ..3..... | ..... |
| FAIRBANKS | .......... | .......... | .......... | 1..121111111 | 12332...1211 | ..32..... | ..... | ..... |

The provisional mean sunspot number for March 1992 issued by the Sunspot Data Centre, Brussels was 106.9. The maximum daily sunspot number was 166 on 1 March and the minimum was 65 on 5 March. The predicted smoothed sunspot numbers for May, June and July, are respectively: (classical method) 125, 122, 120; (SIDC adjusted values) 138, 137, 136.

# The only strings attached –


## When buying from Martin Lynch...

**OK so I'll admit – there are strings attached when you buy from Martin Lynch. But I don't think you'll complain. New or Secondhand – the "MONEY BACK GUARANTEE" applies. If the equipment is not as described, you can have your money back! No Quibble, no arguments. Nobody offers this kind of deal. Either visiting the shop or Mail Order, the rule still applies. You can't lose.**

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RADCOM NEWS FEATURE

# The Story of ZA1A

**A moving personal account of the first 'missionary DXpedition', from a much longer article by Martti Laine, OH2BH**

TO DXERS AND ordinary mortals alike, Albania seemed a mysterious and sought-after corner of the world. This enigmatic Balkans country was a sealed entity isolated within Europe. For decades, Albania's borders with its neighbours had been closed, and diplomatic relations were maintained with only a handful of countries.

The US and the Soviet Union were lumped together as arch-enemies seen as wanting to harm or attack Albania in the immediate future. In the end, ties were also cut with China, Albania's remaining pillar of support in the international arena.

Albania's history is one of wars and occupation by successive aggressors. Rising to power in 1951, Enver Hoxha found it easy to base his regime on xenophobia and constant fear. For decades, few people had visited Albania, there was no hook-up with any international telephone systems and Albania did not take part in any international activities despite belonging to the United Nations and many of its specialized agencies. It had fallen far behind other countries in terms of overall development, having its own primitive way of life in total isolation from the rest of the world.

## DX History

AN OPERATION by DM2ACB to put ZA2ACB on the air in the 1950s was apparently the only legitimate one in those days. By the time a Finnish group arrived in 1970, ZA already ranked as the most wanted country in the world.

Our group was allowed to demonstrate amateur radio for a few hours and make some 800 contacts. Much to our surprise, there was no customs check (or officials) at Tirana airport. Once this was announced in the DX press, DL7FT was able to proceed with his ZA2RPS operations without permission from the authorities. But all combined, these efforts only resulted in a tiny drop in a huge ocean. Just a few thousand contacts were amassed in those early years. The Albanian authorities did not give them too much credit at the time or later.

Only a couple of years after our 1970 foray, we arrived in Tirana again as a result of a near-total misunderstanding, breezing into the city with a large group (ZA5Z) and carrying loads of equipment and masts. It ended with the confiscation of our valuable hardware and led to a complete surrender of the operators, literally. By that time Albania was fully closed, giving few signs of a possible sympathetic attitude toward DX in decades to come, so it was no surprise that Albania remained absent from amateur frequencies for the next twenty years.

When ZA made its reappearance, things had to happen in a way that paid homage to that long history. We had already waited far too long for the Albanians to join the international community of radio amateurs. We must never lose them again or leave them with an impression that our intentions might be of a kind that their autocratic ruler had warned them of over many decades.

## Missionary DXpeditioning

IT STARTED one May day in Tirana, which will remain forever the most important one for me. A new era dawned, to be remembered with a certain measure of pride far down the years.

Several trips to Albania had already been made, and there had been a number of meetings with Albanians in Finland. But I learned this first basic truth about the people of Albania. A kind of person-to-person trust had been formed which in the Albanian's case was quite different from what one is accustomed to elsewhere in the world. Despite the Albanians' peculiar history shaped by fear, if they had confidence in something, their trust was absolute, genuine and total, leaving no room for doubt.

Getting started with a DXpedition in the traditional sense of the term could have been only a few steps away, but this newly acquired trust offered no encouragement to take advantage of that opportunity. Besides, making a one-shot DXpedition no longer looked like an interesting proposition because on that day a new concept was born, a 'missionary DXpedition'. A specific deal and a detailed plan emerged there and then on how to launch amateur radio in Albania taking into account all these lost decades, plus the fact that Albanians as a nation were now prepared to acknowledge their relative underdevelopment and were eager to catch up with the rest of the world - amateur radio included.

There arose a need to establish a national amateur radio association in Albania, a need to train Albanians to make radio contacts from their own country and a need to acquire equipment and supplies. A programme had to be developed to enable Albanians to meet people from the out-

From left: OH1VR, ITU Liaison; 12MQP, ARI Secretary General; Ibrahim Gila, Director General; JA1HQG, JARL Director and OH2BH, IARU Project Organiser. In front: JA1BK, Support Coordinator and Agim Muco, Secretary General.

### The ZA1A Team

| | |
|---|---|
| DF5UG, | Hans-H Ehlers |
| I2MQP, | Mario Ambrosi |
| I2KMG, | Giorigio Goggi |
| I5FLN, | Luciano Fusari |
| IK0FEW, | Antinio Mattu |
| JA1BK, | Kan Mizoguchi |
| JA1HQG, | Yoshio Arisaka |
| OH1RY, | Pekka Kolehmainen |
| OH1VR, | Seppo Sisatto |
| OH2BH, | Martti Laine |
| OH2BAZ, | Vilho Flink |
| N7NG, | Wayne Mills |
| K7JA, | Chip Margelli |
| W7SW, | Scott Martin |

### The International Support Team

| | |
|---|---|
| W1RU, | Richard Baldwin |
| K1ZZ, | David Sumner |
| JA1AN, | Shozo Hara |
| JA1MP, | Sako Hasegawa w/ YAESU |
| JA1EFT, | Tomo Tanaka |
| PA0LOU, | Louis van der Nadort |
| W6OAT, | Rusty Epps w/ NCDXF |
| HB9BGN, | Albert Muller |
| OH2BBF, | Erkki Heikkinen |

side world and to get them out of their isolation.

DX bulletins reported a steady stream of bogus ZA operations, and individuals ready to travel to Albania turned up almost weekly, but the authorities insisted that preparations for the project be made on a confidential basis and that an official announcement of the establishment of amateur radio in Albania be made by the Albanians themselves.

## Setting the Stage

WHAT LAY AHEAD was a memorable one-hundred days. 15 September, 1991 was to be the day when ZA hit the airwaves! My first job was to choose participants and participating countries in such a way as to establish contact and co-operation with nations of importance to Albania, with each individual and country making a contribution to help make it a total success.

It was no mere accident that Italians would be among the first to be invited to join the project. Among Albania's neighbours Italy was the only one with important potential, lying only 50 miles away. All television antennas in Albania were pointed that way and everyone in Albania spoke Italian. Italy had offered more help to Albania than any other country, and it still does. The two were good neighbours, and this provided a firm basis to build on.

The Japanese had emerged as a superpower in the field of electronics and amateur radio, having a larger number of amateur licensees and greater ham radio potential than the rest of the world together. Their drive and desire to be involved in this project could be anticipated, and at no stage did they let us down.

The international umbrella organization for national societies (IARU) and the body administering DXCC (ARRL) were housed in the same building in Connecticut. It was gratifying to note, then, the American willingness to play a full part in this endeavour.

Standing tall in the world of DX, Finland and the Finns were left with a distinctive role in making all these arrangements and choices, which was in tune with the country's noted bridge-building efforts in the field of international relations and diplomacy.

Added to this was a touch of German know-how and precision, and the stage was set for a truly international production.

Another historic moment came in August 1991 in Tokyo when, at a JARL convention, Albanian government officials made the momentous announcement of the establishment of amateur radio in the country. The trip to Tokyo was not easy for them. There were continuing reports of serious unrest in Albania and of frequent changes in the Tirana government in those weeks.

**In one week these Albanian students were ready for their first on-the-air experience. From left: ZA1s TAA, TAB, TAD and OH2BH, their proud instructor.**

The Secretary General of the Albanian PTT delivered a critical and strongly-worded speech. Ringing in our ears were in particular the following words: "I think you know very little about my country, which geographically is very small. Socially, it is gripped by a powerful political-economic crisis. But my people are very proud and full of hope and love for every beautiful thing in life. My people want to make up for the time they have lost under the dictatorial regime. That's why the doors of our country are wide open to sincere friends".

Everyone should recall these words when travelling to that unforgettable country or when proudly holding that last pinnacle of DX - a ZA1A QSL featuring not DX performers but Albania's national symbol, the Albanian flag with double-headed eagle.

## To the People

THERE WAS one thing that everyone agreed on: working together with the people of this 3-million-strong nation was a unique experience. The Albanians were open, confident and filled with hope of a brighter future. Their sincere faith and trust in better things to come made any mention of each participant's personal problems or those of his home country look like unfair peevishness in this world of great diversity and inequality. In every home we visited we were the first foreigners ever seen there, and in each neighbourhood local residents went out of their way to make our stay comfortable and memorable. Every household did its best to play host. It seemed to us that the world around Albania was not a good enough place for these friendly and hospitable people. Leafing through my ZA1A photo album often brings me to tears. Therefore I wish to dedicate this article to all the people of Albania and, in particular, to those through whom we were able to experience and get to know this country and its people.

In these times of turbulence and tumult, we have witnessed the decline and downfall of countries and whole empires. In the amateur sphere, Albania has remained No 1 country on all Most Wanted lists. Now Albania has disappeared from these lists to become an active and participating country in the world at large as well as in the international amateur radio community.

But let Albania remain a "rare one" in our minds, an object of our all-round, sincere interest. The Albanians need our support and our help in catching up with everything they were denied over the past decades.

## Dedications

IN HIS ARTICLE, Martti Laine wrote lengthy personal dedications to those listed below. Unfortunately, there is not enough space to include them here. For those requiring more detail, the American magazine *CQ* has published the full article over ten pages in the March 1992 edition.

**Toli Halili**, ex-President and Director General of the Albanian PTT.

**Ibrahim Gila**, Current President and Director General of the Albanian PTT

**Dajlan Omeri**, General Secretary of the Radio Commission of the Government of Albania.

**Agim Muco**, Secretary General of the Albanian PTT

**Mama Muco**, Agim's mother - and mine when I was in Tirana

## The first ZA students

THE FIRST DAY WAS FULL of excitement for all of us. **Geni** was the first to muster enough courage to speak to we instructors. Regretting that he had never before had a chance to talk to any foreigners, Geni was surprised to see that we understood his English. (ZA1TAB).

**Jovan** was more accustomed to communicating with others since he had been to Italy and met with people from other countries. (ZA1TAH).

**Niko** looked quite mysterious with his dark hair, and we paid him particular attention knowing that he was employed at the Ministry of Defence. (ZA1TAD).

**Theo** came to the classroom wearing a military uniform, attracting our respectful attention. We were proud of Theo since he was one of those with an open, inquisitive mind who wanted to assemble the antennas we had brought along. (ZA1TAF).

**Mirella** was sure to become an instant teachers' pet, being the only lady among our students. There was no doubt that Mirella enjoyed the boys' respect. For one thing, she was Albania's master telegraphist of a few years ago. A beautiful girl that Pekka and the other instructors fell in love with. (ZA1TAL).

It was great to visit many of the students at home and meet their families and children. There was no question that they went out of their way to show true Albanian hospitality. I recall with warmth our visit to **Dik's** house where his parents always stood up to thank me when I had spoken to them, and the abundance of food that **Lushi's** and **Jovan's** wives had conjured up! Not to mention **Dajlan's** parties. Every day was filled with hospitality and we all made one big family during those weeks. (ZA1s TAE, TAC, TAH and TAA).

All instruction was provided through an interpreter but somehow everyone managed to absorb the information from one another. The students were eager to spend long hours in the classroom and at the station in the evenings and at night.

The world could hardly believe its ears when Lushi and Niko showed up on the bands after just one week of training. All passed the examination to qualify for a license corresponding to the US General-class, something that they can be particularly proud of. All instructors had prior experience of conducting amateur licensing courses but none had ever met such enthusiastic students.

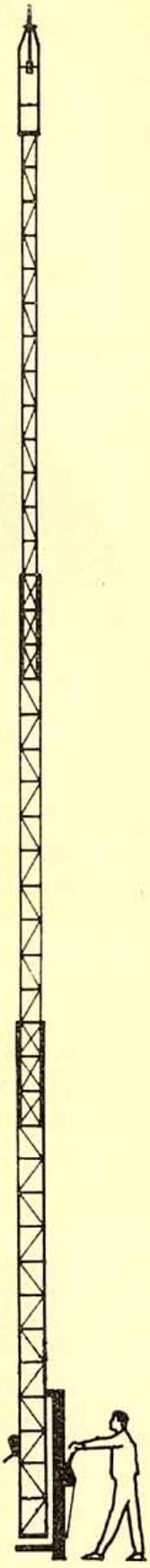
Not surprisingly, all of the students became active radio amateurs and, using in rotation the radios we left behind, are reported on the bands almost daily now. We wish to welcome Albanians to the international family of radio amateurs.

# WIN THESE FABULOUS PRIZES!

## *Have Fun Raising Money For the RSGB's Mencap Albania Appeal – one of the most needy causes of the decade*

IN APRIL's *RadCom* we outlined the problems encountered by mentally and physically handicapped people in Albania, and the way in which the RSGB is helping Mencap train nursing staff in hospitals and institutions in that country. You will now have seen this month's feature by Martti Laine, OH2BH, on the DXpedition to Albania and gained an insight into the background of the country and how far behind the rest of Europe they are. We have already had a very positive response to the RSGB Albania Mencap Appeal, but we expect a substantial contribution to come from sponsored activities, so to encourage clubs and individuals to take part our advertisers have generously offered the prizes shown on this page and overleaf.

Many clubs have already included this appeal on their next Committee Meeting agenda and, with the best of the summer months in front of you, there is nothing to stop you participating in one of the most needy causes of this decade. Your donation, be it small or large, will dramatically change the lives of the mentally and physically handicapped in Albania. It is not often that a small donation can have such a large effect on a person's life - but make no mistake your donation will play a very important part in bringing the lives of these European people into the modern world that we so easily take for granted. Sponsored events can cover anything that you want to do - let your imagination really run riot and think of something which you will enjoy doing and which will attract sponsors. You might even win a prize for it.



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We would like to thank the following companies for their support in this appeal:

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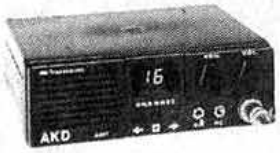

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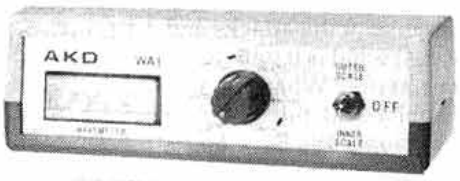


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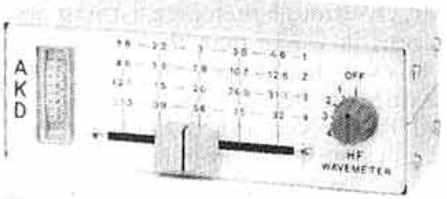


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John Wilson G3PCY

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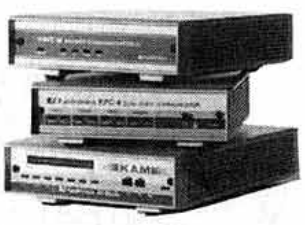

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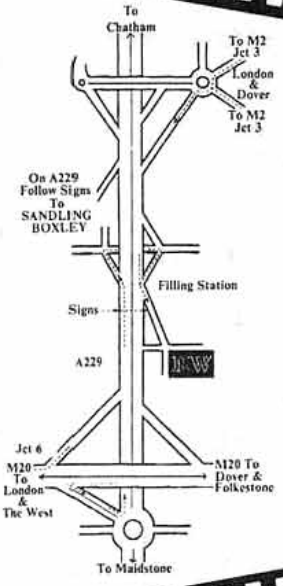


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RADCOM TECHNICAL FEATURE

# QRP + QSK

## a Novel Transceiver with Full Break-in

by Peter Asquith, G4ENA

THE PAST DECADE has seen significant advances in semiconductor development. One such area is that of digital devices. Their speed has steadily improved to the point which permits them to be used in LF transceiver designs. One attractive feature of these components is their relatively low cost.

The QSK QRP Transceiver **(Fig 1)** employs several digital components which, together with simple analogue circuits, provide a small, high performance and low cost rig. Many features have been incorporated in the design to make construction and operation simple.

One novel feature of this transceiver is the switching PA stage. The output transistor is a tiny IRFD110 power MOSFET.

This device has a very low 'ON' state resistance which means that very little power is dissipated in the package, hence no additional heatsinking is required. However, using this concept does mean that good harmonic filtering must be used.

The 'HC' type logic devices used in the rig are suitable for operation on the 160m and 80m bands. The transmitter efficiency on 40m is poor and could cause overheating problems. Future advances in component design should raise the top operating frequency limit.

### CIRCUIT DESCRIPTION

#### VFO

The circuit diagram of the transceiver is shown in **Fig 2**. TR2 is used in a Colpitts configuration to provide the oscillator for both receive and transmit.

The varicap diode, D1, is switched via RV2/R1 by the key to offset the receive signal by up to 2kHz, such that when transmitting, the output will appear in the passband of modern transceivers operating in the USB mode. C1 controls the RIT range and C29/30 the band coverage. IC1a, IC1b and IC2a buffer the VFO. It is important that the mark/space ratio of the square wave at IC1b is about 50:50. Small variations will affect output power.

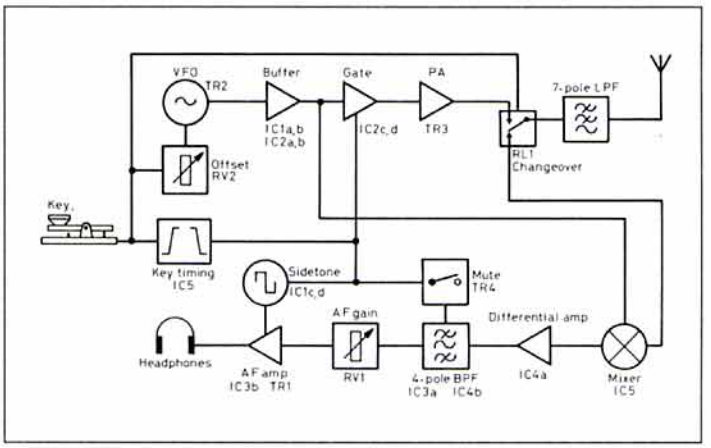



Fig 1: Block diagram of the QRP transceiver.

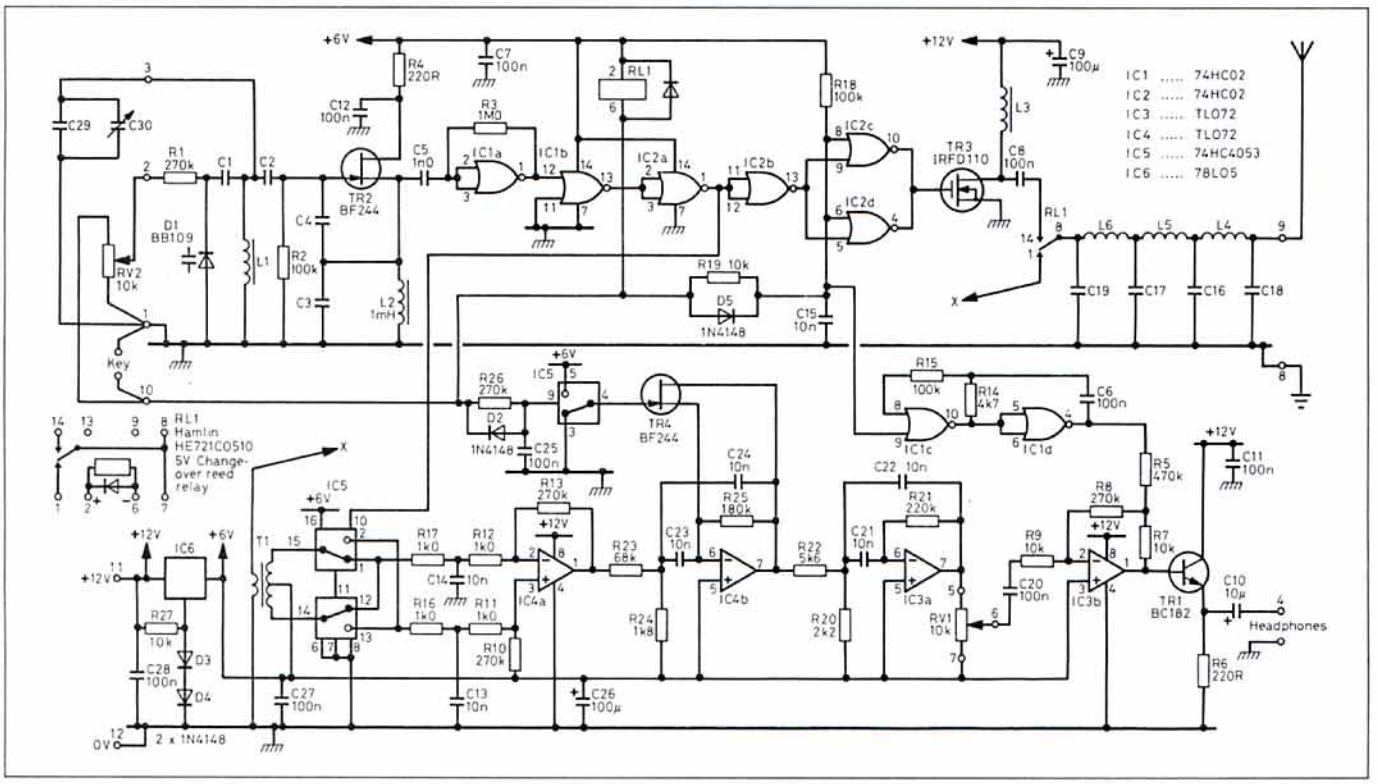



Fig 2: The switching PA stage requires a 7-pole filter, as shown in the circuit diagram above.

### TRANSMITTER

When the key is operated, RL1 will switch and after a short delay, provided by R19/C15, IC2c and IC2d will gate the buffered VFO to the output FET, TR3. TR3 operates in switch mode and is therefore very efficient. The 7-pole low pass filter after the changeover relay removes unwanted harmonics, which are better than -40dB relative to the output.

### RECEIVER

The VFO signal is taken from IC2a to control two changeover analogue switches in IC5, so forming a commutating mixer and providing direct conversion to audio of the incoming stations. IC4a is a low noise, high gain, differential amplifier whose output feeds the 4-pole CW filter, IC4a and IC3a, before driving the volume attenuator, RV1. IC3b amplifies and TR1 buffers the audio to drive headphones or a small speaker. When the key is down TR4 mutes the receiver and audio oscillator IC1a and b injects a sidetone into the audio output stage, IC3b. The value of R5 sets the sidetone level.

## CONSTRUCTIONAL NOTES

THE COMPONENT LAYOUT is shown in **Fig 3.**

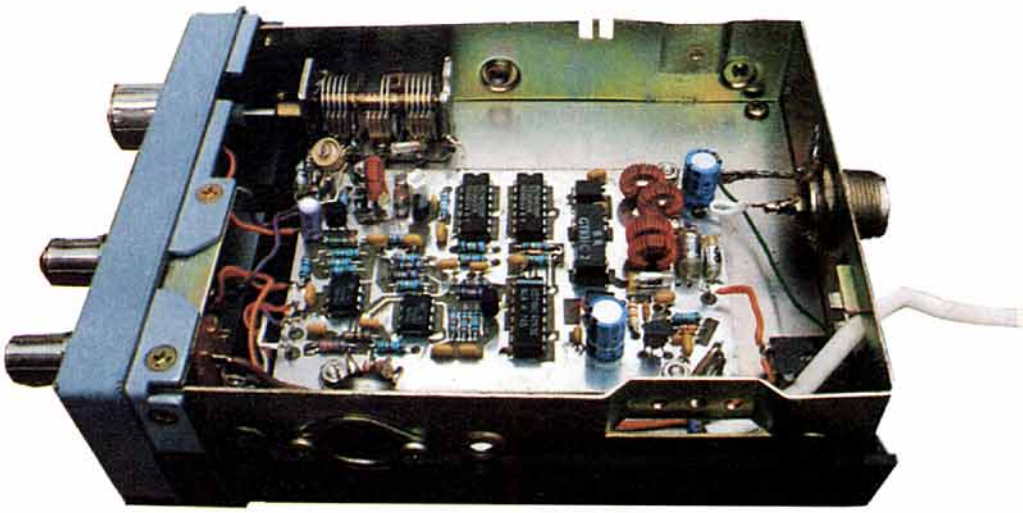
a) Check that all top side solder connections are made.
b) Wind turns onto toroids tightly and fix to PCB with a spot of glue.
c) Do not use IC sockets. Observe anti-static handling precautions for all ICs and FETs.
d) All VFO components should be earthed close to VFO.
e) Fit a 1A fuse in the supply line.
f) Component suppliers: Bonex, Cirkit, Farnell Electronic Components etc.

## TEST AND CALIBRATION

BEFORE TR3 IS FITTED, the transceiver must be fully operational and calibrated. Prior to switch-on, undertake a full visual inspection for unsoldered joints and solder splashes.

### PROCEED AS FOLLOWS:

1) Connect external components C29/30, RV1/2. headphones and power supply.
2) Switch on power supply. Current approx 50mA
3) Check +6V supply, terminal pin 7 (Approx 6V3).
4) Select values for C29 to bring oscillator frequency to CW portion of band (1.81 to 1.86MHz/3.50 to 3.58MHz). Coverage should be set to fall inside the band limits of 1.810/3.500MHz.
5) Connect an aerial or signal generator to terminal pin 9 and monitor, on headphones, the received signal. Tuning through the signal will test the response of the CW filter which will peak at about 500Hz.
6) Connect key and check operation of sidetone and antenna changeover relay. Sidetone level can be changed by selecting value of R5.
7) Monitor output of IC2c and IC2d (TR3 gate drive) and check correct operation. A logic low should be present with Key-up, and on Key-down the VFO frequency will appear. This point can be monitored with an oscilloscope or by listening on a receiver with a short aerial connected to IC2c or IC2d.



## COMPONENTS LIST

### RESISTORS

| | | | | | |
|---|---|---|---|---|---|
| R1,8,10,13,26 | 0.25W 2% | 270K | R20 | 0.25W 2% | 2K2 |
| R2,15,18 | " | 100K | R21 | " | 220k |
| R3 | " | 1M | R22 | " | 5K6 |
| R4,6 | " | 220R | R23 | " | 68K |
| R5 | " | 470K | R24 | " | 1K8 |
| R7,9,19,27 | " | 10K | R25 | | 180K |
| 10K | | | | | |
| R11,12,16,17 | " | 1K | | | |
| R14 | " | 4K7 | RV1,2 | Linear | 10K |

### CAPACITORS

| Ref | Type | Pitch | 80m | Value | 160m |
|---|---|---|---|---|---|
| C1 | Ceramic Plate 9 | 2.54 | 4p7 | | 15p |
| C2 | Polystyrene | - | 47p | | 100p |
| C3,4 | Polystyrene | - | 220p | | 470p |
| C5 | Ceramic monolithic | 2.54 | | In | |
| C6,7,8,11,12,20 | | | | | |
| 25,27,28 | Ceramic monolithic | 2.54 | | 100n | |
| C9,26 | Aluminium Radial 16V | 2.5 | | 100u | |
| C10 | Aluminium Radial 16V | 2.0 | | 10u | |
| C13,14,15,21,22,23,24 | Ceramic monolithic | 2.54 | | 10n 10% | |
| C16,17 | Polystyrene | - | 1n5 | | 2n7 |
| C18,19 | Polystyrene | - | 470p | | 1n |
| C29* | Polystyrene | - | 470p | | 820p |
| C30* | Air spaced - V.F.O. | - | 25p | | 75p |

* Select on test component.

### INDUCTORS

| Ref | type | 80m | 160m |
|---|---|---|---|
| L1 | T37-2 (Amidon) | 31T 27 swg (0.4mm) | 41T 30 swg (0.315mm) |
| L2 | 7BS (TOKO) | 1mH | 1mH |
| L3 | T37-2 | 2.2uH 23T 27 swg | 4.5uH 33T 30 swg |
| L4,6 | T37-2 | 2.9uH 26T 27 swg | 5.45uH 36T 30 swg |
| L5 | T37-2 | 4.0uH 31T 27 swg | 6.9uH 41T 30 swg |
| T1 | Balun | 2T Primary, 5+5T Secondary, 0.2mm 36 swg (28-43002402) | |

### SEMICONDUCTORS

| | | | | | |
|---|---|---|---|---|---|
| D1 | Varicap diode | BB109 | IC1,2* | Quad NOR | 74HCO2 |
| D2,3,4,5 | Signal diode | 1N4148 | IC3,4* | Dual Op-amp | TL072 |
| TR1 | Transistor (not "L") | BC182 | IC5* | Analogue switch | 74HC4053 |
| TR2, 4 | J-FET | BF244 | IC6 | Regulator, 5V | 78L05 |
| TR3* | Power HEXFET | IRFD110 | * Static sensitive device. | | |

### RELAY

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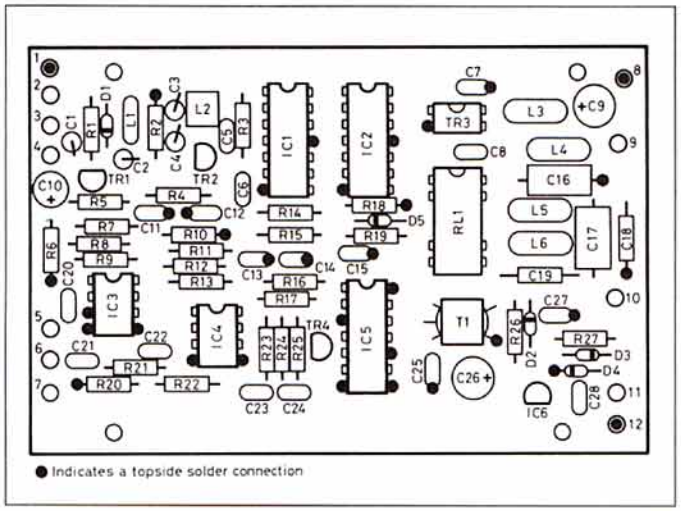


**Fig 3: A neat component layout results in a compact unit, suitable for portable operation. (The PCB supplied by G4ENA is slightly larger than this).**

8) When all checks are complete fit TR3 (*Important! - Static Sensitive Device*) and connect the transceiver through a power meter to a dummy load. On key-down the output power should be at least 5W for +12V supply, rising to 8W for 13.8V supply. *Note*: Should the oscillator stop when the key is pressed it will instantly destroy TR3. Switch off power when selecting VFO components.
9) Connect aerial and call CQ. When a station replies note the position of the RIT control. The average receive offset should be used when replying to a CQ call.

## ON AIR

THE QSK (FULL BREAK-IN) concept of the rig is very exciting in use. The side tone is not a pure sinewave and is easily heard if there is an interfering beat note of the same frequency. One important note is to remember to tune the receiver into a station from the high frequency side so that when replying your signal falls within his passband.

Both the 160 and 80m versions have proved very successful on-air. During the 1990 Low Power contest the 80m model was operated into a half-wave dipole and powered from a small ni-cad battery pack. This simple arrangement produced the highest 80m single band score!

Its small size and high efficiency makes this rig ideal for portable operation. A 600 mAh battery will give several hours of QRP pleasure - No problem hiding away a complete station in the holiday suitcase!

### TECHNICAL UPDATE

#### 2M INTERFERENCE REDUCTION SYSTEM

Apr 92 *Radcom*, pp48-50. The author has informed us of two corrections to last months article.

(a) The PCB layout has a short circuit across C14. This should be modified to remove track between the pins.

(b) L5 and L6 are each 3 turns (*not* 8 turns as shown).


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# Pat Hawker's Technical Topics

## ANOTHER COMPACT VK2ABQ 14MHZ ANTENNA

IT IS NOW ALMOST 20 years since *TT* presented the original VK2ABQ three-band (14/21/28MHz) wire beam antenna, first published as a short letter in *Electronics Australia*. Since then, Fred Caton, VK2ABQ (formerly G3ONC) has followed this with a number of other ideas, submitted directly to *TT*, including several modified forms of his original design which has become well-established (see *ART7*) and which has been endorsed by Les Moxon, G6XN in his book *HF Antennas for All Locations* (available from RSGB sales). I must admit that I sometimes wonder what professional antenna specialists such as VE2CV would make of the jottings which Fred sends along to explain his ideas.

A recent letter is no exception and I can only hope that I have understood at least the gist of this new design which dispenses with the open-wire phasing line used in the original VK2ABQ design, and has the driven element fed directly from a coax feed-line. The dimensions shown are for 14MHz, and should be divided by two for 28MHz. A 14MHz antenna can be used on 21MHz as an extended-element array, but the feedpoint impedance will rise and become reactive, so that an ATU will be necessary.

In effect, **Fig 1** shows a KISS recipe for a simple 14MHz two-element array. The unidirectional 135° phase shift is achieved using equal-length elements without a phasing line but with critical coupling.

Take a 71ft length of lightweight plastic-coated wire (bare/enamelled copper wire would need to be rather longer). First check for resonance with the wire fitted on the wooden frame, using a GDO. Then fold the 71ft wire into four, and touch the plastic with a hot soldering iron to identify where the sides are to be cut. The frame can be constructed from four 11ft 6in dowels ($^5/_8$in diameter) or garden canes, mounted on a square piece of board with about 15in sides (as in the original VK2ABQ designs). In placing the wire on the framework, make sure the two current-focus sections are placed an eighth-wave apart (2.5m on 14MHz) with the voltage-tips adjustable to 4in gaps in order to provide the quarter-cycle (90°) phase-shift between L1 and L2. The 90° critical coupling between L1 and L2 plus the 45° current loop spacing gives the required 135° phase-shift between the two elements resulting in an effective unidirectional two-element array with a satisfying front-to-back ratio, useful forward gain and sharp side nulls. VK2ABQ stresses that the gaps between the elements are critical in achieving critical coupling, in his case he found 3.75in optimum.

**Fig 1(b)** shows the piece of flat plastic material used as an insulator at the element feed point. The 0.25in coax cable is then routed down through the hole in the centre-board. Seal and 'gunk' the feedpoint, using for example *black* bitumen paint or similar. A nylon cord is loosely connected as a stabilizer between the feed-point insulator and the centre rear of the L2 current loop. VK2ABQ likens the array to an old-style critically-coupled IF transformer with lumped-components, but opened-up to tickle the ether and provide a simple, cheap, compact but effective two-element beam. To adjust the coupling, a simple current sampling gimmick can be used as in **Fig 2(a)**. Provided that the loop of the device is very small in terms of wavelength, it will not respond to the electric (voltage) field. **Fig 2(b)** shows a similar device but with a meter to increase sensitivity. With the antenna at shoulder height, and with the aid of a helper, the gaps at the voltage tips can be adjusted for equal current in both elements, indicating a 90° phase shift. Overcoupling will be indicated by more power in the reflector element, undercoupling by more power in the driven element. When power is shared equally, the coupling will be providing the correct 90° phase-shift. It should be appreciated that a VK2ABQ-type array is basically a form of driven array rather than a Yagi parasitic-reflector array.

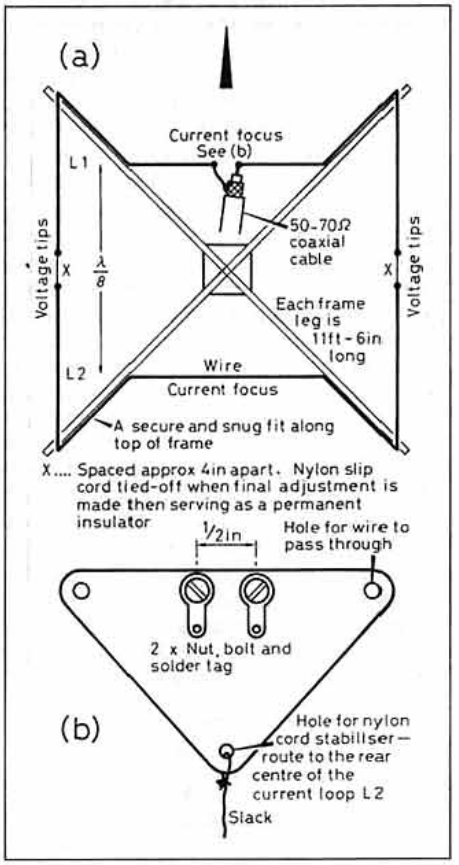


**Fig 1(a): The VK2ABQ KISS 14MHz array. (b) Feed-point insulator with nylon cord stabiliser.**

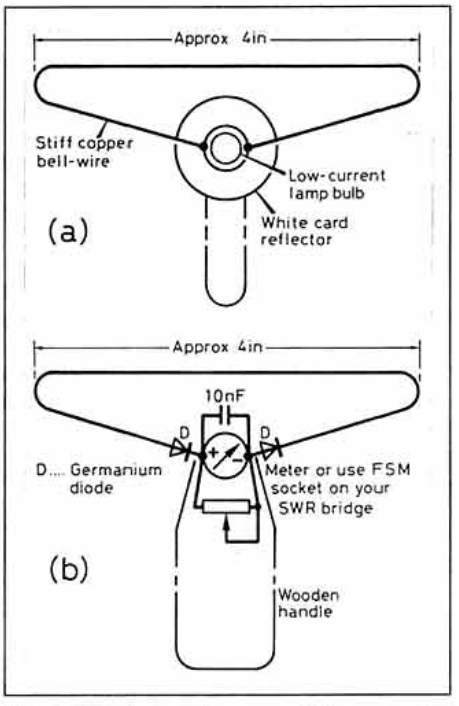


**Fig 2(a): Simple current sampler. (b) More sensitive current sampler.**

Adjustments may be carried out with one person standing in the middle of the shoulder-high array using the current sampler, and with a few watts of 14.05MHz RF fed to the antenna. The helper then adjusts the spacing at the voltage tips, but moves *well away* from the voltage tips after adjusting the spacing to instructions. Any large object near the voltage tips will nullify the adjustments.

Finally, VK2ABQ endorses the value of a tip that appeared many years ago in *TT* and elsewhere, and is applicable to all dipole-type antennas with low-impedance feeder. A 20KΩ carbon resistor soldered across the element feedpoint has no effect on the operation of the antenna but allows an ohmmeter check to be made in the shack as a warning against a broken feedline. VK2ABQ has used such a resistor (well covered in 'gunk') for some 25 years.

Incidentally, at the age of 74 years, Fred no longer feels able to correspond with readers seeking further advice on his antennas. He hopes that the information provided here will enable readers to achieve satisfactory results.

## ANTENNA GAIN AND EFFICIENCY

JOHN BELROSE, VE2CV, as a professional antenna engineer, is clearly concerned at the looseness and inexactitude of much of the terminology and information that appears in the amateur radio periodicals (including, I must confess, those in *TT*). For example he was disturbed to read the suggestion by G4HOL (*TT*, December 1991) that "his horizontal loop at 3.5MHz has 9dB more gain than his quarter-wave sloper". VE2CV comments: "Great. Should he throw out his sloper? Maybe not? When on 3.5MHz I switch from my dipole to my half-delta loop, which has an overhead null, the signals received from stations a few hundred kilometres away decrease by up to three S-units (15dB); whereas the signals from DX stations a long way away, on the west coast of Canada, increase by up to three S-units, depending on propagation conditions (angle of arrival of the skywave signal). No wonder amateurs do not understand antennas. They read so much conflicting information."

In pleading *mea culpa* I would suggest that this is an age-old problem not made easier by the fact that the whole subject of antenna gains and losses offers enormous scope for

sophistry, semantics and what is known in the trade as 'specmanship' - ie why say your antenna has a gain of 6dB when with some subtle redefinition you can say the gain is 12dB? For those of us who are not professional engineers, antennas are not easy to understand even in purely pragmatic terms! Think of the signal leaving the antenna and spraying out in many directions, possibly boosted by ground reflection according to polarization. Then consider the tiny percentage of the original power that actually tickles the receiving antenna, as found only by accurate ray-tracing of the signal over the specific path concerned and the actual height of the reflecting layers. It then becomes evident that the performance of an antenna may bear little relationship to a single definition of gain without reference to the lobe patterns of both horizontal and vertical radiation. The development of computer-modelling based on NEC codes has made it easier for professional-amateurs and some others to assess antenna performance without actually engaging in practical trials - but most of us still depend on subjective assessments.

Tony Henk, G4XVF, has shown clearly that the overall efficiency of small transmitting loop antennas in terms of the amount of power actually radiated compared with the output power of the transmitter is usually quite low with more energy being lost in the matching components including the capacitors than in the actual loop element.

Rightly, he warns against spending a lot of money on a remotely tuned loop if you have sufficient space to erect a more conventional transmitting antenna. But the small loop can be a useful addition to the amateur antenna armoury. I seem to be bombarded with enthusiastic letters and information from amateurs who have developed or used such loops (I will try to find space to include some of this information before too long). And for those who would wish to experiment with low-cost loops, a reminder that the idea can be tried out without remote tuning or expensive high-voltage capacitors using 'capacitors' formed from parallel rods (as in a *CQ* design from the Dec 1991 and Jan 1992 issues) or from lengths of coaxial cable etc. Certainly, many of those who have built small magnetic loop antennas have been pleasantly surprised how well they work, even though they tend to be inherently 'low-efficiency' antennas. They bestow a number of useful characteristics both for medium and long-distance operation.

