Volume 71 No 9 September 1995

RadCom

Radio Communication

The Journal of the Radio Society of Great Britain

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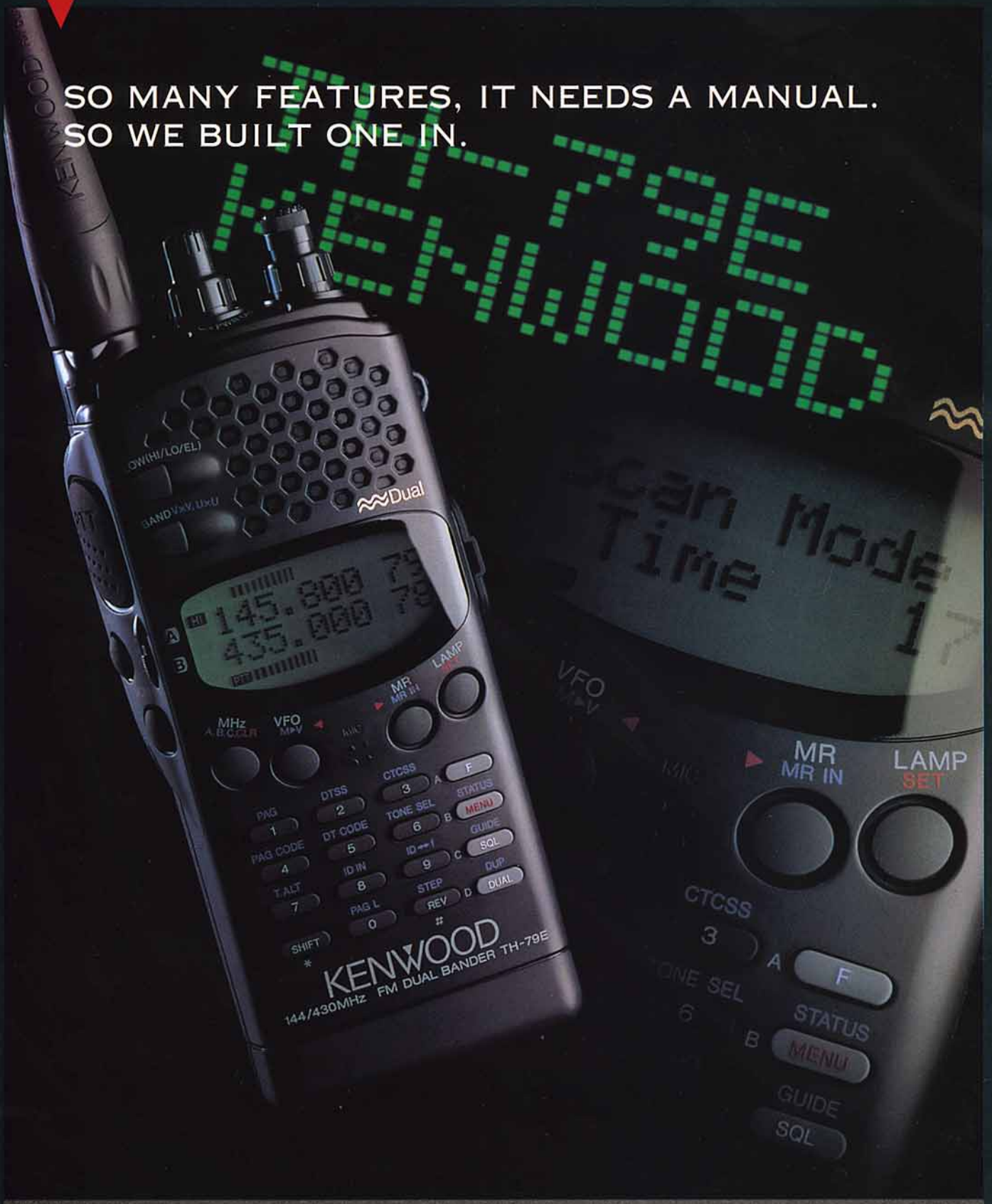

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Peter Dodd, G3LDO

News Editor
Stephen Telenius-Lowe, G4JVG

Features Editor
Deniz Huseyin

Technical Illustrator
Bob Ryan

Production Assistant
Brione Meadows

Editorial Secretary
Julie Pugh

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: 01707 659015
Fax: (Editorial *only*) 01707 649503

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RadCom

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  18.068–18.168 MHz
  21.000–21.450 MHz
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  28.000–29.700 MHz
  50.000–54.000 MHz*
  144.000–148.000 MHz*
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- Power supply requirements : 13.8 V DC ± 15%, 20 A
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- Frequency stability : Less than ± 200 Hz from 1 min. to 60 min. after power ON. (After that, rate of stability change is less than ± 30 Hz/hr. at +25°C; +77°F).
- Current drain (at 13.8 V DC) : Receive squelched 1.5 A
  max. audio output 2.5 A
  Transmit 20 A
- Dimensions (projections not included) : 167(W) x 58(H) x 200(D) mm
  6 9/16(W) x 2 9/32(H) x 7 7/8(D) in
- Weight : Approx. 2.5 kg (5 lb 8 oz)

■ TRANSMITTER

- Output power

	1.8 to 50 MHz bands	144 MHz band
SSB/CW/RTTY/FM	5 to 100 W	0.5 to 10 W
AM	2 to 40 W	0.2 to 4 W

- Spurious emissions : Less than –50 dB (1.8–28 MHz)
  Less than –60 dB (50–144 MHz)
- Carrier suppression : Less than –40 dB
- Unwanted sideband : Less than –50 dB

■ RECEIVER

- Receive system :
  SSB, CW, RTTY, AM, WFM Double conversion superheterodyne
  FM Triple conversion superheterodyne
- Sensitivity (pre-amp ON) :

	0.5–1.8 MHz	1.8–29.995 MHz	50–54 MHz	144–148 MHz
SSB/CW/RTTY (10 dB S/N)	—	0.16 µV	0.16 µV	0.16 µV
AM (10 dB S/N)	13 µV	2.0 µV	2.0 µV	2.0 µV
FM (12 dB SINAD)	—	0.5 µV (28–29.7 MHz)	0.5 µV	0.25 µV

- Selectivity (normal) :
  SSB, CW, RTTY More than 2.3 kHz/–6 dB
  Less than 4.0 kHz/–60 dB
  AM More than 6.0 kHz/–6 dB
  Less than 20.0 kHz/–40 dB
  FM More than 15.0 kHz/–6 dB
  Less than 30.0 kHz/–50 dB
- Spurious and image rejection : More than 70 dB (HF bands)
- Audio output power : More than 2.0 W (with an 8 Ω load)

OPTIONS

AH-2b ANTENNA ELEMENT (for use with the AH-3)
AH-3 HF AUTOMATIC ANTENNA TUNER
AT-180 HF + 50 MHz AUTOMATIC ANTENNA TUNER
CR-502 HIGH-STABILITY CRYSTAL UNIT
CT-16 SATELLITE INTERFACE UNIT
CT-17 CI-V LEVEL CONVERTER
EX-627 HF AUTOMATIC ANTENNA SELECTOR*1
FL-100 CW NARROW FILTER (500 Hz/–6 dB)
FL-101 CW NARROW FILTER (250 Hz/–6 dB)
FL-103 SSB WIDE FILTER (2.8 kHz/–6 dB)
FL-223 SSB NARROW FILTER (1.9 kHz/–6 dB)
HM-103 HAND MICROPHONE
IC-4KL 1 kW HF LINEAR AMPLIFIER*1
MB-62 MOBILE MOUNTING BRACKET (for main unit)
MB-63 MOBILE MOUNTING BRACKET (for detachable front panel)
OPC-581 SEPARATION CABLE (3.5 m)
OPC-587 SEPARATION CABLE (7 m)
OPC-589 ADAPTER CABLE (modular mic con. → 8-pin mic con.)
OPC-598 ACC EXTENSION CABLE (7 m for the AT-180)
OPC-599 ADAPTER CABLE (13-pin ACC con. → 7+8 pin ACC con.)
IC-PS30 DC POWER SUPPLY (13.8 V, 25 A)
PS-85 DC POWER SUPPLY (13.8 V, 20 A)
SM-8 DESKTOP MICROPHONE*2
SM-20 DESKTOP MICROPHONE*2
SP-7 EXTERNAL SPEAKER (for base station use)
SP-10 EXTERNAL SPEAKER (for mobile use)
SP-12 EXTERNAL SPEAKER (for mobile use)
UT-102 VOICE SYNTHESIZER UNIT

*1 An optional OPC-599 is required.
*2 An optional OPC-589 is required.

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See also Icom's display on the inside back cover.

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RIDES AGAIN

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The RadCom Leader

News From HQ

AS I SIT DOWN TO WRITE this Leader, I am looking forward to taking my annual holidays after what has been a busy year for the Society. We have managed to increase the membership by putting a lot of effort into improving our Marketing services.

A number of new innovations have been planned and launched, including the new subscription rates and several new publications. The whole of the headquarters staff have been heavily involved with the introduction of the new computer system at HQ, which I am confident will improve our services even more.

Since I took over as General Manager in 1992 I have encouraged staff to become more involved in Amateur Radio activities and I am pleased to inform you that we now have over 50% of the HQ staff who hold either a full licence or Novice licence. This is the highest percentage ever amongst the full-time staff and shows the commitment of us all at Lambda House to provide the best possible service to the members.

SPECIAL OFFERS

YOU WILL SEE advertised in the RSGB Book Shop (pages 90/91) an outstanding offer of a limited edition tankard to celebrate the Marconi Centenary. Only 250 of these tankards have been produced and at £11.95 they are sure to be a sound investment. I would urge you to get in quick, because they will be snapped up by collectors of such artefacts.

The Royal Mail Marconi stamps are also being launched this month and first day cover envelopes will be available, overstamped by the RSGB mark. Again, I have been advised that they will be in great demand, not only from within the Amateur Radio community but also from philatelists worldwide.

Finally, before I close, I am pleased to report that responses to the DSI Phase II proposals are coming in at a steady rate, which is encouraging. More are required: keep up the good work.

Peter Kirby, G0TWW
General Manager

RadCom NEWS

● THE CENTRE FOR the History of Defence Electronics (CHIDE) has been opened at Bournemouth University. They are seeking to interview people with radio or radar experience from WWII up to the 1960s. If you can help, contact John Burtenshaw, G1HOK, at the university, tel: 01202 595089.

● THE LATEST CALL-SIGNS issued by SSL as of 30 August were in the G*0WK*, G*7VR*, 2*0AM* and 2*1EJ* series.

Land's End to John O'Groats - on 2m/70cm

DR TONY WHITAKER, G3RKL, completed a solo trip to John O'Groats on 9 August, 43 days after starting out from Land's End. He walked about 650 of the 874 miles, with the remainder being by bus and train. While walking, he wore a Raynet reflective jacket at all times, as a safety aid. Using a Standard C528 handheld transceiver, QSOs were made through about 16 2m repeaters, with a further 20 repeaters being heard. On 70cm he worked through an additional five repeaters. The aerial was a dual-band collinear, supported from his 35lb backpack, and provided a great improvement over the 'rubber duck' aerial on the rig. Best DX included two Norwegian repeaters, LA8DR and LA8SR, when north of Dingwall, and on simplex GM/EI5EVB/M (on top on Ben Nevis) from near Golspie.

Tony Whitaker, G3RKL, seen here as GM3RKL/M, after completing the marathon trek to John O'Groats. Note the Raynet high visibility vest and high gain collinear aerial.

Radiocommunications Agency / RSGB award encourages talented teenagers

Young Amateur of the Year Award 1995

THE 1995 YOUNG Amateur of the Year is 16-year old Leroy Kirby, GW0ULC, from Cardigan, Dyfed. Leroy learnt of his success whilst away in Spain, and got back just in time to attend the presentation ceremony at the RSGB International HF Convention in Windsor on Sunday 10 September. His achievement has earnt him some very attractive prizes, including the first prize £300 cheque from the Radiocommunications Agency, together with a conducted tour round the Agency's Radio Monitoring Centre at Baldock, and a Sony general coverage receiver from the RSGB.

Leroy has worked hard to promote amateur radio, firstly through the Scouts and more recently through the Air Training Corps. He actively helps his local amateur radio emergency service, and has managed to re-activate his local YMCA amateur radio club which he helps to run as vice-chairman. He is also a keen contester, and is busily collecting 'parchment'. However, his main interest is packet radio and he has helped to set up a new local BBS system.

The Young Amateur of the Year 1995, Leroy Kirby, GW0ULC.

Runner-up Charles Banner, G7UBA / 2E1CHY.

The runner up is 15-year old Charles Banner, G7UBA / 2E1CHY, from Birmingham. Charles is a GB2RS newsreader, and promotes amateur radio through special event stations, and teaching newcomers on a Novice Licence Training Course. He is a QRP enthusiast, and is also assistant secretary of his school's amateur radio society. Charles has won a £50 cheque from the RA, and will also get a tour round the Agency's Monitoring Station at Baldock.

RSGB VHF / UHF Awards News

ERIC ASHDOWN, G1SDO, has been awarded 432MHz Senior transmitting certificate number 144. Eric already holds 144 and 50MHz Senior awards and qualifies for RSGB Supreme Award number 83.

Robert Tweddell, G1RST, was recently awarded a Standard Transmitting Certificate on 144MHz, 40 countries confirmed (two-way) on 50MHz, 175 squares confirmed on 50MHz, DX 25 country award on 50MHz, 100 squares / 20 countries on 144MHz, and 40 squares / 10 countries on 432MHz.