John Brodzky, G3HQX, uses both a small loop and a full-wave (3.5MHz) more-or-less horizontal loop antenna formed by conversion from a long-wire antenna by continuing it back up his garden, across the house and back to where it started, fed at one corner with 300-ohm ribbon and through a 4:1 balun to his ATU. He considers the large loop is "the best wire antenna that I have ever used". It works well on all bands up to 28MHz. On 3.5MHz the low height means that it radiates at a high vertical angle primarily suitable for medium-distance contacts but able to get across the Atlantic at times. Above 14MHz he works anything he can hear. But he was not satisfied with the performance on 7MHz after hearing UK stations working JA and ZL stations that he could not even hear. He was attracted by the idea of introducing some further vertically polarized components into his signal and studied the F1CLI antenna but he decided that it would not suit his location. Instead he hit on the idea of bringing down near the ground a point that was removed from the feed-point by $3\lambda/4$. He felt that the two arms of a V (see **Fig 3**) formed by this alteration would now be at about 45° and carrying currents in phase, with a current maximum at the top of each arm. In making this change the overall length of the loop had to be increased by 12ft and the feed-point moved down one of the legs to get the bottom of the V to come to the bottom centre of his garden. The increased length has shifted the loop resonance to the CW end of 3.5MHz and at 7MHz it is also at the preferred frequency. The overall length of the loop is now 286ft.

I am not sure what computer-modelling (or VE2CV) would make of this arrangement - and one may have to discount the unusually good HF propagation conditions early this year - but G3HQX reports that since he made the changes he finds that on 7MHz most mornings he can work ZL, JA, VE (including VE7) and plenty of Ws (including West Coast W6s). He bases his operating times on 'grayline' propagation as described in the book *Low-band DXing* by ON4UN (available from RSGB) using his computer to predict sunrise and sunset times at the home QTH and those of the areas of interest. It is unlikely that others will wish to duplicate an arrangement designed to fit a particular location, but it is interesting to note that good 7MHz DX is possible with a large loop having a height varying between 12ft and 24ft.

TECHNICAL TOPICS

## VE2CV'S COMMENTS ON THE F1LCI ANTENNA

IN *TT*, DECEMBER 1992, Jean Bourdereau, G1LCI, showed how he had effectively adapted an 84-metre horizontal loop antenna to provide 1.8MHz DX operation by grounding the far-end (centre-point) of the loop via a thick conductor (or grounded metal mast) and by connecting the open-wire loop feeders together at the attic transmitter end to form what was termed a top-fed grounded Marconi antenna on 1.8MHz. On other bands, by restoring the balanced feed, the operation of the antenna as a multiband horizontal loop was not affected: **Fig 4**.

The item has resulted in correspondence between Dr John Belrose, VE2CV (well-known as a professional antenna specialist who acts as an ARRL Technical Adviser) and F1LCI. VE2CV was intrigued by the idea of a single antenna that could be switched between: (1) a horizontal rectangular loop and (2) what is technically more accurately described as a form of vertical electromagnetic ground-plane loop (akin to the VE2CV half-delta loop as described in *QST* etc).

His own interests centre more on the 3.5MHz band than 1.8MHz. He writes: "Since both short and long distance communication is possible on this band, one would like to have more than one antenna with a switch to choose between antennas matched to the distance or azimuthal direction requirement. For near-vertical-incidence-skywave (NVIS) signals, out to several hundred kilometres, we want an antenna that favours high-angle skywaves, such as a dipole or horizontal loop at a height of about a quarter-wave (or less - *G3VA*). For distant stations, we want an antenna that has a vertical-plane pattern that favours low-angle skywaves; a null for NVIS signals is useful in order to reject nearby strong interfering signals, man-made radio noise and radio noise from nearby to medium-distance thunderstorms."

Consequently, VE2CV computer-modelled (ELNEC) the F1LCI antenna with reference to 3.5 and 7MHz as well as for its intended 1.8MHz. He comments as follows:

(1) The description of the antenna as (a) 'horizontal mode' and (b) 'vertical mode' is somewhat a misnomer. Both arrangements when used for the higher frequency bands are electrically large, and both polarizations (horizontal and vertical) are radiated by each arrangement. The change of pattern with frequency for the EMGP arrangement is particularly complicated.

(2) With the shorted-feed line, the antenna is *not* 'a top fed Marconi antenna' (the same applies to G3BDQ's 'steeple antenna'). It is a kind of electromagnetic ground plane (EMGP) loop; a rectangular half-loop top-corner-fed, excepting that there are two top wires, and this makes the difference between this EMGP loop and thin-wire half-loop. The grounded metal mast or

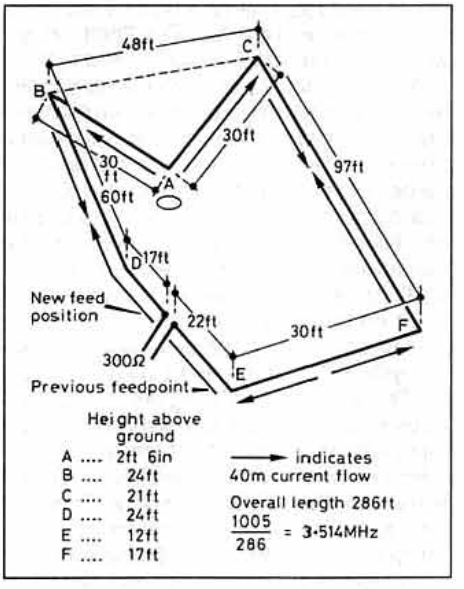


**Fig 3: The large multiband loop antenna as modified by G3HQX to improve DX performance on 7MHz by adding the V-shaped section.**

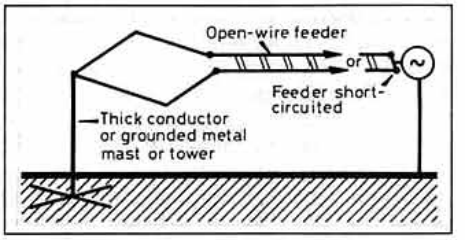


**Fig 4: The F1LCI antenna as described in the December 1991 *TT* with option of a short-circuited feeder for 1.8MHz operation.**

## QRP - A TRANSMITTING MORSE KEY

IN *TT*, JULY 1990, p31, in describing some of the small 'AP' series of Polish clandestine radios designed and built at the Polish Radio Centre Workshops, Stanmore in 1941-45, I noted that: "In 1945, in the final months of the war, the Poles developed the prototype of what may have been the smallest (complete, mains-operated) HF transmitter-receiver of all - the AP7 using miniature valves and the whole not much larger than a 20-pack of cigarettes . . . ." The AP7 was in fact designed to fit into two 'pocket' metal containers (6 x 5 x 2.5ins) with a 4.5 to 8MHz superhet receiver. It used four 9001 and one 9002 miniature valves and a crystal controlled transmitter, using a 117N7 high-voltage-heater valve as power oscillator and mains diode rectifier. This resulted in approximately 3W RF output, and the entire transmitter-receiver weighed some 3lb.

I was reminded of this 47-year-old design by a photograph in *QST* (Dec 1991) of a 3.5MHz SSB 1-watt transceiver dubbed the Neomyte by its builder, Joe Stipec, VE7TX of Whiterock, British Columbia. This little rig is shown alongside (and of similar size to) a pack of 20 du Maurier cigarettes. I would guess it's size to be about half that of the AP-7, although in this case battery-operated and requiring antenna, headphones and 12V power source to bridge the transcontinental distance between VE7TX's home and Quebec. The microphone is built into the front panel.

Most of the smaller war-time equipment had a built-in key (preferably silent in action) and SSB phone was not contemplated. CW is, however, still very much in evidence for modern QRP operation. In *CQ* (February 1992), the *World of Ideas* column by Dave Ingram, K4TWJ, describes a 'QRP key' in which a 1.5W, 7MHz CW transmitter is built onto the base (1.25 x 0.87 x 2.25 in) of a small brass Morse key: **Fig 5**. The FT-243 crystal plugged into the side is comparable in size with the transmitter enclosure. WA8MCQ who built this transmitting key uses $^1/_8$ Watt resistors, ultra-miniature trimmer capacitors and a 0.25in toroid. With no room for a heat sink, the bottom cover of the box is left off during operation.

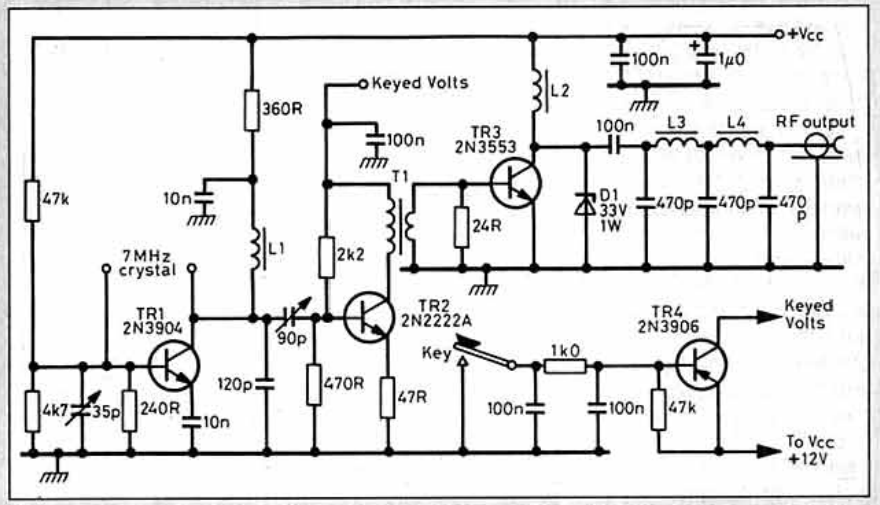


**Fig 5: Circuit diagram of WA8MCQ's 'QRP-key' with a 7MHz transmitter built in a small box on which the brass key is mounted. D1 is 33V, 1W zener diode to protect TR3. L1 15 turns on ferrite toroid core type FT-23-43. L2 20 turns on FT37-61. L3, L4 16 turns on FT23-43. All coils wound with No 28 or No 32 enamelled copper wire. *CQ* also provides details for 10MHz conversion.**

tower at the far end of the horizontal loop and the 'ground wire' to the transceiver chassis-ground both carry current and are connected to real earth. It is thus an EMGP loop no matter how you look at it.

If you insulate the end of the horizontal loop from the grounded mast or ground wire, the antenna truly becomes a top-fed Marconi antenna or inverted-L. This is a perfectly good antenna and the lack of success with it on 1.8MHz reported by F1LCI is undoubtedly because the transceiver 'ground wire' which forms the vertical element of the inverted-L is inside the house.

(3) According to ELNEC, the EMGP loop is resonant at about 1.72MHz. Its radiation pattern for 1.9MHz is not unlike that for a thin wire half-quad, diamond or delta loop. That is the direction of fire is broadside to the plane containing the loop, and the radiated field is almost entirely vertically polarized. However, this is clearly not the case for 3.5MHz.

(4) At 3.75MHz the pattern is quite different, not unlike that for a horizontal dipole or a full-wave horizontal loop, except that the input impedance is not particularly easy to tune or match. The field radiated is analogous to two dipoles fed in phase - a broadside pattern horizontally polarized. The azimuthal pattern resembles that of a broadside array.

(5) The radiation patterns for 7.15MHz are more complicated. At this frequency the sides of the loop are approximately a full-wave long and therefore there is a null in the broadside direction for horizontal polarization. The azimuthal pattern is a complicated mixture of the two polarizations. According to ELNEC the impedance is not particularly attractive for matching purposes.

VE2CV summarises that the EMGP loop is a good antenna for 1.9MHz (the band for which F1LCI intended it - *G3VA*), but he is not impressed with either impedance or pattern when used as an EMGP loop on other bands. He feels that it is not a suitable candidate to complement his own 3.5MHz antenna system. But notwithstanding these comments, he recognizes that the system is, in principle, a neat idea. He adds some further suggestions:

"One problem with large horizontal loops is that as frequency increases the antenna's azimuthal pattern breaks down into many lobes, which in my view is undesirable. The ability to switch between two different arrangements could give the ability to hear a station that might otherwise have been missed in a pattern null. The following remarks refer to the method of feed and the function of the 'ground wire' to the attic-located transceiver. When the open-wire transmission line is fed in the balanced mode, this ground connection is unimportant since little current will flow on the wire. It might even be better to let the transceiver chassis-ground float, from the viewpoint of the antenna's response to local man-made radio noise. The horizontal loop is grounded at the far end, and it is sometimes better that antenna systems which are physically large have only one earth-ground, so that a noise current will not flow between two earth-grounds.

"When the open-wire feeder is shorted at the end, and the antenna is fed as a form of EMGP loop, the equipment ground becomes very important. This wire will carry a radiating current, and unfortunately the wire will usually be inside the house as at F1LCI. In this case the transceiver will certainly not be at RF ground. It would be preferable to modify the method of feed. The EMGP should be tuned to 1.9MHz by means of a series capacitor and this tuned loop fed by a current balun. The loop would connect to one of the balanced terminals of the balun and the 'ground wire' to the other balanced terminal of the balun, which could be a W2DU type of current balun. This comprises a short length of transmission line with ferrite beads to kill current flow on the outside of the shield of the ferrite-loaded transmission line. The transceiver ground-wire should connect to the 'shield' of the W2DU transmission line balun on the balanced side, and the transceiver chassis ground should be connected to the 'shield' on the unbalanced side. This avoids forcing the balun to work in the phase reversal mode, and connecting the balun this way means that the transceiver chassis ground will be tied to DC (and 50Hz) ground, but leaving the chassis ground floating with reference to RF ground. There will be little or no RF voltage on the chassis ground of the equipment. The 'ground wire' should be insulated since it will have RF voltage on it, and currents can be coupled into the electrical wiring of the house, and into water pipes if a water heating system is used. This ground should be a heavy wire running down the outside of the house, and tied to a good earth system."

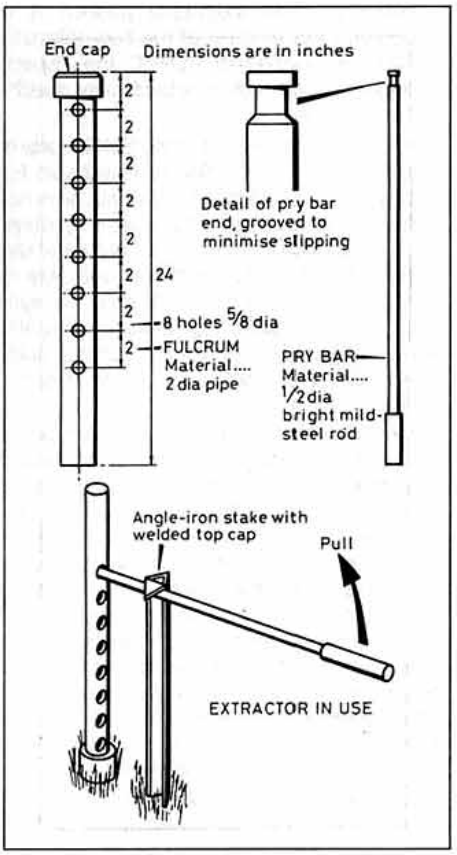


**Fig 6: G1TPS's extractor for removing guy-rope stakes from hard ground.**

## REMOVING GUY ROPE STAKES

SOME TIME AGO R SMITH, G1TPS, came up with an idea for removing stakes from hard ground. With summer on the way, it seems an appropriate time to find room for his notes. He wrote:

"On a number of occasions over the past few years, I have participated in National Field Day events and Special-Event stations where we have been operating in the field with masts supported by the usual guy ropes made-off to stakes driven at an angle into the ground. At the end of the day, these stakes often require much straining to extract them, with a high risk of damage to the stakes and/or the person trying to lift them. For several years, reduced rainfall has meant that the ground has been particularly hard making the task of extraction more difficult and led me to make an extractor to ease the task: **Fig 6**.

"The pry bar is a two-foot length of half-inch steel bar, grooved at one end to prevent slipping out of the fulcrum hole, with a length of shrink sleeve or similar at the other end to form a handle. The fulcrum consists of a length of 2-in scaffold pole or water pipe, about two feet long, with a line of 5/8-in holes drilled every two inches to furnish a variety of fulcrum heights and with an end plug to act as a base.

"In use, the fulcrum is placed alongside the stake, spaced about three inches away, and the pry bar then inserted into a convenient hole. The bar is positioned under the projecting top of the stake, the fulcrum pole being angled to match the angle of the stake, thus aligning the lifting force in the direction where it can do the most good. Then an upward pull on the end of the pry bar should apply sufficient force to lift the most stubborn stake. If the head of the stake is different from that shown in Fig 6, the pry bar can be modified or an adaptor, perhaps an 'S' hook, could be employed to engage with the stake.

## OVERTONE OSCILLATOR SPURII

RECENTLY, IAN BRAITHWAITE, G4COL, having bread-boarded a 116MHz crystal oscillator checked its output on a spectrum oscillator. This disclosed what he at first took to be spurious oscillations. He writes:

"However, I found that the oscillations were very stable and could not be shifted by dabbing a small capacitive probe at various points on the circuit. This made me suspect the crystal itself, a suspicion confirmed by warming the crystal with my fingers. As the temperature rose, the 'spurii' came and went in turn, and obviously were temperature sensitive.

"**Fig 7** shows the plot of the output with and without the unwanted signals. The 'clean' trace used a lower analyser bandwidth to give a larger dynamic range, though this is not evident from the plotted parameters due to an error on my part.

"Looking at the signals in more detail showed that the unwanted components were in the form of sidebands, spaced from the 116MHz carrier by about 45 and then a further 25MHz (I was not attempting to measure to great precision). When I checked the crystal itself, the light dawned a little further. The 116MHz frequency is the crystals 5th overtone, with the 3rd at 69.6MHz (46.4MHz away) and the fundamental at 23.4MHz.

"I believe that the crystal, run at a high drive level, was behaving non-linearly and producing sidebands related to the 3rd overtone and fundamental frequencies. The sidebands disappeared when the drive level was reduced by reducing the standing emitter current in the oscillator transistor.

"I have not seen this effect before and wonder if any members can offer any enlightenment."

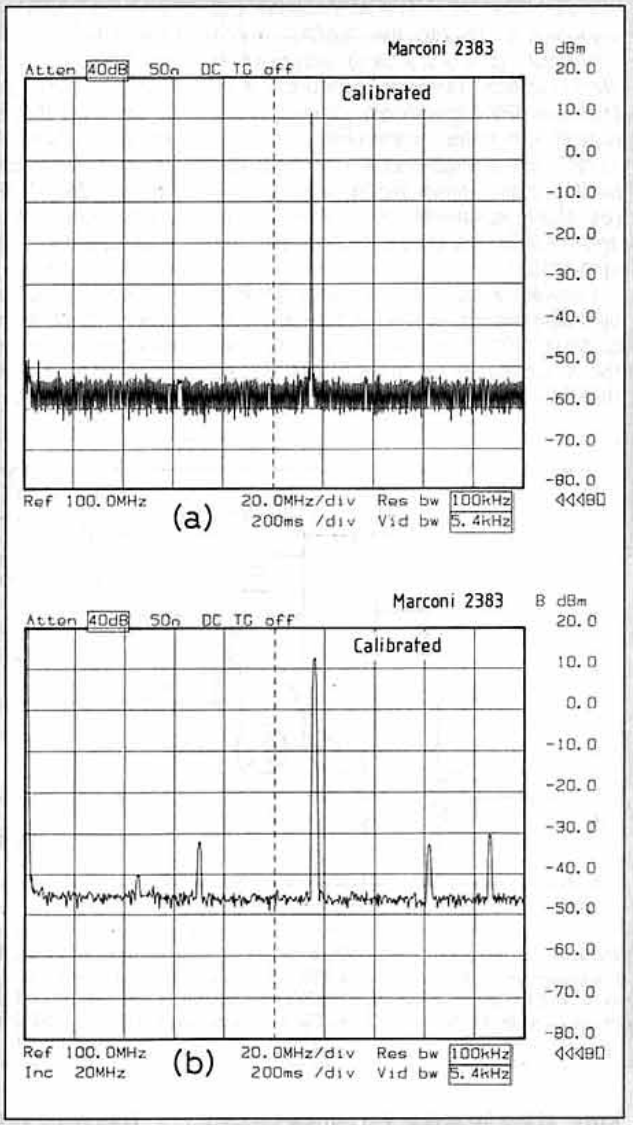


**Fig 7: Analyzer plots of G4COL's 116MHz overtone crystal oscillator. (a) Clean plot with lower analyser bandwidth. (b) Plot showing the unwanted sideband 'spurii'.**

## AURORAS AND MAGNETIC STORMS

SOLAR CYCLE 22 HAS HIGHLIGHTED the dramatic effects of major magnetic storms, including extensive power failures, the undermining of navigation systems and, of course, the disruption of radio communications. One result has been increased scientific interest in attempting to determine the loose association that appears to exist between solar activity and terrestrial magnetic storms. A note in *Nature* (5 March 1992) by W S Kurth of the University of Iowa, surveys recent work which suggests that "extreme southward magnetic fields in and in front of flare-associated coronal mass ejections that intercept the Earth's magnetosphere, are most likely to generate the largest events .... Minor variations in the

(solar) wind speed or solar magnetic field direction result in minor fluctuations of the magnetosphere and drive nearly continuous auroral displays at high latitudes. Major disturbances in the solar wind, however, can severely distort the configuration of the magnetosphere (**Fig 8**), even to the extent of pinching off part of its long tail, resulting in a relaxation of the stretched field lines and the subsequent dumping of energy stored there in the form of spectacular aurorae moving to abnormally low latitudes."

It is the major auroral events that result in displays visible in the south of England or even in Texas. However it appears that the work of the two teams attempting to identify the most effective features of flare-associated disturbances in generating storms (Gosling *et al*, Tsurutani *et al*) has not yet positively identified a unique set of necessary and sufficient conditions for a major magnetic storm. It would seem that the coronal mass ejections often do not lead to significant magnetic storms, whether or not accompanied by a shock or southward magnetic fields. This would seem to account for the fact that some of the warnings of major magnetic storms have proved false. It is still extremely difficult to forecast with certainty the onset of a major storm with an auroral display visible in low latitudes - desirable though this would be.

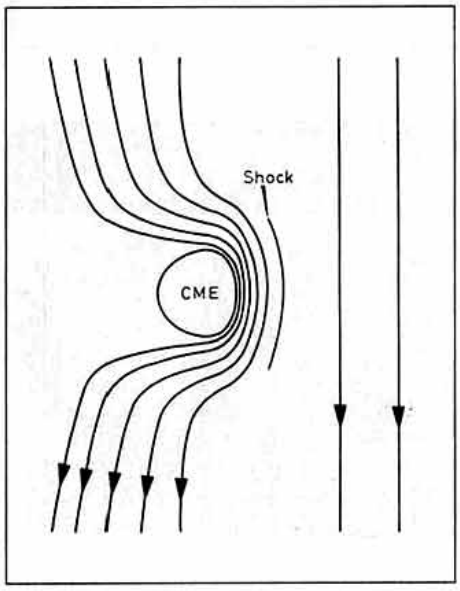


**Fig 8: Diagram of a coronal mass ejection (CME) from the Sun moving from left to right showing the compression and draping of solar magnetic fields in a southward-directed configuration ahead of it. This can result in a major terrestrial magnetic storm, with aurora displays visible at relatively low latitudes.**

## GOING MOBILE - SAFELY

STEVE FORD, WB8IMY, an assistant technical editor of *QST*, contributes 'Going Mobile - Part 1' in the December 1991 issue of the ARRL's journal.

In this he discusses the use of hand-held portables in cars, including their use with externally-mounted antennas and with the addition of an external power amplifier, with both hand-held and amplifier connected directly to the vehicle's battery.

However, he warns: "Do not attempt to power a hand-held directly from the vehicle's electrical system without consulting your owner's manual first. Some hand-helds permit a direct 13.8V connection but others do not".

TECHNICAL TOPICS

A side panel emphasises safety aspects applicable to all mobile installations: "Safety Always. In whatever mobile configuration you decide to use, make safety your top priority. Install all wires and cables neatly. Keep them away from areas where entanglements could have serious consequences. Place your transceiver in a suitable position that allows you to manipulate the controls without taking your eyes off the road for long periods of time. Make sure you have a bracket to hold your microphone or headset when you are not using it.

"Mobile operating is fun, but it should never take precedence over your most important task: driving safely. If traffic is heavy and you're uncomfortable holding a QSO, sign off as quickly as possible and tell the other stations you'll return when the situation improves. They'll understand . . . ."

A section headed 'Penetrating the Great Wall' notes that most amateurs shudder at the prospect of running wires through the firewall:

"This is actually not as difficult as it sounds. Open the hood and examine the firewall at the rear of the engine compartment. You'll find at least one large grommet where a bundle of cables make their entry into the passenger compartment. If there is more than one grommet, choose the one that is closest to the driver's side.

Many manufacturers install electronic control modules along the passenger side of the vehicle, making it an undesirable location for your wiring harness. Your dealership or service centre should be able to show you the locations of these modules.

"Threading a stiff piece of wire through the grommet will provide a flag to assist you in locating the entry point within the passenger compartment. Finding the opposite end of the wire may require the removal of a section of the dashboard, but in most cases this isn't necessary. At worst you may have to bend and stretch a bit to reach the wire from underneath.

"Once you've located the interior side of the grommet, you'll discover that there is usually enough extra space to accommodate your power leads. Feed the wires through the grommet and secure them along the driver's side of the engine compartment.

According to most automobile manufacturer's guide-lines, the negative and positive leads for the transceiver and the amplifier should be individually connected to the battery. This means that you'll be running four separate wires to the battery. (Do not use the chassis as a short cut for the negative ground return). In addition, be sure to use heavy-gauge wire for the amplifier leads. Remember the amplifier will be drawing a substantial amount of current through a significant length of wire.

"To reduce the possibility of interference to the electronic systems in your automobile, keep all power leads as far as possible away from control modules and their associated cables. Also, keep the wires together in a tight bundle as you route them through the engine compartment. If the battery is on the passenger side of the vehicle, then the power leads should cross in front of the engine (see **Fig 9**).

"Making connections to the battery terminals can be as easy as removing the cable clamps, sliding the stripped ends of the power leads into the clamps and then repositioning the clamps on the battery posts. (Be sure to place the positive leads on the positive terminal and the ground leads on the negative terminal. Doing otherwise may reduce the life span of your equipment from many years to a few nanoseconds!) If your cable clamps feature lugs for connecting additional wiring, so much the better. For an extra measure of protection, place fuses in both the negative and positive power leads for your amplifier and hand-held".

Note that while the above notes provide useful guidance, they refer specifically to American cars with their left-hand drive and negative chassis and this must be taken into account when dealing with British cars. WB8IMY also covers such matters as avoiding UFOs - unrestrained flying objects:

"Most amplifier manufacturers provide mounting hardware for securing the amplifier to the automobile. For your own safety, use it.

Another good reason to avoid under-seat locations concerns air-bag control modules. Some newer designs place these modules beneath the seats, making this area a poor environment for a warm, bulky amplifier. Generally speaking, amplifiers are best kept in the trunk. Although this entails greater wiring hassles, it is unquestionably the safest location". ***G3VA***

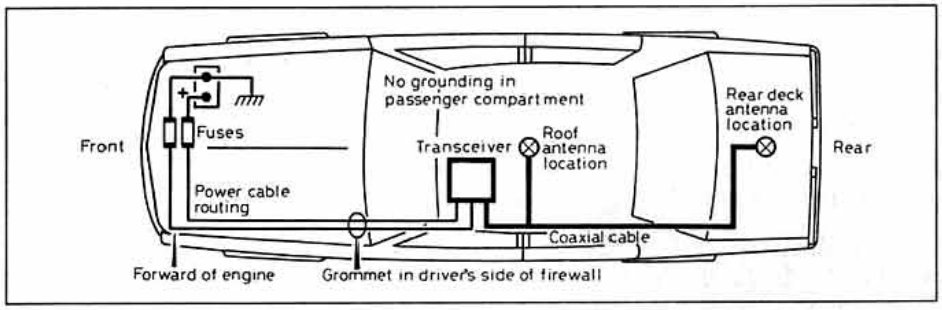


**Fig 9: Typical wiring diagram for mobile transceiver installation. Note that the diagram and text are based on American left-hand-drive cars rather than British cars with right-hand-drive and positive earth battery connections.**

# MEET YOUR MATCH The ultimate tuners from VCI


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New 3kW Antenna tuner with inputs for two dipoles and a wire or balanced line antennas. Dual balanced meter for accurate FWD/REV/SWR readings plus Digital Bar graph reading of Peak SSB power. Precision Roller Coaster for optimum matching plus 5Kv variable capacitors with vernier drives. Chemically treated aluminium finish and pem nuts avoid the use of self tapping screws. . . . £399

## VC300

300 Watt antenna tuner with precision cross pointer metering for FWD/REV/SWR readings. Switch between two coax antennas plus wire or balanced line ( a 4:1 balun is included). Switching allows both tuned and direct antenna selection. Uses same high quality case and front panel as the HT-1500 . . . £139

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**Eire:** Long Communications. 010-353 73 37152.

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**Fife:** Jaycee Electronics Ltd. 0592 756962.

**Hampshire:** SMC Headquarters. 0703 255111.

**Lancs:** Holdings Amateur Electronics. 0254 59595.

**Merseyside:** A R Communications Ltd. 0925 229881.

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**West Yorks:** Leeds Amateur Radio. 0532 452657. SMC (Northern) 0532 350606.

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# RSGB'92

**HALL 7, NATIONAL EXHIBITION CENTRE, BIRMINGHAM**

## National Convention and Amateur Radio Exhibition

## Official Programme

**Saturday 30 May: 10 am to 6 pm**

**Sunday 31 May: 10 am to 5 pm**

***Access for disabled at 9.30 am on both days***

**Admission: £3. Concessionary: £1.50**

*(includes free parking and shuttle service to Hall 7)*

**Children under 12 years of age accompanied by an adult are admitted free of charge**

*Special Attraction!*

# COME TO THE "KANTRONICS PACKET SEMINAR"

## Saturday and Sunday at RSGB '92

Something you cannot afford to miss. The enthusiasts from Kantronics will be coming to the RSGB '92 show to give a full day Seminar devoted entirely to Packet Radio. Starting from "What is Packet?" they will gradually extend your packet knowledge to the state of the art . . . and beyond! Plus on Sunday morning the 'Great Debate'!

### 1 Overview of Packet Radio

**10.30am-noon Saturday**

In this session we'll introduce you to Packet Radio, explaining how packet works, and what's required to set up a packet station.

We'll discuss the AX.25 packet protocol as adopted by the American Radio Relay League, and briefly describe some of the uses of packet radio.

Many of the possibilities of packet are just beginning to be explored, including the DX spotting networks (Packet Cluster), satellite operation, high speed packet for end users, and higher level packet protocols.

If you've been thinking of joining in on the fastest growing mode in amateur radio today, but have been holding back, this is your chance to come and ask those questions you have. You may even find answers to questions you didn't know you had!

Also during the session, we'll draw one name from the registration cards and that lucky person will win a **Kantronics DVR 2-2** two-meter radio. This is the first radio designed with the packet operator in mind — off the shelf, it's ready for your standard 1200 baud packet, or for the 9600 baud operation that's gaining popularity with the new Kantronics Data Engine.

Kantronics Customer Service Manager Karl Medcalf (WK5M) will be the speaker. The session will conclude with a question and answer period, allowing you to ask those all-important questions concerning your initial entry into this exciting new area.

### 2 Connecting Your Equipment

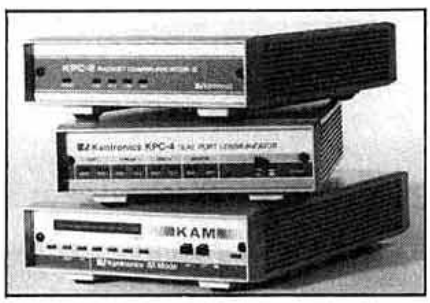
**12.30am-2pm Saturday**

During this session, we'll explain the "mysteries" of RS-232 and TTL levels, and how to connect your computer to your TNC. We'll start with a discussion of the data as your computer knows it, and what's required to make it travel over the air to another station. We'll have slides showing the connections required for many popular computers and radios, so bring your pencil and paper. We'll take a giant step toward making your entry into the packet world as easy as possible so you can enjoy the fun that so many are already experiencing.

We'll also show you how to connect your TNC to your radio, using specific examples for several of the popular radios in use today, including hand-held radios. The tips you learn in this session can save you many hours of frustration in the initial hook-up of your equipment.

We'll continue this session with some discussion of the RS-422 signals used by some of the newer computers on the market today, and of course we'll give you the opportunity to ask questions specific to your station equipment. At the end of this session, we'll draw the ticket from our door prize box, and the winner will receive the new **Kantronics Telemetry Unit** (KTU) with Weathernode. The newest in applications for packet radio! Just connect for the weather.

Terminal programs will also be discussed with some general guidelines concerning what to look for (and what to look out for), as well as some guidelines for those wanting to write their own terminal software. We'll also cover the pros and cons of Host Mode software.




### 3 Getting On The Air

**2.30pm-4pm Saturday**

This leads us to the part that you probably will fear the most — putting the packet station on the air for the first time.

We'll discuss how to make that first connect, the basics of digipeating, and what the various lights and indicators on your packet TNC mean to you.

This session will also present information concerning the use of networks like Net/Rom, TheNet, and G8BPQ, which can provide much greater data throughput over longer distances. We'll discuss Nodes lists, Routes and the automatic routing feature of these nodes, explaining how a network is supposed to work. Also, we discuss why the current networks are not performing as originally planned.

Our drawing for this session will be for a **Kantronics Data Engine** — the next generation Packet TNC. We'll discuss packet bulletin boards, the Kantronics KA-NODE, and the enhanced features which this can provide for all packet users.

Gateway operation will be discussed, along with many of the parameters which you control to tailor your station exactly as you wish it to be.

We'll explain many of the settings which cause problems with various radios, computers, and operating practices.

As always, we'll conclude this session with a question and answer period, allowing you the chance to explore the many facets of packet radio.

### 4 The Great Packet Debate

**11am-12.30pm Sunday**

Full Kantronics demonstration and an open forum. Here is your chance to ask those awkward questions that seem to come up when you are sitting in front of your keyboard . . . totally baffled!

**Special prize for the best, most productive question!**

# FREE

## PRIZE DRAW EACH SESSION!

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**PLEASE COME EARLY!**

## KANTRONICS is distributed in the UK by LOWE ELECTRONICS LIMITED

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As President for this year I would like to extend a very warm welcome to all of you to RSGB 92 at the National Exhibition Centre here in Birmingham.

This exhibition is attended by radio amateurs and representatives from National Societies all over the world, and is the Radio Society of Great Britain's Showcase event of the year at this prestigious venue. It has not been an easy year for our members or our many friends within the trade sector, and I would like to thank all of you for your continued support.

This year as you can see from the Programme of Events there will be a full lecture programme on Saturday and Sunday. Morse tests will be held on Saturday only.

The RSGB Mencap Albania Appeal will be running throughout the summer, and I ask you to support this in the very best amateur radio spirit. See the RSGB Bookstand and *RadCom* stand for prizes being raffled during the weekend.

To paraphrase a Northern Ireland saying appropriate at election time - buy early and buy often.

Drive carefully and have a safe journey home.

J T Barnes, GI3USS,
President.

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# PRODUCT NEWS

**The information below is compiled from information sent in by the exhibitors concerned. Details are published in good faith but the RSGB cannot be held reponsible for false or exaggerated claims made in the source material.**

## LOWE ELECTRONICS

### (Stand B10, B12, B14, B16)

THE NEW **Kenwood TH28E, 48E** and **78E** offers new standards of quality and enhanced features in the handheld transceiver market. The handheld market is such that many people already have one, but the new '8' range should tempt many amateurs into a change. The TH-28E is of course a 2 metre FM transceiver with up to 5W RF output and boasts a good receiver performance.

The receiver can also cover 118 - 136MHz AM for the VHF airband, and 136 - 174MHz FM for amateur, marine and general purpose monitoring. Not only that, the TH-28E receiver also covers the 70cm amateur band, so you can cross-band easily.

On the other side of the same coin, the **TH-48E 70cm transceiver** has a 2 metre receiver inside it to do the same thing in reverse - a clever idea! Other features include CTCSS encode built-in for the new repeater requirements, and a new alphanumeric non-volatile memory which can store up to 41 channels of TX/RX frequencies and a six character message or identifier on each channel. When you call up the memory you will have an identifier in the display to remind you of the service or repeater or whatever. An optional memory extension unit increases memory capacity up to 241 channels, and the contents of the memories can be 'cloned' to another transceiver.


Also they are very small! **TH-28E/48E** measure only 49.5 x 116 x 36mm, and weigh only 340g including the standard PB-13 battery pack.

The **TH-78E is the new dual band 2m/70cm handheld** in the '8' series and effectively combines the features of the single band handhelds in one compact package. Each band has the ability to receive two frequencies in the same band, or you can cross-band as well.

Frequency extension to airband and other bands is available from the front panel. The alphanumeric memories incorporated in this transceiver allow identifier text to be recalled by memory scan, and the whole concept is a step forward in ease of operation. Also featured are signalling facilities such as CTCSS encode, DTSS, and DTMF.


## JANDEK

### (Stand Q7, Q8)

ALL KIT PRICES have been held for RSGB'92. The very popular **audio notch filter kit**, based upon the article in *RadCom* January 1991, will again be available, as will the new high frequency GDO kit.

As usual, many of the kits may be seen in operation, and it is hoped that a range of new modules will be ready for RSGB'92, which, when combined with our existing ones, will produce a system for SSB generation and reception.

A selection of some of the most popular types of **ferrite and iron dust cores from Amidon Associates** will be on show, along with a cross-section of **Minffordd cases and boxes**, including some of the new chassis-style cases.

Also, on sale will be lots of other bits and pieces for the Novice course, QRP operators and constructors.

## G4ZPY PADDLE KEYS INTERNATIONAL

### (Stand TBA)

**A NEW BABY morse key** has just been announced, which is believed to be the smallest in the world! It measures just 30 x 25 x 6mm, and is fully adjustable (see photograph). Another recent addition to the product range is a **Miniature Iambic Electronic Keyer**, considered to be unbeatable for size, price and versatility. It is fully RF proof and housed in a Vinyl covered steel cabinet.

## NEVADA

### (Stand A9, A11)

NEW FROM Nevada is the **Alan CT 450 70cm Handheld Transceiver** which is on display for the first time at RSGB 92. The set has a full range of features including 20 memory channels and a power output of 5W.

Selling at just £199.00, the set is expected to be a big success with novice licence holders. It also represents excellent value for money for any one system using the British 70cm repeater system.



## ICOM (UK)

### (Stand A1, A5)

THE **IC-728 is a compact, lightweight, HF all band transceiver** designed for beginners and for mobile operation. The concept for the IC-728 grew out of consumer demand for a passband tuner and a speech compressor, which was absent from the IC-725. The passband tuning function is very effective in reducing interference, and a built-in AF speech compressor increases the talk power, sending clear signals over long distances.

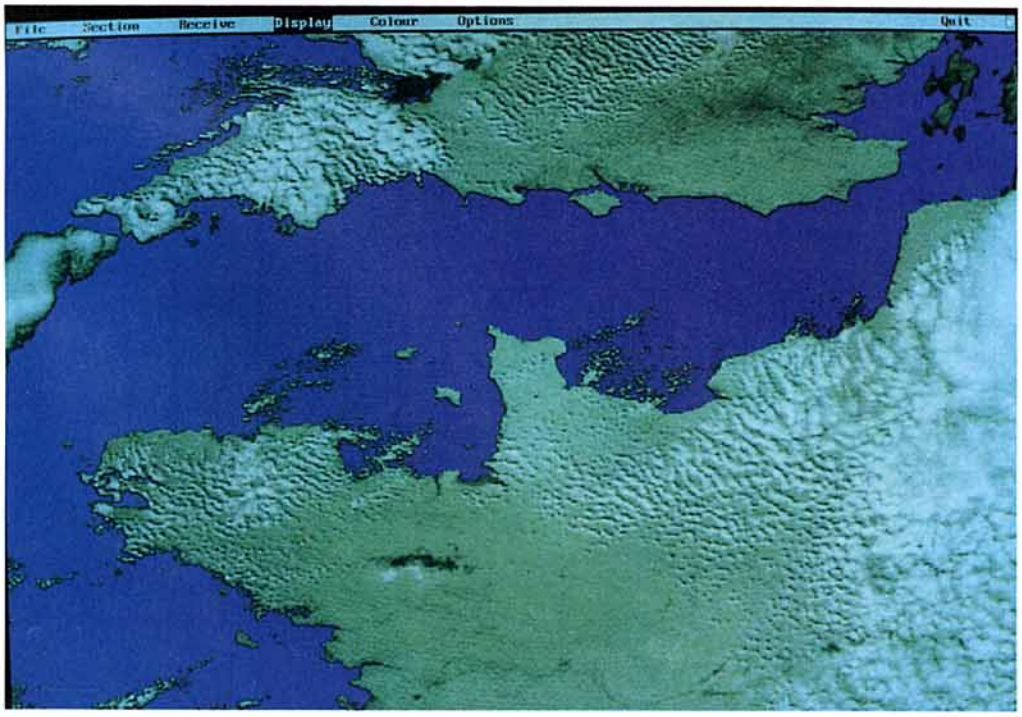
The IC-728 is the same size as the IC-725 and almost the same weight. Mobile installation is easy and because of its light weight it can be carried almost anywhere. There is also an optional automatic antenna tuner. Attractive features include 105dB dynamic range, 100W CW/SSB with optional AM and FM on all amateur bands plus a general coverage receiver.