Another bumper package brought certificates for Colin Redwood, G6MXL, covering 20 countries two-way on 50MHz, 10 squares on 1.3GHz, and a DX 25 countries award on 50MHz.

The achievement of Derek Thoms, G3NKS, in becoming the third person to be awarded the 70MHz 45 squares / 8 countries certificate, illustrates what can be worked on the 4m band. Derek just needs to have a confirmed contact with Cyprus to have worked all 10 possible countries with a 4m allocation.

Congratulations to all award recipients who include:

50MHz. 10 countries G8FDJ, G7ORH, G1EFL. 20c G1HLT. 30c G7GYS, G7KAO, G8CDW. 70c G1SDO, G4FVP, G4SEU. 80c G0LCS. 110c G6HKM.

25 squares G7RUY. 50s G8CDW, G7GGM. 100s G7GYS, G7KAO, G4DCJ. 225s G1SDO, G4SEU. 250s G7BXS. 275s GW6VZW. 325s G8BQX.

DX Award 25 countries G0SOO, G7GYS. 75c G4SEU.

144MHz. Standard Transmitting Award G0GRI.

40 squares / 10 countries G3RHH, G7ORH. 60s / 15c G3FIJ.

432MHz. Standard Transmitting Award G3YHF.

70 squares / 15 countries. G4MKF, G8NEY.

1.3GHz. 50 squares G6HKM. 85s G3XDY.

24GHz. Advanced Award (150km) G6XM/P.

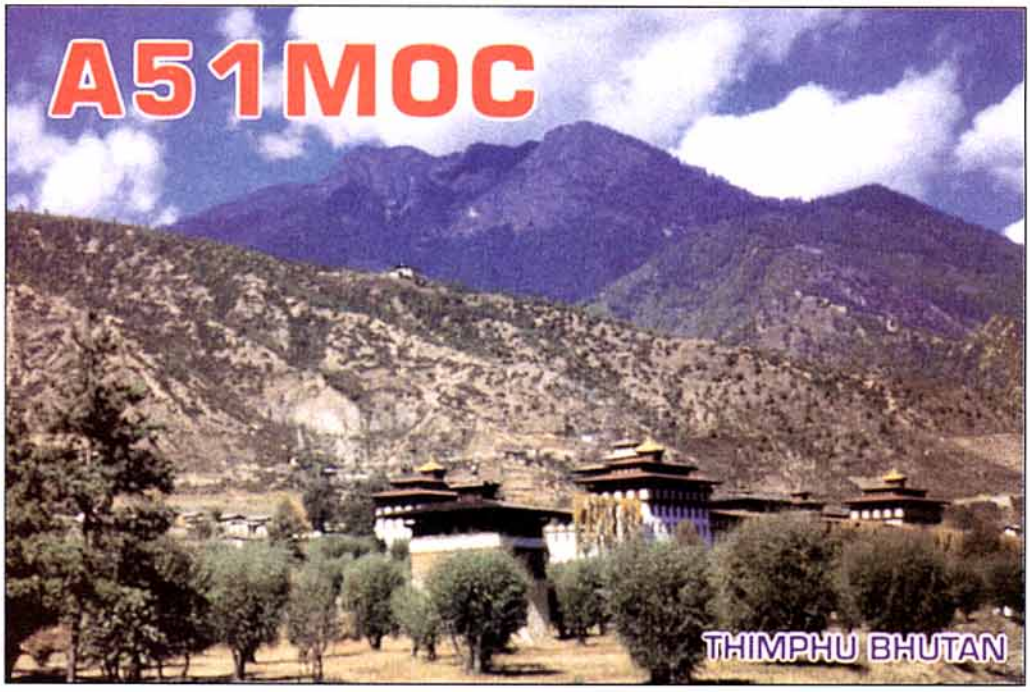
Details of the RSGB VHF / UHF awards are contained in the 1995 RSGB *Call Book* or may be obtained from the awards manager, Ian L Cornes, G4OUT, 6 Haywood Heights, Little Haywood, Stafford ST18 0UR, or tel: 01 889 882262.

RADCOM NEWS FEATURE

Return to the Kingdom of Bhutan

by Jim B Smith, VK9NS*

WHEN I FIRST contacted the Ministry of Communications (MOC) in Thimphu, Bhutan, about amateur radio in 1988, I never envisaged that more than six years later I would be travelling to the country for a third time. My activity as A51JS in 1990 was reported in 'Amateur Radio in the Kingdom of Bhutan' [*Radio Communication*, February 1991]. Back in 1990 I was convinced that the Amateur Radio Service would be in place in Bhutan a few short months after I left. We now know that this was not the case, but some five years later it now appears that things are really on the move.



The A51MOC QSL card, sent out to 27 lucky JA stations

Initial Proposals

IN DECEMBER 1993 the then Minister of Communications, Dr T Tobgyel, was promoted to the post of Ambassador to Bangladesh. A few days later his next in line, Dasho Nado Rinchen, was promoted - not to Minister of Communications, but as Ambassador to India. In the period of a couple of days my two main contact points with the MOC had evaporated. Over the years I had developed a warm and friendly relationship with both Dr Tobgyel and Dasho Rinchen.

*P O Box 90, Norfolk Island, Australia 2899.

In mid-January 1994 I submitted a further amended proposal to the MOC. The changes were intended to make things easier for the Ministry, for example by limiting frequencies of operation (in the short term) to make any monitoring (if required) easier. Many other areas were addressed and several other amendments made to material previously submitted. As a suggestion to take away any 'personality issue', the idea of using the callsign A51MOC was proposed. Any such callsign was neutral: no one individual tag was involved, only the idea of Bhutan, and this was well received.

Progress

IT WAS TO BE mid-April before a Deputy Minister was in place. However, in the ensuing months it appeared that things were moving quite quickly: this had been approved, that had been given the OK, and so on. In short, as the months of 1994 moved along I felt I could gradually release comments about amateur radio in Bhutan. Things finally came to a head in late September when it was indicated to me that all would be OK for an A51MOC operation. Training of Bhutanese operators and other areas were also mentioned, these were all part of the various proposals which had been submitted over the years. I then started to make definite plans to return to Thimphu and after further discussion with MOC I had agreement that Kan Mizoguchi, JA1BK, could accompany me. In all honesty I felt that help was needed and that if A51MOC was to be fairly active

Left: Putting up R5 vertical outside the MOC building in Thimphu.
Right: Wangdo operates A51MOC.

Jim, VK9NS; Wangdo; Phub and Kan, JA1BK at the A51MOC station.

then a 'one-man band' was not a reasonable approach.