Other new products from Icom include the **IC-X2E dual-band handheld transceiver for 70cm and 23cm**, and the compact **IC-3230E dual-band mobile transceiver for 144 and 430MHz**.

## TIMESTEP ELECTRONICS LTD (STAND X12, X13)

TIMESTEP IS showing its new **PDUS (Meteosat Primary Data User Station)** for the serious Weather Satellite enthusiast. Featuring 2.5km ground resolution and a full Earth Disc image every 30 minutes, this system will also animate in spectacular colour. The more obscure parts of the world such as the River Niger, the Volta Rivers, Lake Volta and the surrounding Rain Forests can be observed and monitored every 30 minutes.

Previously PDUS systems were only available at prices from £10,000 to £35,000, but now for about £1,000 and a dish this High Resolution Digital Imagery is available in your shack !



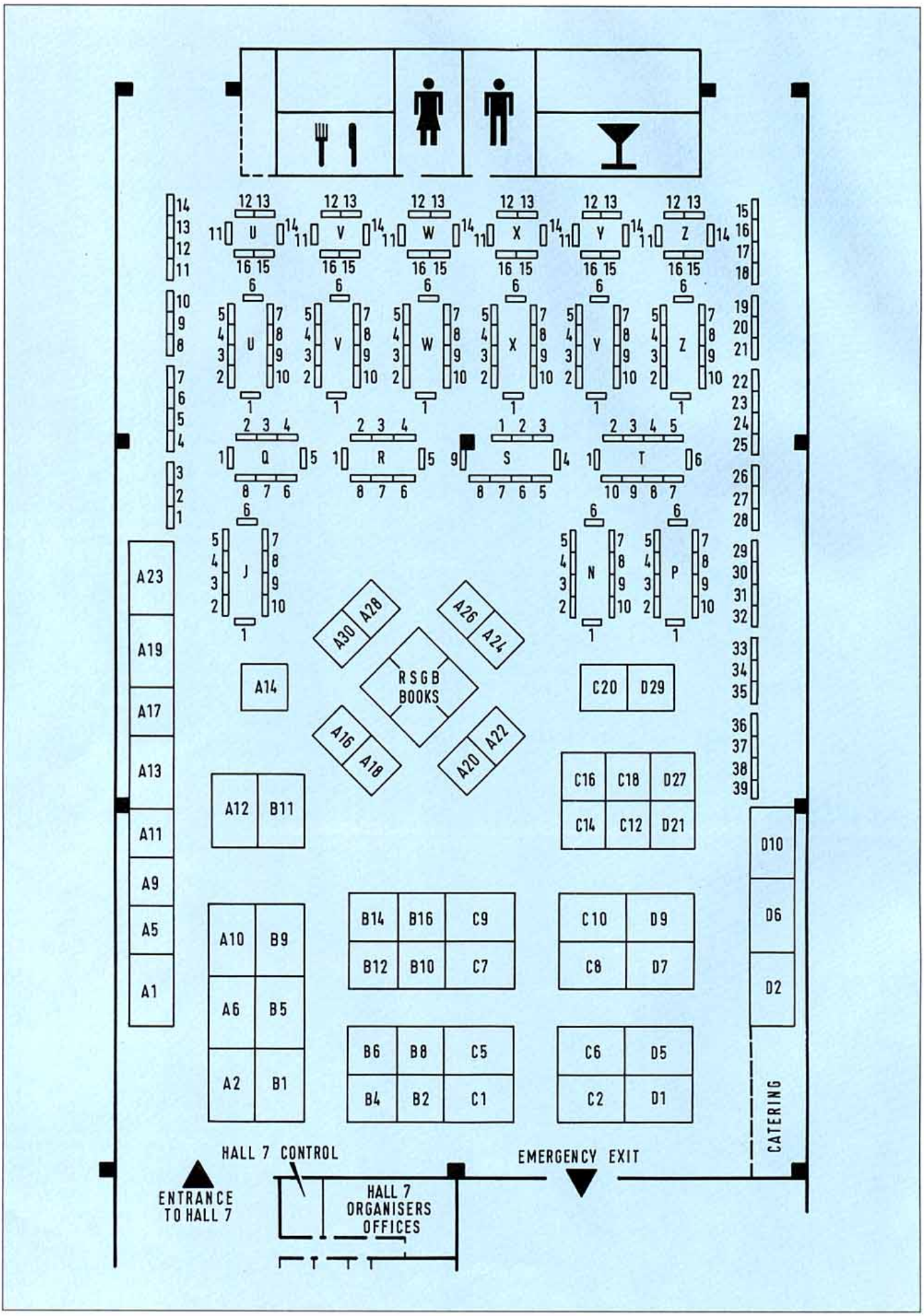


## G C ARNOLD PARTNERS

### (Stand Y12,Y13)

*RADIO ART* describes the evolution of the wireless set, from the 'bread-board' to the present day. Over 250 stunning colour photographs of sets from the 1920s to the 1990s, some familiar, some rare. On sale at £14.99 on the *Radio Bygones* and *Morsum Magnificat* stand.

**CONTINUED ON PAGE 53** ▶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| Amateur Radio Exchange | C8 |
| AMSAT | C16 |
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| West Midlands Police | D7 |
| Wiermead | V11,12,13,14,15,16 |
| Wilson Valves | T5,6,7,8,9,10 |

***. . . . and many more!***

# PROGRAMME OF EVENTS

## Lecture Programme

### Saturday

**Room 1**

**Kantronics Packet Seminar**

| | |
|---|---|
| **1030 - 1200** | Pt 1 - Overview of Packet Radio |
| **1230 - 1400** | Pt 2 - Connecting Your Equipment |
| **1430 - 1600** | Pt 3 - Getting On The Air |

**Room 2**

| | |
|---|---|
| **1100 - 1200** | "Intelligent HF DXing - Knowing what, when and how", by Bob Whelan, G3PJT |
| **1215 - 1315** | "From Circuit to Signals - QRP", by George Dobbs, G3RJV |
| **1330 - 1500** | "Future of Raynet", by Geoff Griffiths, G3STG |
| **1515 - 1615** | "DXpedition to the Solomon Islands", by Nigel Cawthorne, G3TXF |

### Sunday

**Room 1**

| | |
|---|---|
| **1000 - 1100** | "Structure of EMC Committee and Q & A Session", by Bob Peace, G8SOZ |
| **1100 - 1230** | Kantronics Packet Summary |
| **1345 - 1445** | "Propagation", by Jim Bacon, G3YLA |
| **1500 - 1600** | "An Introduction to the Excitement of Satellite Operation - by a Simple Amateur", Roderick Clews, G3CDK. |

**1030 - 1500 Morse Tests (Saturday only)**

These must be booked in advance with RSGB

All Morse tests are held on the first floor above the exhibition hall (Hall 7).

*In addition to the above events, the following meetings will be taking place on Saturday. For further information please contact Norman Miller, G3MVV, or enquire at the RSGB Book Stand.*

RLO Meeting

International Police Association Amateur Radio Club AGM.


## ICS ELECTRONICS LTD

### (STAND B1)

ICS ARE THE European importers of the new **Davis Instruments weather station** range. These are competitively priced and can be used to record local weather data on an IBM-compatible computer. An optional modem adaptor is available so that weather data can be sent over a landline or radio link. Prices start at just £169.96.

**ICS-FAXII** is the latest version of their simple-to-use system for receiving grey scale facsimile pictures on an IBM-PC. The latest version includes RTTY, FEC and Navtex as standard. The price, including hardware, is £129.95.

ICS have recently been appointed an official **Sony distributor**. Their current range of receivers are among the most suitable for weather facsimile reception and are very easy to use. On show will be the latest compact **SSB communications receiver from Sony, the ICF-SW55**.

The latest version of the new **DSP-2232 Digital Signal Processing intelligent terminal unit from AEA** includes all possible HF modems, VHF modems at up to 9600 Bauds and packet satellite modems. The price is £949.50.

The **ISOLOOP 10-30** is an improved, wide frequency loop antenna from AEA, covering 10 to 30MHz. It is much more robust than previous versions and comes pre-assembled with remote antenna tuner at just £299.95.

The latest version of ICS's **MET-2a WEATHER SATELLITE SYSTEM** offers greatly enhanced picture quality and ease of use. The price is £939.94 and upgrades are available for existing users at £176.19.

## WOOD AND DOUGLAS

### (Various Exhibitors' Stands)

WOOD & DOUGLAS are pleased to announce the release of a new product for the amateur market - **The 144PK dedicated 2m packet transceiver**.

The 144PK benefits from W & D's commercial activity in the telemetry and data communication markets and offers the UK amateur a product that is UK designed and manufactured with all the attendant qualities that you have come to expect from Wood & Douglas. The unit is fully synthesised and can potentially cover the whole 2m band with repeater splits etc, all 'designed-in' with only minor changes.

The discerning packet operator will identify with this product and W & D say "we expect it to become, as our products have in the past, the measure by which other products are judged". The first release of the 144PK is available now direct from the factory address and also from exhibitors at RSGB'92. Introductory Price: £190 + VAT

## WATERS AND STANTON ELECTRONICS

### (Stand B5,B9)

**ALINCO** IS launching three new models for the spring. These comprise two mobiles and one handheld.

**The DJ-580E is a highly compact dual band handheld for 2m and 70cms** with power output levels up to 5 Watts when used with an external 12V supply. As well as the more usual memory and scanning facilities, the DJ-580E has several novel features.

ALINCO has patented a low voltage operational circuit that allows the transceiver to continue to operate even when the battery voltage falls to 50% of its normal value. Although this will have little application with ni-cads, it does enable dry cells to be used for very extensive periods, although at reduced transmit powers. By keying in a code on the keyboard the DJ-580E turns into a self contained automatic cross-band repeater. This may have applications for RAYNET operation and the like. Another code is keyed in to open up the receiver range and this includes and AM detector for VHF airband monitoring.


The **DR-599E is the new dual band mobile from ALINCO** and has power outputs of 50 Watts on both bands. The feature of a detachable head unit has been retained and the transceiver can also be put into the automatic repeater mode, if required. By the application of DTMF codes or CTSS the DR-599E will find wide appeal for emergency use, particularly if used as a portable repeater.

To complete the trio ALINCO has updated the **DR119E 2m mobile** which has an output of 50 Watts. Extended receiver capability segments which extend up to 995MHz are promised.

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- **SGS Electronics** will show the latest BIRD RF Dummy Loads.
- **Technical Software's** stand will feature their new GX-2 Fax and SSTV system.
- **Lake Electronics** have intrigued us with the promise of a new model for the show.
- **Kanga Products** will show a large selection of kits, including a dummy load and a transistor tester.
- Last but not least, **Wilson** will offer their usual comprehensive stock of valves.

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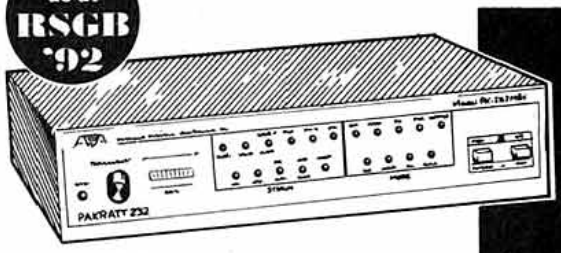


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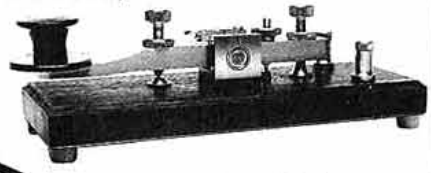

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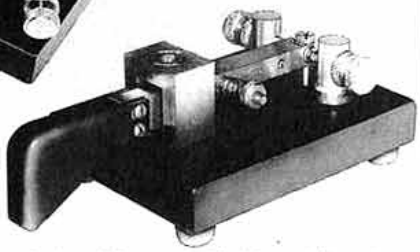

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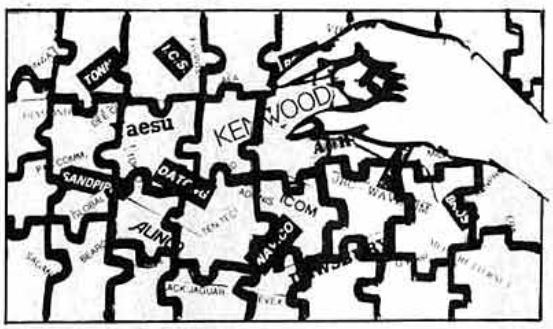


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RADCOM TECHNICAL FEATURE

# The EXJAY

## Resonant Multiband Antenna System

by Bob Rylatt, G3VXJ

ALTHOUGH AN HF enthusiast, I have never regarded beam antennas a realistic possibility for normal suburban reasons. Equally, family and career commitments have caused patchy activity over the first twenty-odd years of my licensed existence.

However, 1989 was a high spot of activity with sunspots peaking, work load under control and children as partially independent teenagers. Some time for radio was thus a distinct possibility. The antenna system which had evolved over a decade comprised two delta loops (see later) strung in series by a traditional method for a chimney to a distant tree and fed with tuned feeders so that, by phasing, a degree of electronic rotation was possible.

My opinion was that it was quite competitive, but certainly it is difficult to describe (and hence replicate!). The loops, however, contained the gem of the ideas outlined below.

Then - from a radio point of view - disaster struck. The family vote was to move QTH to another suburban location! This clearly would involve the 'education' of new neighbours and I would have to start with simpler arrays than previously in use. This approach also made sense as I wanted to be up and running as soon as possible after the move, so as not to miss the sunspot peak. Also little extra time would be available in the light of the painting, digging, drilling etc required at the new idyllic family home.

What was required was a three-band HF antenna with general all round coverage. A commercial ground plane was quickly fitted to the chimney and commissioned. Equally quickly a TVI problem appeared on a rather sensitive set-up next door. It proved necessary to move to horizontal polarisation, and a half size G5RV was utilised. The TVI was now gone, and G3VXJ was free to operate, but in comparison with the ground plane signals were significantly down particularly on 21MHz. I decided to try something different.

### THE FIRST ATTEMPT – *or How Things Didn't Work the First Time*

FORTUNATELY, MY JUNK BOX always has plenty of slotted 300Ω twin feeder in it, due to a history of antenna experimenting. This was used for all experiments, but any twin cable of suitable strength can be used. It was decided to try a 3λ/2 for 21MHz in parallel with a λ/2 dipole from 14MHz and then try to get 28MHz going with 'stopping stubs'. The general arrangement is shown in **Fig 1**.

This worked fine on 14 and 21MHz but with no amount of adjustment could I get this arrangement to resonate on 28MHz

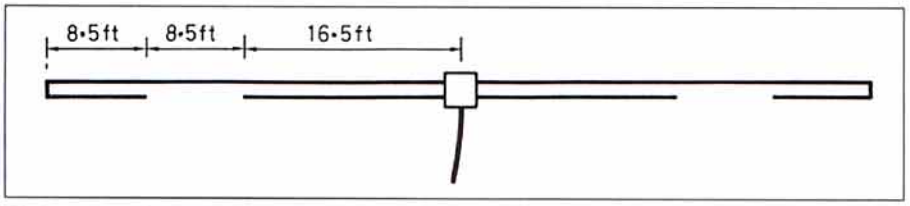


**Fig 1: Basic configuration for 14MHz and 21MHz.**

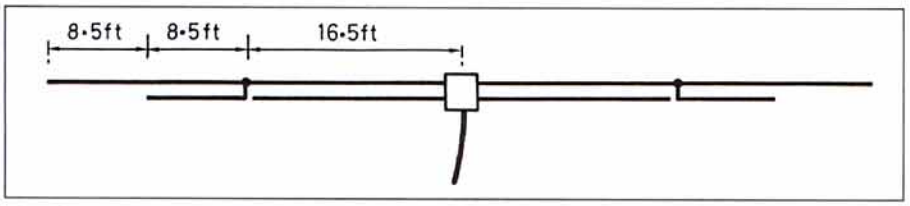


**Fig 2: Stubs added for 28MHz operation.**

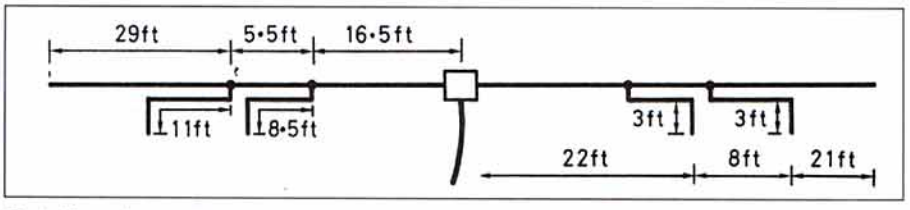


**Fig 3: Dimensions shown give low SWR on three bands.**

### THE SECOND ATTEMPT – *or The Discovery*

THE ARRANGEMENT SHOWN in Fig 1 implies that two sections of the twin feeder had been cut away. This, in fact, was not the case and by a quirk of lazy serendipity I had left the wire isolated between the 14MHz dipole and the 28MHz stubs. In frustration, these 28MHz λ/4 lengths were connected to the 21MHz 3λ/2 at the ends of the 14MHz dipole and - bingo! - 28 MHz resonated. The design at this stage appeared as in **Fig 2**.

### THE ANALYSIS – *or Why Did it Work?*

ALTHOUGH I HAD NEVER seen any such arrangement published before, the 28MHz operation appeared intuitively obvious. When several λ/2 dipoles are connected together onto a common feeder, the dipole for a selected band takes the power because it is fed from a low impedance current antinode into a resonant λ/4. The 8.5 ft stub on the 21MHz antenna provided a stub for operation 28MHz at exactly an equivalent low impedance position, assuming the centre feed point position to be a current antinode.

If this theory was correct λ/4 stubs for any band could be positioned at the appropriate current antinode position on a wire and resonance would occur. It was decided to try this out.

### THE THIRD ATTEMPT – *or When Things Really Worked Out*

JUST TO REMIND OURSELVES, what was really needed was a three-band horizontally polarised antenna offering all round coverage. I decided that a 3/2λ pattern mounted

| Frequency | SWR |
|---|---|
| 14.0 | 1.9:1 |
| 14.15 | 1.4:1 |
| 14.3 | 1.9:1 |
| 21.0 | 1.4:1 |
| 21.15 | 1.0:1 |
| 21.3 | 1.6:1 |
| 28.0 | 1.1:1 |
| 28.15 | 1.1:1 |
| 28.3 | 1.2:1 |
| 28.45 | 1.2:1 |
| 28.6 | 1.3:1 |

**Table 1**

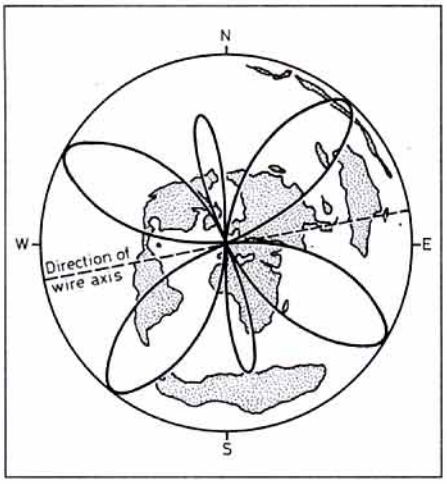


Fig 4: Radiation pattern with the antenna horizontally polarised.

East/West (my only option) would be my best compromise.

Using the new found technique the three band version shown in **Fig 3** was erected. The ends of the 21 and 28MHz dipoles were turned down as shown for three reasons. First this facilitated tuning of the ends to bring each band to resonance. Second, separating the voltage node from adjacent wires reduced capacitive detuning. Finally, for 28MHz these turn-downs allow the 21MHz λ/4 to be connected at the right position.

After some time adjusting the 3/2λ lengths for each band the final dimensions, shown together with SWR performance, in **Table 1**, were achieved. The SWR was no surprise considering 3/2λ centre fed has an input impedance a little above the 50W feed.

## PERFORMANCE – *or Did it Really Work?*

HAVING GOT THE ANTENNA resonant and in the air at 20ft, some considerable time was spent listening, comparing the new antenna performance to the ground plane. Very little difference was noted in any direction or on any band with the slight difference illustrating the six peaks of the 3/2λ radiation pattern shown in **Fig 4**, so the first objective of all round performance on three bands with horizontal polarisation had been achieved.

Now came the time to use the antenna in anger - after all, the original objective had been to get going quickly and simply at the new QTH. In the six months from December 1989 to May 1990 the antenna was used with 100W of CW and 250W PEP of SSB. A 'shout list' is not the best way of illustrating an antenna performance but for illustration the following half dozen prefixes worked on each band is given:

14MHz KH5J, XU8, T32, FW, 3Y5, ZD7.

21MHz 1S0, 7O1, JD1, 3W, V85, 3D2 Conway.

28MHz ST0, ZZ0 Trindade, ZS8, VR6, FH5, XW8.

| Freq. MHz | λ | Length ft. | Notes | |
|---|---|---|---|---|
| 3.6 | 1/2 | 131.2 | A | |
| 18.1 | 5/2 | 134.8 | A | |
| 10.1 | 3/2 | 134.9 | B | Corrected length for end insulators |
| 24.9 | 7/2 | 133.8 | B | Corrected length for end insulators |
| 28.3 | 7/2 | 121.0 | C | |
| 14.1 | 3/2 | 103.3 | D | |
| 7.05 | 1/2 | 67.0 | E | |
| 21.1 | 3/2 | 69.0 | E | |

Table 2: See text for explanation of notes.

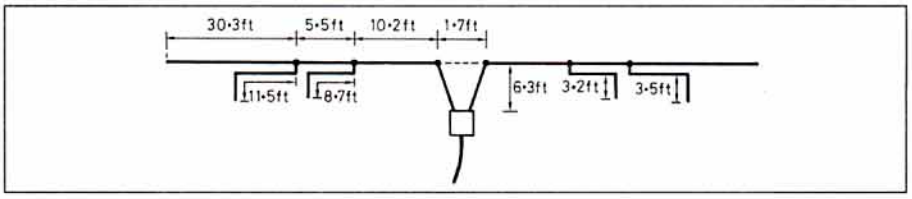


Fig 5: Conversion to form a 3-band double extended zepp.

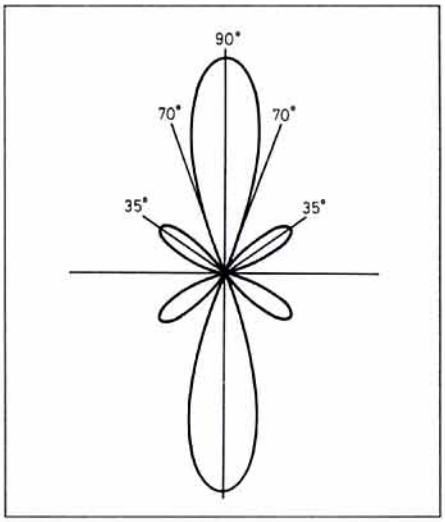


Fig 6: Theoretical radiation pattern for the above antenna.

RADCOM TECHNICAL FEATURE

These results compared very well with other wire antennas used previously as these were all new countries for me.

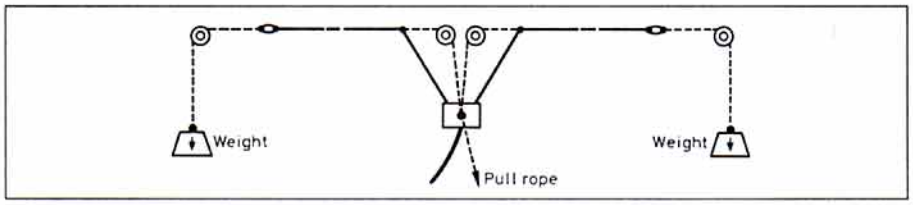


Fig 7: Suggested mechanical arrangement to change the characteristics.

## DEVELOPMENT – *or What Else Can Be Done With That Idea*

IT WAS NOTICED THAT THE 14MHz length was a little shorter than expected and the 28MHz a little longer. I decided it was therefore possible to create a 2 x 5/8λ three-band double extended zepp by folding back the centre to give a North/South radiation pattern with a theoretical gain of 3db. **Fig 5** shows the general arrangement, and **Fig 6** the theoretical radiation pattern.

To bring the antenna to resonance the ends had to be lengthened slightly as shown, but the SWR improved to 1.1:1 on 14MHz, 1.2:1 on 21MHz and 1.1:1 on 28MHz. More importantly the radiation pattern sharpened North/South, as predicted, when compared to the ground plane.

An idea not implemented at G3VXJ was to mechanise the change from 3/2λ to double extended zepp format by the use of pulleys, as shown in **Fig 7**, so that the radiation pattern could be changed at will. However, my shack is not at the centre!

Another version I tried briefly was a loop version comprising a delta loop on 14MHz and folded 3/2λ for 21 and 28MHz. (The arrangement had been used successfully at my original location). The arrangement is shown in **Fig 8**, together with the current distributions for the 3/2λ version This was a little unsightly by my required standards and was quickly replaced.

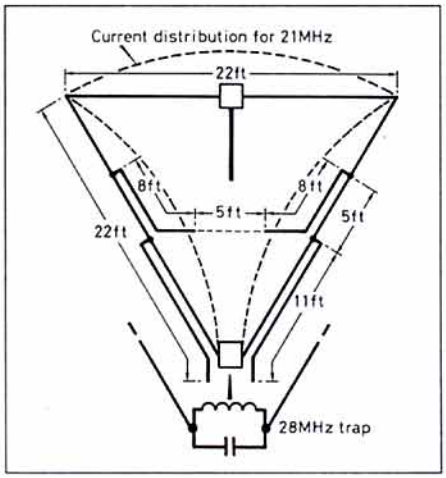


Fig 8: Loop version of the antenna uses a 28MHz trap.

## THE EIGHT BANDER – *or The Ultimate?*

BEFORE STARTING TO EXPLAIN this it should be noted that my garden is not long enough to accommodate this antenna so dimensions reflect a 'bent end' version of this arrangement. Others experimenting with a

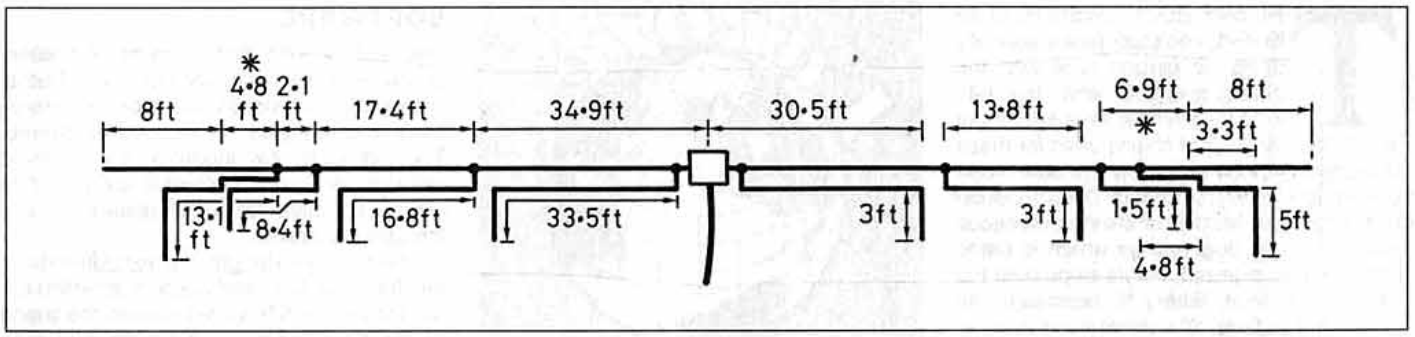


**Fig 9: Final dimensions of the eight band version.**

straight antenna in the clear will, no doubt, have to adjust dimensions.

Experimenting with independent wires the relationships shown in **Table 2** were developed.

It can be easily seen that on bands marked with the same letters a single wire will resonate on both bands. For instance, note A shows a length which resonates at 3.6MHz and 18.1MHz. Length B was selected to support the system as the end effects shortened the length a bit. From this the eight band antenna show in **Fig 9** was built.

The overlap shown at * was made by threading an additional third wire through the slotted 300Ω feeder. This stub provides the 18MHz λ/4 whilst the overall length including the stub is the 3.5MHz antenna.

The antenna exhibited an SWR of 2.5:1 or better on all eight-bands (after some trimming). I am confident that in a straight forward environment a better result would be achieved, but I returned to the three band version which fits the garden.

## CONCLUSION – *or Was it Really a Good Idea!*

I HAVE NOT SEEN THE simple use of λ/4 stubs in my thirty years of amateur radio, but little is new under the sun so maybe it has been used before. It seems to work well in a number of antenna applications and hence, no doubt, it can be used by others to help in multi-banding where required. From my point of view the basic three band HF variant has been reinstated and continues to serve me well.

Many multi-band dipole antennas have been proposed over the years - what is different about this technique is that the antenna is truly resonant on each band. This is achieved without the use of traps (which introduce losses) and provided correct matching to coax feeder reducing other losses.

When correctly adjusted the antenna can be directly connected to rigs with solid state power amplifiers.

At G3VXJ there are other criteria. The three band antenna was an important part of solving a TVI problem whilst providing horizontal polarisation and good all round coverage.

Probably equally important is that it is 'scenic' in the suburban environment. 300Ω twin feeder shows little more that a single wire at 30ft and the turned down ends are equally minimal in their visual impact. In particular, no adverse comments have been received from the new neighbours.


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IDEAS FROM ABROAD


TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

**J Kneip, DG3RBU** and **F Radlherr, DL8MBT**, have demonstrated a **voice mail box**. See last month's *Eurotek*. Here are more technical details and future applications in real-time digital voice transmission. **T Kamp, DF5JL**, wrote the article in *CQ-DL* 11/91.

THE MAILBOX CONSISTS of an IBM-PC computer plus a specially designed plug-in card with the analog-to-digital and digital-to analog converter for speech input and output. An FX709 chip is used for these conversions by Continuously Variable Slope Decoding (CVSD), a form of Delta modulation. In this process it is not the instantaneous value of an analog voltage which is being sampled and digitized, but its slope over the sampling interval. Binary '1' represents an increasing voltage, '0' a decreasing voltage. Encoding the slope of the increase or decrease depends on the prior sample. If both the prior and present samples are '1', a steeper slope is assumed than when '1' follows '0'. Decoding does the same in reverse. This process is particularly suitable for digitizing speech; even at a modest data rate of 16kbit/s it yields good voice quality.

The plug-in board (**Fig 1**), provides the required functions, starting with the address coding for the PC (IC1&2). In the FX709 (IC10), the signal passes through a bandpass filter to the 1-bit serial encoder; after conversion to an 8-bit parallel format the data is passed to the PC-bus via IC3; in the other direction, voice signals pass through a software-programmable audio filter; registers for pause and level recognition complete the module. The FX709 has a loop-back mode which permits a received and encoded speech signal to be decoded and retransmitted, an easy way to check the fidelity of the path (radio receiver - encoder - decoder - radio transmitter).

Clock oscillator (IC12f) and divider (IC11) provide different, externally programmable clock rates. For user control, a DTMF decoder (IC9) with its register for tones and strobe (IC4) are included. Another register, (IC5) for PTT control, has an EXNOR gate (IC8b-d) to prevent spurious PTT keying prior to initialization of the register.

The 70cm receiver has a DCD output to keep noisy signals from causing DCD spikes which would stop the encoding of incoming speech.

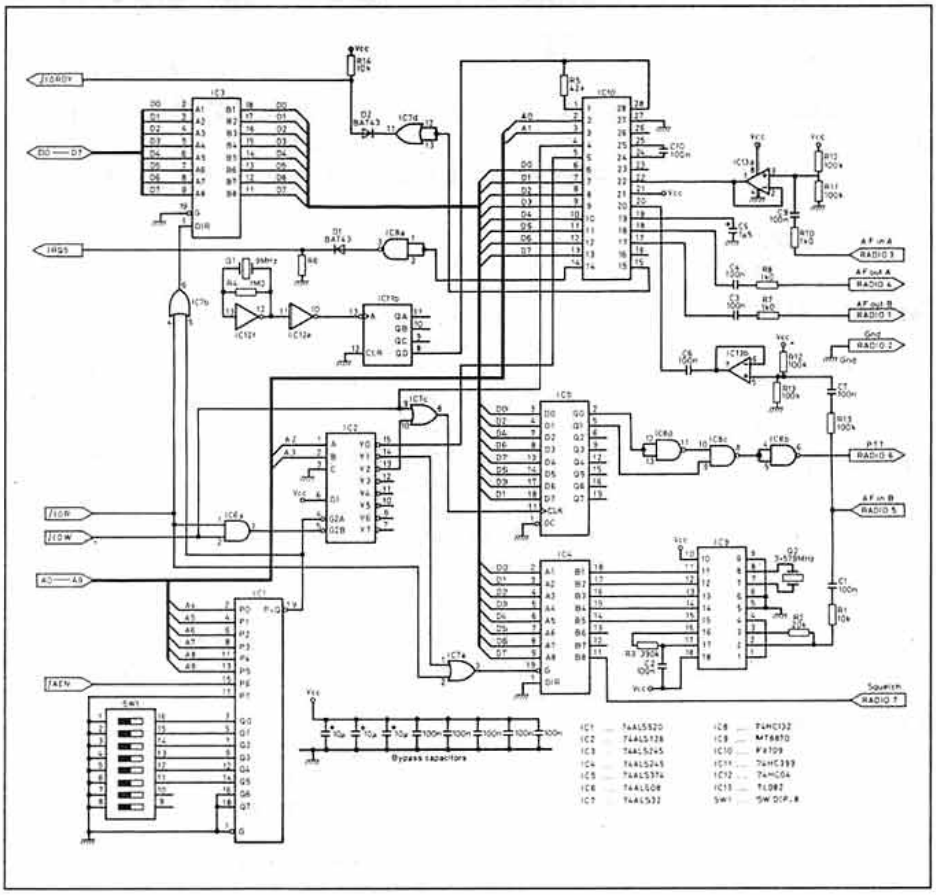

**Fig 1: The voice mail box, mounted on a plug-in card for a PC-AT, uses an FX709 for Delta modulation.**

## SOFTWARE

THE SOFTWARE, WRITTEN IN 'C', enables simple remotely controlled operation. Output is based on a function which permits transmission of a digital file from mass storage. The individual text modules, the received call-sign and user messages are joined to make a complete text which guides the user through the system.

The maximum length of a text depends on the data rate. We used 32kbit/s, at which it is hard to tell the difference between the sound on the input and the output which has gone through digitizing, storage, and re-conversion to analog. The FX709 has no internal buffer; the whole file must be read from RAM in real time, ie without access to the hard disk. This limits the file length to 150s.

## THE FUTURE

DG3RBU AND DL8MBT ARE working on hardware and software to permit the existing digipeaters DB0RGB (Regensburg) and DB0AAB (Munich) to handle digitised speech.

Each terminal is to contain a PC-AT with a custom-built ADC/DAC board with mass storage, derived from the mailbox. The digitized speech is transferred from there, via high-speed data link (Arcnet and RS485), to the packet net node, where it is AX25-encoded and forwarded by microwave radio to the other terminal. There, by the reverse process, the decoded data goes via the speech server to the user.

For the next two or three years the following projects are planned:

- Development of Arcnet boards and equipment drivers, and software, for data transfer to the node computers.
- Development of plug-in boards for the existing BayCom node computers to enable these to handle more data at higher speed.
- Design, construction and test of 23cm receivers and transmitters capable of data rates much faster than the present 9600Bd.
- Testing digital speech transmission but not in real time, ie using buffer memories.
- Finally, testing digital speech transmission in real time.

Considering the magnitude of the task, especially the development of microwave and high-speed digital techniques with amateur resources, success seems more than a dream away.

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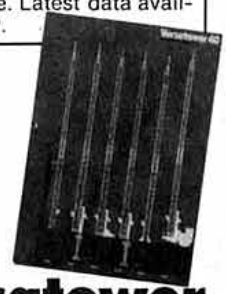

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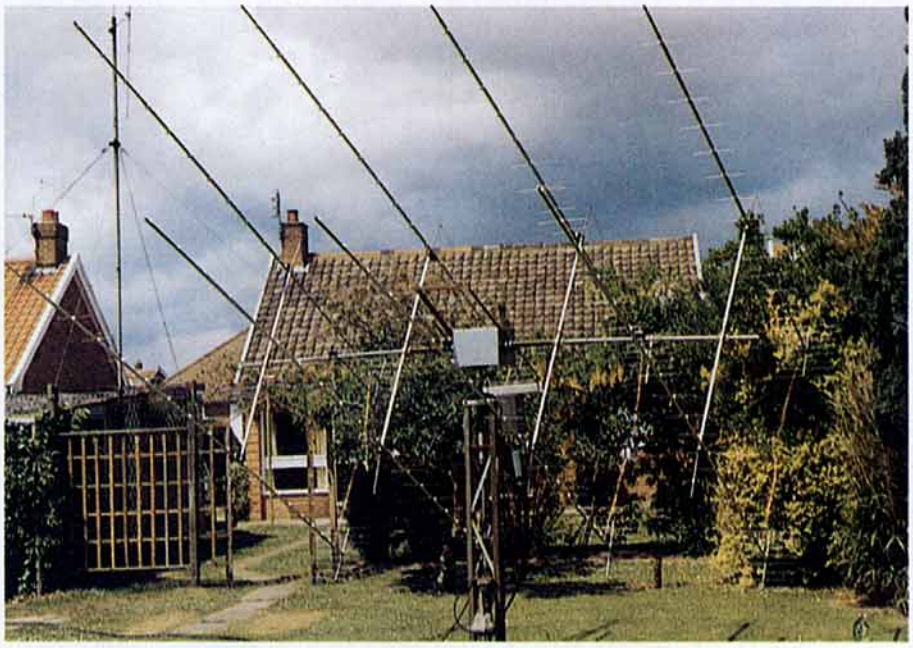
RADCOM TECHNICAL FEATURE

# An Introduction to MOONBOUNCE

## 144MHz EME by Ray Soifer, W2RS

INTEREST AMONGST UK amateurs in 144MHz earth-moon-earth (EME) communication has grown rapidly since the maximum output power available to UK CW operators was increased from 100 to 400W (from 20 to 26dBW), from 5 April 1991. Much new activity has also come through the efforts of Graham Daubney, G8MBI, and Mark Turner, G4PCS, whose outstanding results with their jointly-maintained station have inspired many to try EME for themselves. These have been described in *RadCom's* monthly *VHF/UHF News* and elsewhere. I have worked G8MBI (and 24 other stations) myself via the lunar route using no more than 150W and a single 19-ele Yagi. In January 1992, CO2KK worked KB8RQ using just 25W and two 5-ele Yagis! If you have reasonably good CW operating skills and your present 2m station is capable of meteor scatter, with the proper techniques it is probably also capable of EME.



**Doug Mallett's, G3HUL, home constructed 430MHz EME antenna system utilises 8x28-ele Yagis.**

### LUNAR PROPAGATION

LET US CONSIDER how you, as the owner of a good, but by no means exceptional, 2m CW station, might join in [1]. In this discussion, we will assume that your present station includes a good quality GaAsFET preamplifier, 100W output at the antenna and a single Yagi, such as a 14-ele Parabeam or 16-ele F9FT, having forward gain in the range of approximately 14.8dBi [2]. Does this sound familiar? The effective isotropic radiated power (EIRP) of such a station would be about 34.8dBW (3.0kW).

Now let us consider the propagation path from Earth to the moon and back again. When the moon is at perigee, it is approximately 221,000 miles (356,000km) away. It is, of course, roughly spherical (very roughly) with a diameter of about 2,160 miles (3,480km), subtending about 0.5° of arc as seen from the Earth, but with a typical radio reflectivity at this frequency of only about six percent. Under these optimal conditions, the path loss at 144MHz is approximately 251.5dB.

This approximates to the attenuation if you were trying to receive a signal from a space probe located at the orbit of the planet Jupiter some 400 million miles distant. When the moon is at apogee (253,000 miles or 407,000 km), the path loss is 2dB greater, or about 253.5dB [3].

### CALCULATING THE S/N RATIO

Optimal receiving conditions occur when the moon appears against the quietest point in the cosmic noise map - the so called 'cold sky' level. That does not occur very often but when it does, the sky noise heard by your receiver at 144MHz measures approximately 165K. If we assume a receiver noise temperature of 80K, a figure typical of a station with good GaAsFET preamp, low-loss switching circuits and a high-quality converter, the combined noise level in your receiver (in a bandwidth of 100Hz) would be about -154.7dBm with the antenna aimed at 'cold sky'. So, under these ideal conditions, how close would you come to hearing your own signal reflected from the moon?

If (S/N) = Pt + Gt + Gr - Lp - Pn,

where

Pt = transmitted power (in this case 100W or +50dBm)

Gt = transmitting antenna gain (14.8dBi)

Gr = receiving antenna gain (the same as Gt)

Lp = path loss (251.5dB)

Pn = receiving noise power (-154.7dBm)

I'm afraid the answer isn't very encouraging - according to the above equation, your received signal will be approximately 17.2dB below the noise level. But wait, there's more!

### SYSTEM DEGRADATION (DGRD)

To begin with, the reality is even worse than we have calculated. How often, after all, is the moon at perigee and at the point of lowest sky noise at the same time? Hardly ever. Some years ago, Derwin King, W5LUU, came up with a convenient definition of 'system degradation' to take into account the moon's actual position relative to the earth and the background of cosmic noise; according to W5LUU's convention, system degradation (often referred to as DGRD in lunar tracking software) is the difference between the actual S/N ratio and the one that would prevail at perigee and a 'cold sky', assuming a receiver noise temperature of 80K as we have done. Although occasionally near zero and sometimes 10dB or more, DGRD typically varies between about 1 and 4dB most of the time; the mean value which I have encountered in my EME contacts so far is 2.5dB. DGRD, as we and W5LUU have defined it, subtracts directly from the S/N ratio, so to adjust our 'optimal' predictions for more realistic conditions, we must increase the signal deficit to 19.7dB for DGRD of 2.5dB. Not a very good start, is it?

### GROUND STATION REQUIREMENTS

One of the wonderful things about EME is that you really do not have to be able to hear your own reflected signal in order to make two-way

***PHOTOGRAPHS: Although 144MHz antenna photographs were not supplied for this feature, we felt that readers may be interested in EME arrays for other bands.***

contacts. If the station at the other end has a larger antenna and more power than you have, all that really matters (most of the time) is that he hears you. After all, I hope you already know what you're sending!

So then, what kind of receiving station would it take to hear your signal via the moon? Referring to the signal deficit of 19.7 dB which we calculated earlier for DGRD = 2.5dB, a receiving array large enough to hear your station (S/N = 0 dB in a bandwidth of 100Hz) would have to have forward gain of 34.5dBi. This sounds like a lot (a power factor of 1,600 or about 32dB over half-wave dipole) but it is actually only 1.2dB more than the 48-Yagi array presently in use at W5UN in Manvel, Texas. Can Dave Blaschke's, W5UN, celebrated ears pick out a signal 1.2dB below the noise in a 100Hz bandwidth? Perhaps, but if DGRD is 1.3dB (a value that frequently occurs in practice) instead of 2.5dB, the S/N deficit for W5UN would be eliminated entirely. Under conditions which are better than average but not at all improbable, our figures show that W5UN might well be able to hear your station 'as is'.

## GROUND-REFLECTION GAIN

NOW FOR SOME INGENUITY which should help to improve your performance. The typical level of sky noise encountered at 144MHz (for my own EME contacts, an average of 291K) is not far removed from the 290K 'black body' radiation picked up from the earth itself when the antenna is pointed at the horizon rather than up into the sky, ie at lunar elevation angles of about 12° or less. Pointing the antenna at the horizon generally results in enhancement of the transmitted signal through ground-reflection gain of 3 - 5dB; the enhancement would be 6dB were the Earth a perfect reflector. In view of the actual sky noise typically prevailing at 2m, the price paid for this in receiving capability is often little to nonexistent, particularly for those living in quiet locations or operating at times when man-made noise is not likely to be prevalent [4]. Another feature of utilizing ground-reflection gain is that, since the antenna is required to be aimed at the horizon, the need for an elevation rotor may be eliminated as long as you are willing to restrict your EME operation to those times when the moon is less than approximately 12° above the horizon!

## POSSIBLE RESULTS

UTILIZING THIS GROUND-REFLECTION effect, I have made several EME contacts with W5UN at 144MHz using only 50W output to a 3.2λ, 19-ele Cushcraft Yagi, which produced an EIRP of only 32.1dBW. This is approximately 2.7dB less than the 100W station we postulated earlier. Gary Kohtala, operating as HL9TG with the US Army in Korea, put together a simple station running 80W to a single 4.2λ Yagi (35.4dBW EIRP, about the same as our assumed station) and worked not only W5UN but also KB8RQ, VE7BQH and N5BLZ. Can a 'typical' 2m CW station work EME? With ground-reflection gain, most certainly yes!

### RESULTS AT W2RS

So far, my own QSO count on 144MHz EME, with 150W and the single 3.2λ Yagi (37dBW), is 66 with 25 different stations, including not only 'superstations' such as W5UN with 48 18-ele Yagis, but seven stations in the four-yagi class, three with six, and seven (including G8MBI) with eight Yagis or the equivalent. **Table 1** lists each of the stations I have worked along with the arrays which they used to work me.

### GOING ONE BETTER (OR MORE)

If you increase the power of your station (as we have assumed it) from 100W to 200W, or add a second Yagi, you'll have more EIRP than I do! A 'serious' EME station which uses the new UK CW power limit of 26dBW to four 4.8λ Yagis (eg K6MYC's popular 2m-5λ design) would produce approximately 48.2dBW

**David Jones', GW3XYW, dish is 22 feet (6.7 metres) in diameter. This impressive array provides effective earth-moon-earth (EME) operation on the 23cm (1.3GHz) band.**

**W2RS – 144MHz EME**

**Stations Worked and their Antennas Employed (1)**

| Station | Array (2) | Estimated gain (dBi) | Notes |
|---|---|---|---|
| W5UN | 48x4.8λ | 33.3 | Random QSO, worked with 50W CW |
| W5UN | 48x4.7λ | 32.5 | Random QSO, worked with 150W SSB and 50W CW |
| W5UN | 32x4.7λ | 30.4 | Random QSO, worked with 130W CW |
| KB8RQ | 24x5.7λ | 30.0 | Random QSO, mutual horizon gain |
| SM5FRH | 24x5.2λ | 29.7 | |
| KB8RQ | 24x4.8λ | 29.5 | Random QSO |
| KB8RQ | 32x3.2λ | 29.3 | Worked with 130W CW |
| N5BLZ | 16x5.2λ | 28.0 | |
| KB8RQ | 16x4.8λ | 27.8 | |
| W4ZD | 16x4.8λ | 27.8 | Mutual horizon gain |
| WB5LBT | 16x4.8λ | 27.8 | |
| K1WHS | 24x2.2λ | 27.0 | Mutual horizon gain |
| N5BLZ | 12x4.7λ | 26.7 | |
| SM7BAE | 16x3.1λ | 26.3 | Worked with 130W CW |
| K2GAL | 8x5.9λ | 26.1 | Mutual horizon gain |
| DL8DAT | 16x2.8λ | 26.0 | |
| VE7BQH | 336ele Coll | 25.7 | |
| AF9Y | 6x6.2λ | 25.4 | |
| HB9CRQ | 8x4.8λ | 25.0 | |
| K9MRI | 8x4.8λ | 25.0 | |
| I2FAK | 8x4.7λ | 25.0 | |
| VE7BQH | 224ele Coll | 24.2 | Worked with 130W CW |
| G8MBI | 224ele Coll | 24.2 | |
| OK1MS | 8x3.6λ | 24.1 | |
| SM2CEW | 6x4.2λ | 23.6 | Mutual horizon gain |
| K2GAL | 4x6.2λ | 23.3 | Mutual horizon gain |
| K3HZO | 6x3.2λ | 23.1 | Mutual horizon gain |
| N1BUG | 24x4ele Quad | 22.8 | Mutual horizon gain |
| AA4FQ | 4x5.1λ | 22.3 | Ionospheric scintiliation |
| W7VXW | 4x4.8λ | 22.2 | Strong libration peaks |
| KI3W | 4x4.2λ | 21.9 | Mutual horizon gain |
| WB2JHG | 8x1.5λ | 21.6 | Mutual horizon gain |
| WB2OYC | 4x2.2λ | 19.7 | Mutual horizon gain |

**Mean Conditions Prevailing:**

| | |
|---|---|
| Sky noise | 291K |
| Path loss over perigee | 0.8dB |
| System degradation (3) | 2.5dB |

**Notes:**

(1) Except when noted, W2RS output power was 150W CW to a single 3.2λ Yagi. 150W CW to a single 3.2λ Yagi.

(2) Except as noted, all antenna systems are multi-Yagi arrays where nλ is the length of each Yagi in wavelengths.

(3) System degradation, as defined by W5LUU, is the overall S/N degradation with respect to ideal conditions (perigee and sky noise of 165K) assuming a receiving system noise temperature of 80K.

**Table 1.**

| First 90 Seconds | Final 30 Seconds |
|---|---|
| G8MBI DE W2RS G8MBI DE W2RS G8MBI DE W2RS | G8MBI DE W2RS K |
| W2RS DE G8MBI W2RS DE G8MBI W2RS DE G8MBI | W2RS DE G8MBI K |
| G8MBI DE W2RS G8MBI DE W2RS G8MBI DE W2RS | O O O O O O O K |
| RO RO RO RO RO RO RO RO RO RO RO RO RO RO | DE G8MBI K |
| R R R R R R R R R R R R R R R R R R R R | DE W2RS K |
| 73 73 73 73 73 73 73 73 73 73 73 73 73 73 | DE G8MBI AR |

**Table 2 (see page 68 - Operational Procedures).**

EIRP; 2m EME stations with EIRP in this range, eg, OZ1HNE, EA3DXU and WD5AGO, have worked more than 100 different stations 'off the moon'. Many stations have now earned Worked All Continents via 144MHz EME, and W5UN has already received the first 144MHz DXCC award with the several others having 2m country totals that are nearing the century mark.

For those with EIRP of 40dBW or more, the greatly increased flexibility to be gained by adding an elevation rotor would be well worth while. Full az-el control also offers a reduction in man made noise and the ability, when receiving to take to take advantage of times when lunar sky noise is well below 290K. On the other hand ground-reflection gain generally disappears at antenna elevation angles above 12° or so, and for the low-power station, the 3-5 dB of additional signal strength it affords often means the difference between success and failure.

## MUTUAL HORIZON GAIN

WE'RE NOT QUITE THROUGH WITH the ingenuity which makes 144MHz such an interesting band for EME. Depending upon the position of the moon relative to the two stations involved, schedule times sometimes can be chosen so that ground-reflection gain is available at both stations simultaneously. Instead of 5dB, the total enhancement from this source can thus approach 10dB. This 'mutual horizon gain' effect was used to accomplish all but two of my contacts with the four-Yagi stations, as well as one with SM2CEW, a six-Yagi station in Lulea, Sweden, proving that mutual horizon gain does not always require both stations to be in close geographic proximity [5]. Because both stations in such a contact will be picking up 'black body' radiation from the Earth, it is often advantageous in such cases to schedule times when the moon will be at or close to perigee to minimize path loss, even though the predicted sky noise may be at or even somewhat above 290K.

PHOTOGRAPH GW3XYW

**An 8m diam. dish is used by OE9ERC on 2.3GHz.**

## LIBRATION ENHANCEMENT

THE MOON'S LIBRATION (wobbling) in orbit gives rise to a quasi-random fading effect on reflected signals. Given the statistical fading distribution, it has been calculated that this libration fading can add 4.5dB to reflected signal levels 10% of the time and 7.0dB 1% of the time. The maximum fading enhancement is in the neighbourhood of 10dB, which would be equivalent to momentarily increasing the moon's reflection coefficient from 6% to 60% [6]. The duration of these signal enhancements is inversely proportional to frequency. At 70cm they typically last less than one second, rendering them relatively useless for practical communication at the narrow bandwidth commonly employed in amateur EME. However, at 2m, libration peaks often last as long as 3-4 seconds, making them extremely useful when CW sending speeds of 15-20 WPM are employed. For example, at 18WPM, my call sign takes less than three seconds to send.

### HEARING MY OWN LUNAR ECHOES

With my output of 37dBW EIRP, the theoretical S/N ratio for hearing my own lunar echoes (excluding ground-reflection gain and assuming a noise level of 290K) is approximately –17.4dB; I went nearly five years without once hearing my own signal coming back from the moon. However, making use of mutual horizon gain (when listening for one's own echoes, the horizon gain is always mutual!) and libration enhancement at times of lunar perigee, this deficit has been overcome for brief bursts of signal (less than 1 sec) captured on tape. The preceding discussion illustrates how this was done.

When listening for one's own lunar echoes, it is important to realize that the distance from the Earth to the moon and back again results in significant time delay, which ranges from 2.4 sec at perigee to 2.7 sec at apogee.

## OTHER UNUSUAL EFFECTS OF EME

### DOPPLER EFFECTS

Although the moon's motion relative to the Earth is relatively slow, EME signals experience significant Doppler shift; the main contributor to this is actually the Earth's rotation on it's axis. For the maximum case, ie a station on the equator listening for it's own echoes when the moon is due east at moonrise or due west at moonset, the Doppler shift would be about 460Hz at 144MHz. The return signal would appear higher in frequency than nominal by that amount with the moon to the west. The actual Doppler shift encountered in practice is generally less, depending upon the actual geometry involved. Typical values at temperate latitudes, when the moon is near the horizon at one of the two stations involved, are 200-300 Hz.

### FARADAY ROTATION

As with man-made satellites, Faraday effects are commonly encountered in EME as well. As virtually all Yagi antennas utilised in EME work are horizontally polarised, Faraday can be a major impediment to successful communication, often necessitating multiple schedule tries before a completed contact can result. Linear polarity is used in 2m EME rather than circular mainly because forward gain is at such a premium relative to antenna size and weight; in addition, ground-reflection gain is maximised when horizontal polarity is employed.

A few 2m EME operators, notably Lionel Edwards, VE7BQH, have experimented with Z-axis rotation in an attempt to match the polarity of the incoming wave. Results achieved have been very successful; however, not many stations have taken this approach because of the mechanical complexity involved. Using a Z-axis rotatable collinear array, VE7BQH has made a study of the Faraday effects, concluding that truly linear downlink polarity occurred only about 15% of the time. About 60% of the time, multipath effects (combined with frequency and phase distortion) resulted in signals appearing at multiple polarity points at the same time. 25% of the time, the incoming signal exhibited no discrete polarity characteristics at all, but appeared approximately equal in strength regardless of the Z-axis position of his antenna! [7]

## LUNAR TRACKING AIDS

AS WITH MAN MADE SATELLITES, it is necessary to track the moon in order to point antennas properly; the large arrays often employed in EME work, and the weak signals, require more precise tracking than is often the case with artificial satellites. Man has been tracking the moon for thousands of years, certainly long before the invention of the computer. In the early days of EME, the 1960s and 1970s, amateurs often used nautical almanacs to aim their antennas. Even today telescopes and optical boresights are commonly used, albeit more often in Arizona than in Britain. However, just as with Oscars, the use of a computer makes EME far easier and more enjoyable.

### SATELLITE-TRACKING SOFTWARE

Many of the modern satellite-tracking programs, such as Satscan and Instant Track, will track the moon with accuracy sufficient for a single Yagi station. However, they lack features important for arranging EME schedules such as a built-in sky noise map for calculating system degradation (DGRD). For all but the most casual applications, I strongly advise the use of a good special-purpose EME program.

### SPECIAL-PURPOSE EME SOFTWARE

For those with IBM PC-compatible hardware, readily available alternatives include a public-domain program by VK3UM that is in common circulation as well as a newer, more complete program called Tracker by WA1JXN; the latter is also available for the Amstrad PCW series. Information on obtaining either of these programs in the UK appeared in G3FPK's fine column in the May 1991 issue of *RadCom* [8]. By far the best of the current EME programs which I have seen, in my judgement, is W5UN's own Skymoon [9]. Hardware requirements for this are an EGA or VGA display plus a hard disk. In addition to the features of the other programs mentioned, Skymoon incorporates the entire

current *144MHz EME Directory* of active stations so that mutual windows may be determined easily.

### OTHER USEFUL INFORMATION SOURCES

The Directory itself, containing well over one thousand detailed entries, is updated continuously and may be obtained from Bev Cavender, W4ZD [10].

Also strongly recommended are the monthly *2-Meter EME News* published by K0IFL [11] (successor to the now defunct *2 Meter EME Bulletin*) and the UK newsletter, *2M Direct*, edited by G4PCS [12].

## EME OPERATION

### FINDING STATIONS TO WORK

Now that you have assembled a station and know where to find the moon, what do you do? Most current EME activity takes place by prearranged schedule. Virtually all the operators mentioned in the newsletters (as well as the larger stations listed in Table 1) would be happy to arrange such a schedule with you. EME operators, after all, are in a friendly competition to see how many stations they can work.

As a 'new boy' (or girl), you'll soon find yourself popular indeed! During almost any weekend with favourable EME conditions, you are likely to find several of the larger stations calling CQ on their customary calling frequencies near the low end of the 2m band. W5UN, for example, may generally be found on 144.008MHz while KB8RQ is usually on 144.016. The antennas listed in Table 1, by the way, are those in use at the time I worked the station - many have since installed larger arrays.

There are approximately three times as many active EME stations on 2m as on 70cm, no doubt because of the wide availability of suitable equipment; W5UN has worked over 1,400 of them. Among those currently active are 24- and 16-Yagi 'super stations' such as KB8RQ, SM5FRH, DL8DAT and N5BLZ with 28-30dBi forward gain, which have no difficulty working those with 100-150W and a single Yagi.

The most common way of arranging schedules is through the 2m EME Net which meets Saturdays and Sundays on 14.345MHz. The net control stations normally listen for check-ins from Europe after collecting schedule proposals from North America; this generally takes place around 1900 or 2000GMT. This frequency is also used as a meeting place for EME and VHF-oriented operators at times when the nets are not in session.

## CW V SSB

OWING TO THE WEAK SIGNALS involved, more than 99% of all current Earth-Moon-Earth activity utilises CW rather than SSB. The latter is sometimes used by the larger stations and 144.155MHz is the usual SSB gathering place. I have had several SSB contacts with W5UN but have not been successful using this mode with other stations.

### OPERATIONAL PROCEDURES

On-the-air EME procedure differs somewhat between 2m and 70cm. At 2m, schedules are typically half an hour in length (although I normally run mine for one hour) and are divided into two-minute segments (not 2.5 minutes as at 70cm). There is nothing sacred, of course, about two-minute segments. I have found, for example, that mutual horizon gain schedules work best if each station transmits for one minute in turn (owing to the extremely rapid Faraday rotation often encountered when the moon is near the horizon at both stations), and W5UN prefers one minute segments for his random CQ activity. In the absence of agreement to the contrary, however, two-minute segments are normally assumed.

Also by convention, the easternmost station transmits during the first segment of each hour, then the third, etc. At 2m, the T-M-O-5 system of signal reports employed at 70cm has fallen into disuse. In internationally-accepted 2m EME procedure, the only signal report sent is the letter 'O', and that only after both call signs have been received satisfactorily. Receipt of the 'O' report is acknowledged with the letter 'R' for 'roger'. A typical 2m EME QSO would go something like **Table 2**, segment by segment:

In this example, I began sending 'O' reports in the final 30 seconds of each segment as I heard Graham's and my call signs from him. The 'RO' from G8MBI signifies that he has heard my 'O' as well as both call signs from me and is giving me a report of 'O' in return. Had he heard my 'O', but just the call signs, then he would send call signs in the first 90 seconds and 'O' in the final 30 seconds, until he hears my 'O' or I hear his.

Assuming that he hears my 'O' first, then he would switch to the 'RO' sequence indicated. When I hear his 'RO', I switch to send 'rogers' ('R'). The 2m EME contact is considered to be complete at the moment G8MBI hears my 'R' since I would not have been sending that had I not heard his 'RO'. Thus, both stations have received call signs, reports and rogers. The sending of '73' is a nice touch but is actually superfluous.

The 8x21-ele F9FT antenna used by SK6AB.

## IT'S YOUR TURN

I HOPE YOU WILL CONSIDER giving 2m EME a try. After all, the moon (sometimes referred to as 'Oscar Zero' by satellite enthusiasts) is one satellite that is always available for use, is incapable of being overloaded and actually encourages high levels of EIRP. As I have hopefully demonstrated, however, high EIRP is not at all necessary if the proper techniques are employed. As Pat Gowen, G3IOR, has often remarked, EME is the ultimate operating challenge. If you haven't yet tried it, the moon awaits!

## REFERENCES


[1] For similar calculations involving Oscar-type stations at 2m and 70cm, see my paper, 'Oscar Zero: An introduction to EME for the Satellite Operator', in the *Proceedings of the sixth AMSAT-UK (University of Surrey) Colloquium (1991)*, from which this article has been revised and adapted. The Proceedings are available from AMSAT-UK, 94 Herongate Rd, Wanstead Park, London E12 5EQ.

[2] Antenna gain estimates for this article were taken from LM Edwards, VE7BQH, '2 Meter EME Antennas', *2-Meter EME News*, Issue 8, May 1990.

[3] For a further discussion of the technical parameters of EME, see *VHF/UHF Manual*, 4th edition, G R Jessop, G6JP, RSGB, 1983, pp 10-16 et seq.

[4] See also my articles in *QST*, 'QRP EME on 144MHz', Feb 1989, pp 28-32, and 'More QRP EME on 144MHz', Oct 1990, pp. 36-38.

[5] Further details on this effect are given in my paper, 'Mutual Ground Gain', *2-Meter EME News*, Issue No 17, Feb 1991.

[6] C Neie, DL7QY, 'Libration Fading', *2 Meter EME Bulletin*, Oct 3, 1988 (now out of print).

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[9] D R Blaschke, W5UN, 9102 Kings Drive, Manvel, Texas 77578, USA.

[10] B B Cavender, W4ZD, PO Box 1083, Lake Placid, Florida 33852, USA.

[11] J M Carter, K0IFL, PO Box 554, Union, Missouri 63084, USA.

[12] M H Turner, G4PCS, 35 Culverhouse Road, Luton, Beds LU3 1PY.



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| TS-850SAT | £1625 | FT-747GXII | £689 | | |
| TS-450S | £1220 | FT-757GX2 | £1035 | | |
| TS-450SAT | £1375 | FT-767GX | £1685 | | |
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| 20813 13 el | 55.00 |
| 20817 17 el | 69.00 |
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**Peter Waters G3OJV/G0PEP**

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Our price £299!

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**Coming shortly — MFJ 20M transceiver**

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| PT-120 | 20Amp 13.5V fully protected (non meter) | 119.00 |
| PC-120 | 20Amp 13.5V fully protected with meter | 149.00 |
| PT-135 | 30Amp 13.5V fully protected (non meter) | 149.00 |

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| SR-200 | 2m 10-50W in 200W max out SSB/FM | 289.00 |
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| X-510 | 2m/70cms 8.3/11.7db gain 5.2m long | 129.00 |
| X-700 | 2m/70cms 9.3/13db gain 7.2m long | 219.00 |
| V-2000 | 6m/2m/70cms 2.15dbi/6.2db/8.4db 2.5m | 99.00 |
| X-5000 | 2m/70cms/23cms 4.5/8.3/1.7 db 1.8m | 109.00 |

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| NR-790 | 2m/70cms 4.5/7.2 dB gain 100 Watts | 48.00 |
| SG-7900 | 2m/70cms whip 5.0/7.5 db supergainer | 68.00 |
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| M-285 | 2m 5/8th whip PL259 | 16.95 |
| EL-2E | 2m 7/8th deluxe whip PL259 | 33.95 |
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| EC-H | PL259/SO239 cable kit for DP-GI | 9.95 |
| SP-M | Heavy duty magnetic mount with cable | 25.95 |

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A great new range of antennas that are pre-tuned, beautifully engineered to professional standards and constructed of heavy duty, multi stranded, clear plastic coated wire. All antennas are balun fed and fitted with SO239 sockets.

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|---|---|
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| Windom 80/40/20/17/12/10m 200W 42m L | £49.00 |
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| Windom 40/20/10m 1kW 21m L | £59.00 |
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| HF Antennas For All Locations | £7.25 |
| How To Pass ARE | £6.75 |
| Log Book For Mobile Operators | £1.99 |
| Morse Code For The Radio Amateur | £3.75 |
| Practical Wire Antennas | £7.95 |
| Radio Amateur's Exam Manual | £6.75 |
| Log Book For Receiving Stations | £4.00 |
| Log Book For Transmitting Stations | £2.50 |
| VHF/UHF Manual | £10.24 |

## Special Publications

| | |
|---|---|
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| Marine Frequency Guide | £4.95 |
| Secret Of Learning Morse | £4.95 |
| HF Oceanic Airband Guide | £3.95 |
| QRA Locator Map (Colour) | £5.95 |
| World Prefix Map — New (Colour) | £5.95 |
| SWL Frequency List 1-30 MHz | £8.95 |
| VHF/UHF Airband Guide 4th Ed | £6.95 |
| World Radio & TV handbook 1992 | £18.99 |
| Mastering Packet Radio | £9.99 |

Add £1 post per book £2 max.

## !!Bargains and News!!

**AZDEN PCS-7000**
The new 2 metre mobile from AZDEN complete with wideband receive and AM airband. This is a fabulous rig with genuine automatic tone-burst that can be programmed into any channel. One of the most underrated products on the market! £299

**YAESU FT-890**
We've got good stocks of this latest hf rig from Yaesu. If you want it with a power supply we can offer you a big saving. Telephone for details.

**PART EXCHANGE**
With pleasure. We are always looking for good clean gear so whether you are buying or selling, give us a call today.

**YAESU FT-470 CLOSE OUT!**
We've got a few pieces of this dual band handheld at a special price. Full duplex and dual display, brand new with ni-cads and charger. Normal price £435 Our Price £319!!

## ALINCO Save £50!

### DR-112EM 2m Mobile 25 Watts £219.95

This current mobile is due to be replaced and so we are clearing our stocks. Fabulous performance at a price you have never seen before and are not likely to see again! Each unit is brand new 1992 stock with warranty cards. You get 14 memories, up/down frequency control, programmable steps, 1750Hz tone, scanning, hardware, and mic etc, all in a size that will fit the modern car. Phone or call today for full details!

### DR-112E 45 Watts Reduced to £239

**Save £50!**

These are the same as the DR-112EM but higher power. We've only got 10 pcs so get moving now!

## ALINCO Save £129!

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We have the last few models we need to get rid of. This price is below cost so you won't ever see this price again. We've got 12 pcs and all are brand new with full warranty. Get in there quick if you want to snap up a bargain!

## KENWOOD TH-77E Dual Band 2m/70cms

**Save £70!**

**£325!**

- 5 Watts max
- Dual display
- 42 Memories
- 12 Months warranty
- DTMF

The Kenwood TH-77E has been a popular handheld and was good value at the old price of £395. Now we can offer it at a price that is almost 20% lower! This is genuine UK sourced stock with full UK warranty and of course you have the added bonus of buying it from one of the UK's most reputeable dealers. Everything is supplied including ni-cad pack, AC charger, dual band aerial, etc. Send or phone for colour brochure today! We expect these to go pretty quickly.

## NEW! ALINCO

### DR-599E 2m/70cm Dual Band Transceiver £549

Just arrived, this is the replacement for the DR-590E and has been radically updated. It now includes the AM VHF airband and extended receive capabilities. Also included is the automatic remote repeater function enabling you to operate your own cross-band repeater. Power has been increased to 50 Watts per band and we have the full colour brochure available for the asking.

## NEW! ALINCO

### DR-119E 2m Mobile 50 Watts £289

See us at RSGB '92

The latest 2 metre mobile from ALINCO now offers superb value. No larger than a car radio it boasts 50 Watts output and extended receiver coverage. Completely re-styled it offers all the usual features including memories, scanning etc, and comes with microphone, mounting kit and full warranty. For more details send or phone for brochure.

## ALINCO Save £40!

### DJ-162ED 2.5 Watts AM Airband 108-142MHz FM Marine 130-174MHz £169!

- 21 Memories
- Max 5 Watts output
- Key-pad Entry
- LCD Display
- 1750Hz Tone
- 12 Months Warranty

Here's your chance to purchase one of the latest products to come from ALINCO at a really bargain price. Each DJ-162E is brand new factory fresh stock with full UK warranty. Coverage is 144-146MHz plus extended receive. We only have 40 pcs so its first come first served. You get all the accessories including helical, belt clip, strap and dry battery box (6 x AA cells). These really are superb value. You won't see the likes of these prices again!

**Head office: Retail and Mail Order: 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835/204965. Fax: 205843**
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**NORFOLK AMATEUR RADIO CLUB**

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**10am to 5pm**

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**ENTRANCE £1 CHILDREN, OAPs & REGISTERED DISABLED 50p**

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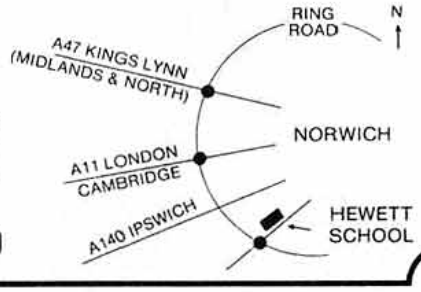


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**Dunstable Downs Radio Club**
**Present the 8th**
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# DataComms

**RICK STERRY G4BLT**
1 Wavell Garth, Sandal Magna, Wakefield, West Yorkshire WF2 6JP

THIS MONTH'S COLUMN is being prepared in a bit of a rush I'm afraid, as my employer actually expects me to do some work for him from time to time! I had hoped by now to have had a go at TCP/IP, and write about my experiences. However, in order not to tie up my main machine, (I could have used the excellent but slow PC emulator), I had intended to purchase a PC-compatible machine, which would have involved *money*. However, Jonathan Naylor, G4KLX, has successfully ported the NET software to run in 'native' mode on the Acorn Archimedes machines, so I have run out of excuses, I'll do it, I'll do it . . . .

I have now located a copy of Hellschreiber software for the Apple-II machine, so if anyone is interested please send a formatted disk, with return postage, address label etc, to Javed Agha, G4VKH, QTHR in Cheetham, Manchester.

The Spectrum version of Hell has proved popular, and Bernhard Spencer, G3SMW, has already had a Hell contact with PA0CSC and PA0KDE on 7·030MHz. He used no TU whatever; the computer was connected directly to the FT101E mic and LS sockets. Gordon Bennett, G3DNF, has also used the Spectrum program to listen to PA0SE and others, but has yet to 'take the plunge' on transmit. Thanks to both these gentlemen I have been able to put together some more notes on the program. If you would like a copy then please send me an SASE.

## A ROSE BY ANY OTHER NAME

EVERYONE LIKES TO have a good grumble about the regulations governing packet radio operation in the UK, yet we are often told that they are among the most liberal in the world. Well, what do you make of this?

In a recent issue of *Digipeat*, the newsletter of the Australian Amateur Packet Radio Association, I read of an extraordinary situation concerning two different types of network node used in Australia: the familiar NETROM/TheNET, and one called ROSE, originating in the USA. I gather that ROSE started out as a TNC eprom like NETROM, but has now also been ported across to run on a PC, rather like the BPQ switch code.

According to the article, whenever a connection is made from a ROSE node to a NETROM node, and then further connection beyond the first NETROM node is made, the packets issued by the ROSE node are illegal! Also, it is claimed that users are acting illegally if they use NETROM nodes at level 2.

This seems utterly bizarre to me, and I can't imagine that this is what the authorities actually intended. I can only assume that the regulations simply cannot cope with the technology, to an even greater extent than here in the UK. We think we've got problems . . . .

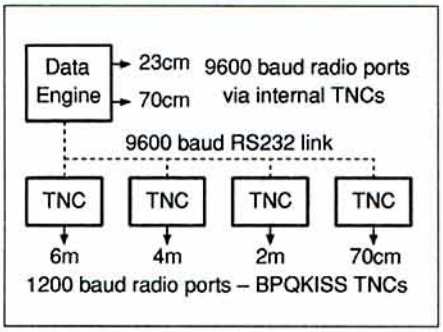


**Fig 1: Typical layout of a Data Engine cluster. Note how the fast internal TNCs are used for the critical 9600 baud radio ports.**

## MORE PACKET RADIO BOOKS

I MENTIONED THE RSGB's own book for beginners in packet, *Packet Radio Primer*, in the March issue. I have since come across two more which I think are worth mentioning.

BARTG publish the *Beginners's Guide to Packet*, as part of their Beginners' Guide series.

Also, there is a book called *A Practical Guide to Packet Operation in the UK*, by Mike Mansfield, G6AWD. This is rather unusual in that, unlike the more slickly-presented RSGB offering, it is more of a 'homemade' book. It is produced on a laser printer in single-sided A4 format, with a plastic spiral binding. This leaves plenty of space for notes, and since the book is virtually printed on demand, it is constantly being kept up to date. The book is available from various amateur radio dealers, including Siskin Electronics for example, and is well worth a look whether you are a beginner or not.

## DATA ENGINES GO FASTER

MANY OF YOU MAY have heard of a device with the extraordinary name of Data Engine. To me, this conjures up a mental image of some bizarre mechanical device that Charles Babbage himself might have devised! In fact, it's a rather useful little box of tricks that replaces the diode matrix normally used to connect several TNCs together in a node cluster.

Diode matrices get very unwieldy when you link more than about 4 or 5 TNCs together, and they are a very inefficient way of optimising the data flow between the TNCs. Not only that, but such clusters can be a bit temperamental, requiring occasional intervention by the (remote) SysOp. In extreme cases, the TNCs may have to be reset manually on site. Steve Wilson, G3VMW, has experience of node clusters and Data Engines, so I will leave the rest to him:

"In its basic format, the Data Engine is a two-port TNC with internal plug-in modems in either 1200 baud or 9600 baud (RUH-compatible) versions. You can also use external RUH modems if preferred. It is fitted with Kantronics 1·03 TNC Firmware in a 27C512 EPROM and operates as a very high specification TNC with PBBS (PMS) facilities. It can be operated in Host Mode and KISS Mode, or as a 'plain vanilla' dual port TNC. The Data Engine is small and is sized 45 x 150 x 230mm and weighs only 1kg, with a very low power consumption of <150mA with one internal DE1200 modem installed.

"The real power of the Data Engine is the fact that it is designed around a PC compatible V40 microprocessor running at 10MHz and an 85C30 SCC (Serial Communications Controller), all on a four-layer PCB which doesn't generate RFI! It is in effect, a PC in a very small box. The two internal Data Engine modems are connected via the PC bus and as a result, data throughput is very fast indeed.

"Because the Data Engine is built around a micro-processor, it has been possible to use it as a developer's platform for software running data communications applications. John Wiseman, G8BPQ, has developed a version of his packet switch software to run in the Data Engine in EPROM. The existing firmware EPROM is simply replaced with a BPQ EPROM, and the Data Engine becomes a full-featured BPQ switch.

"A BPQ Data Engine node has the advantage of a single callsign/alias for a multi-port network node, an improved statistics package, network management facilities, and on the latest version of the BPQ switch (4·05), an integral MH facility which is available on a individual port basis, eg *MH 1* will list all stations heard on Port 1 of the packet switch.

"One of the real advantages of a BPQ Data Engine node with BPQKISS polled TNCs, is the way it solves the rather nasty problem of internal routing loops which can occur with multiport NET/ROM clusters. Although solutions to this problem have been suggested (either by using a diode matrix which does not fully interconnect all the TNCs, or by careful manipulations of qualities), none seem to be totally successful.

"I was lucky enough to be able to Beta-test the early versions of the BPQ software for the Data Engine in the SHEF:GB7YS packet switch at Sheffield. The software is very stable and reliable, and even after a power failure or glitch; it always resets cleanly.

"The effect of removing the old diode matrix, (which supported only four TNCs), and replacing it with the Data Engine in a configuration similar to that in **Fig 1**, was an immediate and impressive speed improvement, and a noticeable increase in data throughput. There was also the advantage of the two additional ports, which were not previously possible with a multi-way diode matrix.

"The RP:GB7RP and CATT:G3EKL nodes now have Data Engines installed, as has the node cluster on the 150ft level of Emley Moor. This uses a Data Engine and six BPQKISS TNCs, to form an eight-port BPQ node - WP:GB7WP rather than the familiar WP21, WP42 . . . . series.

YAXPAK will be installing a Data Engine at the XGN node site during the spring or early summer, and a new BRAM node will appear in 1992 called YORKS:GB7YW, also running a Data Engine and BPQ code. I think that Yorkshire packet has a healthy future!"

# Microwaves

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

ANDY, G4JNT, SENT A detailed letter which reminded me that in the March column, I again mentioned the continued use of the old five-character European QRA locator as being outdated, inaccurate and very 'parochial' ie being only suitable for local, not world-wide use. It is impossible to *accurately* convert QRA Locators into any other, more precise, locator system in current amateur use.

On the higher microwave bands (10 and 24GHz or above) it is necessary to calculate the bearing to another station to be able to point a high gain dish antenna accurately. If the bearing isn't known to at least the 3dB beamwidth of the antenna (in the order of a degree or two), then the QSO may not happen. This is especially so in the case of the long distance, weak-signal QSOs now being made routinely. Dishes used on 10GHz, typically, now have diameters of 0.6m or more, resulting in 3dB beamwidths of less than 3°. In the recent past, three methods of bearing calculation have been used:

1) The European 'QRA Locator' - a five-character reference derived in a peculiar, non-decimal way, from latitude and longitude, NOT suitable for use beyond Europe. Accurate to about +/- 3km.
2) The 'National Grid Reference' (NGR). This is restricted to the UK alone (G, GD, GI, GJ, GM and GU). Bearings are calculated from the relative Eastings and Northings by using 'triangulation'. This has two major flaws: The first is that only UK stations have an NGR to use for the calculation, and the the second is that, as the location of either station moves away from the 2° W longitude line (where the UK National Grid is aligned), the accuracy of bearings falls off. The NGR can be accurately converted to Lat/Long, but this does not solve the first problem. Accurate to about +/-0.5km with a *normal* 8-character reference.
3) The world-wide 'LOC' (Locator) system using a normal 6-character reference for each station, derived from Latitude and Longitude. The mathematics are more complicated but, with a programmable calculator or computer, this is no problem. It has the added advantage that bearings are exact and of the same accuracy, world-wide. The whole world can be divided into Fields, Squares and Sub-Squares. For example, IO (Field) 90 (Square) IV (Sub-Square), gives Andy's location to an accuracy of about +/-3.5km from anywhere on the earths' surface.

The normal 6-character 'LOC' reference thus specifies the location to about 7km. This may be accurate enough for most world-wide VHF/UHF purposes but is not accurate enough for most microwave applications, even over quite short distances. Although the bearing calculation is *exact*, it is between the *centres of the loc squares*. Thus, if two stations are using their LOC for bearing determination, there is the possibility of a combined positional uncertainty of up to 14km. Over a path of 200km, this could lead to an error in bearings of 4°, enough to 'destroy' the link, although it must be said that troposcatter signals tend, in practice, to effectively broaden the apparent antenna bearing. The effect of this inaccuracy is illustrated in **Fig 1**.

Andy suggested (as was suggested a long time ago, here and elsewhere) that the solution is quite simple: *Extend* the Locator system by adding a further two numbers at the end to sub-divide the Sub-Square into 10 x 10 smaller units, each approximately 0.5km in size. Each of these 'Sub-Sub-Squares' (maybe '*micro*squares' for *micro*waves?) consists of 0.25 minutes of Latitude and 0.5 minutes of Longitude. This will reduce bearing errors to a fraction of a degree. Enough, even, for the biggest dishes! As an example, the Locator given above would become IO90IV58, see **Fig 2**. The basic world-wide LOC system, using GM4ANB's 'look-up' tables, was re-published in Vol 1 of the *Microwave Handbook* (available from RSGB sales - see Book Case pages).

By using the full 8-character LOC in contests, the ambiguities in scoring that currently arise due to some stations using NGR and others LOC, would thus be eliminated, since the distance between them would be known to better than 1km. Andy has programs, for a PC compatible and for the Casio FX730, to convert between NGR, Lat/Long and LOC and also to calculate accurate bearings. The conversions are accurate to at least 50m (1mm on the 1:50,000 Ordnance Survey maps!). He will provide copies (QTHR) on receipt of an SASE (and disk for the PC version). My thanks to Andy for re-awakening interest in accurate distance and bearing calculations at a time when such calculations are assuming a new importance.

## BEGINNERS CORNER

THIS MONTH SOME GOOD news for beginners! With the Novice Licence in mind, the Training and Education Committee (TEC) of the RSGB is, at the moment, preparing a 'Transmitters for the Novice Bands' book which covers low-power (QRP) transmitters and some simple transmitter test equipment for *all* the Novice bands from 'Top Band' (160m) through to microwaves, including both the 1.3GHz and 10GHz microwave bands.

Similar books covering receivers and antennas will be produced. Many of the most reliable and 'easy to build' microwave designs you've seen (or missed!) here and, maybe, in the *Microwave Handbook*, will be collected together in an easy-to-read book to guide you through the construction and testing of transmitters. The Microwave Committee Components Service will be able to supply the special components and printed circuit boards (PCBs) needed for many of these microwave projects, although 'ordinary' components can be obtained from suppliers who advertise in *RadCom* and elsewhere.

Don't forget that the Microwave Committee and other RSGB Committees, of course, are here to help you in whatever way we can. In the microwave bands, if we can't help you directly, we might know someone who can! So if you have a problem, then all I need is a letter and a stamped, self-addressed envelope (SASE) for either a reply, or to point you in the right direction.