Initially as Kan and I finalised our plans things went very well. Details of the equipment each of us would bring, meeting point and the dozens of other details were sorted out between us by fax and telephone. However, at one point in discussion with MOC I felt a moment of unease: were things really OK in Thimphu? In a way I wondered if that invitation of another person had thrown a spanner in the works. However, as events were to prove this was not the case but in another way my hunch was proved to be correct.

Settling in

KAN AND I met in Bangkok and with plane and visa allocations in place we were ready for the Sunday flight to Bhutan. After our arrival at Paro airport around lunchtime we quickly had our 14-day visas stamped in our passports. A short time later customs had cleared our amateur radio equipment and although we were carrying quite a lot, the clearance went smoothly. The two-hour drive to Thimphu, at around 7,000ft asl, was exhilerating for me: Bhutan is that sort of place, and I felt at home.

Settling into my room at the Hotel Druk in the middle of Tnimphu I could not help but notice changes: the room was very comfortable, warm, small and bright and the 'facilities' clean and convenient, quite different to the 1990 experience in the Hotel Mottithang.

That evening, Kan and I were invited to the home of Ugyen Namgyel, the Director of Planning at the MOC. Unfortunately Kan was feeling unwell as a result of the altitude and travelling those winding Bhutanese roads. I spent a pleasant evening with Ugyen and his family and arrangements were made for Kan and me to call at the Ministry the following morning around 10.00am.

Problems

THE MEETING WAS soon with us and it quickly became apparent that in the real 'official' world there were problems. It seemed that most of what had been said over the previous months was not actually in place. It was to be yet another day before Kan and I were actually in the office of the Deputy Minister. Dasho Leki Dorji gave generously of his time and the 45 minutes passed very quickly. As a result of very searching questions from the Deputy Minster, we had a wide-ranging discussion on many areas of amateur radio. Finally, courtesy gifts were exchanged, and we both received a wonderful gift of Bhutanese stamps in red stamp albums. However, it seemed that permission to operate A51MOC was not possible, as no amateur radio legislation was in place. This was confirmed later in the Director's office. Later I prepared an official letter of thanks to the office of the Deputy Minister.

It seemed that Kan and I now had problems in the sense that nothing was to be achieved. I was thankful that, taking Kan's advice, my release to the DX outlets had been changed: in short it promised nothing, only the fact that we would do our best - the original in the waste paper basket at home had been much more positive! In searching for a solution, Kan and I submitted a letter to the Ministry requesting permission to 'demonstrate' amateur radio.

Breakthrough

A FEW HOURS LATER we received word that the Minister had approved our request for an official demonstration of amateur radio. He had agreed to the use of the A51MOC callsign, and needless to say we were both delighted. It now seemed that the situation had swung back slightly in our favour and something had been salvaged from the visit.

But that pendulum swung back again - permission was only granted for a one-hour operation, and contacts had to be with JA stations, as Japan was celebrating its National Day! [Pity it wasn't 23 April - *Ed.*] Kan alerted a few key stations in Japan: we both wanted a couple of strong stations for a good demonstration, and I alerted Kirsti [VK9NL, Jim's wife - *Ed*] on Norfolk Island.

A51MOC on the Air

NEXT MORNING, in getting ready for the 10.00am start, the Yaesu FL2100Z linear amplifier which HIDXA, the Heard Island DX Association, had donated in 1991 was released for our use. Kan, Chhimmy, Phub, Wangdo and myself got stuck into getting the station ready. Kan, with some assistance, very quickly had his Cushcraft R5 vertical ready and gradually the A51MOC station began to take shape. The office allocated to us in the Ministry building was adequate, with a large desk, power outlets etc. Kan soon had his Kenwood TS-690S, keyer, mic and headset all ready to go. A pre-test showed a fault in the antenna system: high SWR on all bands. A few minutes later Phub and myself, with the aid of a meter, located a faulty section of coaxial cable and we were soon back in business.

Initial tuning around the bands was not very hopeful and it soon became apparent that propagation conditions were terrible. At 10.00am with a few minutes to spare we were ready to start. It was planned that Phub Tshering and Wangdo Dorji would do the main operating, with Kan and myself supervising. We would both also make a couple of token contacts. The following hour was hard frustrating work, but very exciting, with a total of 27 QSOs being made. Despite the pre-warning to several JA stations, no S9+ QSOs took place: propagation really was lousy. Some twenty minutes after the A51MOC demonstration started, the Minister and the Director paid us a courtesy visit. Photographs were taken, questions asked and so on. Some 40 minutes later it was all over with smiles all round. Phub and Wangdo had operated under difficult conditions, but both Kan and I knew that given a bit of time they would be fine. They had had their brief moment of amateur radio activity and I am sure they enjoyed themselves.

The Future

AN OFFICIAL LETTER of thanks was prepared and submitted to the Minister. It was generous of him to permit the demonstration under the circumstances. I have great confidence in this man and feel that he will draw together all the material submitted over the years. He has a tremendous task ahead in his planned re-organisation of the MOC. When that is done, the legislation will be passed permitting the Amateur Radio Service to start properly. This has happened in many countries; Bhutan will not be an exception.

Thanks go to the members of HIDXA, especially Kan Mizoguchi, JA1BK; the Deputy Minister of MOC, Dasho Leki Dorji; the Director of Planning, Ugyen Namgyel; Phub Tshering; Wangdo Dorji; and my old friends of the Wireless Division. Thanks especially to my fellow DXers, we know that patience is a virtue. *Tashi Dalek* (May your journey be a safe one).

[Jim Smith, VK9NS, will be giving a lecture entitled 'Bhutan - 40 years of Amateur Radio' at the RSGB 1995 International HF Convention which takes place on 9/10 September. For further details see page 21 - *Ed*] ♦

Kan, JA1BK, and Phub Tshering assembling the A51MOC station.

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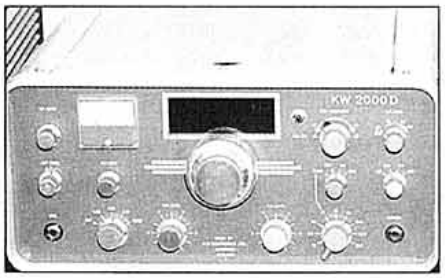

During a recent visit to RSGB HQ, Rowley Shears, G8KW, generously presented the RSGB museum with a unique exhibit: a KW 2000D transceiver (left). This prototype, the only one ever made, was a digital frequency readout version of the famous KW 2000E transceiver. Unfortunately, it never went into production due to increasing competition from Japanese imports. Rowley arrived at HQ in his appropriately-registered car (right) and is seen here with RSGB General Manager Peter Kirby, G0TWW.

RSGB Council Vacancies

The following RSGB Council vacancies arise for the term 1996 - 1998:

Ordinary Members

J Bazley, G3HCT, retires but is not eligible for re-election (Article 26).