This month's 'technical' spot is a design for a simple power indicator, based on a directional coupler, which can be left in circuit all the time to monitor transmitter output. It is suitable up to about 50W. **Fig 3** shows the layout of the tracks which are etched onto a piece of high quality 1.6mm double sided

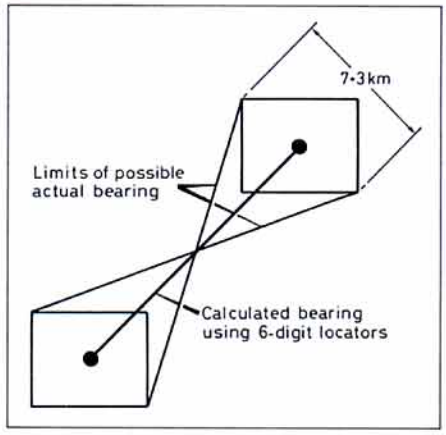


**Fig 1: The maximum angle error using QRA locator squares.**

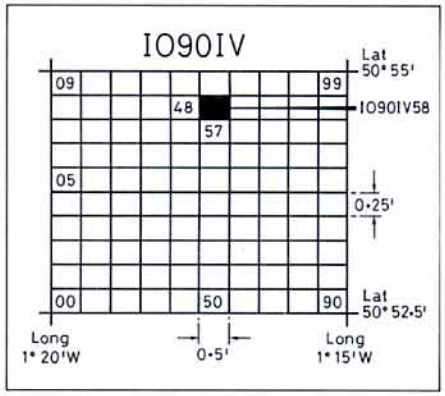


**Fig 2: Dividing the sub square(s) into micro-squares.**

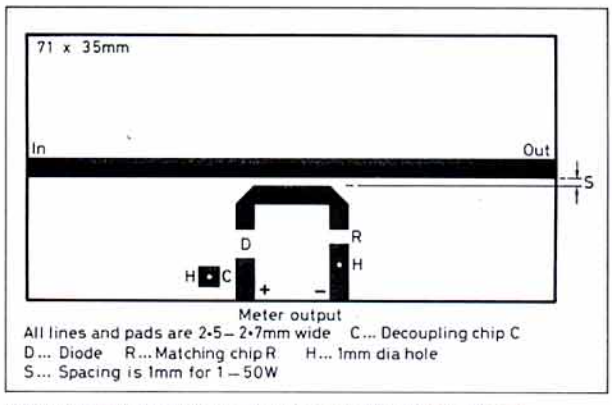


**Fig 3: Printed circuit lay-out for a simple directional coupler.**

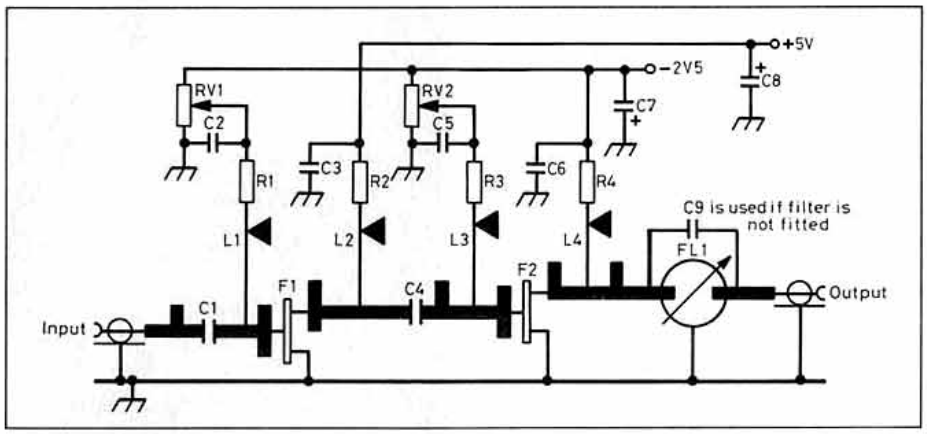


**Fig 4: Circuit of the G3WDG005 amplifier.**

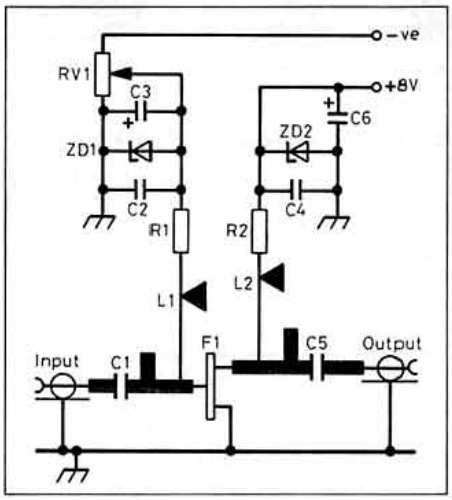


**Fig 5: Circuit of the G3WDG006 power amplifier.**

polyester/glass PCB material. The reverse side of the board is unetched, to act as a groundplane. The method of construction is exactly the same as for the resistive load/power meter described in the 1991 column. The board is soldered into the same size of tin-plate box (approx 71mm long x35mm wide x 27mm deep) and input and output sockets are arranged in the same way as before, so that the socket spills can be connected directly to the 50W microstrip lines: this time, both sockets *must* be suitable for the frequency. BNC, TNC or SMA are best. N-types are suitable but rather too big and UHF connectors are definitely 'non-starters'. The DC output from the detector diode can use any convenient connector.

Again I used 2.5mm circuit tape (the microstrip tracks should really be 2.7mm wide for a 50Ω match) as the etch-resist, though you could use an etch-resist pen and draw the lines carefully to the right width. Don't forget to protect the groundplane side against etching! Low inductance earth (ground) connections are made, as before, by using 1mm circuit pins soldered on both sides of the board *as close as possible* to the surface mount component to be grounded. The figure tells you all you need to know, and there is no 'setting up' to be done - just connect it into your antenna feed cable, connect a suitable meter to the detector output and read the relative (forward) power output on the meter.

I suppose you could calibrate the indicator by connecting it between your transmitter and the resistive power meter, noting the readings from the coupler meter and comparing them with the readings from the power meter. You might also add another coupled line, load resistor and decoupled diode - the other way round, on the opposite side of the main through line, so that you could, using a second meter, read return (or reflected) power at the same time as forward power. Any changes in the relative forward and reflected power indication would tell you whether the transmitter and antenna are 'normal'.

## TECHNICAL CORNER

DEVELOPMENT OF the G3WDG 10GHz modules has continued apace since the last update, with the recent release of no less than three amplifier modules. Two of these are intended as receive preamplifiers, designed to improve existing narrowband equipment such as the G3JVL transverter, SSB Equipment modules or the well known M/A Com 'white boxes'. The third is a linear power amplifier to boost the power output of the G3WDG-001 Tx or the G3WDG-003 144MHz to 10GHz linear transmit converter.

The G3WDG-004 low-noise HEMT preamplifier (with a target noise figure of less that 1.2dB) has not yet been finalised and released, so the modules in the new release are the G3WDG-005, -005F and -006. The G3WDG-005 is a 'standard' two stage 10GHz amplifier with an overall gain of about 20dB, noise figure of about 2dB and a power output of about 50mW. This means that it can be used ahead of a G3JVL transverter, either as a receive preamplifier or, turned the other way round, as a power amplifier to boost the (usually) very low output power of the 'JVL. There is no 'on-board' filtering in this application, as good filtering in the 'JVL design is already provided by the waveguide iris-coupled filter at the input/output waveguide port and no extra filtering is needed.

The G3WDG-005F amplifier circuit is identical (the circuit is given in **Fig 4**) except that there is a single 'pill-box' resonator filter at the output of the module so that this unit can be used with receivers which have relatively poor image rejection, such as the SSB modules and M/A Com 'white boxes' mentioned earlier. With the single filter, more than 25dB of image rejection can be obtained when using the usual 144MHz IF. The overall gain of this unit is a couple of dB down on the filterless design, at about 18dB. For those of you who have already successfully built and are using the G3WDG-001/G3WDG-003 modules, the G3WDG-006 linear amplifier should prove to be an easy and economical solid-state way of boosting your output power from the 50mW-plus of these designs up to 250mW-plus. The circuit of this module is very simple (**Fig 5**) and is the first module to use a higher power 'regular' (non-surplus) GaAs FET, a Mitsubishi MGF1801.

'Short' kits are now available for all three modules from the Microwave Committee Components Service at 314A, Newton Road, Rushden, Northants NN10 0SY. Other modules, available soon, will be the G3WDG-004 HEMT preamp, the G4JNT-001 transverter sequencer/control board and, taking the pain out of 'plumbing', an SMA to WG 16 transition which will get your signals from the world of PCBs and coax connectors into the WG16 antenna feeds or test equipment.

## 10GHZ FIREWORKS FROM NORTHAMPTONSHIRE

CHARLIE, G3WDG, AND XYL Petra, G4KGC, reported themselves active with a fixed station on 10GHz from their new QTH just in time for the January Winter Cumulative. The station then comprised (needless to say) a G3WDG transverter driven by a G4DDK-004 LO source. This was followed by a 2W TWT fed through a 3dB-loss elliptical waveguide to a 60cm Amstrad offset dish.

During the Cumulative, they worked G3JVL and G3ZFP and had one-way contacts with G4PBP, G4CBW, G3LQR, G4DDK and G0BPU. Daily tests followed with Ray, G3ZFP, over a single obstruction (Dunstable Downs) 51km path. Signals varied by up to 10dB although Ray's 30mW personal beacon is normally about 30dB above noise. On 30 January, a 'phone call from G4CBW indicated that Tony (near Newcastle, Staffs) was hearing the GB3SEE beacon (Surrey). A two-way QSO at S9+ (>50dB above noise) resulted. Reducing power to 60mW (plus feeder losses) still gave fully readable signals. At 1929GMT G3FNQ's personal beacon (near Southport) was heard at 20dB above noise. Later in the same evening, Charlie and Petra worked G4PMK (nr Leeds), G3FYX (nr Bristol), G4DDK (nr Ipswich), G4EQD (nr Scunthorpe) and G3ZFP (nr Dunstable). By 2335GMT the GB3SEE beacon, never before heard, was audible.

The following day GB3SEE was 'there for most of the day' and later in the afternoon, for the first time, GB3MHX was copied. By 1705GMT G3FNQ's beacon was again audible, but G3FNQ was not able to come on for a contact. A few minutes later PA0EZ was worked at >50dBn. At 1948GMT DC0DA was worked, peaking >30dBn - no sked or talkback! By 2115GMT, G3FNQ was there again and GB3SEE was up to 38dBn. At 2335GMT the DB0JK beacon (JO30IX) was up to 28dBn and at 0020GMT on 1 Feb 92 "we scraped a QSO with DJ5BV at 552km for our best DX yet". At 1015GMT, PA0EZ's CQ was answered directly and was followed by a direct QSO with G3LQR and another direct QSO by answering PA0WWM's CQ call. Several tries with G3NWU (Hartlepool) were, unfortunately, unsuccessful. Thanks to Charlie and Petra for this report: any other reports would be most welcome.

# Satellites

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

## AMSAT-UK SECRETARY HONOURED

READERS MAY HAVE already read that Ron Broadbent, G3AAJ, AMSAT-UK's Honorary Secretary, was honoured earlier in the year, by receiving the 'Amateur of the Year Award', donated by *Ham Radio Today* magazine.

We cannot let this honour go without adding our congratulations to him and saying that he certainly deserved it. It would be hard to find another radio amateur who has given so much time, hard work and devotion to our hobby of amateur radio. It is good too, to see someone who has put this effort into one of the less popular specialities of amateur radio being selected for the award. Makes one feel too that 'satellites' have a far greater interest to the amateur radio fraternity than is often thought.

## THE RUSSIAN SATELLITES - WHAT FUTURE?

AT THE TIME OF writing (March) rumours are flying around about the future of the USSR (now CIS), amateur radio satellite scene. It is said that another satellite of the RS 12/13 type was due to be launched in April last and that there were seven further satellites in the early or planning phase. All this is now in the 'uncertainty' category like much else in the former USSR.

Stories of absolute dismay keep coming, such as a lack of food and non-payment of staff wages. The uncertainty of future employment in the amateur radio satellite field and consequent resignation of those looking for employment in which they can use their highly specialised skills, bode ill for the future of Russian amateur radio satellites.

Space enthusiasts have been quick to suggest measures which might alleviate the situation, as it would be a disaster if the Russian amateur radio satellite projects were wound up. They have concentrated on providing simple satellites, constructed in several cases by space orientated students in technical schools to give them practical experience which is otherwise hard to come by.

These satellites are very handy for the beginner to gain experience of satellite techniques. Elsewhere the tendency has been to go for technically sophisticated satellites, which are expensive and difficult for the beginner to use.

We have evidence that a lot of amateurs who would otherwise have a go at satellite communication, give up once they find how expensive and complicated the present satellite sphere has become. It is very interesting to note how, since the launch of the latest Russian satellite RS 12 which uses familiar amateur frequencies, a steady stream of new calls has been heard on the air. It is ideal for the beginner in the amateur radio satellite field, as it receives earth signals in the 15 metre band and re-transmits back to earth in the 10 metre band. This enables those with only the usual amateur radio station equipment to participate without having to equip themselves with expensive specialised receivers, transmitters and antennas.

Suggestions for keeping the Russian amateur radio satellite scene going have varied from sending them money to help keep the existing set-up in operation, to purchasing the whole outfit! In this connection, it is rumoured that 'commercial interests' have offered a large sum of money to take over the amateur side of the activities and use it for commercial purposes! Heaven forbid!

The matter is probably the concern of the IARU. AMSAT-UK and IARU Region 1, have been in consultation over the matter and it is hoped their deliberations will come up with something which will keep the Russian amateur radio satellite activity going along the lines it has followed in the past.

## SARA - THE SAGA CONTINUES

RETURNING TO THE satellite SARA, the matter seems to boil down to 'Just what is an Amateur Radio Satellite?'. Patrick Hamptaux, ON1KHP, President of BELAMSAT, who are much involved with SARA, makes a very strong case supporting the project. On the supposition that an amateur radio satellite is one which supports educational and scientific projects, self-training in satellite techniques, etc, SARA does fulfil these criteria.

He makes the point that it was built to make interesting experiments that could be used by as many people as possible and to let them know how amateur radio can help in scientific experiments. He asks radio amateur satellite enthusiasts to get in touch with their local astronomy clubs and with the science teachers in their local schools. His point that the Project may be of use in amateur propagation studies would seem to be a valid one.

Perhaps a recommendation from the AMSAT Board of Directors, who recently discussed the matter, could serve as a very useful guide-line for future decisions on the amateur radio status of a satellite.

The AMSAT Board of Directors Meeting on Sunday, 10 Nov, 1991, made the following recommendation:

"We encourage amateur scientific satellites from any source so long as they meet the following criteria:

1) Data be publicly available with published formats (preferably before launch)
2) There is an amateur radio operator involvement and only licensed amateurs operate the control stations for these satellites.
3) Frequency coordination before launch with the amateur satellite community.
4) Notification of official bodies via IFRB (International Frequency Registration Board) of filings in adequate time for comment before launch.

**Amateur of the Year, RSGB member Ron Broadbent, G3AAJ, in formal attire.**

## THE KITSON-A MISSION.

IN 1990, THE University of Surrey agreed to cooperate with the Korean Advanced Institute of Technology (KAIST) in a Spacecraft Educational Programme. As a result of this project, KAIST student-engineers have begun building an amateur satellite at UoS, known as KITSAT-A. The primary space-craft is to be an oceanographic satellite, TOPEX/ POSEIDON, launched from the Ariane V-52 rocket. Proposed launch date is 1 July 1992, and intended orbit nearly circular: semi-major axis 7700 Km and inclination of 66°, which is unique for an OSCAR orbit. Payloads include store-and-forward digital communications.

More than 200 amateur radio stations regularly used the UO-14 PACSAT transponder which became overloaded and KITSAT-A will help relieve this. It will have an upgraded version of the UoSAT-Oscar-22 Earth Imaging System (EIS), which has conclusively demonstrated that amateur satellites can produce meteorological images. The EIS will consist of two CCD imagers, one will give a wide field of approximately 4 km and the other a telescopic image of around 400 metres. There will be speech transmissions, telemetry transmissions, bulletins and educational messages - similar to DOVE's anticipated multi-lingual messages. Space radiation measurements will be taken, similar to those already taken by Oscar 14 and Oscar 22. These measurements have so far been taken from the relatively benign environment of low altitude - high inclination orbits. KITSAT-A will be in a high altitude - low inclination orbit which has a much worse radiation environment.

Radiation monitoring will be carried out by on-board microcomputers, power systems, memories and solar panels. These radiation studies will be invaluable in the design of the Phase 3 D satellite, and as it's designers say, will certainly further the IARU's goal expressed in Resolution 89-3. In particular: "The encouragement of a wide dynamic range of activities stimulating training through increasing intellectual challenge" and "the stimulation of young people in schools and universities to develop an interest in amateur radio through participation in amateur satellite activities."

# Raynet

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

LOUIS PAYAS, THE acting zonal Representative for Zone 20, (Gibraltar) has sent a few notes to let us know how his members are getting on in their newly formed overseas Raynet branch.

The Zone's main link with the user services is through the Chief Fire Officer, who is the person commissioned by the Governor to have responsibility for the service.

Three communications exercises have been held since the Zone was set up, although to date, Raynet have not participated in these but have busied themselves charting all the many radio blind spots and devising an adequate relay system to overcome the problems.

An antenna rigging session has been carried out, and suitable antennas are now available at the City's Fire Brigade Headquarters which, as it happens, is very well situated at the centre of the peninsula. Regular meetings are held in one of the fire station's lecture rooms on Monday evenings.

## ONE NUMBER FOR STRATHCLYDE

THERE ARE EIGHT RAYNET groups in Strathclyde Region, covering areas which are politically or geographically defined.

As the user services' boundaries do not necessarily coincide with those of Raynet and, as it can be difficult to ensure that a group can be contacted at all times, a twenty-four-hour Raynet Emergency line has been set up.

The telephone number has been issued to all the user services and each group controller and the regional controller take turns to ensure that the number is always answered.

Should the emergency be in the area of a group other than that of the controller who took the call, he will take all details, and initiate the call-out of the relevant group.

If for some reason, contact cannot be made with the targeted group, he will then contact an adjacent group or call out his own members who will deal with the situation until the 'home' group can be contacted.

## SCOTTISH SYMPOSIUM

THE SCOTTISH ZONAL representative, Eric Garrington, GM3RFA, will be organising the Scottish Raynet Symposium in Aviemore on Saturday 2 May. Further details from Eric, who is QTHR.

## SOLIHULL PAGER PROJECT

THE SOLIHULL RAYNET Group are undertaking a pager project, designed at covering the large geographical area of the homes and businesses of the Group's members. This would be used in the event of an emergency call-out.

The group carried out 'Exercise Greenlight' earlier this year to assess the usefulness of the St John Ambulance Brigade Headquarters in Shirley as a control room.

The building has the immediate advantage of plenty of space in which to set up the traditional control desk in the middle of the room and there is plenty of overhead lighting, and as the building is situated in a high part of the town good coverage can be obtained.

A 25 watt CAIRO converted base station was used and easy connection to a dual band antenna was obtained, making setting up a simple operation.

## NATIONAL RED CROSS EXERCISE

RAYNET GROUPS FROM Strathclyde, Tyne and Wear and London will be taking part in a national exercise for the Red Cross at the end of June.

Red Cross volunteers from many branches will be taking part in a project, and Raynet will be providing communications at each venue in Glasgow, Newcastle and London, as well as linking all three. This is a good opportunity to try out HF communications, together with local VHF and UHF links.

## RAYNET AT HATFIELD POLYTECHNIC

RAYNET PROVIDED AN input to the Master of Science Degree/Postgraduate Diploma in *Civil Emergency Management* Course which is currently being held at Hatfield Polytechnic.

The Diploma will be awarded by the University of Hertfordshire, and Raynet's input covered all aspects of our use in emergency situations.

## LONDON NEWS

LFCDA HAVE NOW arranged for the installation of three runs of LDF-450 helix feeder at their Albert Embankment Headquarters and hopefully, by the time this is published, the following antennas will have been erected at the same time.

Diamond X-500 Dual band collinear (2m/70cm)

Diamond X-5000 Tri band collinear (2m/70cm/23cm)

2m beam

70cm beam

23cm beam

(The three beams will be triplexed down one feeder).

## INTER-GROUP MEETING

THE NEWLY FORMED North Argyll Raynet Group held an informal party to bring together neighbouring groups. It was a great success, marred only by the fact that the Highlands Group, travelling from Fort William, was held up for over two hours by a fatal car accident which completely blocked the Fort William to Oban road.

It was, however, a very pleasant evening, and thanks go to Shirley, GM0ERV who, along with controller Tyge, GM0EQW, organised the event.

## YOUR NEWS PLEASE

WE WOULD LIKE TO USE more 'local' news in this column, but find it difficult to obtain. Please send your news (or a newsletter if you have one) to Ron Cowan, GM4SRL, 516 Clarkston Road, Netherlee, Glasgow G44 3RT. Please do not send your information directly to *Radio Communication*.

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# Annual General Meeting, 1991 — Informal Session

THE PRESIDENT OPENED THE informal meeting by announcing the presentation of awards as follows:

The Founder's Trophy to R Ballister, G3KMA, for his services to IOTA.

The Courtney Price Trophy to M Dixon, G3PFR, for his work on the Microwave Handbook.

The RAYNET Trophy to those amateurs involved in the Romanian relief effort. The trophy to be kept by E Ogden, G0EWO.

The G5RV Trophy to J McFall, G4HFX, for his work on EMC problems.

The President announced that Council had decided to make G Jessop, G6JP, a Vice President. This was the highest award which the Society could bestow on any member.

The President then spoke briefly about the difficulties the Society had gone through in 1991, but he said due to actions taken by the Council an improvement in the Society's finances could be seen. This improvement had only been achieved by the regrettable loss of some staff and other cost cutting measures. He went on to say that the 'roof fund' he had personally initiated had not been as successful as he had hoped. Nevertheless about £1200 had been raised for the Society. He announced that Council was in the process of formulating a three-year plan in order to provide the Society with a structured approach to the provision of its services and its spending policy. He praised the success of the Novice Licence scheme and said that over 400 people had passed the examination.

Finally the President paid tribute to the staff and volunteers of the Society who gave their time and expertise in order to make the Society a success.

The President then opened the informal question and answer session.

G Mills, G1CSF, asked why the Chairman of the Raynet Committee was still claiming that Council had failed to investigate properly the case of the Berkshire County Controller.

P Howarth, G3YAC, replied that this question had been aired before and was past history and, as far as he was concerned, the matter was closed. G1CSF asked why then was he (G3YAC) still pursuing the matter. He also asked the Company Secretary to state the constitutional position of the Raynet Committee. The Company Secretary replied that it was his understanding that the Raynet Committee was a committee of Council and as such it derived its authority from that body. Its chairman was appointed by Council and could be removed by Council.

G Griffiths, G3STG, agreed with that definition but went on to say that the members of Raynet submitted themselves to the discipline of the Raynet committee and that appointment of, or confirmation of appointment of, county controllers were matters within the authority of the Raynet committee.

G1CSF then asked whether this meant that Raynet rules over-rode Council rules but G3STG said that was not what he meant at all. Simply put what he was saying was that when members joined Raynet they signed an undertaking to observe the rules of that organisation. Those rules made it quite clear that the appointment or confirmation of appointment were matters entirely for the Raynet committee. There is no avenue of appeal from the Committee's decisions in such matters.

The President then read a question from N Fitch, G3FPK, asking for a statement about the GAM1 beacon and its possible installation date.

J Bazley, G3HCT, answered by saying it had been difficult to find a suitable site for the beacon but it was hoped that one had been located and the Society had provided sufficient funding for installation. R Reed, G2RX, said the project had been around for some 10 years and he was very anxious to see it come to fruition. It was going to provide a vital service to many amateurs and others all over Europe. J Bazley agreed and said that the aim was to have the beacon operational by 1 February 1992.

S Bryan, G1SGB, asked what action had been taken to recover the radio equipment stolen from HQ and were the police notified? The General Manager replied that the police had been informed as had Council and, as the property was insured, the claim had been met in full by the insurers. He said the police had made recommendations as to security and these would be put into operation along with the rewiring of the building.

G Foster, G1DRG, asked what steps were being taken to eradicate the abuse on repeaters on 2 metres.

G Griffiths, G3STG, AROS coordinator then spoke at length about the measures being taken but emphasised that it was the hobby that had to clean itself up. If the bands were not kept clean then the hobby would lose them but RIS could not and would not act in isolation. All amateurs had a duty to see that offences were reported and offenders shut down. S Brian, G0PLF, said he could not really accept that as he had personally complained to RIS, RA and RSGB without effect. G Griffiths said he appreciated the problems only too well and said that he would be speaking at Wakefield on 4 February about the problem and all were welcome to attend. He stressed, however, that the courts were extremely busy with far more serious cases than abuse of radio frequencies and it was for the hobby to make sure that any cases put before magistrates were supported by unequivocal evidence properly documented. The bottom line was that the hobby should be self-policing and only as a final sanction should the criminal courts be involved. J Bazley, G3HCT, said that a great deal of work had been put into the problem by the LAC and new administrative procedures had been agreed with respect to repeaters and repeater keepers. These would be introduced shortly and should reduce the violations.

G Stancey, G3MCK, then asked whether advertisers influenced editorial policy on *RadCom*. Mike Dennison replied that RadCom policy was set by Council and not by any commercial concern.

A Neil, G6AHY, asked why then was editorial space reduced on one occasion to allow a commercial concern to feature an advertisement in a particular part of the magazine. Mike Dennison refuted that the policy of the magazine had been influenced. The case quoted was a special one and was worth a considerable sum of money to the Society and a compromise was reached which slightly reduced the amount of editorial space available for a short time but in no way influenced the content of the magazine.

J Kennedy, G3MCX, asked that if the AGM was to be held at different venues could better information on parking facilities be provided.

B Manning, G1LKJ, asked what controls there were over cheques issued on behalf of the Society. The General Manager explained that he had the authority to sign cheques for amounts up to £500. Over that amount a second signature was required. In addition a list of all cheques written during a month was sent to the Honorary Treasurer.

F Rose, G2DRT, asked why, if Ms H Sharman was to be made an honorary member of the Society, was she not present to receive the honour. The President said he had done his best to secure her attendance but she was extremely busy and had not been able to find the time. The 1992 President would continue to try and fix a suitable day for the presentation.

I McLuskie, G8ORG, asked why it took so long for *RadCom* to publish the results of VHF competitions. Mike Dennison said that that was not so and the results were published as soon as they were to hand.

R Reed, G2RX, said he would like to congratulate the editor on the high standard of *RadCom*.

H Kay, G0FAB, asked why, when the RSGB was a society dealing specifically with communications, radio microphones were not being used to enable those present to ask questions. The President replied that the Society was in the hands of the host venue. It was their equipment and the Society had received assurances from the management that the facilities would be more than adequate.

S Bryan, G0PLF, asked what measures the RSGB intended to take to ensure that Class B licence holders received the same privileges as Novice Licence holders. He elaborated by saying that Novice Licence holders were allowed to use certain bands and yet a B licensee had to hold that class of licence for a year before he or she could apply for a Novice Licence. The President replied by saying that this inequality had been recognised but it was the RA who stipulated the one year wait, not the Society. Representations were being made to change this.

R Ray, G3NCL, asked why the small group of on-air Morse trainers could not receive some financial support from the Society. The Honorary Treasurer replied that if the group put forward a proposal the F & S Committee would consider it.

P Howett, G4MD, said he was dismayed at the current situation in the relationship between Raynet and the Society. What could be done to improve matters? The Company Secretary said it was high time entrenched views on this subject were abandoned, and the time was ripe for sensible negotiations between representatives of the two parties involved to take place. He hoped that this would be so in the very near future. He said that both sides would have to compromise but saw no reason why a negotiated settlement could not be reached.

G Griffiths, G3STG, strongly supported this proposition and pointed out that those Raynet members who attended the Manchester conference were clearly in favour of a democratically elected National Raynet Committee with a strong and special relationship with the RSGB. He regretted the fact that Council had seen fit to authorise the circulation of an inappropriate questionnaire which had merely inflamed an already difficult situation.

The Executive Vice President said there was nothing sinister about the questionnaire. It was an attempt to try and clear the ambiguities which he felt existed after the UMIST meeting. He personally regretted any offence which had been caused by the circulation but said it had seemed a good idea at the time it was suggested.

The President closed the meeting at 5.45pm and wished all present a Merry Christmas, a Happy New Year and a safe journey home.

**Trophies were presented to (left to right): Roger Ballister, G3KMA; Mike Dixon, G3PFR; John McFall, G4HFX and Eddie Ogden, G0EWO (on behalf of Raynet members involved in the Romanian relief effort).**

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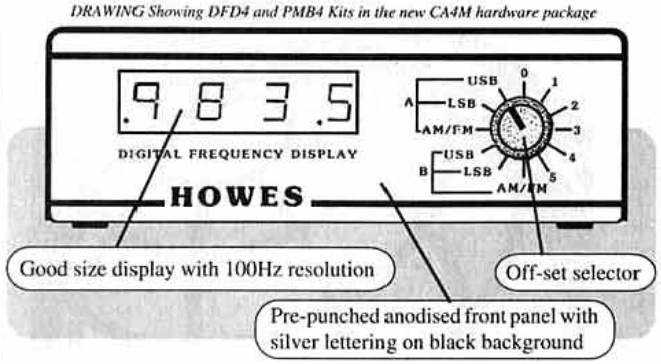


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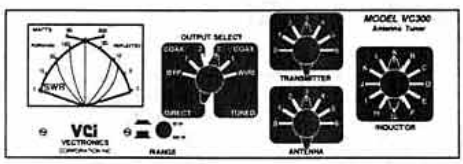


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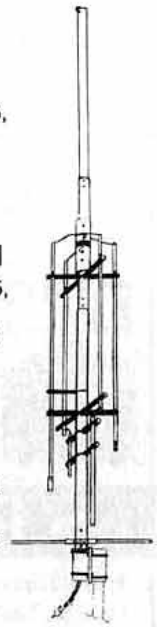

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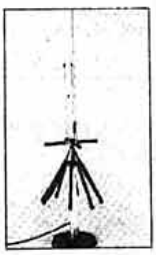

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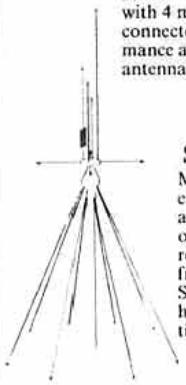

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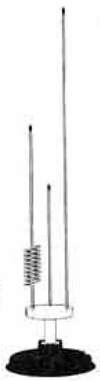

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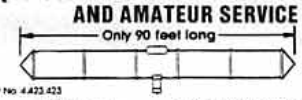


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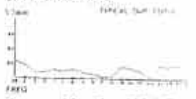

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| TM 135 | Capacitance and temp. ranges (inc. probe) | 56-00135 | £45.95 |
| TM 175 | Frequency (15MHz), capacitance ranges with HFE, diode, continuity and LED test. | 56-00175 | £53.60 |
| TM8020 | 3¾ digit display, frequency (4MHz), capacitance (40µF), AC + DC current to 20A | 56-08020 | £54.76 |
| TM8030 | 3¾ digit display, frequency (4MHz), temperature (inc. probe), AC + DC current to 20A | 56-18030 | £59.96 |
| 7705 | Capacitance meter, 1pF to 20,000uF | 56-07705 | £39.82 |

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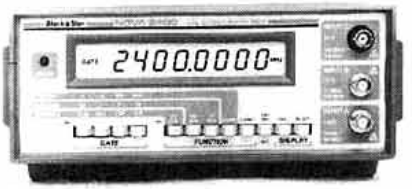


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| | | | |
|---|---|---|---|
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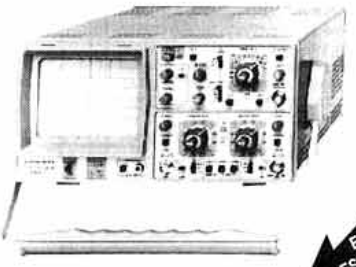
| Orion | PAL TV pattern generator | 56-01600 | £269.00 |
| 1410 | Video Monitor Tester | 56-01410 | £527.00 |
| Meteor 100 | 100MHz counter | 56-00100 | £128.08 |
| Meteor 600 | 600MHz counter | 56-00600 | £158.63 |
| Meteor 1000 | 1000MHz counter | 56-01000 | £209.15 |
| Apollo 100 | 100MHz counter/timer | 56-10100 | £381.88 |
| Nova 2400 | 2.4GHz counter | 56-02000 | £351.33 |
| Jupiter 500 | 500kHz function generator | 56-00500 | £129.25 |
| Jupiter 2000 | 2MHz function generator | 56-02001 | £175.05 |



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# CONTEST NEWS

**All rules should be read in conjunction with the General Rules published in *Contest News* January 1992**

## HF RULES

### LOW POWER FIELD DAY 1992 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 1992 *RadCom* will apply.

**2. When:** Sunday July 19th 1992, 0900-1200 and 1300-1600GMT.

**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 and 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 1992 *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, e.g. '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:** 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 three entrants in each section and to the QRP Fixed station (submitting a checklog) giving the most points to entrants.

### SUMMER 1.8MHZ CONTEST 1992 RULES

**1. The General Rules** for RSGB HF Contests (as published in January 1992 *RadCom*) will apply.

**2. When:** 2100GMT Saturday 27th June - 0100GMT Sunday 28th June 1992.

**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 1992 *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 and closing date for logs:** RSGB HF Contests Committee, c/o S.V.Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF, England. Send within 15 days from end of contest.

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

## CORRECTIONS

### 2ND 1.8MHZ CONTEST 1991

The results tabulation for the above contest printed in the March 1992 edition of *RadCom* contains an error - G4HLU, shown in 25th place, is really G2HLU! Sorry, Harold! We ought to know your callsign by now.

### LOW POWER FIELD DAY 1991

Due to a misunderstanding the entry from the Stockport Radio Society G6UQ/P was treated as a checklog, when it had been correctly submitted as a full entry. With a checked score of 1142 points they take third place, and all other entrants (G3UFY/P and below) move down one place. (Results published in Jan 1992 *RadCom*)

The HFCC apologise to all persons affected by the above changes.

## HF RESULTS

### 21/28MHZ SSB CONTEST 1991 RESULTS

Super-plus conditions on both 21 and 28MHz enabled the top entrants to achieve the highest ever scores in this series of events. Once again G3NLY wins the Whitworth trophy for the best overall score, but this year he is beaten into second place on 28MHz for the Powditch trophy by G4BWP. G3OZF, a previous winner and regular supporter of this contest, is in overall second place with another regular high-scorer, G3NAS, a close third. The Ellesmere Port DARS went portable on the IoM to make the highest Multi-Operator score.

The Committee was very disappointed with the small SWL entry from both the UK and Overseas. With two trophies available for the UK section it is surprising that only three entrants took the trouble to send in logs. The lack of support degrades the awards and unless there is a substantial increase in the support for this section there will have to be changes in the rules for the award of these trophies. Both the Metcalf and the Powditch Receiving were once again won by BRS32525.

There was a good entry from overseas, but it was unfortunate that *QST* published the pre-1990 rules showing the UK prefix as the multiplier. Many of the overseas logs had to be re-scored, a time consuming task for your adjudicator. Checklogs gratefully acknowledged from: G0AFH, G0CLP, G0HGW, G2FNK, G3OHL, G4DJC, GW0ARK, K6FM, KI6W, LA2CBA, LZ2HM, NM9J (G3VNQ), N0IZZ, RA4PIO, UA4PKM, UA0SFN, UZ3XWC, UZ4FWA, VE3TR, VE7XO, VE8RMP, YO6AHP. Congratulations to all the award winners. *G6LX*

### UK SINGLE-OPERATOR SECTION

| Posn | | Call | Score | Pos | Score |
|---|---|---|---|---|---|
| 1 | #* | G3NLY | 615600 | 2 | 229878 |
| 2 | * | G3OZF | 511176 | 4 | 210144 |
| 3 | * | G3NAS | 459378 | 7 | 146292 |
| 4 | #* | G4BWP | 385632 | 1 | 385632 |
| 5 | | G6LX | 379232 | 5 | 208762 |
| 6 | | G3TBK | 376162 | 8 | 119880 |
| 7 | | G4IUF | 228000 | 3 | 228000 |
| 8 | | G4PKP | 221652 | 13 | 52416 |
| 9 | | G4ARI | 193671 | 6 | 193671 |
| 10 | | G0IGM/P | 167670 | 10 | 53802 |
| 11 | | G4NOK | 150246 | 14 | 46332 |
| 12 | | G4IQM | 133182 | 16 | 26460 |
| 13 | | G3NKC | 124527 | 19 | 18630 |
| 14 | | GW4HSH | 122055 | 11 | 53632 |
| 15 | | G0AEV | 106782 | 9 | 106782 |
| 16 | | G3OLU | 103740 | 15 | 40239 |
| 17 | | G0GDA | 103200 | 12 | 53592 |
| 18 | | GW4OXB | 74680 | 23 | 11628 |
| 19 | | G0FGI | 72048 | 20 | 15720 |
| 20 | | G4WYG | 68796 | 17 | 25026 |
| 21 | | G2QT | 61965 | 18 | 20664 |
| 22 | | G4XKR | 51075 | 22 | 12915 |
| 23 | | G0GFQ | 37350 | 21 | 15714 |
| 24 | | G0EGX | 32277 | 24 | 9639 |
| 25 | | G5LP | 29412 | 32 | 1152 |
| 26 | | GW0AJI | 23472 | 28 | 2322 |
| 27 | | GM4HQF | 23088 | 31 | 1305 |
| 28 | | G3HQX | 20436 | 25 | 8277 |
| 29 | | GM0GNT | 14706 | 30 | 1620 |
| 30 | | G2BLA | 12150 | 26 | 2709 |
| 31 | | G4FVK | 11970 | 28 | 1785 |
| 32 | | GW4HBK | 10440 | 36 | 0 |
| 33 | | G4MET | 7200 | 27 | 2592 |
| 34 | | G0LZL | 4788 | 33 | 336 |
| 35 | | G6QQ | 4650 | 34 | 144 |
| 36 | | G0FGS | 3622 | 35 | 90 |

### UK SWL SECTION

| | | | | | |
|---|---|---|---|---|---|
| 1 | #* | BRS32525 | 129604 | 1 | 46080 |
| 2 | | BRS20249 | 18955 | 3 | 3300 |
| 3 | | BRS28198 | 15372 | 2 | 4320 |

### UK MULTI-OPERATOR SECTION

| Pos | Call | Club | Score |
|---|---|---|---|
| 1 | GD3CSA/P* | Ellesmere Port & DARS | 406068 |
| 2 | G0PNW/P* | Preston & NWCG | 346632 |
| 3 | G0FDX* | Central Lancs ARC | 255945 |
| 4 | G4RFR | Flight Refuelling SC | 242064 |
| 5 | G4IRC/P | Ipswich RC | 220332 |
| 6 | GW0MVJ | GW0MVJ Group | 167466 |
| 7 | G4SND | G4SND Group | 123624 |
| 8 | G3SDS | Sth Dorset RS | 64056 |
| 9 | G4WKS | Warwick School ARS | 43395 |
| 10 | G6OI | Stourbridge & DARS | 25431 |

# Trophy Winner; * Certificate Winner

### OVERSEAS SINGLE-OPERATOR SECTION

#### Europe

| Pos | | Call | Score |
|---|---|---|---|
| 1 | * | YT1BB | 162096 |
| 2 | * | LZ2ZO | 150921 |
| 3 | * | UB5EDU | 95004 |
| 4 | | RB1IZ | 86360 |
| 5 | | RB5IM | 83160 |
| 6 | | RB5QW | 76230 |
| 7 | | HA3OU | 60600 |
| 8 | | UY5TE | 48060 |
| 9 | | OE1MCV/1 | 31806 |
| 10 | | LZ5W | 28420 |
| 11 | | YU4XA | 27305 |
| 12 | | UZ4HXX | 24924 |
| 13 | | UZ1TWC | 23040 |
| 14 | | OK3CRH | 23037 |
| 15 | | UA4NCI | 20502 |
| 16 | | LY2BFN | 15741 |
| 17 | | OK3TEG | 14520 |
| 18 | | UA1CK | 14400 |
| 19 | | HA8EK | 13689 |
| 20 | | OH7MDZ | 13650 |
| 21 | | CT1AVR | 11781 |
| 22 | | EA4CQF | 10764 |
| 23 | | SP4GFG | 10500 |
| 24 | | EA6ZY | 8784 |
| 25 | | YL2SW | 8775 |
| 26 | | YU7LS | 8436 |
| 27 | | SP1DTG | 8118 |
| 28 | | YL3FW | 8100 |
| 29 | | OH6UP | 7998 |
| 30 | | YO9FVU | 7029 |
| 31 | | UC2WEV | 6393 |
| 32 | | RA3LJ | 6327 |
| 33 | | LZ1DM | 6105 |
| 34 | | OH7NDV | 5481 |
| 35 | | OH4TY | 3150 |
| 36 | | UB4LCB | 3078 |
| 37 | | YO7LFV | 2900 |
| 38 | | OK1FSM | 2808 |
| 39 | | CT1QF | 2700 |
| 40 | | UT5UBN | 2574 |
| 41 | | SP9CPU | 2430 |
| 42 | | UV3DJB | 2307 |
| 43 | | SP7FQI | 2296 |
| 44 | | OH7NW | 2295 |
| 45 | | EA1EXU | 1947 |
| 46 | | RA4YM | 1799 |
| 47 | | OH6MIL | 1764 |
| 48 | | YU7SF | 1188 |
| 49 | | YO4RDN | 1134 |
| 50 | | OK1DKS | 1106 |
| 51 | | YO5BAH | 782 |
| 52 | | YO5BWI | 630 |
| 53 | | EA3DVJ | 624 |
| 54 | | UA3TAM | 570 |
| 55 | | EA1EXB | 486 |
| 56 | | IK0HTM | 405 |
| 57 | | EA3LA/2 | 315 |
| 58 | | DL7YS | 300 |
| 59 | | SP4KTO | 297 |
| 60 | | UB5ZME | 96 |

#### Africa

| | | | |
|---|---|---|---|
| 1 | * | EA8TE | 7353 |
| 2 | | 6O3AA | 2022 |
| 3 | | ZS3AN | 433 |

#### N.America

| | | | |
|---|---|---|---|
| 1 | * | N4UH | 91314 |
| 2 | | K3ZO | 36128 |
| 3 | | N8FU | 5437 |
| 4 | | WA2UDT | 2640 |
| 5 | | K6XT | 1890 |
| 6 | | VE2CXG | 1212 |

#### S.America

| | | | |
|---|---|---|---|
| 1 | * | PW1Z | 3081 |
| 2 | | PY2DBU | 660 |
| 3 | | CE2AUU | 453 |

#### Oceania

| | | | |
|---|---|---|---|
| 1 | * | VK2BJ | 9450 |
| 2 | | ZL1AAS | 8910 |
| 3 | | 5W1AS | 553 |

#### Asia

| | | | |
|---|---|---|---|
| 1 | * | JH7WKQ | 19440 |
| 2 | * | JH0BBE | 17442 |
| 3 | * | UL7OAG | 12546 |
| 4 | | JH1BXH | 8976 |
| 5 | | JH7JGG | 8820 |
| 6 | | JA7BEW | 7326 |
| 7 | | JM1NKT | 4950 |
| 8 | | JL1MWI | 3780 |
| 9 | | JA6EFT | 3024 |
| 10 | | 4J4GK | 2997 |
| 11 | | JA7MVX | 2925 |
| 12 | | RA9STK | 2235 |
| 13 | | JA1SRG | 2088 |
| 14 | | JR1VAY | 2016 |
| 15 | | JR7EAR | 1716 |
| 16 | | JA2DJN | 1425 |
| 17 | | UL7RDZ | 1326 |
| 18 | | JA8GTO | 1260 |
| 19 | | JG1KBI | 960 |
| 20 | | JH2WHS | 864 |
| 21 | | JR9NVB | 858 |
| 22 | | JP1DQJ | 840 |
| 23 | | JA4KWU | 714 |
| 24 | | JI3GPC | 630 |
| 25 | | JH2CWD | 441 |
| 26 | | JA1AAT | 330 |
| 27 | | JG4OOU | 288 |
| 28 | | JA1STY | 216 |
| 29 | | JR7LVK | 213 |
| 30 | | YC7BVY | 195 |
| 31 | | JE2IFM | 126 |
| 32 | | JL6IPK | 60 |
| 33 | | JA1MZP | 12 |
| 34 | ] | 7N1HFK/2 | 3 |
| 34 | ] | JO1MCC | 3 |

### OVERSEAS MULTI-OPERATOR SECTION

| | | | |
|---|---|---|---|
| 1 | * | RY0Q | 100230 |
| 2 | | LZ5W | 28420 |
| 3 | | UZ4HXX | 24924 |

### OVERSEAS SWL SECTION

| | | | |
|---|---|---|---|
| 1 | * | OH2-612 | 14520 |
| 2 | | OE1-0140 | 1275 |
| 3 | | SP4-208 | 48 |

# Trophy Winner; * Certificate Winner

### HF CONTESTS CALENDAR - 1992

| | |
|---|---|
| **May 2/3** | *A Volta RTTY* |
| **May 9/10** | *CQ-M CW/SSB (RSF) Rules fm G3FKM)* |
| **May 16** | County Roundup SSB (Mar 92) |
| **May 17** | County Roundup CW (Mar 92) |
| **May 16/17** | *ARI Intnl. DX CW/SSB* |
| **May 23/24** | *Baltic SSB/CW 3.5MHz (Rules fm G3UFY)* |
| **May 30/31** | *WPX CW* |
| **May 30/31** | *Ibero/American SSB* |
| **Jun 6/7** | NFD (+ IARU R1 FD) |
| **Jun 20/21** | *AA (CW)* |
| **Jun 27/28** | Summer 1.8MHz (May 92) |
| **Jul 4/5** | *Venezuela SSB* |
| **Jul 11/12** | RSGB SWL Contest |
| **Jul 11/12** | *IARU Championship* |
| **Jul 18/19** | *SEANET CW* |
| **Jul 18/19** | *HK DX CW* |
| **Jul 19** | Low Power Field Day (May 92) |
| **Jul 25/26** | *Venezuela CW* |

## VHF RULES

### VHF FIELD DAY

You will see below the rules for 1992 VHF Field Day, please note that the time for shutdown of 23cm and 13cm has been changed, this is to allow for any possible late night or early morning openings. The times for shutdown on 70MHz have not been changed. The magic numbers have been removed, however please be aware that even more stringent checking will take place on accuracy of all logged details. Station inspections will continue and hopefully those of you who have missed out in the past will be visited this time, this doesn't mean that that those stations visited previously will be left out. Don't forget that once you have been inspected, you can be visited again! Enjoy yourselves, keep the Bar B's going and the 'mineral waters' flowing. If you have any problems with registration, please ring me or my wife G0ESO on 0702 460747, or if it is any other problem you can ring or write to any other VHFCC member. Bryn Llewellyn G4DEZ.

### VHF NATIONAL FIELD DAY 1992 RULES

**1. Duration:** 1400GMT Sat 4th July to 1400GMT Sun 5th July 1992

**2. Site Notification:** Each Group intending to compete must send details of the site to be used to: VHF Contests

Committee, c/o B Llewellyn G4DEZ, 110 South Avenue, Southend-on-Sea, Essex SS2 4HU, to arrive no later than 10 June 1991.The appropriate site registration form can be obtained from G4DEZ or photocopied from the callbook, and should contain the following information. The name and address of the person responsible for the entry, the name of the group, the callsigns to be used on each band, the section (Open, Restricted or Low power), the locator and national grid reference of the site, and sufficient access information for an inspector to locate the site (preferably a sketch map).Each group may only register one site. TWO copies of registration forms and maps/directions MUST be included in your registration.

**3. Bands**: Up to four separate stations may operate simultaneously on the 70, 144, 432, 1296 and 2320MHz bands. Single band entries for 144MHz will not be accepted. The 70MHz CW section will take place in the period 1400-2200GMT, and the 70MHz SSB section will take place in the period 0600-1400GMT, with close down between 2200GMT and 0600GMT. The same callsign must be used on 1.3GHz and 2.3GHz, with no simultaneous operation on these two bands. The 1.3GHz and 2.3GHz stations will close down for the period 2300-0500GMT

**Note**: 23cm and 13cm operation time is 1400-2300GMT Sat and 0500-1200GMT Sun

Yes, the close down time on Sunday is 1200GMT!

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

Affiliated RSGB societies may enter (operators MUST be members of the Affiliated Society, but not neccesarily members of RSGB themselves). A signed declaration (as required in other AFS contests) that the operators are members of the society is required with the entry (not at registration), this must be signed by the club secretary or chairman, if entering as an AFS society. This rule has been amended to help clubs over possible manpower problems.

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

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

**7. Contest exchanges**.

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

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

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

**8. Sections**. There will be four sections:

Restricted section (R):

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

(ii) Only one antenna per band may be used (eg. no stacked, bayed or collinear arrays or switching between two or more antennas). A slot fed Yagi or Quad antenna is permitted.

Dish or Backfire antennas must not exceed 2m diameter.

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

Low Power section (L):

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

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

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

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

Open section (O): as per general rules.

SWL section (S): as per general rules.

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

**10. Entries**.

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

(b) Entries must be addressed to: VHF Contests Committee, c/o B Llewellyn G4DEZ, 110 South Avenue, Southend-on-Sea, Essex SS2 4HU. **NO Recorded Delivery or Registered Post**, - any such entry will be dissallowed.

**11. Awards**. The Surrey Trophy will be awarded to the overall winner of the Open section, the Arthur Watts Trophy to the overall winner of the Low power section, the Tartan Trophy to the leading resident Scottish entry in the Open section, the Scottish Trophy to the leading Scottish entry in the Low power section, and certificates will be awarded to the winners and runners-up on all bands in each section, and to the leading stations in each county.

# VHF RESULTS

## 1991 CONTEST RESULTS (ADJUDICATOR G8XVJ)

The following contest results are made up of those contests that should have been adjudicated by G8XVJ. The missing parcel of logs has never been received by me (G4DEZ) and the duplicate set of discs that were supposed to have been sent have also mysteriously disappeared on route to Southend!

Despite requests on air, in *Radcom*, and on GB2RS for duplicate logs, very few people bothered to re-submit. I can say that I am not at all surprised, for two reasons, firstly that having put the logs together the first time there does not seem to be much incentive to do it all over again, secondly from looking at the way some contestants read the rules, expecting them to read Radcom is asking too much!

The VHFCC apologises for the delay in producing the results and for the missing entries, but it has been beyond our control.

It will not happen again. *Bryn Llewellyn G4DEZ, VHFCC Chairman*

## CHRISTMAS FUN CONTEST.

This contest was subject to the request for low power operation on 70cm during December. The 70cm section was therefore removed.

### 70 MHZ

**Only one entry received.**

| Psn | Call | 28th | 29th | 30th | 31st | QSO,s | Total |
|---|---|---|---|---|---|---|---|
| 1 | G4DSP | 9X2 | 33X5 | 41X7 | 31X6 | 114 | 656 |

### 144 MHZ

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | G4PIO | 1253X48 | - | 1202X47 | - | 240 | 116638 |
| 2 | G4HUP | 553X36 | 1203X29 | 1035X32 | 681X26 | 306 | 105621 |
| 3 | G1DSP | 368X40 | 884X40 | 587X34 | 437X29 | 281 | 90711 |
| 4 | G1APV | 186X21 | 512X28 | 449X27 | 212X23 | 157 | 35241 |
| 5 | G0OFE | 393X27 | 366X27 | 329X21 | 258X27 | 190 | 34338 |
| 6 | G6GAU | 331X21 | 307X22 | 237X20 | 175X16 | 132 | 21245 |
| 7 | G0GRI | 261X26 | 189X27 | 289X22 | 156X19 | 145 | 21211 |
| 8 | G4IDF | - | - | - | 83X11 | 23 | 913 |

aaa x bbbaaa= pts bbb=multiplier.

Congratulations to G4DSP and G4PIO winners and to G4HUP runner up, apologies to those whose logs never arrived.

## 50MHZ TROPHY

Thankfully of the three stations who bothered to send me a duplicate log, all receive a certificate for winning their section!

### FIXED SINGLE OPERATOR

| Psn | Call | Pts | QSO | QTH | Pwr | Ant | Best DX | Km |
|---|---|---|---|---|---|---|---|---|
| 1 | G6HKM | 516 | 110 | JO01 | 20 | 5 | G4KUX | 347 |

### MULTI OPERATOR FIXED

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | G4KUX | 2097 | 211 | IO94 | 5 | 2X6 | GJ4ICD | 597 |

### OTHERS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | GW1VDF/P | 954 | 158 | IO81 | 8 | 6 | G4DCV | 325 |

*G4DEZ*

## SECOND 23CM FIXED STATION CONTEST

### OVERSEAS SECTION

| Psn | Call | Pts | QSO | QTH | Pwr | Ant | Best DX | Km |
|---|---|---|---|---|---|---|---|---|
| 1 | PE1EWR | 1 | 7 | JO11 | 10 | 23 | G4DEZ | 196 |

### MULTI OPERATOR SECTION

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | G8OHM | 155 | 25 | IO92 | 120 | 4X23 | G8PNN | 316 |

### SINGLE OPERATOR SECTION

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | G8OPR | 173 | 27 | IO91 | 110 | 55 | G3JYP | 380 |
| 2 | G8GTZ | 150 | 26 | IO91 | 100 | 39QL | G8ESB | 338 |
| 3 | G3UVR | 146 | 20 | IO83 | 120 | 23 | G4DEZ | 324 |
| 4 | G8ZQB | 132 | 24 | IO92 | 50 | 27L | G8PNN | 298 |
| 5 | G4DEZ | 123 | 21 | JO01 | 15 | 4X55 | G8REQ | 327 |
| 6 | G8PNN | 83 | 7 | IO95 | 25 | 55 | G8DDK | 373 |
| 7 | G6HKM | 53 | 13 | JO01 | 10 | 43 | G3UVR | 294 |
| 8 | G8REQ | 52 | 12 | IO83 | 8 | 23 | G4DEZ | 327 |
| 9 | G3MEH | 49 | 17 | IO91 | 20 | 1.05D | G0CFM | 137 |

Certificates once again to section winners and runners-up, apologies to those whose logs went astray.

## LATE PUBLICATION OF VHFCC RESULTS

There are various reasons why contest results can take a long time to appear in *RadCom*,- some are unavoidable, some are not, and they are as follows:

1) There is always a delay of 16 days minimum between the contest and the arrival of all logs at the adjudicator, especially if you send your logs to the wrong person!

2) If there are many entries in a contest, then the elapsed time between receipt and adjudication increases.

3) Adjudicated results should be presented to VHFCC, to verify and re-adjudicate any queries. The committee sits every six weeks, on average, therefore if results are ready in the week after a VHFCC meeting, they cannot be signed off for at least another five weeks.

4) The disk sent to *RadCom* with results, may just miss the deadline or there may not be sufficient space available for publication, this could delay printing for another two to three weeks.

These are some of the more common problems. There are also further problems where adjudicators fail to meet our own committee deadlines. We as a committee do all we can to provide accurate results as soon as possible. Please remember however, that we are all volunteers and have our normal day jobs to attend to.

*Bryn Llewellyn, G4DEZ, VHFCC Chairman*

## VHF CONTESTS CALENDAR

| | |
|---|---|
| **2/3 May** | 432MHz to 24GHz & 70cm Trophy (Mar 92) |
| **16/17 May** | 144MHz/SWL/Single/All (Mar 92) |
| **7 Jun** | 70MHz CW (Mar 92) |
| **7 Jun** | 50MHz CW (Mar 92) |
| **21 Jun** | 432MHz FM Fixed/Open (Mar 92) |
| **21 Jun** | 432MHz CW Single/Multi-Op (Apr 92) |
| **4/5 Jul** | VHF Field Day (May 92) |
| **25 Jul** | 144MHz LP/SWL (Apr 92) |
| **26 Jul** | 432MHz LP/SWL (Apr 92) |
| **23 Aug** | 432MHz Fixed/SWL (Apr 92) |
| **1/16 Sep** | 144MHz CW Cumulative |
| **5/6 Sep** | 144MHz Trophy/SWL (Apr 92) |
| **20 Sep** | 70MHz Trophy/SWL |
| **3/4 Oct** | 432MHz-24GHz |
| **3/4 Oct** | 2.3GHz and 1.3GHz Trophies |
| **3/4 Oct** | SWL Contest and IARU |
| **1/16 Oct** | 144MHz CW Cumulative |
| **5/21 Oct** | 1.3 & 2.3GHz Cumulative |
| **14/29 Oct** | 432MHz Cumulative |
| **1 Nov** | 2nd 1296MHz Fixed/SWL |

For details of rules for European contests, contact G4PIO, QTHR.

# DIRECTION FINDING

## BANBURY QUALIFYING EVENT

**Date: 10th May**

Map: **151 (Stratford Upon Avon)**

Assembly: **13.00 pm for start at 13.20 pm**

Location: **Kineton High School, NGR 342 510**

Competitors requiring tea should notify Graham Nicholls, 64 Mascord Road, Banbury, Tel: 0295 265 492, no later than 3rd May.

## TORBAY QUALIFYING EVENT

**Date: 31st May**

Map: **202 (Torbay and South Dartmoor)**

Assembly: **13.00 pm for start at 13.20 pm**

Location: **Windy corner on A3022, NGR 890 569**

Competitors requiring tea should notify Paul Clark, 180 Roselands Drive, Paignton, S. Devon, Tel: 0803 523599, no later than 24th May.

## RSGB DF NATIONAL FINAL (1991)

Seventeen qualifiers gathered at a lay-by on the A47 near Rugby. Two of the three transmitters were heard at the start and an approximate bearing was given for the third. As the competitors were starting the missing Tx 'came up', the delay being caused by a terrific downpour at the start time.

TX 'A' was at Brigstock Country Park 24k SE, manned by Peter, G3UJO. TX 'B' (Barkby Wood 14k NW of the start, manned by G4MZX helped by Tony) was on the opposite side of a track to some 800ft of aerial wire which was thoroughly investigated by most competitors before 'signing in'. TX 'C' (nr Kelmarsh 28k S of the start, manned by G4YJP) was found by most competitors relatively easy, however no one made it their first choice.

After the contest some 60 people sat down to tea at the village hall in Yardley Gobion, where RSGB President, John Case, GW4HWR, presented the prizes.

Thanks are due to Sue Lineham and her helpers for tea, and also to Bill Mays for his time and effort in setting up the TX sites.

| Pos | Name | Club | TX 'A' | TX 'B' | Tx 'C' |
|---|---|---|---|---|---|
| 1 | C Plummer | S Manchester | 16.02 | 14.15 | 15.15 |
| 2 | R Gray | Mid-Thames | 16.11 | 14.11 | 15.14 |
| 3 | P Lisle | Mid-Thames | 14.20 | 16.14 | 15.15 |
| 4 | A Collett | Chelmsford | 14.15 | 16.16 | 15.14 |
| 5 | R Brocks | Chelmsford | 16.26 | 14.06 | 15.24 |
| 6 | G Foster | Mid-Thames | 15.53 | 14.11 | - |
| 7 | A Simmons | Mid-Thames | - | 14.39 | 16.01 |
| 8 | B Bristow | Mid-Thames | - | 14.07 | 16.01 |
| 9 | G Whenham | Coventry | 15.10 | - | 16.02 |
| 10 | A Mead | Chelmsford | - | 14.21 | 16.02 |
| 11 | M Standen | Mid-Thames | - | 14.12 | 16.03 |
| 12 | T Gage | Mid-Thames | - | 13.50 | 16.10 |
| 13 | C Wells | S Manchester | 14.26 | - | 16.11 |
| 14 | C Metcalfe | S Manchester | - | 14.13 | 16.20 |
| 15 | P Tyler | Mid-Thames | - | 14.26 | - |
| 16 | M Hawkins | Colchester | 15.54 | - | - |
| 17 | P Cunningham | Chelmsford | - | - | - |

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If so, why don't you put your name down for the *Practical Wireless* Morse Weekend? For around the £160 mark, we're planning to provide meals and accommodation in a good quality, comfortable Hotel. The weekend will start on the Friday evening, and finish after lunch on the Sunday. You will have the opportunity to have some Morse tuition, before you take the Morse test itself. You'll also have the chance to see and try all the latest aids for c.w. working in amateur radio, meet the experts, other 'key' enthusiasts and have fun at the same time.

## OTHER ATTRACTIONS

Originally planned for the late spring, we're now looking at a weekend in September. There will be other attractions for friends and family members not joining in with the amateur radio events. Don't forget that we're very close to the delights of the New Forest, the Hampshire and Dorset sea-side resorts and some delightful 'Stately Home' attractions. With that in mind, we plan to organise some coach trips so that the weekend will have something for everyone.

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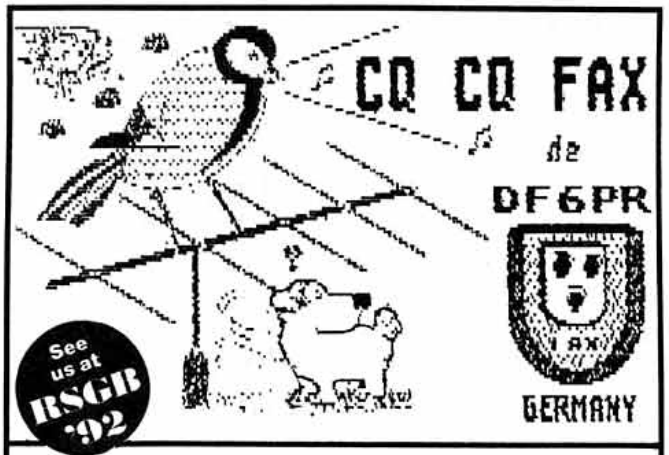
**PW Morse Weekend, Enefco House, The Quay, Poole, Dorset BH15 1PP. Tel: (0202) 678558.**

Alternatively, if you want to hear more about the Morse Weekend, why not call Rob Mannion G3XFD to talk about it? (Between 3 and 4pm please!)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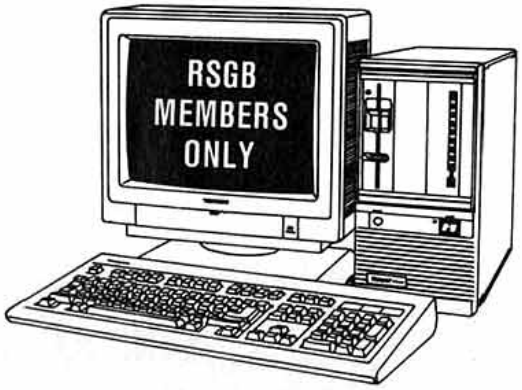


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RSGB Members wishing to place an advertisement in this section must use the official form incorporated on the label carrier of Radio Communication. This will prove membership and must be for the current month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged pro rata. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Ads for CB equipment will not be accepted. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsign and QTHR, provided their address in the current edition of the RSGB Amateur Callbook is correct. RS members will have to provide their name and address or telephone number. Please include your town and phone number in the free boxes provided to assist readers.

***Warning:*** *Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid.*

## FOR SALE

**2x3CX800** UHF amplifier PS4 bird 4305 power meter :£1200. Mutek 2m transverter: £170. MM 28-432 transverter: £170. MM 144-70 transverter: £75. Kenwood TH75E 2 batteries case speaker mic: £220. Wrasse SC1 SSTV fax convertor: £350. Jaybeam TB2 brand new: £195. Tonna 5-ele 50MHz new: £40. Tonna 9-ele 144MHz new: £30. Jaybeam 145MHz co-linear new : £30. Wanted ICOM 471H or similar. (Blairgowrie) 0250 872475

**700' ASL** shack (attic conversion) 3 bed semi, lounge, dining-kitchen, bath, wc, GCH, garage, garden. Panaramic views over Cheshire/N Wales Lancs. Open country end of close golf course nearby :£57,000. (Dukinfield) 061 303 0162.

**ALINCO** DJ120E handheld with extended receive, as new, boxed: £115. G6TLP QTHR. (Colchester) 0206 824308.

**AMSTRAD** PPC 640D computer (portable) dual 3.5" drives, modem only 8 months old: £265. Sharp electronic organiser IQ7000: £87.50. G8DQZ QTHR. (Nr Bury St Edmonds) 0359 42104.

**ANTENNA SALE**: Cushcraft R5 HF vertical: £130. CPL5130 log periodic 50 to 1300MHz: £75. KW traps and balun for 10 to 80 metres: £30. 2 metre 1/4 wave gutter mount whip: £10. Prefer buyer inspects and collects. G4TLK QTHR. (Norwich) 0603 410229.

**BNOS** 6M transverter TL50-28-25 all mode 25W. Patch leads for both Kenwood and Icom transceivers. Mint with original box and manual: £195. (No offers) postage extra. G0MDZ. (Nr Nottingham) 0636 830005.

**CAPCO** loop, AMA3: £185. Kenwood AT230: £140. Squeeze ELE key: £50. Buyer to collect. G0IKM. (Cheshire) 0606 556779.

**COLLECTORS** radios, C42, C13, C11/R210, D11/234. Offers of exchange any XWD radios. Wanted R216, B47, C45. Phone Len G4WZU QTHR. (Grantham) 0476 74047.

**COLLINS** S-Line 75S1, 32S1, 516F2, 312B4, 30L1 and 32V2, each complete with spares, valves manuals. Spares for 30S1. BRT400, National HRO500 and labgear LG300 Johnson Viking KW matchbox: £200. AVO valve tester: £80 and Universal measuring bridge: £90. FTC4703: £100. FTC1540A: £300. FTC2040, FT404R: £95. Hygain TH2 Mk3: £250. Dermot EI5J. (Sligo) 010 353 71 60761.

**COMMODORE** C128D computer, much software inc GEOS VGC :£200. Peter G0KUX, QTHR (Southgate) 081 882 2351.

**FT902DM** All filters, fan, Curtis keyer fitted: £495; YO901\P monitor scope: £200. 60ft 3-section Versatower head cage bearing stub winches base plate post: £275. Cushcraft A3s 3-ele tribander: £100. Buyer inspects collects. Bill G0AWG (Peacehaven) 0273 582345.

**HW9 TX/RX**, unused: £290. Cirkit 23cms converter: £18. 50MHz converter: £15. 70cms ATU 1/2W TX: £25. All mint. G3KZU QTHR. (Oxford) 0865 63000.

**ICOM** IC240 10W mobile tcvr, accessories: £120. Overhauled KR500 elevation rotator with control box £100. Hirschmann 250 rotator with position pot: £45. Heathkit 'Cantennia' 1kW dummy load, 'N' connector, unused: £40. Cumanda 80T SSDD Disc drive, BBC 'B' colours and cabling: £40. Advance electronics 13.6v 20 amp switch-mode PSU, circuit: £30. G8EZE QTHR (Plymouth) 0752 406489

**ICOM** 781 HF allmode transceiver new condition hardly ever used for receive only boxed complete with all manuals can be seen working : £3,695 + CAPCO 300 ATU unused still boxed complete with manuals : £155. Dave G7HCE QTHR (Exeter) 0392 421774.

**ICOM** IC725 mint inc FM and narrow filter : £560. matching 20amp PSU PS-55: £130 ALINCO ALD-24E FM mobile 35watt 2m/70cm TCVR, Heathlite mobile/mike :£200. YAESU FT23R 2m H/Held, softcase, nicads.charger :£160. DNT converted 10m/fm, 30watt linear RA Authorised :£25. IBM PC-XT Mono, 20Mb hard disc excl packet machine :£200 John G40GL (Chelmsford) 0245 400825

**KAWASAKI** KG1500B generator. 1350VA max output. Excellent condition: £330. John Clifford G4BVE. (Northwich) 0606 48880.

**KENWOOD** TL922 2kw HF Linear absolutely unused: £1100, Trid SM22 monitor scope/B58 Panadaptor £275, Buttemut HF6V HF vertical antenna with 18/24 MHz coils, kit (new): £145, CAPCO 300D ATV (mint): £180, ICOM PS55 20A PSU (New): £135, JAYBEAM 15/15 23cms antennas (new): £45 each, LDF450 Heliax 30m (new: £75, Connectors: £11 each (M/F). Paul G4XHF (Crawley) 0293 515201 anytime.

**KENWOOD** TS440S auto-ATU, CW, SSB filters, voice unit, matching speaker, desk mic, Heathkit headset, Diawa 30amp PSU, boxed: £975ono. G0HEK. (Cambridgeshire) 0353 722466.

**KENWOOD** TS711E 2M multi mode base station with D.C.S, GWO: £ 525. Yaesu FRG 8800 with FRT 7700. Excellent performance: £455. G0PJI. (Plymouth) 0752 775375.

**MOSLEY** TA33 warc 5 bands on one 12FT boom using common feedline. Outstanding performer: £130. Jaybeam 4Y/6M: £25. Jaybeam Q4/2M quad: £20. Carolina Windom 10-160m ex-radio works USA: £45 G0MDZ (Nr Nottingham) 0636 830005.

**OPEN UNIVERSITY** complete course PM951 'Computers and Computing'. Total weight of pack 12 pounds: £20 plus carriage. G3APV QTHR. (Seascale) 09467 28449.

**RACAL** 6ft enclosed rack, internal power distribution, top mounted fans, removeable side panels, superb product, best offer. G3FLD QTHR. (Telford) 0952 641641 (day) or 223758 eves.

**REDUNDANT?** Too old to get a job? Have you thought of the tourist industry? House with B&B facilities and two self-catering flats for sale in Devon for: £150,000. Good site for ham operation. The Old Manse, Mary Street. (Bovey Tracey) 0626 833367.

**TEN-TEC** Corsair matching PSU/speaker: £600, Ten-Tec argonaut 515 CW PSU CW filter: £310, Datong FL2: £65, Samson ETM8C keyer: £75, MFJ 422 Keyer complete with bencher paddle: £75, G3KDB QTHR. (Lichfield) 0543 253398.

**TRANSFORMERS** QRO 125+125V input, 3760-0-3760V 380mA out plus starting choke, WT.70lbs, brand new: £55. 120+120V input 2265V 500mA out: £27. Woden UM3 multi ratio modulation: £13. Buyer collects. John G3LYW QTHR. If not available then leave your number and I will phone you. (Bath) 0225 423479.

**TRIO** TS 430S with FM fitted and AM, SSB filters boxed VGC :£525 ono pref buyer collects (Brighton) 0444 417509 B/4 5pm.

**TRIO** TS520S, excellent condition, GWO: £345. Various meters, CN460 SWR, SW100 mobile HF, Weltz power (brand new), offers? Commodore 64 complete with disk drive, printer, software including 'ham' programms. Ann G4EYL. (Luton) 0582 504462.

**TS940S** incorporating Lowe's modification with SP940 radio, as new condition, original boxes/manual: £1400. GW0GDK. (Nr Chester) 0244 541303.

**TRIO/KENWOOD** TR9000 multimode: £250 TM231E: £250. TS820 VFO: £40. AT230 ATU: £150. SM220 Station monitorscope: £250 SP820 speaker with filters: £20 all items nearly new condition most are boxed. John G0HMW not QTHR (Derby) 0332 677284.

**TS930S** tcvr with auto ATU. ex condx, orig packing: £975. IC72 Rx, superb condx: £580. Heathkit SB610 monitor scope: £30. Shure 444 mic: £30. Ham -Soku twin needle power meter SWX777: £45. Heathkit HM102 power meter: £20. 2 off brand new GE6146B, 1 off 12BY7A, all in orig bxs: £30 for set. Buyers collect. G3MSL QTHR (Fleet) 0252 621446 (after 6pm).

**TS940S** internal A/ATU plus SM220 station monitor with Pan display: £1500 mint one owner will split + MM3 Morse Machine electronic keyer/tutor unwanted gift: £120 new unused + Tonna F9FT 2m beam 13 element: £40 unused + ALTRON ground post for CM30 mast unused planning problem: £50. G0CHX (Dereham) 0362 691813

**TYPEWRITER** ribbons and printer ribbons. Hundreds to clear the shack. SAE for list or phone after 9pm. GM8LMA Chas QTHR. (Aberdeen) 0224 641695.

**YAESU** FRG8800 general coverage receiver, CW FRV8800 VHF converter, as new, boxed: £445. Welz D13ON dixone antenna: £29. RN 50MHz to 28MHz transverter: £95. MM 144MHz to 28MHz transverter: £95. (Usk, Gwent) 02913 2466.

**YAESU** FT102, FC102, FV102, SP102: £850. Daiwa NS-660P SWR/PEP meter: £80. SEM iambic keyer with touch paddle: £40. Bencher BY-1 lambic paddle: £35. Kenwood MC-50 desk mic. Contact Sandy Duncan GM3DZB QTHR. (Banff) 0261 812274.

**YAESU** FT290mk1 with FL-2010 linear, vinyl case : £225 both radios boxed etc Peter G0KUX,QTHR (Southgate).081 882 2351.

**YAESU** FT690MK1 with Nicads, vinyl cover, mobile mounting bracket boxed: £225 Peter G0KUX,QTHR (Southgate) 081 882 2351.

**YAESU** FT707 FP707 PSU DAIWA CNA 1001 auto atu ICOM 1050 10fm TX-RX WKS1001 10HTR TX-RX DTI approval :£550 the lot ono (Boston) 0205 351844

**132FT** long wire possible! QTH - 3 bed semi, conservatory, log garden, fertile soil, rotovator, garage, near sea: £65,000. G3DGT not QTHR. (Portchester) 083 483 369.

**35FT** Tiltover tennomast wall mounted brand new complete with head unit DL800 autobrake winch not being used genuine reason for sale tiltover angle between 45/50 degree angle complete with wall bolts price: £490 no silly offers, buyer collects GOLUU QTHR (Huddersfield) 0484 862912.

**4 ELEMENT** quad: £10. 5 element Yagi: £10. 8 element Yagi: £12. All 2m. VHF rotator: £30ono. G8XNG QTHR. (Swindon) 0793 537622.

**4' PARABOLIC** dish/cover, fibre glass. Ex 7GHz link dish: £30. Buyer collects. G8CCQ QTHR. (Tadworth) 0737 813942.

**45' TOWER** 3 sided with some guy ropes etc. Also 70cm amplifier valve Professional. Offers! G3PTU. (West Yorks) 0484 400020 eves.

**60 FOOT** crank up tower. Buyer inspects and collects: £300ono. Details G7ICV. (Maidstone) 0622 890831.

**751A** TX/RX, new Aug 1991, speaker scan mike prefr valves: £900. G3JJU. (Fleet) 0252 615831.

**ADVANCED** DMM3 bench digital multimeter :£30 , Advance dual trace 25MHz oscilloscope :£60 Telequipment DM63 Dual Beam 4 channel 25MHz storage oscilloscope :£75, ICOM IC202S 2m SSB Tcvr fully xtalled :£100, G4DDK 002 1 watt 11S2 to 1300 MHz linear amp £20 camcorder VHS - C 6x power 200m electronic viewfinder :£75, VCR VHS-C portable CW accessories little used :£80. (Bury St Edmunds) 0284 754318.

**AEA PAKRATT** PK232MBX multimode data controller with all manuals, driver programs for BBC and IBM PC included: £250, Post paid. G3RDG. (NW London) 081 455 8831.

**ALINCO** ELH 230E VHF linear amplifier: £40. HF-2MT receive converter: £40. Icom 2E leather case: £5. Motorola leather case: £5. Icom ICB1050 11MT tcvr, needs alignment: £10. Howes HF airband receiver: £25. Call Peter G6VBJ. (Sevenoaks) 0732 459135.

**ALL UNUSED**. 3 element multiband TA33Jnr antenna plus 50 metres UR67 coax weather proofer, instructions. Buyer collects, best offer accepted. (Scunthorpe) 0724 844572.

**AMSTRAD** 1512 CGA. monitor, 20MB hard disk, professional software: £400ono. Commodore C-64, 1541 disk drive, MPS 801 printer, software: £160ono. Spectrum + 48K, tape recorder, software: £40ono. Heathkit SB610 monitor scope: £60. All in very good condition. G4SSX QTHR. (Pinner) 0895 630627.

**AMSTRAD** PC1512, 20Mb HD, 5.25" floppy, 640Kb RAM, colour, mouse, Epson LQ86 printer plus cut sheet feeder. All very good condition: £250. (Chelmsford) 0245 442176.

**AMSTRAD** PC1512, 640K upgrade, 20Mb hard card, 5.25" drive, mono monitor, manuals, software, original boxes: £275ono. G4FYX QTHR. (Warwicks) 0926 813244.

**AMSTRAD** PC2286/40 colour VGA, 12MHz, 1MB-RAM, 40MB H/D, windows, DOS 4 software: £395. Star B2410 printer: £175ono. G0MZI. (Salisbury) 0722 337711.

**ANTENNAS** new Jaybeam MBM 48EL 70cms :£30, Jaybeam LW8 8EL 2m :£15. SMC 6m whip mobile magmount :£20, 2/813 Valves new :£15 each. One new 813 base :£5. All unwanted gear due shack changes. G30SH QTHR collect or carriage (Horton) 0460 53349.

**ATARI** 1040 with monochrome monitor: £280. Dr. TM Hawkins, 3 Westbury Close, New Milton, Hants BH25 7AZ.

**BBC-B** 312C computer with 40/80 track disc drive: £240ono. (Norfolk) 0692 630297 (day) 0692 630030 (eves).

**BBC-B** computer, issue 7, 40/80T disk drive, 32K Ramcard, amber monitor, Interword, betabase D.B.: £250. (Nottingham) 06077 6441.

**BBC-B** master, Co-processor, single port - single sided disk drive and manuals. All in exc. condn: £250. (Wrexham) 0978 356682 eves and w/ends.

**BNOS** LPM-10-100 2mtr linear, excellent condition, hardly used: £110. Uniden 10FM rig, external meter £45. Chris G0KCF. (Portsmouth) 0705 693968.

**CANON** BJ10E Bubblejet printer (black) boxed unused with warranty until November 1992 : £150 ono. RadComs 1967 1969-77 1980-88 1990-91 some bound volumes: £25 ono. Interlocking aluminium tubing 1.5"dia 5'long each, 10 total : £12 buyer collects. (Delamere) 0606 888277

**COLLINS** KWM 380, vgc: £1500. Consider exchange, other quality TX/RX. G3GBB. (Bury St Edmonds) 0379 783657 evs and w/ends.

**COMMODORE** PET4032, dual drive 3040 serial printer 3022, all gwo: £70. Also manuals for above: offers. Encore guitar and amp stand + cover lead and book, gd condx: £60. (Darwen) 0254 774103.

**COPIES** of air publications (workshop mans) for WW2 equipmt T1154 R1155 R1132A R1481, also have wking instructions for wave-

meter Class D: £6 per copy pp £1.50. Copy of wkshop repair man for Kenwood TS520: £10 pp £2. G3KNG, 09074 3134.

**CREED/ITT** 3000 teleprinter, built-in printer, VDU. Offers!. Brother M1109 dot matrix printer, serial, parallel, excellent condition: £55. G0AOZ. (Abingdon) 0865 820749 eves.

**CUSHCRAFT** A4 Tribander 4-ele HF Beam: £250 ono. AOR-3000 as new boxed still under guarantee (Lowe) 7 months old for: £530. TEN-TEC CORSAIR II exc condition boxed with instruction:£750. Owner wants concentrate only on computing for the time being, hence bargain! (Falkirk) 032432594.

**CUSHCRAFT** R5, hardly used: £150. M.M. 144/30 2m linear: £50. Peter G0BAG. (Horndean) 0705 596087.

**DATONG** D70 Morse tutor, very little used: £40, including postage and packing. G4CEY QTHR. (Nr Peterborough) 0832 280355.

**DATONG** FL3: £65 good condition Tentec antenna tuner as new: £65. Sony 7600 Sinclair pocket TV: £50. Commodore 645Q built in colour monitor and disc drive: £200 (Brentwood) 0277 823434.

**DENTRON** of America GLA 1000B linear amplifier 4 x D-50A (6LQ6) valves giving 800 watts CW input and 1200 watts input PEP SSB, built-in 240v supply. Compatible with solid state transceivers max drive of 125 watts 4x6LQ6s new spare valves boxed with handbook: £425 ono G4ISK QTHR. (Basingstoke) 0256 469682.

**DRAKE** R4C MS4, good condition, spare valves available. Some VHF conversion units. Old age forces retirement. Phone offers. (Heathfield) 0435 865993.

**DRAKE** R8 Receiver: £835. ALINCO FM TX/RX DR112 5/35 Watts £200. Kenwood Station Monitor SM230 £600. Digital processor DSP100: £350 or take the two units for: £800 cash. All items subject to offers or swap for Racal transistorised receiver. G3ENB QTHR (Scarborough) 0723 365093 anytime.

**DRAKE TR7** transceiver, PSU7, VF7, MS7, service manuals, extender cards, very good condition, fully operational. Call for demo: £450. (Aylesbury) 0296 661386.

**E/MAC** 4CX250B tubes unused:£20. HI-MOUND BK100 Bug key :£18, BALUN 1:1 :£10, AR88D receiver :£45, AMSTRAD DMP-1 Printer :£50, channel Master model 9500 rotator (USA) offset type unused :£42, Hygain TH3JR 10/15/20m beam :£90, KW1000 Linear :£320 (Norfolk) 036 288 506.

**EDDYSTONE** 1830 marine general purpose communication receiver: £200. (Herts) 0707 320271.

**ERA** microreader MKII RTTY CW decoder and morse tutor mint condition boxed with leads instructions demo tape :£105 inc postage. ALTAI multimeter nine ranges 20kV with instructions and leads :£10 Martin G0HRZ (Chadwell Heath) 081 597 0234.

**ERA** Microreader MKII, pristine condition boxed manual: £120. CBM64 cartridge, interface lead for PK88 etc: £25. Diawa auto ATU SWR, power, ant switch, dummy load etc, 500w model. Boxed as new: £125. Ring Patrick between 9-5pm Mon-Fri (Swaffham) 0760 24624.

**ETM-8C C-MOS** memory keyer (Samson). Twin paddles, eight memories, 8-50 wpm, cost £147 - as new condition: £85. (Plymouth) 0752 339738.

**FC102**, new condition: £175. Daiwa C510 SWR power: £35. RA17, needs attention, is working: £80. (Beeston) 0602 256389.

**FREE TO** good home, standard B46 receiver, 1948 42lbs! with manuals and some spares. Recipient to collect. Mark G4EZR QTHR. (Petts Wood) 0689 837953.

**FREQ** counter 10Hz-1.3GHz. Skyscan discone with masthead. Pre-amp, linear amp 3-30MHz. 10m tx with DTI cert. Apologies to anyone who answered last advert. Ansaphone went faulty, please ring again. Andy GM0GON QTHR. (Campbelltown) 0586 552496.