J Greenwell, G3AEZ, retires and is eligible to stand for re-election

T I Lundegard, G3GJW, retires but is not eligible for re-election (Article 26).

Zone Members

Zone A (North of England)

P R Sheppard, G4EJP, is elected President for 1996, thereby creating a vacancy.

Zone B (English Midlands)

Position vacant.

Zone C (South East England and East Anglia)

N Lasher, G6HIU, retires and is eligible for re-election.

Zone D (South and South West England)

J N Gannaway G3YGF retires and is eligible for re-election.

Zone E (Scotland)

Position vacant.

Full details of how to nominate someone for these vacancies can be found on page 10 of the August RadCom.

J C Hall, G3KVA, Company Secretary, 26 July 1995

Star Teachers in STELAR

THE 17 TEACHERS who completed the STELAR intensive RAE course (see *RadCom*, July 1995, p93) would very much like to hear from radio amateurs who would be willing to help them develop their skills and expertise, or would be able to work with their students. The teachers are at schools in London NW9; Sutton and Cranleigh in Surrey; Gillingham; Alton, Hamphire; Cheltenham and Tetbury in Gloucestershire; Dorchester, Dorset; Holsworthy, Devon; Alford and Ludford in Lincolshire; Cromer in Norfolk; Netherton, Dudley; Halifax and Keithley in Yorkshire; Millom, Cumbria; and Fortrose in Rosshire.

If you are interested in helping this worthy cause and in promoting amateur radio in schools in the future, please contact the *RadCom* office for further details of the schools involved.

RAE and Morse Courses Currently Available

South-East

● Ray Oliver, G3NDS, will be the tutor for the **RAE** course commencing Wednesday 13 September and the **Morse** code course commencing Friday 15 September, at Newbury Technical College, **Newbury, Berkshire.** Further details from the college on 01635 35353.

● An **RAE** course starts on Monday 18 September at Wye Valley School, in **Bourne End, near High Wycombe, Bucks.** For further details please contact the Buckinghamshire County Council Adult Continuing Education Office course hotline on 01494 536637.

● The West Herts College (Dacorum Campus), at **Marlowes, Hemel Hempstead** will be holding a **combined RAE and Morse** course starting on Thursday 21 September. To enrol, contact the Adult Studies Dept direct on 01442 63771 during office hours, or for further details of the courses contact the tutor, Brian Hardy, G4BIP, on 01442 66337.

● An **RAE** course starts on Monday the 18th of September at Redborne Community College in **Ampthill, Beds.** Further details from Nigel Reynolds or Liz Hollman on 01525 404412 or the tutor Eric Elsley, G3YUQ, on 01234 768120.

● Bromley Adult Education College at **Church Lane, Prince's Plain, Bromley** will be holding an RAE course commencing Thursday 21 September. Those interested are requested to enrol at least two weeks before the course begins. To enrol and for further details telephone 0181 462 9184.

● The **Barking** Radio and Electronics Society will be running an **RAE** course starting on Thursday 26 September. Enrolment will be on 14 and 21 September. Those interested should contact Bill Chewter on 0181 478 4758 or Alan Salmon on 01708 557606 for further details.

South

● Highbury College, in **Cosham, Portsmouth,** will be offering an **RAE** course starting Thursday 14 September, an **RAE Revision** course (for the December 1995 exam) starting on Monday 11 September and a **Morse** code workshop, starting on Tuesday 12 September. The course tutor is R E Snelling, G8ACM, and further details may be obtained direct from the college on 01705 383131.

● **RAE** courses will be starting in September in **Horsham** and **Burgess Hill, West Sussex.** For further details contact John Fuller, G0OIO, on 01444 450957.

West

● Ray Oliver, G3NDS, will be the tutor for the **RAE** course commencing Monday 18 September at Swindon Technical College, **Swindon, Wiltshire.** Further details from the college on 01793 498300.

● The Trowbridge and District Amateur Radio Club is holding regular **Morse** code classes on Wednesday evenings at the Village Hall, **Southwick, near Trowbridge, Wiltshire.** For further details, contact Chris Parnell, G0HFX, on 01225 764874.

Midlands

● An **RAE** course will be held on Tuesdays and a **Morse** course on Thursdays at the Fairham Community College, Farnborough Road, **Clifton, Nottingham.** For further information contact the college on 0115 984 4668.

● The Telford College of Arts and Technology, Haybridge Rd, **Wellington, Telford,** will be running a beginner's **Morse** code course starting Thursday 22 September, with the objective of passing the RSGB 12WPM Morse code test. The instructor is John Christophers, G0ISI, and further information may be obtained from the college on 01952 642226.

● The Rugely Adult Education Centre, in Taylors Lane, **Rugely,** will be running an **RAE** course commencing Tuesday 20 September. The tutor will be Brian Smith, G4EQC, and further details may be obtained from Mr B Golemboski at the centre on 01889 578738.

● The Mackworth College, **Derby,** will be holding both NRAE and **RAE** courses. Enrolment is on 4 / 5 September. For further details contact Student Services on 01332 519951 or Frank Whitehead, G4MLL, on 01332 512080.

North

● The North Cheshire Radio Club will be running both an **RAE** and an **NRAE** course. Enrolment for the full amateur radio licence course will take place at 8pm on Sunday 10 September while enrolment for the Novice course will take place at 8pm on Thursday 14 September, in both cases at Mobberly Road, Morley Green, **Wilmslow, Cheshire.** For further details contact Gordon L Adams on 01565 634040.

● An **RAE** course will be held on Thursday evenings beginning 14 September at Marple Ridge College, Hibbert Lane, Marple, **Stockport, Cheshire.** For further details telephone 0161 427 1111.

Scotland

● Dundee Amateur Radio Club will be holding an **RAE** course starting Friday 1 September at Dundee College, Graham Street, **Dundee.** Contact Arthur Campbell on 01382 834891 for further information.

Wales

● Bridgend and District Amateur Radio Club will be running an **RAE** course at Club Brynmenyn, **Brynmenyn near Bridgend.** Contact Alun Hulmes, GW7KYT, on 01656 721574 for further information.

Details of RAE and Morse courses at over 20 other venues around the country were published on page 85 of the August *Radio Communication.*

CONTINUED ON PAGE 16

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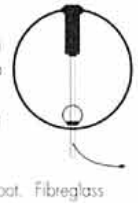

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Kenwood

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TS-850SAT	RRP £1959.95	£1765
TS-450SAT	RRP £1649.95	£1485
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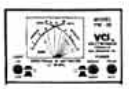

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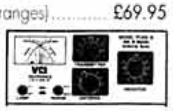


New From OPTO

OPTO 3300 - A new miniature H/Held counter - thats very sensitive.

- 1 MHz - 2.8 GHz
- 10 Digit LCD Display
- Hold Switch Locks Display
- Good Sensitivity
- Supplied c/w Ant, NiCads & Chargers

Special Offer..... ~~£159.95~~ £139.95

OPTO Scout V.3.1

This New mini counters got the lot!