**FRG7** communication RX, good condition: £110. Icom IC2025 2m SSB/CW TX/RX plus nicads, charger, mint condition: £110. Kevin GW4FIN. (Rhyl) 0745 591942.

**FSTV** fortop TVT435/R, 70cms 12VDC, 10W transceiver video colour b/w in/output connects to domestic television, mint, instructions: £155. QTH G0EZW. (Selston) 0773 810010.

**FT101B**, CW filter, very little use: £200. Sharp MZ80K computer, I/F box, single d/drive, I/O card, EPROM blower card, lots of software (not games), User Club mags: £90 or split. Microwave modules 432/28 MHz transverter: £45. BC221: £20. Amstrad PCW8256 word processor computer, some extras, discs: £190. Aztec B/W video camera, very nicely made: £25. Decca wood cased video monitor, nearly new: £25. Zoom 'C' mount lens CW case, as new: £55. YU3UMV Wx sat frame store, CW PSU in professional case, RIG mags: £90. G3NKL QTHR. (Preston) 0772 784997.

**FT101EX** FAN, WARC Bands (RX only). Some spares: £250. KW Vespa 50w SSB/CW 160-10m TX. with PSU. £60. Sommerkmap TS31ODX 28MHZ SSB/CW/AM TCVR. RF output low hence: £70. MMG1691 Down-converter: £15. 28MHz 25w poweramp: £20. 144-160MHz. 10 channel xtal scanner, useful 145MHz fitted: £25. UHF TV sound tuner: £10. Prefer buyer collects. (Reading) 0734 418586.

**FT101ZD** 9 band (WARC), FM fitted, mic, h/book, matching SP901 spkr, ex condx: £425. Stuart, G8OXA QTHR (Barnsley) 0226 752632.

**FT101ZD** Mk3, thoroughly overhauled, new driver, PA valves, excellent condition, spare pair 6146B included plus manual. Buyer collects as owner handicapped: £400. No offers. G2CVO. (Colchester) 0206 383363 any time.

**FT102**, FC102 ATU: £450, G0BQU QTHR. (Penzance) 0736 64156.

**FT221**. 2 metres multimode, good condn: £225 or offers. (Durham) 091 388 2790.

**FT225RD**, latest Mutek front end fitted. Noise blanker and power level mods done: £525. G4IYA QTHR. (Sittingbourne) 0795 421207.

**FT277ZD** (FT101ZD) 9 bands transceiver, CW filter, hand mic, manual, good condition with MFJ949 cross needle antenna tuner: £500ovno. G0MBJ QTHR. (Market Drayton) 0630 658136.

**FT290R** all mode tcvr complete with charger, nicads and soft case, boxed as new: £225ovno. G0EET QTHR. (Swindon) 0793 611048.

**FT290R** mint, nicads case: £220. Trio 2400 synth H/Held: £100. KW2000, Shure mic, PSU, gwo: £120. IBM PC-XT hard disk, EGA colour: £300. Fidelity 10M FM: £20. 2 metre 4-chan pocket scanner: £20. Barlow Wadley XCR30, collectors, offers! G4PIK. (Sheffield) 0742 874772.

**FT290R** soft case, nicads, chrgr mic: £220. Kent single paddle: £28. Bencher non iambic: £50. New RCA 6146B: £8 each. Used 6146W: £3 each. Hy-gain 18AVQ vertical: £20. CW filter XF-8.9HC: £20. Collect or post extra. G2FDF QTHR (Oswestry) 0691 658422.

**FT290R** with mutek front end. Excel condition with Nicad batteries charger hand microphone and heatherlight mobile microphone complete with carrying case any test welcomed. Reason for sale purchase of dual bander rig.: £240 OVNO G0OWO (Harrow) 081 904 6171.

**FT290R**: £240. Microwave modules MML144/30LS: £55. Welz SP-15M: £25. Collins RF linear 30L-1 plus Nevada TM1000 ATU: £300. Both QTHR. (Swansea) 0792 390233.

**FT726R** good condition. 2 metres only, extended coverage down to 143.5MHz: £450. (Dukinfield) 061 330 1356.

**FT736R** 2m 70cm 100w 2m linear 70cm 50w linear. G400RC Azimuth rotator. KR500 elevation rotator. 19 element 70cm. 9 element boom. PK232. Power SWR meter. £1200. Hodges G0EJV (Lincoln) 0522 683113 Going QRT.

**FT747**GX-with FM, as new: £400. No offers. (Burton-on-Trent) 0283 42989.

**FT767GX** 100W HF transceiver, general coverage RX, integral PSU/ATU, split VFO, memories, cat, etc: £975. No offers. Buyer collects. G3XZO. (Stratford-On-Avon) 0789 740073.

**FT902DM** 250Hz CW filter fitted: £525. Racal RA17 receiver: £120. SRX30 receiver: £60. Ring Colin G4ITN QTHR. (Blackburn) 0254 852420.

**FT902DM** all filters fan curtis keyer fitted: £495. Y0901/P monitor scope: £200. 60' 3 section Versatower head cage bearing stud winches base plate post: £275. Cushcraft A3s 3-ele tribander: £100 buyer inspects and collects. Bill G0AWG (Peacehaven) 0273 582345.

**G2DAF** TX/RX, used daily: £160. Yaesu FT480R, boxed, manuals: £250. Dragon 32 + PSU: £15. VHF/UHF pocket modem: £45. (Warminster) 09856 301.

**HEATHKIT** DX100w TX with SSB adaptor : £70. KW Valiant TX needs PSU :£20. Racal RA17 RX GWO :£180 G3CWT QTHR (Burton) 0283 44677.

**HEATHKIT** HW100 homebrew matching linear plus power supplies, handbooks, HM102 pwr/swr meter: £175. Printer Panasonic KXP1081, recent overall: £140. Must clear from shack. John G3CXI. (Cheltenham) 0242 673834.

**HEATHKIT** SB220 linear amplifier, 2kW, handbook exc condition: £450 offers, same rating as TRIO TL922. Western DX32 tribander: £70. Valve 10m amp FM/SSB 80watts output:£35. SC160 B&W SSTV:£35. G4FBA QTHR (Knottingley) 0977 672005

**HEWLETT** Packard 100MHz scope dual beam with probes and trolley: £350. Gould LA500 logic analyser with PODS: £50. G0JIB. (Liverpool) 051 548 0452.

**HI-MOUND** HK-702 marble base key :£25. SEM QRM eliminator :£40. KENWOOD MC30S noise cancelling mike :£25. DATONG DC144/28 VHF converter :£15. DATONG RFC/M speech procesor board :£15. Sinclair ZX81 16K RAM + Books + Printer + PSU + Tapes :£30. Phillips QB3/300 valve :£5. Manuals DX60B SW717 R600 HF125 :£2 each. Going M/M! tatty 4/20 sailing dingy with road & launching trailers needs attention :£200. G4GAS (Swindon) 0793 750130.

**HOWES** 21/28 MHZ transceiver HPA10 HTX10 VF10 DXR10 DCS2 CA10 all modules built and in custom case decided to go microwave instead of HF :£120 inc carriage GM7GUC Paul (St Andrews) 0334 838959.

**HUGE EME** Antenna system for 2m and 70cm complete with post mounted versatower with special heaby duty AZ/EL rotators digital control well proven performance must be sold so best offer will be accepted. Also IC505 50MHz tranceiver £295 LS202 2m multimode h/held with LA207 car adaptor unit: £195. GW4CQT QTHR (Gwent) 0633 867566.

**IC-3210E** dual band mobile. 25 watt, 2M/70cm. Mint condition. Base station use only, original packing, manuals: £350. G0BII QTHR. (Oxford) 0865 880229.

**IC701** CW IC701PS CF1 Fan ICRM3 remote control ISCM2 desk Mic H/Book boxes, Immac :£400 ,Belcom LS202 2m valve linear 100w CW H/Book, spare valve :£60 wanted Yaesu YO901P scope with pan-adaptor, any FT901 accessories G4JBH OTHR (Yeovil) 0935 23873

**IC740 HF** transceiver: £525. Microwave modules, 100W UHF amplifier: £225. 432MHz transverter 10m IF: £75. 12V 30A PSU: £40. ARRL sequential switch: £20. (Ely) 0353 741354.

**IC751A**, including mains power unit, P535 and 250Hz CW filter: £1000. MFJ 949D versatuner: £90. Low SEM QRM eliminator: £50. Cushcraft R5 vertical antenna: £80. QTHR G3HRY. (Newport Pagnell) 0908 616519.

**ICOM** 02E 2m H/H incl battery packs, HS10 headset, HS105B switch box, IC-CPI DC lead charger, case: £110ono. (Cheltenham) 0242 227860.

**ICOM** 228E 25W 2m mobile with mic and manual: £225ono. G0CTQ QTHR (Margate) 0843 45312.

**ICOM** 251E 2-metre multimode tcvr, excellent condition, little used. Boxed, manuals: £325. (Bristol) 0272 246360.

**ICOM** 551 50MHz tx/rx like new, orig box: £475 inc P&P. Swap WHY? Tel Andy GD7JOI. (Douglas) 0624 626080.

**ICOM** AT-100 automatic ATU, mint with original box and manual: £225. (No offers) postage extra. G0MDZ. (Nr Nottingham) 0636 830005.

**ICOM** BC-335 bttry chrgr: £50ono. Several BP-3 nicads for IC2E/4E: £20 each. Two BP-2 fast charge nicads: £35 each. Creed 444 teleprinter: £5. Commodore comms modem, suitable for CBM64/128: £70ono. PAC-Comm TNC-220: £150ono. Thurlby CM200 digital capacitance meter: £100ono. Sabtronics freq counter: £100ono. Hameg HM-605 scope, ex condx: £575ono. Computer terminal (Dumb), can handle various speeds: £40ono. G4KZZ QTHR (Coventry) 0203 444160.

**ICOM** IC720A 0-30MHz HF transceiver with FM mode fitted matching speaker and desk microphone all boxed extremely clean: £625ono G7GKO 0922 410492

**ICOM** ICR7000 25 to 2000MHz, all mode scanning RX with remote control. Immaculate condition: £599 ovno. (Guildford) 0483 62586.

**JAYBEAM** 2m 4el quad: £25. RadComs 1978-82: £45. Buyer collects. G4KRN QTHR. (Liverpool) 051 734 5167.

**K.D.K.** 2mtr mobile/base 5/25 watts, 11 memories, selectable split scanning, new PA module, good condn, original box: £120ovno. (Flint) 0353 763698.

**KENT** twin paddle Morse key (assembled): £25 plus postage. (Shoreham by Sea) 0273 461454.

**KENT** twin paddle Morse key, very good condition, boxed: £30. Swedish brass hand key, good condition, no box: £40. G0EOL QTHR. (Agent G0HXD). (Cheshire) 0606 554857.

**KENWOOD** 6805 immaculate :£650, 2m ICOM :£70, 6m :£70, ATU: £70, Rotator plus Beam :£70, 70/2m vertical :£20 packet modem :£20, CBM 64 :£60, COMIN64 RTTY CW SSTV :£60, PSU 20amp :£70, PSU 5amp :£5, 10m :£120 (Telford) 0952 200 307.

**KENWOOD** TM-741E plus PC-4L: £600. Kenwood TR-751E: £500. Kenwood TH-77E plus voxhead set and remote control speaker mike: £350. BNOS 12/30E PSU: £180. Emotator 105-75: £100. All items are in excellent condition. Phone Geoff during office hours: (Northampton) 0604 760991.

**KENWOOD** TS-430S with FM, vgc, boxed, AM, SSB, filters also fitted. G7FHV. (Nr Brighton) 0444 417509 before 5pm.

**KENWOOD** TS120S tx/rx, 200W P.E.P. 13.8V, 10-80M, seen working prefer collect, manual: £325. (Birmingham) 021 478 2429.

**KENWOOD** TS711E 2m multi mode base station with D.C.S., good working order: £525. Yaesu FRG8800 with FRT7700, excellent performance: £455. G0PJI. (Plymouth) 0752 775375.

**KENWOOD** twin valve, Shure mic and EZE match manual, works well, buyer collects, might swap for tap top: £165. (Halifax) 0274 600471.

**KW204 TX** and allied AX190 RX £200 TX serviced by KW RX has intermittant fault will split, buyer collects or carr extra also QST 1977-85 not complete collect or carr extra G0DDZ QTHR (Woodbridge) 0394 387076

**MUTEK** TVHF230C TVTR 10m>2m 10W output, full ALC feedback, cable for TS830 TS930 TS940, manual excl performance: £175 ono or swap for 6m version. WANTED YK99-A AM filter for Kenwood G4UDT QTHR (Wembley) 081 902 5995.

**MUTEK** TVVF144A transverter: £145. Yaesu G-5400B AZ/EL rotator: £160. Revex P300 12V 30amp PSU: £70. John G4ZTR. (Colchester) 0206 860238 early evenings.

**NELSON** triband quad, complete except for wires: £180. Hately dipole of delight, 80+40 high power version: £35. Kenwood MC35 microphone: £12. TS830S, service workshop manual: £6. Prices above include carriage P&P. (Omagh) 0662 241458 after 6pm.

**OSBORNE1** in ex condn with CP/M, utils and much SW inc. Term emul : £70 ono will deliver anywhere is SE London or NW Kent. (Beckenham) 081 650 0563.

**PK-232MBX** data controller. Super condx, bxd, leads, mans, plus Amiga Pakratt s/ware: £250. It's boring. Returning to CW. G4PHC QTHR (Minehead) 0643 706936.

**PMR** Equipment clearout two Pye Europa MF5FM bought as working untested :£25, Burndept BE460 rack mounting UHF TR plus Cossor similar 75% for spares :£20, Pye PF2 1VHF 1UHF 1 case 1 speaker/mic :£25, 5 batteries for above with PYE eight position automatic charger : £20. Telequipment S51B oscilloscope syc needs setting up :£15, BT Freeway cordless phone :£35. Recordacall 1000 ans phone :£20. (Dereham) 0362 696993.

**PYE** Westminster low band, 12.5KHz AM PMR-GWO, 8 sets + base station (tack thro') mag mounts, 2 base dipoles/gnd plane antennas antennas - including all coax cable etc. Buyers collect. (York) 0904 769245 evenings.

**QRM** eliminator SEM Mk 2, brand new, unused: £70. G4PYQ QTHR. (Hyde) 061 366 0927.

**SILENT** KEY sale - G6NFS Patrick. Icom ICR71E multi mode, high performance general coverage receiver, immaculate, boxed: £550ovno. G3MGW QTHR. (Brightlingsea) 0206 302382.

**SILENT** key sale FRG7700 memories :£200. AVO8 MK3 :£50. Heathkit scope 10-12u. Advance Sig-Gen 100 MHz RF micro-voltmeter. VARIAC 7amps cross-hatch generator. H/brew test equip, lots of components prefer buyer inspects/collects offers to Derrick G3EON QTHR (Chester) 0244 683865

**SILENT** Key sale TRIO TS530S HF tranceiver: £475. Kenwood AT230 Antennatuner: £115. Kenwood MC50 Cardiod mike: £20. DAIWA AF606K Allmod Act Filter: £32. Arrow KD508 Digital multi tester: £25. (Northampton) 0604 410822.

**SIX METRE** five element Tonna beam, three months old: £30. (Exmouth) 0395 277479.

**SONY** ICF 7600D pocket rcvr FM/LW/MW/SW BFO. Direct, scan and memory tuning. Mains/battery, all accessories and manuals: £95. G2FOG QTHR. (Maidenhead) 0628 27302.

**SPHINX** transmitter. 160/80/40/20 40W SSB/AM, good performer, manual: £75. EC10 MkII, gc transistor receiver. 550kHz-30MHz in five ranges, battery or home brew mains PSU, gwo and vgc, Derek G4GVM. (Langport) 0458 252848.

**STANDARD** C528 2/70 handy, covers 128-170 327-399 400-470 900-979, nicads, leather case, as new: £285. 5X200 receiver: £75. (Gravesend) 0474 823797.

**STANDARD** C58 portable 2 metre multimode nicads, charger: £185. G1WIW. (Hinckley) 0455 845019.

**TEKTRONIX** 200 scope trolley for any 400 series portable scope: £40. ML7211 (ceramic 2C39): £10 each. Disc seal triodes DET22 (2), CV273 with exc equip mounting incl anode clamp, fingerstock etc. CV597 (DETZA?): £20 lot call or fax Steve GW8GSQ (Bridgend) 0656 665225 anytime.

**TEN TEC** Corsair II matching EX VFO PSU/Speaker (the line UP) 250Hz, 500Hz, 1.8kHz and 2.4kHz filters fitted. Bought new by me and in pristine condition boxed and manuals.: £950 cash. Buyer inspects and collects. G4WNG QTHR (Northumberland) 0670 822172.

**TENTEC** Argosy II transceiver, 5-50W RF 3.5-30MHz, model 525D 225 PSU fixed mobile NB 223 CB 1125, 2 years, mint condition: G3JNY QTHR. (Leeds) 0532 863058.

**TONO** 9000E RTTY CW ASCII multimode terminal, inc-light pen + simple word-proc inc VDU, printer, manuals. Original pkg. Pye low Band AM (68-88MHz) sets. Jones VHF/UHT 80-500MHz wattmeter Tec 710-40 Daisy wheel 40 cps. Printers x 2. VGC Paral'l interface, manuals. G3VGH QTHR (York) 0904 769245.

**TRIO** 201A 2mtr TX/RC 25W mobile, instructions, boxed, mint condition: £155. FT727 2mtr/70cms portable. Bass, wall and car chargers, boxed: £300. (Macclesfield) 0625 876192.

**TRIO** 7200G 2m FM R2-R57 S19-23 mobile antenna mobile mounting bracket plus J beam colinear excellent condition: £175. Ken G3KVE QTHR. (Liverpool) 051 525 5256.

**TRIO** R2000, little used, exc. condn: £325ovno. 0285 750603.

**TRIO** TR9130 2M multimode: £320. EK150 electronic keyer: £55. AR900 scanner: £135. 10M FM transceiver: £20. MK703 twin paddle key: £18. Spectrum 48K+: £30. Morse practice oscillator, vol/tone controls: £15. T3-170L SWR power meter: £15. G0MHQ QTHR. (Peterborough) 0733 230088.

**TRIO** TR9130: mint 2M multimode, complete mobile and base station, set-up Oscar 2NE 7/8 mobile, Kenwood SWR/PWR Hy-Gain, CD-45-11, complete with all fixing kits: £400. Graham G6FYP. (Glossop) 0457 864144 after 6pm.

**TRIO** TS830S ex unmarked cond, h/book, bxd: £725. Kenwood TS660, all modes tcvr 6m 10m 15m 12m, super rig, excl cond, mic, h/book, bxd: £600. 4Cx250B 432MHz PA homebrew: £125. Datong Universal RF speech clipper RFC/M: £35. 4cx250Bs, new: £35. (Brixham) 0803 856698.

**TRIO** TS830S, pristine condition, complete with manual, unboxed: £650. Yaesu FT790R plus 10W Alinco linear, mint: £325. G0HES. (Runcorn) 0928 715604.

**TS 520 HF** transceiver, mic, manual, gwo, full 180 PEP output: £200ono. G1RFT QTHR. (Luton) 0582 37692.

**TS120S** HF tcvr, CW filter fitted, manuals. Checked by Lowes: £325. Wanted YK88SN filter, G whip extension piece. John G4ILA. (Bolton) 061 790 2338.

**TS140S** Kenwood, 10 months only, excellent condition with box: £625. Also IC211E 2m multimode: £260 or exchange mobile multimode (Trio/Kenwood) G0EGX Alan. (Tiptree) 0621 815978.

**TS520** HF tcvr, mic, man, gwo, full 180 PEP output: £200ono. G1RFT QTHR (Luton) 0582 37692.

**TS530SP** fitted extra filters 500Hz and 1.8kHz, ex condition, little used complete with mic, original packing: £495ono. G3GHB QTHR. (Worcester) 0386 792582.

**TS530SP**, immac condx, used QRP only. Fitted with 500Hz CW filter and 1.8kHz SSB filter, orig bx, manual. Reason for sale going QRP Homebrew: £500. 3 Hoylake Close, Cottingham, Hull. 0482 841713 (eves).

**TS830** full output all WARC bands. If shift VBT/VOX mic proc little use original pristine condition: £650 G3RXW QTHR (Hitchin) 0462 812611

**TS930S**, mint: £885. SP930 speaker: £65. KW109 ATU: £120. Tiny2, latest ROM: £120. Amstrad PCW8512 + RS232 interface: £255. Datong clipper: £25. BARTG ST5C terminal unit: £45. 2ele Gem vacuum variable: £85. G4EVS QTHR. (Guisborough) 0287 636464.

**VERSATOWER** Strumech P40 telescopic tilt-over: £100 plus dismantling and carriage (post is in concrete; new 5 P12 obtainable). GM4CHX. (Aberdeen) 317966.

**VHF** Dopplescan radio direction finder: £120. Heliax connectors: £5. 433MHz PF2: £25. Codar HF receiver: £30. Buyer collects. (Walsall) 0922 473492.

**VICTOR/SIRIUS** computer, MS-DOS 2, 256K memory, double disk drives, green 12" monitor, keyboard, manuals, software, wordstar, super calc 2, few games, spare diskettes: £80. Also complete set-up, eg keyboard, monitor, but computer prints double characters after warm up: £30. Dowty Quatttro V22 BIS 2400 BRS full duplex, high performance modem, SB 2422 also runs 1200/600 BPS or '300/1200/75' in asynchronous mode only, user manual included: £180ono. G4ISK. (Basingstoke) 0256 469682.

**WESTERN** DX33 triband Yagi for 10,15,20M boom length 4.3M (14'2") longest element 7.87M (26'): £100ono. 12el 70cms crossed yagi: £30 ono. G4NUM QTHR. (Leeds) 0532 686016.

**WIN108** airband h/held.receiver. Keypad frequency entry, memory channels, scanning. Lowe Lab airband aerial : £100. (Woking) 0483 728688.

**WONDERFUL** QTH 75ft HD Mast with 4 element beam 8 x 16 Hamshack 6 acres close to A34, M4 Intersection 4 bedrms, 2 bathrms, kitchen, toilet, various outbuildings lovely views retiring and moving to coast :£350K further details G4GVF QTHR, (Newbury) 0635 201533

**YAESU** FP700 PSU: £90. Heil HC3 mike element: £10. F.T. Newsletter USA Publication, 2 vols, good read: £4. G4CPD QTHR. (Bradford) 0274 630266.

**YAESU** FRG 8800 receiver, FRV 8800 VHF converter, FRT 7700 tuner, excellent condition: £450. (Teddington) 081 977 3546.

**YAESU** FRG7 gen coverage rcvr: £115ono. 2 metre Ringo Ranger: £25. 70cms version: £30.ono. Both new. G4CSG QTHR. (Eastbourne) 483659.

**YAESU** FRG7700, FRT7700 ATU, FRV7700 VHF converter (118-150MHz), manual, vgc, original packing: £290. G3NRU QTHR. (Canterbury) 0227 730558.

**YAESU** FT-101B tcvr 100W CW/SSB 160 80 40 30 20 15 10m. Recent new PAs and driver, re-aligned, internal PSU, complete with CW filter, mic, h/book: £200. Philips D2935 gen cov portable, digital display, 9 memories, BFO etc, absolutely mint: £90. Amstrad CPC464 computer (mono monitor), mans, s/ware, games: £75. All above vgc. Buyers inspect and collect. Tony, G4DFP (Manchester) 061 736 3187 (eves).

**YAESU** FT101Z HF transceiver fitted with fan, desk mic and manual, one owner: £310. G4FJO Geoff. (Weymouth) 0305 781164.

**YAESU** FT101ZD MK3 Warc CW filter, fan, FM board, DC/DC Convertor, Handbook, Workshop manual, hand mike spare PA valve: £445. ICOM 290E plus MM 144/432 transverter plus Maplin 7a 13.8v PSU multimode 2m/70cm station: £325. Microwave modules linear MML144/505 10/50w with RX preamp: £50. Yaesu YD148 desk mike with 4 pin plug: £25 buyer inspects and collects all items. G30GP QTHR (Billingshurst) 0403 822275.

**YAESU** FT290R with nicads, case, carrying strap and mobile mounting bracket: £230. Complete 2m aerial system: Tonna 9ele, rotator, all scaffolding required. Brackets, 20M cable, extremely sturdy: £100. Buyer takes aerial down from its present house - mounted position. G7HAM QTHR. (Colchester) 0206 45083.

**YAESU** FT708R with charger + speaker mic: £130. KW Viceroy TRX: £50. Buyer collects. G4LKU. (Corby) 0536 742835.

**YAESU** FT767GX + 2m 70cm 6m, excellent condition: £1150. (Cleethorpes) 0472 357763.

**YAESU** FT767GX: £850. Kenwood TH75E dual band 144/430 handie: £200. Mizuho 40m SSB portable AN-7 antenna: £95. Paccomm handi packet: £150. (Romford) 0708 374043.

**YAESU** FT902DM, FV901DM scanning VFO, FTV901R, VHF/UHF transceiver with VHF fitted, FC902 ATU and MD1B8 desk microphone, All boxed in mint condition. Used receive only by present owner: £1000 ovno, no split. (Basingstoke) 0256 462810.

**YAESU** G600RC unused: £170. MFJ949D: £100. MFJ204B: £55. Himound key HK705: £11. Pair 6146B GEC: £18. M/Wave H/Books vols 1/2: £11. 1/1balun: £12. Mech filter 453 kHz: £15. 100uA Meter: £2. All new 1991 int. callbook £9 + post, offers G2HKU QTHR (Sheerness) 0795 873100.

**YAEUS** FT757GX immac condition: £575. FC757AT: £200, prefer no split. Two AEL 813s: £45. MJF artificial ground: £40. All good working order, going QRT, 813s brand new, and boxed all items are boxed, GM0MDB OTHR (Helensburgh) 0436 76486 after 5 pm weekdays.

# WANTED

**455kHz** "Q" multiplier, Walters, Heathkit GD125, or WHY? G3JFC QTHR. (Kent) 0474 872743.

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**AP1086** Issue 1 1938-52 (RAF radio stores ref Nos) also air pub. relating to radio, radar eqip excl proces offered would purchase post - war to current magnetrons, klystrons, T/R cells, TWTs photo multipliers, microwave and CV special types, required static or rotary converter, AC or DC input with output of 80/115v, 1500/200 cycles, also R/X type R1355 unmodified. phone any time (London) 071 511 4786 or 071 790 2846.

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**DRAKE** RR1, RR3, R4245, TR4310, any condition CW75 keyer, cash waiting. Interested also in Collins 75A4 or Rockwell 75S3C 75A4 or Rockwell 75S3C. G3YFK. (Shrewsbury) 0743 884858.

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**FT-726R** modules: 70cm and satellite modules wanted, also CW narrow filter. Bill Cowell G0OPL. (Ludlow) 0584 872522 (day) or 0584 876675 (eves).

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**R1475** receiver for restoration without major modifications preffered. G7JOO John. (Reading) 0734 722017.

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**WANTED** Jaybeam TB3. Must be in very good condition. Also G4MH mini beam. G4XLG. (Beds) 0525 220174 any time.

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**'RADIO TIMES'**, 'World Radio', wireless books, magazines, catalogues. Galaxy. G2DAF Tx. Pilot radio. Lissen valves. 8-track cartridges. For Wireless Museum. (Ryde IOW) 0983 67665.

**'SINGLE** Sideband Principles and Circuits'. Pappenfus, Bruene and Schoenike, McGraw-Hill 1964. SSB systems circuits. Sabin, Schoe, 1987. Top prices paid. (Bridgend) 0656 665225.

**2TOP** band AM valve TX required by partially sighted pensioner unable to cope with solid state PCBs Codar AT5 preferred but similar home brew rig in working order might suit. Will pay fair price and carriage G2AGH QTHR (Norwich) 0603 860963

**ANY C-BAND** satellite equipment. eg receivers, LNBs, mounting dishes, two metres or larger. G3GLL QTHR. (Tollesbury). 0621 869309.

**BIRD** Through Line RF Wattmeter complete with elements, Icom 24G VHF tcvr, Yaesu FT730R UHF tcvr. Gd condx essential. G8CPH QTHR. (Ipswich) 0473 831448.

**CALLBOOKS** pre 1970 wanted for research project. Condn immaterial, buy or borrow. G3RKH QTHR. (Halifax) 0422 202551.

**CIRCUIT** diagrams for Telequipment S43 scope with TS41 timebase using valves to V107. All exps paid for photocopy or loan. (Wadhurst) 0892 783859.

**CODAR** CR70A RX restoration project requires Shinohara type S meter or info circuit diagrams, any Codar equipment to sell, WHY? G0EVJ. (Lichfield) 0543 251915.

**COLLINS** R389 and R391 receivers. Must be complete, not necessarily operational. G8LIU QTHR. (Uxbridge) 0895 230006.

**DATONG** Morse tutor or similar. Also Cushcraft R7 vertical antenna. GM4CHX. (Aberdeen) 0224 317966.

**DATONG** PC1 general coverage short wave receiving adaptor. G8BKE QTHR. (New Milton) 0425 615143 after 6pm.

**DISCONE,** aluminium, screw-in radials, strong construction. TX 80-200MHz. (Lyndhurst) 0703 813558.

**DRAKE** 7-line R7-R7A receiver, TR7A, options, 7077 desk mic, CW75 keyer, RV7S VFO, TV3300LP LP filter, service manuals, TR7/R7. (Notts) 0602 609345.

**EDDYSTONE** EA12 to gd home, also circuit anyone? Plus KW Victor; WHY? (Ipswich) 0473 311665 after 7pm.

**EDDYSTONE** EC10 in mint condition. Cash waiting, will collect. (Surrey) 037 245 4381.

**EDDYSTONE** receivers, 940, 830/7. Reasonable condition, working or not. G3PJK QTHR. (Manchester) 061 654 6160.

**HANDBOOK**, calibration manual, TF1370A Marconi wide-range RC oscillator loan or copy, expenses paid. G3MPF QTHR (Preston) 0772 813867.

**HEIL** SS-2 loud speaker, top price paid. G4IOF QTHR. (NW London) 071 722 7040.

**INSTRUCTIONS** for BBC ROMS, Enigma, Disc doctor, Sleuth, View, Viewstore, Viewsheet, Viewcalc, floppy-Wise plus, Interchart, Brom. Expenses paid, G4MQX QTHR. (Axbridge) 0934 732655.

**KENWOOD** TS440S fitted CW 500Hz filter. Also suitable PSU. Details G4FJO QTHR. (Weymouth) 0305 781164.

**LINEAR** amplifier for Trio 120V (10W), preferably matching unit, also 2/3ele HF Yagi 21MHz. G2CYN QTHR, (London) 071 935 7119 days.

**MICROWAVE** modules MMS2 advanced Morse trainer (Morse talker). (Kilkeel) 06937 63210.

**OSCILLOSCOPE** small 2-3" CRT Y-AMPL, better than 2MHz. (Leeds) 0532 654644.

**PHILIPS** semiconductors BTR59-1300 and BYV34-450 two of each needed. Cannot find supplier. G3MWO QTHR. (Beyton) 0359 70218.

**PYE PF9R** pocketfone receivers also require PF9T and information will pay for working or non-working units, and pay expenses. Also needs info on Tandata C12HD model 620B colour monitor will pay all costs. contact John (Kilmarnock) 0563 26732 evenings 6-9 pm.

**QST**: Buy, borrow or photocopy, April 1934, May 1936. Bernard Litherland G4IMT QTHR. (Chippenham) 0225 891254 anytime.

**SERVICE** manual and circuit with parts list for Telequipment oscilloscope 720. Beg, borrow for copying against deposit, or buy. All expenses paid. EFC Owen, office hours only. (Crawley) 0293 520172 ext 242.

**RACAL** 1218. Eddystone 880/2 or 1837/38. Drake 1.5K filter. Other recievers considered. Your price paid. (Glasgow) 041 649 2326.

**SILLY** Square Basher seeks mobile tower in towable condition. Phone details, if not home, ansaphone will take your message, thanks. (Huddersfield) 0484 538426.

**SPEAKER UNIT**, Kenwood SP430, will pay reasonable price for A1 condition. Also required lattice tiltover tower, preferably 60ft, would consider smaller if right price. Phone Ken James G4XQA QTHR with details. (Warrington) 0925 264166.

**SPECTRUM** analyser for use upto at least 1300MHz. Cash ready. Eg Texscan AL60-B. G3UKV QTHR. (Telford) 0952 255416.

**TO BORROW**: TM11-300AK book BC221, full postages paid. To buy pair 600ohm phones, SG Brown or similar. G4PRI QTHR.

**TRY BEFORE** buy: have need to borrow or short short term loan 2 metre multimode, my requirement is to identify possible complex EMC compatability at present QTH located within retirement flat environment and to justify equipment capital expenditure. Help appreciated. G1CMH. (Gloucester) 0452 714961.

**TS780** transceiver. (Ely) 0353 741354 before 9pm please.

**UNIDEN** 2830 or similar wanted very good price paid for one in excellent working order. Also required base charger unit for Trio TR 2500 and SMC 25 speaker mic for same. Seaton, 32 Digby Street, Kimberley, Nottingham (Nottingham) 0602 386333.

**VERSATOWER** or similar 3 section post mounted 45ft lattice tower. Must be complete in good condition for sale. 10m portable mast cw guys haliard and carrying case.: £45. HF Manpac radio full info available not working: £75. (Horsham) 0403 864222.

**WANTED** - Valves 6V6, 6BA6, 807; valve output transformers; 250pF per section split stator capacitor; AR88 tuning drive; BC221 + PSU. Andy. (Torquay) 0803 690284.

**WANTED EHT** transformer for Telequipment D83 scope, your price paid. G4OYN QTHR. (Northants) 0536 725586.

**WANTED**. AEL 1233, plus PSU. Basic transceiver, cash or exchange. G3XKF. (Aylesbury) 0296 614128.

**WANTED**. Workshop manual for SRX30 RX Lowes for alignment details or copy of same, costs refunded. G7GHI QTHR. (Doncaster) 0302 867441.

**WANTED**: Heathkit SB600 speaker and SB620 spectrum analyser, preferably with manual. Good prices offered. (Sheffield) 0742 455216.

**YO901P** Yaesu monitor scope with pan adaptor. Also small b/w TV monitor for SSTV, can collect. (Yeovil) 0935 23873.

# EXCHANGE

**TS530S** CW filter: £475. or PX exchange for 2m/70cm dual band mobile or any XWD radios. Phone Len G4WZU. (Grantham) 0476 74047.

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**EXCHANGE**: Lowe HF225 as new with FM and synchronous AM: £300. Or exchange winch up tower, prefer tiltover 40ft. (Derby) 0332 372696.

**HANSEN** FS710HF auto SWTR-PWR AVE-PEP 20/200/2KW meter WANTED Noda-Tushin SWR 427h SWR-PWR meter mint condition only . SELLING CAPCO SPC300D ATU mint EXCHANGE for HD PSU 35-40amp or Kenwood AT250 auto HF ATU selling Lowrey GX.1 Organ GW4 RCP QTHR. (Caernarfon) 0286-5264.

**HAVE** Create V Dipole model 730v-1, 10-40m cost: £162 new and unused. Exchange for best scanner offered tel sharp after 7pm (Swindon) 0793 826325 or write G4MNB QTHR.

**RA17L** revalved throughout manual VGC for Eddystone 730/4 or WHY? KW2000A new PAs spare valves manual for 2m h/held or :£175 , Realistic PRO '38 scanner 66-512MHz nicads, charger for radio gear GW0FPY, 4 Bryn Deiniol, Valley Road, Llanfairfechan, Gwynedd LL33-OSR North Wales.

**TEST** Equip AVO 8, HF135, signal generator, 100KHZ to 240MHz mint, Bradley Portable oscilloscope VGC, Telequip. DM64 - Poor cond and a high intensity bench/work lamp 240 vac supply, I require a compact HF beam and a rotator. For sale 40m cw QRP TCUR. DCTRX varicap VFO, PPPA, RIT, etc :£45 no reasonable offer refused WHY. G4WUS (Guisborough) 0287 642596.

**YAESU** FL2100B, very good condition. Exchange for any dual band handheld or cash. Peter G8EUX. (Towcester) 0327 53522.

# CLUB NEWS

DEADLINE - Items for inclusion in the July 1992 issue must be sent to HQ marked "Club News - DIARY", to be received by 22 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 - 14, talk 'Raynet, What, Why and Who?' by Lance, G0CCU; 28, bring & buy sale. Details 0272 721744.

CITY OF BRISTOL GROUP - 18, talk 'First British Amateur Radio Operation from Uzbekistan' by Barry, G3ZLK; 25, picnic - Ashton Court, 2pm. Details 0275 855123.

SOUTH BRISTOL ARC - 13, exhibition of your own hobbies; 20, talk 'The Talking Brick' by Muriel, G4YZR; 27, Signwriting for the Rally. Details 0275 832222 on a Wednesday evening.

WESTON-SUPER-MARE RC - 4, talk by Tony Griggs, G4KMB; 18, social & constructors night; Jun 1, talk by Barry Steel, G4LZK about his radio holiday in Uzbekistan. Details 0934 415700.

### BEDFORDSHIRE

BEDFORD & DARC - ***CHANGE OF VENUE*** Bedford United Football Club, Clapham Road, Bedford. Details 0234 365660

DUNSTABLE DOWNS RC - 1, talk 'Studio Lighting'. Details 0582 451057.

### BERKSHIRE

BRACKNELL ARC - 13, visit to Racal Communications Field Trials Site Moss End, near (New Leathern Bottle) Jeallots Hill. Details from Steve, G4AUC.

BURNHAM BEECHES RC - 2/3/4, Dx Picnic Stafford; 18, Fox Hunt G7KBG Fox. Details 0628 25720.

READING & DARC - 9, Support Christian Aid Walk; 14, HF NFD planning (provisional); 28, alignment evening (provisional). Details 0734 722489

### BUCKINGHAMSHIRE

AYLESBURY VALE RS - 6, test & measurement evening. Details 0296 81097.

CHESHAM & DARC - 20, visit to Martin Lynch in Ealing; 27, open discussion. Details 0494 482479.

MILTON KEYNES & DARS - 11, talk 'Fighter Aircraft and Aces' by Stuart Lightfoot, G0GOF; Jun 8, construction contest and judging. Details 0908 611005.

### CAMBRIDGESHIRE

CAMBRIDGE & DARC - 8, visit by the Duxford Scouts; 15, talk 'Op Amps and Their Uses' by Murray, G0PFG; 22, talk and demonstration 'ATV' by Ian, G3KKD. Details 0763 243570.

### CHESHIRE

CHESTER & DARS - 7, radio ideas and discussion; 12, talk 'Electronic Experiences, Japanese Amateur Radio & Video' by GW7KTA; 26, surplus equipment sale. Details 051-608 3229.

NORTH CHESHIRE RC - 3, talk and slides 'Roses for your Garden'; 10, start of club project - constructing a noise bridge; 17, talk 'ABS Braking Systems' by G0AUB; 24, talk 'A Funny Thing Happened to Me on the Beat' by G0NHX. Details 0565 777288.

### CLWYD

CONWAY VALLEY ARC - 7, talk by Dr David Last, GW3MZY; Jun 4, AGM plus construction competition. Details 0492 530725.

NORTH WALES RRC - meets every Thursday at YMCA Building, Queens Street, Colwyn Bay. Details 0745 591704.

RHYL & DARC - 18, Fox Hunt No.1. 144MHz DF contest (fox - GW4HDR). Details 0745 338276.

WREXHAM ARS - 5, talk 'Collecting Stamps about Amateur Radio' by Taizo, JA3AER; 19, field evening and buffet supper. Details 0978 266887.

### CORNWALL

CORNISH RAC - 7, 'Ham Snaps from Ozz' presented by Les, G0KSF. Details 0209 820836.

EAST CHINA CLAY RC - ***CHANGE OF NAME*** now called St Austell Amateur Radio Club (G0ECC). Details from G4TRV, QTHR.

### DERBYSHIRE

BUXTON RA - 12, video show; 26, quiz night; Jun 9, new members' invitation night. Details 0298 25506.

DERBY & DARS - 6, junk sale; 13, 2m DF practice - Allestree Park, Derby. Details 0773 852475.

TOR ARS - 7, buffet and get-together at the Duke of Wellington, Chesterfield Road, Matlock. Details 0773 826747.

### DEVON

PLYMOUTH RC - meets at The Royal Fleet Club, Devonport, Plymouth; 7.30pm every Tuesday.

TORBAY ARS - 22, junk sale. Details 0803 526762.

### ESSEX

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

CLACTON RC - ***NEW VENUE*** The Imperial Public House, Rosemary Road, Clacton-on-Sea. Club meets 1st and 3rd Wednesday of month.

ILFORD RSGBG - ***CHANGE OF DATES*** Club now meets Thursday evenings. Details 081-478 3741.

LOUGHTON & DARS - 15, planning night for Aylmers Farm field weekend (provisional); 23-25, Aylmers Farm field weekend (provisional). Details 081-504 4581 (eves & w/ends).

### FIFE

DUNFERMLINE RS - 7, 'Call My Bluff' evening with the Lothians RS; 21 auction and junk sale; Jun 4, visit by Ian Suart, GM4AUP, RSGB Zonal Rep for Scotland. Details 031 331 4340 (evenings).

### GLOUCESTERSHIRE

GLOUCESTER ARS - 6, 'Flights of Fancy' quiz by G0FEW; 20, visit by Churchdown Guides; 27, Packet self-help group. Details 528533, extn 2734.

### GRAMPIAN

ABERDEEN ARS - 1, junk sale; 8, Energy Transduction Exhibits; 29, talk and demo 'Top Band DF Receiver' by GM0CSZ. Details 0224 780519.

### GREATER LONDON

ACTON, BRENTFORD & CHISWICK ARC - 19, talk 'My Feed Line Tunes my Antenna' by G3IGM. Details 071-938 2561.

COULSDON ATS - 11, talk 'Packet Radio for Beginners' by Peter Burton, G3ZPB; Jun 8, team quiz night. Details 081 684 0610.

CRAY VALLEY - 7, surplus sale. Details 081-850 1386.

EDGWARE & DRS - 14, talk 'Advancements in RF Power Semi-Conductors' by G3SGC; 28, constructors' contest and NFD briefing. Details 081-953 2164.

HAVERING & DARC - 13, talk 'Portable Appliance Testing' by Bill Ardley, G0BOF - bring small domestic appliances for test and print-out report; 27, talk 'A Hard Maths Night' by Peter Weedon, G8ZKZ, Jun 10, talk by Dave Bull, G8YSK. Details 0255 821554.

SOUTHGATE ARC - 14, talk 'Early RADAR, Part 2' by Stan Woods, Marconi historian. Details 081-360 2453.

SUTTON & CHEAM RS - 21, Annual General Meeting. Details 081 644 9945.

WIMBLEDON & DARS - 29, talk 'Cable TV' by Bob Knight, G3DPW Details 081-397 0427.

### GREATER MANCHESTER

ECCLES & DARS - 5, talk 'The Pros and Cons of Owning a Fiesta XR2i' by G6FEI; Jun 2; demonstration 'Circuit Cimulation using CAD' by G8KRG. Details 061-773 7899.

SOUTH MANCHESTER RC - 1, contest preparation; 8, home brew contest; 15, QRP and 'S' meter calibration; 22, Annual General Meeting; 29, talk by the winner of the home brew contest. Details 061-969 1964.

### GWYNEDD

DRAGON ARC - 4, surplus equipment sale; 18, demonstration of Amateur Television by John Lawrence, GW3JGA; Jun 1, talk 'Pre-Radio Communications in Anglesey' by Tomos Roberts. Details 0248 600963.

### HAMPSHIRE

BASINGSTOKE ARC - 4, social and junk sale; 29/30/31, New Forest Fox Hunt & BBQ weekend; Jun 1, planning for VHF NFD. Details 0256 25517.

HORNDEAN & DARC - 7, EMC update. Details 0705 472846.

ITCHEN VALLEY RC - 8, talk by Terry Barnes, GI3USS, RSGB President; 22; talk by Bob Button, Communications Division, Hampshire Fire Brigade. Details 0703 736784.

THREE COUNTIES ARC - 6, talk by speaker from British Nuclear Fuels Ltd 'Their Operations and the Environment'; 20, talk 'The Management and Equipment Needed to Run the UoSAT Groundstation' by Duncan, G7HHJ; Jun 3, talk 'The Falkland Islands and the British Antarctic Survey by Richard Fletcher-Cook (ex-Deputy Governor Falkland Islands). Details 0420 83091.

### HEREFORD & WORCESTER

BROMSGROVE ARS - 12, Annual General Meeting. Details 0527 54607.

HEREFORD ARS - 1, talk 'Marine Radio Navigation Systems; by John Morris, G4BXS; 15, annual construction contest; Jun 5, talk 'Planning Permission' by John McFall, G4HFX. Details 0432 355297.

VALE OF EVESHAM RAC - 7, talk 'Electronic Warfare' by Peter Chadwick, G3RZP. Details 0386 41508.

WOODPECKER RG - ***NEW VENUE*** Richmond Place Club, Edgar Street, Hereford; 8.30pm every Monday. Details 0432 352441.

### HERTFORDSHIRE

CHESHUNT & DARC - 6, talk '23cm and 10GHz Amateur Television' by Dave McQue, G4NJU; 20, portable evening on Baas Hill Common, Hoddesdon; Jun 3, NFD briefing. Details 0992 464795.

DACORUM ARTS - meets first (informal) and third (formal) Tuesday each month; 7.30pm at the Heath Park pub, Cotterelle, Hemel Hempstead, Herts. Information from Club Secretary G1AKX, QTHR, tel: Hemel Hempstead 259620.

HODDESDON RC - 28, talk 'EMC' by Brian Bond, G3ZKE. Details 081-804 5643.

STEVENAGE & DARS - 12, computer modification and enhancement (IBM clones etc). Details 0438 724991.

VERULAM ARC - 26, talk on 'RadCom' by Mike Dennison, G3XDV. Details 0923 262180.

WELWYN/HATFIELD ARC - 4, Lemsford fete; 18, talk by speaker from CM Howes Communications on Howes Kits. Details 081-440 6783.

### HUMBERSIDE

GOOLE R&ES - 8, video evening - showing early GRES events plus last year's contest sessions; 15, talk 'Propagation' by Andy, G8ZCS and Richard, G0GLZ; 22, mystery trip. Please assemble in cars at the club car park at 8pm prompt; 29, social evening at the Black Swan Inn, Asselby, Goole. Details 0405 769130.

GRIMSBY ARS - 7, Grimsby Packet meeting; 14, talk 'DF Techniques' 21, DF Hunt; 28, NFD organisation; Jun 5 NFD at CIBA Sports Ground; 11, evening visit to SCM Chemicals. Details 0472 825899.

HORNSEA ARC - 6, open night; 13, rig check, 20, talk 'Computer Logging' by Rick, G1YVL; Jun 3, NFD preparation. Details 0964 533331.

NORTH FERRIBY UNITED ARS - 1, Way Ahead meeting with Ken, G4VKK; 8, talk 'QFE or QFH - What Are They Talking About?'; 29, surplus equipment sale. Details 0482 650410.

### LANCASHIRE

BURY RS - 12, talk 'The Sun' by L M Dougherty; Jun 9, talk 'Contest Operations' by Keith Khan, G3RTU. Details 0204 883212.

FYLDE ARS - 14, DF Foxhunt; 28, NFD preparations; Jun 11, visit to Police HQ Communications Centre, Hutton. Details from R J Bourn, G7CUL.

PRESTON ARS - 14, talk 'Pageant of Lancaster Priory' by Mrs Tomlinson; 28, preparation for NFD - 6/7 June; Jun 11, illustrated talk 'Vanoise National Park' by Mr Ruthven. Details 0772 686708.

THORNTON CLEVELEYS ARS - 3, Bank Holiday Barbeque - venue TBA; 11, video 'History of the Lancaster bomber'. Details from G4BFH, QTHR.

SKELMERSDALE & DARS - meets at The Grimshaw Public House, behind the Fire Station, Skelmersdale, West Lancs - last Friday of each month. Details from John Rogers, G4SME, QTHR.

### LEICESTERSHIRE

LEICESTER RS - 4, NFD preliminary planning; 18, talk 'Aeronautical Navigation from a Microlight' by Baz, G4BUD; Jun 1, open meeting & NFD final arrangements. Details Leicester 762241.

LOUGHBOROUGH & DARC - 5, talk 'Raynet'; 12, Spring junk sale; 19, 160m Double DF; 26, HF evening. Details 0509 218259.

### LINCOLNSHIRE

LINCOLN SWC - 13, Annual General Meeting; 27, games night; Jun 10, junk sale. Details 0522 522715.

### MERSEYSIDE

LIVERPOOL & DARS - 5, talk 'Parachuting' by G3OSI; 12, open night; 19, discussion - Awarding Trophies; 26, surplus sale. Details from Gordon, G4VYR.

### NORFOLK

ARC OF FAKENHAM - 5, talk 'How to Start in ATV - Your First TX' by Mark, G4WVU; Jun 2, EGM (details by post) and members to display 6 of their favourite QSL's. Details 0485 528633.

NORFOLK ARC - 6, 'Real Radio' evening; 13, GB3NB Repeater Annual General Meeting; 20, talk 'Project JUNO - What Happened' by Alan Wright, G0KRU; 27, final HF NFD briefing; Jun 3, talk 'The American Radio Scene' by Tony Barton, G3JQI. Details 0603 747992.

YARMOUTH RC - 7, used equipment sale; 21, caravan maintenance party Bradwell; Jun 4, NFD contest preparations. Details Yarmouth 721173.

### NOTTINGHAMSHIRE

AMATEUR RC OF NOTTINGHAM - 7, forum to discuss this Summer's Fox Hunts; 14, talk by Mary, G0NZA, the Regional Liaison Officer; 21, 2m Foxhunt; 28, talk 'Raynet' by Dave, G3YUT; Jun 4, forum; 11, talk 'Balance, Impedance & SWR' by Rex, G0REX. Details 0602 733740.

MANSFIELD ARS - 7, Annual General Meeting. Details 0623 755288.

SOUTH NOTTS ARC - 1, open forum; 15, video show 'OSCAR' and 'FUJI'. Details 0602 841940.

### SHROPSHIRE

TELFORD & DARS - 13, contest equipment checkout; 20, spectrum analysis and alignment night with G8DIR; 27, outside visit. Details Bridgnorth 761203.

### SOMERSET

YEOVIL ARC - 7, open discussion and preparation for QRP Convention; 14, talk '80m Superhet Receiver' by G3PCJ; 21, talk 'Protective Multiple Earthing' by G4XKK. Details from G0HDJ, QTHR.

### SOUTH GLAMORGAN

CARDIFF RSGBG - 11, talk 'Antenna Matching' by Jeff Diplock, GW3UZS; Jun 8, slide show by Don Green, GW3MRI on his latest trip to South Africa. Details 0446 773212.

HIGHFIELDS ARC - ***NEW CONTACT*** D Benson, GW3TQI, Chairman Highfields ARC, 26 Allensbank Road, Cardiff.

RHONDDA ARS - ***NEW SECRETARY*** Mr Dennis F Tippett, 30 Berw Road, Tonypandy, Rhondda, CF40 2HD, tel: Tonypandy 440680.

### SOUTH YORKSHIRE

BARNSLEY & DARC - 4, Open talk on 1992 Rally; 11, talk 'The RSGB' by G4EJP, Zone 'A' Council Member; 18, talk 'Amateur Radio Observation Service' by G3STG; 25, talk 'Novice Licence' by G0NMJ, Jun 1, talk 'Breakthrough and Interference' by Tony, G4DXA. Details from E Bailey, G4LUE, QTHR.

DRONFIELD & DARC - 18, Foxhunt; Jun 1, talk 'The Magnetic Loop Aerial - Construction and Operation' by Wesley Mitchell-Watson, G0LUM. Details 0246 290444.

### STRATHCLYDE

WEST OF SCOTLAND ARS - 8, talk 'WAB - 25 Years On' by Tom, GM4FDM; 22, Annual General Meeting. Details 041-776 4181.

### SUFFOLK

FELIXSTOWE & DARS - 18, ESWR planning Details 0473 642595 (daytime).

IPSWICH RC - 13, talk 'Packet In - I'm a Bit Busy' by G0DVJ; 20, ESWR planning; Jun 10, visit to Harwich Harbour Board. Details 0473 742072.

LEISTON ARC - 5, talk 'Direction Finding' by Alan Martindale, G3MYA. Details 0728 832924.

LOWESTOFT DISTRICT & PYE ARC - 7, talk 'This is GB3LO' by G4RKP; 21, club barbeque at the club shack. Details G4KDL, QTHR.

### SURREY

DORKING & DARS - 26, talk 'The Role of the Radio Investigation Service' by Mr T J Cullimore, Radiocommunications Agency. Details 0306 77 236.

ECHELFORD ARS - 28, talk 'Safeguarding Electro-static Devices' by Jim Todd, G4XLM. Details 0344 843472.

### TAYSIDE

DUNDEE ARC - 12, talk by George Allan, GM4HYF, member of MEGS, the Morse Enthusiasts Group Scotland; 19, The John Martin Award evening. Details from GM4FSB, QTHR.

### WARWICKSHIRE

STRATFORD-UPON-AVON RS - 11, talk 'Computers in Amateur Radio' by John Price, G4OIL; Jun 8, talk 'Cables and Feeders' by Glen Ross, G8MWR. Details 060 882 495.

### WEST SUSSEX

HORSHAM ARC - 7, talk 'Miniature Antennas' by G3LDO. Details 073784 2150.

MID SUSSEX ARS - 7, talk 'MIDI' (Musical Instrument Digital Interface) by Reg, G3GZT; 14, construction contest; 21, talk 'A Look at Wartime Enigma' by Don, G3XHQ. Details 0444 241 407.

### WEST YORKSHIRE.

DENBY DALE & DARS - 6, club contest discussion led by Brian, G0NMH; 20, general rally meeting and GB2YIA rally discussion; 27, Fox Hunt organised by Brian, G0NMH; Jun 6, talk 'HD Repeater' by John, G0PRF. Details 0484 532371.

HALIFAX & DARS - 19, talk 'CW Operation' by S Wilson, G3VMW. Details Halifax 202306.

KEIGHLEY ARS - 14, horse-racing at the Cricket Club; 28, Foxhunt; Jun 4, talk 'Stoneage Man PDH' by Mr Dougherty. Details from Kathy, tel: 0274 496222.

PONTEFRACT & DARS - 11, junk sale. Details 0977 677006.

SPEN VALLEY ARC - 7, surplus sale; 21, Swindon Cup; Jun 4, Fox Hunt. Details 0274 875066.

### WILTSHIRE

SALISBURY R&ES - 5, talk 'DX Packet Cluster' by Neil, G4LDR; 19, 2m DF Hunt; Jun 2, guest speaker. Details from Dave Hay, Secretary.

# RALLIES AND EVENTS

This is a list of all rallies, hamfests, 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'.

### 3 MAY

9TH ANGLO-SCOTTISH Rally - Tait Hall, Kelso. Details from Bruce, GM4UIB, QTHR.

BATC Rally - Harlaxton Manor, nr Grantham, just off the A1. Usual traders, bring & buy, bar and refreshments. Lecture programme, Talk-in, demonstrations, flea market and craft corner. Family venue. Details Paul G8MJW, 0522 703348.

### 4 MAY

DARTMOOR RC Rally - St Pauls Church Hall, Yelverton. Doors open 10.30am. Usual traders, refreshments, bring & buy. Free parking. Details George Spray, 0822 853885.

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, 0606-77787.

### 10 MAY

MARS/DRAYTON MANOR Radio Rally - Drayton Park, Tamworth, Staffs. Details from Peter, G6DRN, tel: 021-443 1189. Trade stand bookings - Norman, tel: 021-422 9787.

YEOVIL ARC 8TH QRP Convention - Preston Centre, Monks Dale, Yeovil. Doors open 9am; admission £1.50 including programme. Talks and demonstrations, QRP and DIY orientated traders. Good food and soft drinks. Free Spectrum Analyser Rig check. Construction Challenge adjudication. QRP Funrun in week prior to the event. Details from Peter Burridge, G3CQR, QTHR.

### 16 MAY

SWINDON & DARC Radio Rally - Oasis Leisure Centre, Swindon. Details from G0LTP, tel: 0793 852855.

### 17 MAY

DUNSTABLE DOWNS RC - 9th National Car Boot Sale - Stockwood Park, Luton (nr Jnct 10, M1). Starts 10am. Talk-in on S22. Details 0582 451057.

MID-ULSTER ARC 'PARKANAUR' Rally - The Silverwood Hotel, Lurgan, Co Armagh. Doors open 12 noon. Usual trade stands, bring & buy stall, bookstall, QSL bureau etc. Talk-in on S22 145.550. The proceeds of this rally go to the Stanley Eakins Memorial Fund at Parkanaur, nr Dungannon. Details from GI0OND (QTHR GI1YGS) 0762 851179.

RIPON & DARS 35th Northern Mobile Rally - Flower Show Hall, Great Yorkshire Showground, Harrogate. Showground open 10am, doors open 10.45am. Bring & buy, cafeteria, 100's of stands, 45,000 sq ft of space. Talk-in on S22. Entry and parking off Wetherby to Harrogate Road. Separate arrangements for disabled visitors off Hockstone Wood Road. Details Mike, G0MKK, 0423 564353/507653.

### 24 MAY

EAST SUFFOLK Wireless Revival (organised jointly by Ipswich RC, Martlesham RS and Felixstowe & DARS) - Maidenhall Sports Centre, Maidenhall Approach, Ipswich. Well sign-posted from A12/A45 - A137 jnct from which point all traffic should approach. Talk-in on S22 by GB4SWR. Doors open 10am. Admission £1. Boots - private cars £5 inc driver and one passenger. Send SAE for free maps. Details from G7HZV, QTHR, 0394 271257.

PLYMOUTH RC Radio & Electronics Fair - Plymstock Comprehensive School, Church Road, Plymstock. Doors open 11am. Admission £1 at door. Over 25 stalls selling electronic, computer & radio components. Bring & buy, bookstall, hot & cold buffet, grand raffle. Club station on air. Free parking. Details Plymouth 787181.

### 30/31 MAY

RSGB National Convention - NEC Birmingham. Details from Norman Miller, G3MVV, tel: 0277 225563.

### 7 JUNE

BURY ST EDMUNDS ARS Car Boot Sale - Scout Pavilion, Stanton, nr Bury St Edmunds. 10am-4pm. Admission free. Light refreshments. £3 per car boot. Talk-in on S22. Send SAE for free map. Details from G0MEV, QTHR, 0359 50271.

NORTHAMPTON RC Radio Computer & Electronics Rally - rear of Red Lion public house (500 yds from Jct 16, M1). Starts 10am. Refreshments. Talk-in on S22 and GB3NH (RB3) and top band 1.933. Much more space for stalls this year - extra field for parking. Pitches first come first served. To book early contact Paul Young, G0HWC, 0327 41267.

SPALDING ARS 24th Annual Mobile Rally - Springfields Exhibition Centre, Spalding. Doors open 10.30am. All under cover; 3 times more exhibition space than previously; full catering facilities; indoor flea market; bring & buy; 5 acres car parking; entry to gardens available. Talk-in on S22 G1DSP/P. Details G4TWR, 0775 722940.

### 14 JUNE

ELVASTON CASTLE Mobile Rally - Elvaston Castle Country Park nr Derby. Over 150 trade stands, technical bookstall, grand bring & buy marquee, flea market (for private vendors) from 9am. Craft marquee, RSGB, band performances, children's entertainments and stalls, laser sport, full on-site catering. Talk-in on 144 and 432MHz. Car parking £2 - coaches £10. Adjacent caravan/camp site - for bookings telephone 0332 751938. Trade enquiries Peter, G3WFU, tel: 0332 700265 (evenings). Details John, G4PZY, tel: 0332 767994.

RNARS Annual Mobile Rally - HMS Mercury, nr Petersfield, Hants. 10am-5pm. Trade stands, RSGB, RAIBC, BARTG, Raynet, RAFARS, RSARS, SUNPAC, RNLI. Bring & buy; flea market; radio-controlled power boats & trains; childrens' amusements; ices and refreshments; arts & crafts exhibition; two raffles; arena displays; free parking & picnicking; admission £1.50 (free for children). Talk-in 2m and 70cm. Details from Cliff Harper, G4UJR, 0703 557469. *This year's event is the last to be held in HMS Mercury; from next year the venue will be HMS Collingwood, Fareham, Hants*.

### 20-28 JUNE

FAREHAM & DARC 1992 SECOND WIRELESS EXHIBITION - HMS Warrior 1860, Naval Heritage Area, HM Naval Base, Portsmouth. Exhibits on display will represent the advance of wireless communication from Marconi/Jackson days up to 1942. Exhibits on loan from individuals, HMS Collingwood Wireless Museum and Mr Len Newman, G6NZ. Details Ray Mclean, G0JVE 0329 238642.

### 21 JUNE

DENBY DALE & DARS Annual Mobile Rally - Salendine Nook High School, Huddersfield (easy access from M62, jnct 23 eastbound 24 westbound). Doors open 11am. Usual traders; craft stalls; bar; catering; car boot sale; bring & buy. Ample car parking. Talk-in on S22 and SU22. Details from Philip, G4FSQ, 0484 644827.

MID-LANARK ARS Annual Rally - Newarthill CE Centre, High Street, Newarthill. Morse tests, trade stands, bring & buy, raffle, plus much more. Free parking. Details from Bill Findlay, GM0LEG, QTHR.

NEWBURY & DARS Annual Car Boot Sale - Cold Ash Playing Field. Less than 10 mins from A34 jnct 13 M4. 10am-3pm. Refreshments and children's play area. Free parking & entrance for buyers. £7 per pitch for sellers, no pre-booking. Talk-in on S22. No entrance to field before 8am. Details from N Jaques, G0HFU, 0635 63310.

NORFOLK RAYNET Rally & Car Boot Sale - Barford, Norfolk (B1108) OS Map 144, Ref TG113078. Starts 10am. Trade stands, refreshments. Car boots £5. Talk-in on S22. Details from G0IYD QTHR 0692 404593 (eves).

RAF COSFORD ARC Annual Station Open Day and Flying Display - RAF Cosford, Wolverhampton. Jnct 3 of M54, 500 yds along the A41 towards Wolverhampton. S22 (GX4CES). Details G0KTH, tel: 0902 373133 (eves).

### 27 JUNE

BRENTWOOD INTERNATIONAL AR & Computer Rally (run in conjunction with Southend ARC) - Brentwood International Centre, Doddinghurst Road, Brentwood, Essex. Easy access from M25 jnct 28 and A12 trunk road signposted by AA. Doors open 10.30am-6pm. 20,000 sq ft of Amateur Radio and Computers. Major suppliers and manufacturers of radio equipment, computers, accessories, antennas, computer s/ware and second-hand gear. Bar and cafe; bring & buy; car park with easy access for disabled visitors. Talk-in on S22 and SU22. Details CLPK, 18 Litchfield Close, Clacton-on-Sea, Essex CO15 3SZ.

### 28 JUNE

BROMSGROVE ARS Mobile Radio Ham Rally & Boot Sale - Lower Wick Country Fair on Worcester to Malvern Road, rear of Bennetts Dairy. Opens 9am-6pm. Tables for boot sale £4. Admission £1. Details Dave Edwards, G4ZWR, 0527 546075.

35TH LONGLEAT AR Rally - Longleat, nr Warminster. Follow the brown signs for 'Longleat House' from Warminster. Extensive trade exhibition; craft fair; RSGB bookstall & membership services stand; over 20 amateur radio clubs; bring & buy; catering; free car parking. Camping & caravanning facilities nearby. Details from Shaun, G8VPG, QTHR, tel: 0225 873 098.

### 5 JULY

KINGS LYNN ARC Rally - Corn Exchange, Kings Lynn Tuesday Market Place. Details from G0MQL 0553 841189.

NEWPORT ARS Junk/Boot Sale - Brynglas House, Newport. Opens 10.30am (10am for disabled visitors). Light refreshments; raffle. Admission 25p. Talk-in on S22 by GC1NRS. Details from GW7BSC, QTHR, 0633 262488 (6pm-7pm wkdays only).

YORK Radio Rally - Tattersall Building, York Racecourse. Doors open 11am (10.30 for disabled visitors). All usual favourites, bring & buy, licensed bar and cafe, arts and crafts. Morse tests, amateur radio, electronic and computers. Entrance £1. Talk-in on S22. Ample free parking. Details from David Moreland, G7FGA, 0904 790079.

### 11 JULY

CORNISH RAC Rally - Penair School, St Clement, Truro. Details from Mr B Thomas, tel: 0872 862046.

### 12 JULY

HORNCASTLE AR Electronics and Computer Fair - Queen Elizabeth's Grammar School, Horncastle. Car boot sale facility for small fee (electronics/radio only please). Talk-in on 2m. Free parking. Details from Tony Nightingale, G6CZV, 0507 522482.

SUSSEX AR & Computer Fair - Brighton Racecourse. Opens 10.30am. All usual facilities. Details from Ron Bray, G8VEH, QTHR, 0903 763978 or 0273 415654 office hours.

### 19 JULY

COLCHESTER RA Radio & Computer Rally - Highwoods Sport and Leisure Centre, Brinkley Lane, Colchester, sign-posted from A12-A120 jnct Crown interchange on north side of Colchester. Doors open 10am. Trade stands, bring & buy, RSGB Morse Test, licensed bar, snacks, drinks. Talk-in on S22. Ample free car parking on site. Admission £1. Details from G3FIJ, QTHR, 0206 851189.

9TH McMICHAEL Rally & Car Boot Sale - Haymill Youth & Community Centre, Burnham Lane, Slough. Details from G8XYN, 0628 25952.

2ND WIRRAL Radio Rally - Masonic Hall, Manor Road, Liscard, Wallasey, Merseyside. Doors open 11am (10.30 for disabled visitors). Details Dave Clifford, G0NVF, 051-639 5922 and Darren Roberts 061-476 3076.

### 25/26 JULY

NORFOLK ARC & Hewett School Rally. Details M J Cooke, 4 Geddes Way, Mattishall, Norfolk NT20 3RE.

### 26 JULY

RUGBY ATS 4th Annual AR Car Boot Sale - BP Truckstop on A5, 3 miles east of Rugby, 2.5 miles NW from Jct 18 M1. Open from 10am. Admission £1 per car. Cafeteria and toilets. Talk-in on S22 by GB6CBS. Pitches £7 pre-booked or £9 on the day. Details from Peter 0455 552449 or Kevin (for bookings) 0203 441590.

SCARBOROUGH ARS Radio Electronics & Computer Rally - The Spa, South Foreshore, Scarborough. Doors open 11am. Many traders, bring & buy, refreshments and bar. Details from Ian Hunter, G4UQP 0723 376847.

### 30 JULY-2 AUG

AMSAT-UK Colloquium - University of Surrey. Details from G3AAJ, tel: 081 989 6741.

### 2 AUGUST

RSGB NATIONAL MOBILE RALLY - Woburn Abbey. Details from N Miller, G3MVV, QTHR, 0277 225563.

### 9 AUGUST

DERBY & DARS Mobile Rally. Details from G3SZJ, QTHR, 0332 556875.

FLIGHT REFUELLING Hamfest 92 - Flight Refuelling Sports & Social Club Grounds, Merley, Wimborne, Dorset. Details from G0API, 0202 691649.

### 23 AUGUST

WEST MANCHESTER RC "Red Rose" Rally - Bolton Sports & Exhibition Centre. Details from Dave, G1IOO, 0204 24104.

### 30 AUGUST

TORBAY ARS Mobile Rally - STC Social Club, Brixham Rd, Paignton. Details from G3HTX, QTHR, 0803 526762.

### 6 SEPTEMBER

BRISTOL Radio Rally. Details from G4WUB, QTHR, 0275 839855.

MILTON KEYNES & DARS Car Boot Rally. Details from Ray, G1LRU 0908 660798.

PRESTON ARS Mobile Rally. Details from G Earnshaw, 0772 718175.

VANGE ARS Rally. Details from G4NVT, 0268 543025 or Doris Thompson, 0268 552606.

### 12 SEPTEMBER

WIGHT WIRELESS RALLY - National Wireless Museum, Arreton Manor, Newport, Isle of Wight. 11am to 5pm. Details from G3KPO, QTHR, 0983 67665.

### 13 SEPTEMBER

BARTG Rally - Sandown Park Exhibition Centre, Esher, Surrey. Details from Peter Nicol, G8VXY, tel: 021 453 2676.

LINCOLN SWC Hamfest. Details from Sue Middleton, 0522 531788 or QTH G8VGF.

### 20 SEPTEMBER

CENTRE OF ENGLAND Autumn Radio Computer & Electronics Rally - National Motorcycle Museum, Bickenhill, near NEC, Jnct 6 M42. Details F Martin, G4UMF, 0952 598173.

EAST OF ENGLAND Radio Rally (Peterborough R&ES) - ICI Building, East of England Showground, Peterborough. Details Mike Bowthorpe, G0CVZ, tel: 0733 222588.

### 27 SEPTEMBER

34TH HARLOW AR Rally. Details 0279 432306 (day) 0279 722569 (eve).

NORTH WAKEFIELD RC Radio Rally. Details John, G4RCG, 0924 362144.

### 4 OCTOBER

GREAT LUMLEY Radio Rally. Details from Barry, G1JDP, 091 388 5936.

WINCANTON Rally. Details from Norman, G4YXX, 8 Fair View, North Brewham, Bruton, Somerset BA10 0JT or tel: 074985 432.

### 11 OCTOBER

HORNSEA ARC Rally (ELHOEK). Details from G4IGY, 0964 533331.

SOUTH DEVON RC Computercations 92 Computer & Radio Rally. Details from W T Trezise, G6ZRM, 0803 522216.

### 23/24 OCTOBER

LEICESTER ARS Show - Details from F Elliott, G4PDZ, 0533 871086.

### 31 OCT/1 NOV

6TH NORTH WALES Radio & Electronics Show. Details from GW7EXH, 0745 591704.

### 8 NOVEMBER

BARNSLEY & DARC 2nd AR Rally. Details from Ernie, G4LUE, 0226 716339 (6pm-7pm please).

MARS/STOCKLAND Mobile Radio Rally. Details from Norman, G8BHE, 021 422 9787.

### 28 NOVEMBER

GREATER LONDON AR & Computer Show - Harrow Leisure Centre, Christchurch Ave, Harrow. Details from CLPK, 18 Litchfield Close, Clacton-on-Sea, Essex CO15 3SZ.

# GB CALLS

The list below shows special event stations licensed for operation during this month and up to 22 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.

**19 APRIL**

| | |
|---|---|
| GB8OEB | Operation Euro-Baby |

**21 APRIL**

| | |
|---|---|
| GB2MSR | Manx Scout Radio |

**23 APRIL**

| | |
|---|---|
| GB4SG | Saint George |

**24 APRIL**

| | |
|---|---|
| GB2IMD | International Marconi Day |

**1 MAY**

| | |
|---|---|
| GB0ECF | European Community Festival |
| GB100BMC | Bowes Museum Centenary |
| GB2OMC | Osbaldwick, Murton Clubs |
| GB3CDY | Coastal Defence Yarmouth |
| GB8SWS | Southampton West Scouts |
| GB0CDZ | Coastal Defence 'Z' |

**2 MAY**

| | |
|---|---|
| GB2BMF | Bocking Mayday Fayre |
| GB2SKE | Straight Key Evening |

**4 MAY**

| | |
|---|---|
| GB2LOW | Low Power/Low Output Watts |

**8 MAY**

| | |
|---|---|
| GB2LDS | Latter Day Saints |

**9 MAY**

| | |
|---|---|
| GB2LOW | Low Power/Low Output Watts |

**10 MAY**

| | |
|---|---|
| GB4CC | Classic Cars |

**14 MAY**

| | |
|---|---|
| GB2NIC | Northern Ireland Castle |
| GB4SRC | Swindon Radio Club |

**15 MAY**

| | |
|---|---|
| GB0MET | Metropolitan Line |
| GB1AFC | Austorfield Field Centre |
| GB2AFC | Austerfield Field Centre |
| GB400CA | Crathes Anniversity |
| GB8RC | Rockingham Castle |

**16 MAY**

| | |
|---|---|
| GB0ASD | Anatolian Shepherd Dogs |
| GB2BHS | Balshaws High School |
| GB2KNC | Knaresborough Castle |

**17MAY**

| | |
|---|---|
| GB0CC | Carew Castle |
| GB2RAR | Rotarians of Amateur Radio |
| GB8OEB | Operation Euro-Baby |

**21 MAY**

| | |
|---|---|
| GB2RCC | Radio Caravan Club |
| GB4ASV | Avon Scout Jamboree |

**22 MAY**

| | |
|---|---|
| GB4BRF | Bedford River Festival |

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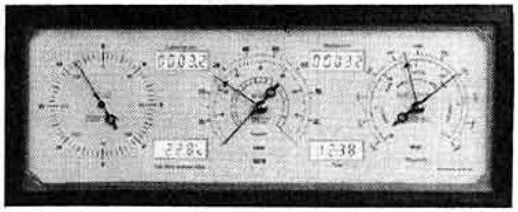

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# The Last Word

## SERIOUS STUDY NEEDED

The first object of any Society must be to prosper. It must do this to have the resources to do anything else.

The way to prosperity is to have a substantial membership drawn from a prosperous section of the community, to whom services can be sold. The Novice project is a flawed and partial approach to this end, and debate continues. It is, however, clear that there is in some quarters an atavistic drive to keep amateur radio exactly as ever was, not least by the imposition of certain obsolete qualifications. It seems that such a viewpoint may have influenced the Novice licence requirements which, taken with the limited facilities offered, may well render groundless both fears that we will be overrun by, and hopes for, a surge of new amateurs. If a sustained expansion of amateur numbers is wanted it is not children and greybeards who should be sought, but younger adults who may be ready for an intelligent interest, have the resources to take on meaningful amateur radio and support the Society, and might just come aboard if not put off unnecessarily.

The Society is run by a highly devoted body of old hands who naturally see things their way. It is a self-replicating body, as a study of the nominators and nominees for Council will show. Unfortunately that seems to prevent it from recognising that most people today are not so devoted to anything; that people are frustrated by inability to influence Society policy and proceedings; that if things go on as they are there will be a slow contraction in membership, and more probably than not in amateur radio in the UK; and that if this is to be reversed a more liberal approach must be implemented. It will not do for some members to maintain a stereotype of a certain sort of 'good' amateur as the only type acceptable, if they want an accession of strength they must tolerate lesser breeds.

May I propose that:

(a) a serious study be set up of the form of incorporation and electoral processes of the Society with a view to enabling election of a more widely representative Council.

(b) it can be recognised, as the history of the last twenty years has shown, that a lot of people can become interested in radio operation, particularly HF radio, but that certain licensing requirements, above all the almost prehistoric Morse requirement, constitute a potent deterrent (Morse will of course always have a place as a speciality as do, say, microwave techniques or packet; but why should that one be compulsory?) It is appreciated that the Society cannot change regulations; it could fundamentally change its attitude to them and its representations in respect of them, when it would be regarded much more sympathetically by many.

*Alex L Dick GM0IRZ*

*[Council has already commissioned a two-day Conference to look into just these sorts of issues. See March* RadCom *for details. - Ed]*

## POSITIVELY BLACK

I have just done as suggested by J S Linfoot, G0CPP, who advised everyone (*The Last Word*, April) to test their meters for reverse polarity on resistance ranges: My Racal electronic voltmeter shows zero at the Ohms terminal, and plus 3 volts at common/earth (checked with a Tandy (Micronta) 22-210 VOM. The Micronta VOM was then checked with the Racal meter to find plus 1.6V at the common (black) terminal. For many years I used an AVO model 8 Mk 2, which also showed plus at the negative terminal on resistance ranges; and through that developed the habit of checking the junctions of diodes and transistors by this the most simple test of all.

My experience has shown, therefore, that Mr Case's statement was quite correct. It is hoped that the above will be convincing enough to prove that one just does not have to accept the word of another for it; and the funny little test with the electrolytic capacitor ought not to be pursued since the assumption on which it is based leaves the capacitor charged in reverse. Try, instead, using a diode which only conducts in one direction. To conclude, I would like to quote from the VOM instruction manual: "Note for testing semiconductor junctions: When attempting to identify cathode and anode ends or the type of transistor (PNP or NPN), the actual polarity of the tester's voltage is opposite of the lead colors. The red is the negative source. The black lead is positive." Most of us already know that, of course.

*E Newton G3JCB*

## FIRST ENCOUNTER

On Sunday 8 March I took my Morse Test at Picketts Lock Centre. It was my first encounter with an RSGB member as I plan to sit the RAE in May.

There were two examiners who did their utmost to make me feel welcome and at ease. The test itself was conducted in a very friendly but professional manner. Happily, I passed!

If these are representative of the standards of your membership I shall be joining the Society as soon as the forms arrive. Well done to them!

*Geoff Hobbs*

## NO CHARITY

I wish to complain most strongly about the charity appeal in the March issue of *RadCom*. I have two complaints:

Firstly, the subject is nothing to do with the RSGB whose objectives are defined in the Memorandum of Association. The activities of the Society are primarily related to *radio communications*, and resources are not provided to sponsor other miscellaneous activities, however worthwhile otherwise. There are serious implications for members of the Society in any extension to other areas, which you should consider carefully. The connection with G2DQU does not excuse this lapse, but perhaps heightens my concern for future forays by the editors. Perhaps you would do a bit for my favourite charity - the National Osteoporosis Society - just a column each month for a year?

Secondly, the content of *RadCom* is a subject of considerable debate, and the use of three - yes three - colour pages when one was quite adequate for the legitimate biographical content generates doubts about editorial policy and competence. The technical content of this issue is again at a low ebb, and the general flavour is difficult to discern. I detect an element of schizophrenia when comparing content with the *RadCom Leader* 'A Different Ball Game'. Do other publications not bound by the Society's objectives find a ready market for launching charity appeals?

*D F Elkington G0PAN*

*[A story about the first licensed radio amateur to be elevated to the peerage must surely be an important one, even more so when it concerns a Vice-President of our own Society. Lord Rix was made a Vice-President, not because he was famous but because he promoted amateur radio on the television several times at no cost to the RSGB. It seemed appropriate to return the compliment on this occasion. As for technical content, March* RadCom *had 16.5 pages of technical/construction/review material which compares well with the other amateur radio magazines. And of course other publications run charity appeals, as do the BBC and IBA - Ed]*

## 1154/R1155 SPARES

I have recently had dealings with W A Parker Aircraft Spares Ltd, who have been very helpful. They hold good stocks of all the Jones type plugs and sockets for the T1154 and R1155 WWII aircraft sets. They also have tuning units for the T1154. These items are quite often advertised for in the *RadCom* 'Wanted' columns.

The address is Manor Trading Estate, 4/6 Armstrong Road, Benfleet, Essex SS7 4PW; tel: 0268 792681.

*Anthony Richards, GW4RYK*

Please note that the views expressed in *The Last Word* are not necessarily those of the RSGB. We reserve the right to edit letters for publication. All letters are acknowledged and may be passed to the relevant department or committee.

## A BIT MORE DATA

I would like to express my disappointment that the only coverage given to packet in *RadCom* is in the bi-monthly *DataComms* column, only part of which is given to packet radio. What a ridiculous state of affairs for such a growth area of our hobby. It is this that has led to my decision to consider my membership of the Society.

*Brett Laniosh G4NZK*

*[The* DataComms *column was given a lower profile as a direct result of a survey of members' preferences. As a past-Chairman of the RSGB Packet Working Group, I share your disappointment, but it is a fact that packet is a minority interest. The recent demise of* Connect International *confirms this. I am continuing to monitor members' views and if datacomms becomes more popular I will make more space for it - Ed]*

## MARK OUT MORE SPACE

With the increasing amount of AMTOR activity, particularly that involving automatic (mailbox etc) stations which have to operate on fixed channels, there is at times an unfortunate level of congestion and mutual interference between such stations on 7MHz. I suggest that this is largely due to the fact that at present most AMTOR activity takes place on 1kHz-spaced channels within 7035 - 7040kHz, and that the number of available channels could be effectively quadrupled by adopting the following two simple measures:

1) Reduce channel spacing to 500Hz. This presents no great problems given clean signals and the use of suitable receiver bandwidth, and is standard practice in the comparable maritime radiotelex bands.

2) Use the whole of the 'RTTY' allocation in the IARU Region 1 bandplan, ie 7035-7045kHz, not just the lower half. No doubt the telephony operators who regard the band above 7040kHz (and so often 7040kHz LSB also) as exclusively theirs would complain, but with little justification since they have the use of over 50% of the band even without sharing 7040 - 7045kHz.

Such an increase in channel availability could provide for better frequency sharing arrangements between automatic stations, and the reservation of some channels for 'live working' etc. Perhaps those more experienced and involved in AMTOR operation than I am will have opinions on this matter; and I suggest that it requires active consideration before the present situation deteriorates further.

*P F Scottorn G3RFI*

## INCENTIVE LICENSING

I have taught the RAE and Morse. I have also been licensed for 43 years and have seen quite a few changes in amateur radio in that time. I was opposed to the Novice Licence when it was introduced but only on the grounds that it should have included a lower age limit, however it is with us and apparently successful.

It now seems unfair to me that Novice Licensees should have to sit the same RAE as those who come directly into the hobby without necessarily any previous experience.

I propose that success in the Novice course and examination becomes the qualification for a first stage licence. There should then be a compulsory period on the air or perhaps six months (and a minimum age limit of 14 years) before candidates for a full licence can sit a much shortened Stage Two examination to replace the existing RAE. Entry to the hobby should be by way of the two examinations with the present Novice privileges available from passing the Stage One examination.

The Morse Test for HF operation has been reduced to 5WPM for the Novices. Since they can operate on some of the HF bands and share them with the present Class A licensee, this 5WPM test should become the norm for all class A licences, Novice and full.

When these proposals have been successfully implemented, I would like the RIS and the Society to consider this next proposal:

I propose that a more advanced technical examination be introduced leading to an Advanced Class Licence with an increase in Maximum PEP to 30dBW if granted. The technical requirement is there to ensure correct operation of high power linear amplifiers. I see no need to vary the Morse test requirement for this advanced class licence above the new standard of 5WPM.

*R J Price GW3ECH*

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- DTMF capability.
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