- 10 MHz - 2.8 GHz
- 400 Memories
- Reaction Tune of RX (with C1-V Port)
- Digital Filter & Auto Capture
- 16 Segment Bargraph for Signal Level
- Software Supplied For PC Upload/Down
- Supplied c/w Ant, NiCads & Charger
- Use the Opto Scout to reaction tune your AR8000 Scanner - call for details

Special Offer..... ~~£449.95~~ £399.00

SWR Meters

Revex W520

A superb SWR/PWR Meter from Japan. Covers 1.8 - 200MHz Power 2/20/2 Kw

Special Price..... £69.95
Diamond SX100 1.6 - 60 MHz 30/300/3Kw..... ~~£139.95~~ £129.95
Diamond SX200 1.8 - 200 MHz 5/20/200W..... ~~£94.95~~ £89.95
Diamond SX400 140 - 525 MHz 5/20/200W..... ~~£169.95~~ £99.95

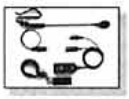
Mobile Headset/Mics

Japanese high quality easy to use and a must for safe mobile operations.

FM50

Headset mic with earphone and lockable PTT will suit most radios.
Price..... £49.95

FM80



Mini boom microphone that clips to the sun visor. Uses lockable PTT for hands free operation..... £49.95

Drake R8E

We have a small number of new ex demonstration models of this top class receiver available at just..... £699

ERA Microreader

New Version 4.2

Decodes CW,AMTOR, RTTY, SITOR. Special Offer :- Microreader with leads, instructions plus free post & packing and also Save £10..... ~~£199~~ £189

Quality Used Equipment

All Safety Tested & Guaranteed For 3 Months

Amateur

Alinco DJ-580	Twinband	£299
Icom 720A	HF Trans. PSU	£695
Icom 737	Excellent cond	£1195
Icom IC-P4E	70cms	£195
Kenpro KT-22	2m thumb-wheeler	£125
Kenwood TS-120S		£450
Kenwood TS-140S	Gen Cov HF	£695
Kenwood TS-830S	Classic HF	£595
Kenwood TS-130V	HF	£395
Kenwood TS940/S	Base HF	£1095
KW1000	H.F Amp	£285
Rexon RL102	2m H/Held	£165
Standard C500	Choice of 2	£225
Standard C528	Twinband	£325
Swan 100 MX	H.F Mobile	£345
Tentec Corsair II	V.G condition	£849
Tono TT40	70cm TX	£199
Trio TS830/S	Average cond	£575
Trio TS940/S	H.F. Base	£1095
Yaesu FT101ZD	Choice of 2	£495
Yaesu FT-102	Base HF	£595
Yaesu FT-107M	+ Matching PSU	£575
Yaesu FC-700	ATU, Boxed	£99
Yaesu FT-707	HF Tx/Rx	£475
Yaesu FT-727R	Dualband	£295
Yaseu FC-757GX	HF	£495
Yaesu FT901 DM	Line up	£629
Yaesu FT-4700	T-Band Mobile	£345
Yaesu FTV901R	With Fitted 2m	£175

Scanning Receivers

AOR 1000	to 1300Mhz	£185
AOR AR1500	to 1300 MHz	£249
AOR AR2002	Base Model	£199
AOR AR3000	Super W/Band	£625
Bearcat 580XLT	Mobile/base	£120
Bearcat 142 XLT	Basic model	£99
Bearcat 200 XLT	As new	£150
Commtel 102	Basic handie	£85
Commtel 204	H/Held	£75
Fairmate HP1000		£195
Realistic Pro-32	Handie	£110
Realistic Pro-37	Good Starter	£150
Realistic Pro 39	Average Cond.	£150
Realistic Pro-50	Clean	£95
Sony Pro80	Handheld	£135
Trident TR-2400		£299
Yupiteru MVT7000	H/Held	£185
Yupiteru MVT7100		£265
Yupiteru VT125	Airband	£125

AR8000 Scanner

Why not Part Exchange your old handheld or pay by 3 post dated cheques for this new handheld that features

- 500 kHz - 1900 MHz
- Computer Control
- Data Clone
- 1000 memories

Price..... ~~£449~~ £389

CU 8232

Computer interface for AR8000/AR2700 (software required for computer control) £99

Shortwave Receivers

Drake R8E	Boxed	£725
Drake SW8	Portable RX	£549
Grundig YB400	Portable RX	£95
HF 225	+ Keypad	£365
Kenwood R1000	Digital S/wave	£325
Kenwood R2000	Gen.Cov	£375
Sangean ATS 803	Portable RX	£95
Sony 7600	Portable RX	£135
Sony SW15	Pocket Receiver	£130
Steepletone MBR7		£45
Trio 9R-59D	Basic S/Wave	£75
Yaesu FRA7700	Active antenna	£45
Yaesu FRG7	+ Digital Display	£225
Yaesu FRG2000	Clean Example	£265
Yaesu FRG7700	Gen Cov+VHF	£450
Yaesu FRG8800	+ VHF	£475

Accessories

AEA PK232 MBX	Data Comms	£199
Ameriton ATR15	ATU	£145
Daiwa DK210	Electronic keyer	£65
Datong D70	Tutor	£45
ERA Microreaders's	Opt. Display	£165
Heathkit SA2040	ATU	£70
Kenwood AT130	Mobile ATU	£95
Kenwood MC50	Base Mic	£45
KW107	Supamatch	£55
MM30LS	2m Amp	£75
SEM	Transmatch	£75
SEM	Multifilter	£35
Spectrum Comms.	6m Amp	£49
Standard C500	Charger	£49
Sure 444	Base mic	£75
TeleReader 670E	+ Monitor	£75
Vectronics VC300DLP	ATU	£99
WELZ CT300	Dummy Load	£45
Yaesu 2m 50W	Amplifier	£99
Yaesu FL-6020	6M Amp	£85
Yaesu FV401	Ext. VFO	£30
Yaesu YM34	Base mic	£45
Zetagi 1210/S	10A PSU	£45
Zetagi M700	Swr/Pwr meter	£65

Wanted For Cash

Your good quality used Amateur & Shortwave equipment.
Call Lloyd G1JAR, now on our hotline.
(01705) 662145

Drake SW8

- Short Wave Coverage 500KHz-30MHz
- VHF Airband (116-136MHz)
- VHF FM (87-108MHz)
- AM/FM/SSB
- 240 V AC adaptor inc.

A top class portable Short Wave Receiver with VHF airband & FM coverage.
Price..... ~~£649~~ £599

SHOWROOMS:- 1A MUNSTER ROAD, PORTSMOUTH PO2 9BS

MAIL ORDER:- 189 LONDON ROAD, PORTSMOUTH PO2 9AE

Council Brief

Notes of a meeting held on 8 July 1995.

Administrative

It was resolved that the 1996 President would be P R Sheppard, G4EJP.

A recommendation from the VHF Committee that J Morris, GM4ANB, be appointed chairman of VHF Committee was approved.

Council resolved that the lack of an HF Manager could not continue. Failing nominations for the post in advance of the next meeting Council reserved the right to make an appointment without further consultation.

Amateur Radio Matters

'Hobby Radio'. A written response from the RA stated that, in view of the Society's representations, they would cease using this term.

DSI Report. LAC Chairman reported that he had received many contributions from individuals, but the club response had been disappointing. Discussions with the RA on the UK position were progressing. He also reported that a meeting with the CAA had taken place about matters connected with 1.3GHz and a meeting with the Low Power Radio Users Association had taken place following an article on EMC which had appeared in Radio Communication.

A recommendation from VHF Committee that the service to amateur radio by G Stone, G3FZL, be recognised was approved. He would be made an Honorary Member, the highest honour the Society could bestow.

A recommendation by the Training and Education Committee that the Kenwood Trophy be awarded to the person making the most significant contribution to training and development in amateur radio was approved.

It was noted that the request for volunteers to join the ARDF Committee had produced only one applicant.

Financial Matters

The General Manager reported that a number of trophies to a total value of approximately £1500 had been stolen by burglary at Headquarters.

The IPP informed Council that it was proposed to sell equipment bequeathed to the Society by a deceased member in order to provide for a small trust fund.

RSGB Regional Meeting in GM

A REMINDER THAT an RSGB Regional Meeting will be held in Inverness on 28 October at 2.00pm. The venue is the Highland Regional Council Local Authority Emergency Operations Centre, off MacIntosh Road, Inverness. Directions and further information may be obtained from the RLO, Mrs Elaine Shread, GM7TZT, 15 Hardie Court, Aberchirder, Huntly, Aberdeenshire AB54 5TG, tel: 01466 780739.

New Senior Novice Instructor

OWING TO professional commitments, Roger Baker, GW4RGI, has had to give up his post of Senior Novice Instructor for Dyfed, although he hopes to continue running NRAE courses at Pembroke School. His successor is Selwyn Meredith, GW4XLK, who has been doing sterling work with disabled students at Coleshill Day Centre. His address is 5 Woodfield Rd, Llandybie, Ammanford SA18 3UR, tel: 01269 850803.

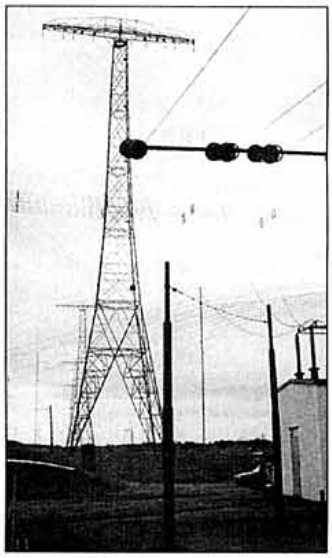
Novice Learns About HQ

KEEN YOUNG radio amateur Alex Gener, 2E1DBP, visited RSGB HQ for a week in July as part of a workplace experience programme. Alex, aged 15, from Mount Grace GM School in Potters Bar, Herts, received an insight into different aspects of HQ's work, spending time in the *RadCom*, Despatch, Amateur Radio, Accounts and the General Manager's departments. He is seen here in executive mode with General Manager Peter Kirby, G0TWW.

Special Swedish Station

TO CELEBRATE 100 years of radio and the 70th anniversary of the Grimeton radio station (callsign SAQ), radio amateurs from Grimeton near Gothenburg will be operating special event station 7S6SAQ during the month of September. Operation will be mainly on CW, including an entry in the Scandinavian Activity Contest on 16 / 17 September from the old Telecom building, using their 'huge' log-periodic antenna.

The SAQ station started regular telegraphy transmissions to Long Island, New York, in 1925, using two 200kW Alexanderson transmitters operating on 16.7kHz. Today, only one of the transmitters remains, and it is the only operational Alexanderson transmitter in the world.



The antenna system at Grimeton: six 127m high masts. A 50m long T-arm carrying the 12 wires which feed the six verticals is on top of each mast.

Poole Novice Contest

IN AN ATTEMPT to encourage Novice licensees to have a first go at contests, the Poole Radio Society has announced their first National Novice Contest. The contest takes place on Sunday 17 September from 1300 to 1500 UTC in the 50 and 432MHz bands. Stations entering should be operated by Novices throughout, although help and encouragement in setting up the station, logging etc is welcomed from whatever source. Exchange a report and location (eg locator or town) and score three points per QSO. Entries and check logs should be sent to Geoff Fowle, 2E1CSR, 12 Lytham Rd, Broadstone, Dorset BH18 8JS to arrive by the beginning of October.

- THE US 1995 'Young Ham of the Year' award has gone to 15-year old Adam Weyhaupt, N9MEZ, in recognition of his operating skills during both the Midwest floods of 1993 and the 1994 US Olympic Festival in St Louis, Missouri. The award is sponsored jointly by Bill Pasternak's, WA6ITF, *Amateur Radio Newsline*, Yaesu USA and *CQ* magazine.

- CONGRATULATIONS to the Southend and District Radio Society, originally the Wireless Society of Southend on Sea, who are celebrating their 75th anniversary this year.

- THE LATEST CALLSIGNS issued by SSL as of 9 August were in the G*0WI*, G*7VM*, 2*0AM* and 2*1EI* series.

Newsreaders Needed

TWO METRE and 70 centimetre FM newsreaders are required urgently for GB2RS in the Cambridge / Mid-Anglia region. A *reserve* newsreader is needed to cover for the 80m broadcast by G5VO in the East Yorkshire area. If you would like to volunteer, please contact Ian Kyle, GI8AYZ, as soon as possible. His phone number is 01846 665034.

The 1995 RSGB HF Convention

A FINAL REMINDER that the RSGB International HF Convention takes place at Old Windsor, Berkshire, on 9 / 10 September. Doors open at 9.30am on Saturday and 9.00am on Sunday, and day visitors are very welcome. Turn to pages 21 and 40 for more details of this year's event.

- MR E PASCOE, GW4DKD, has been installed as Worshipful Master of the Radio Fraternity Lodge No 8040 for the year 1995 - 96. He sends greetings to other RSGB Masonic members and would be pleased to hear from them via the Secretary, Sam Fisher, G4ATK, Border Cottage, 8 Beechcroft, Chestfield Village, Whitstable, Kent CT5 3QF.

- CONGRATULATIONS TO the Grafton Radio Society, G3AFT / G8DWL, in north London, which this year is celebrating its 50th anniversary. For further information about the society, contact the Secretary, Rod Harrigan, G0JUZ, 7 Torrington Gdns, Bounds Green, London N11 2AB.

THIS MONTH'S LEADING FEATURE

Amateur Radio on Postage Stamps

By Taizo Arakawa, GW0RTA / N2ATT / JA3AER*

I AM A PHILATELIST as well as a radio amateur, so naturally I collect stamps with telecommunications or radio as their theme. When I started my collection of 'ham stamps', only a few existed. This was just before the issue of a stamp: '50th anniversary of amateur radio in Japan - 1977'.

Amateur radio stamps can be divided into two categories: 'Ham Stamp' and 'Quasi-Ham Stamp'. One of the American ham stamp collectors suggested these definitions to me, and I have circulated them to over 100 collectors with my Ham Stamp List (reproduced as **Table 1**). So far I have not received any objection from them, though of course the definition can vary from collector to collector.

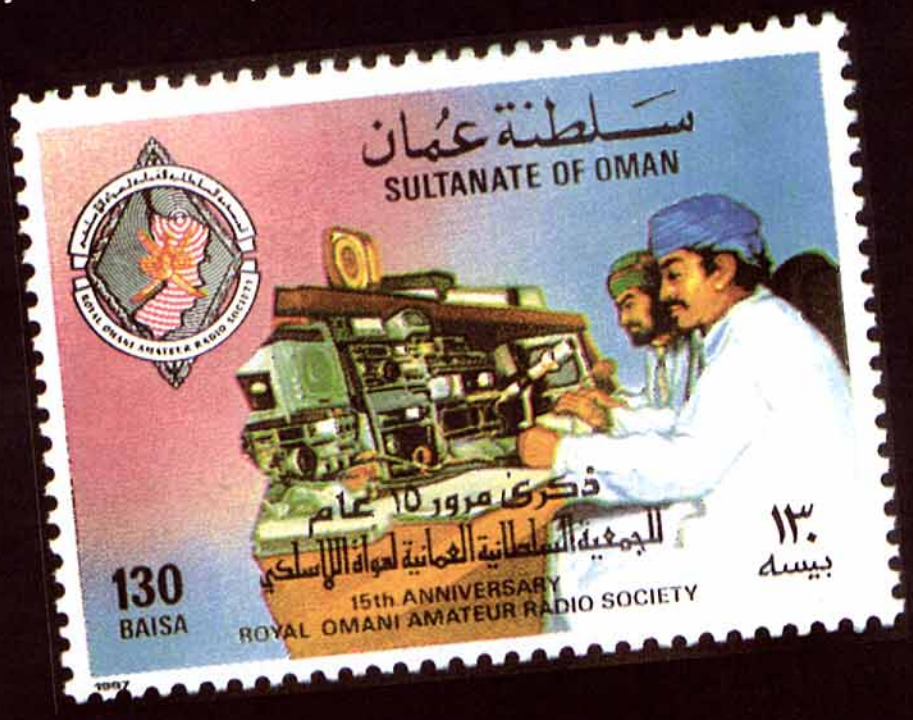
Ham-Stamp: A commemorative postage stamp which features amateur radio. The face of a Ham Stamp must contain specific wording which honours an amateur radio organisation or group, amateur radio activities or events, individuals identified as radio amateurs, technical aspects clearly belonging to amateur radio, or amateur radio itself.

Quasi-Ham Stamp: A postage stamp which does not meet the definition of a Ham Stamp but which relates indirectly to amateur radio; the Quasi-Ham Stamp might illustrate amateur equipment or operators, individuals known to hold an amateur radio licence, or individuals who have made a significant contribution to amateur radio.

If you count stamps with radio or telecommunications as their theme, this multiplies the number of stamps a hundredfold. Therefore, this article deals only with amateur radio related stamps, postcards and envelopes.

My list of Ham Stamps is shown in Table 1. If you are interested in receiving an updated list, which also includes Quasi-Ham Stamps, please write to me at the address below, enclosing an SASE. If anyone has corrections and / or updates to the list, I would very much appreciate hearing from them.

*5 St Johns Close, Hawarden, Deeside, Clwyd CH5 3QJ.



COMMUNICATION STAMPS ARE OUT THIS MONTH

THE ROYAL MAIL are issuing four special stamps on 5 September featuring two pioneers of modern communications. Two feature Sir Rowland Hill, the father of the postal system and two - the 41 pence and 60 pence stamps - show Guglielmo Marconi, who developed the first effective radio transmissions in 1895. The issue marks the 200th anniversary of the birth of Rowland Hill as well as the 100th anniversary of radio.

Rosena Robson, Royal Mail's special stamp manager said: "It is no exaggeration to say that Hill and Marconi between them helped to revolutionise communications. This issue is especially appropriate because the Post Office played a pivotal role in the legacies both men left the World . . .

"The British Post Office was the first organisation in the World to champion Marconi's work at a crucial point in the development of radio."

The story of Marconi's early work and the Post Office's involvement is told on pages 16-17 of the April 1995 *RadCom*.

Technical Details

The portraits have been hand engraved by Czeslaw Slania, one of the World's foremost engravers. These features have been printed by essentially the same method used 155 years ago for the printing of the Penny Black. The stamps are printed in Intaglio and Litho by Harrisons and Sons Ltd. They are vertical in format and measure 35mm x 37mm with a perforation of 15 x 14.5. The paper is phosphor coated except the 19p which has one phosphor bar and PVA Dextrin gum.

Cylinder numbers and colours: 41p - 1A Silver, 1B Grey-Green, 1D Black; 60p - 1A Silver, 1B Deep Ultramarine, 1D Black.

The two Marconi stamps, issued by the Royal Mail on 5 September: The 41 pence stamp shows a picture which will be familiar to *RadCom* readers, against a background of a map of the North Atlantic, and the 60p shows Marconi later in life against a background depicting the importance of his work for marine safety and navigation.

TABLE 1: HAM STAMP LIST

NO	ISSUE	COUNTRY	FACE VALUE	GIBBONS	SCOTT	REMARKS
1	1961.06.26	Poland	2.50 zlotys	1239	993	Conference of Communication Ministers of Communist Countries (Emblem of PZK).
2	1961.06.26	Poland	3.50 zlotys		993a	S/S of Conference of Communication Ministers of Communist Countries (Emblem of PZK).
3	1964.12.15	USA	5 cents	1242	1260	50th Anniversary of ARRL.
4	1966.05.22	Yugoslavia	85 paras	1205	809	20th Anniversary of SRJ.
5	1972.08.08	German Dem Rep.	25 pfennigs	E1494	1391	Society for Sports & Technology.
6	1973.05.10	Colombia	60 centavos	1333	813	40th Anniversary of LCRA.
7	1975.04.15	Poland	1.50 zlotys	2356	2088	IARU Reg I Conference.
8	1975.04.16	Costa Rica	1.00 colones	998	C633	16th Convention of Fed de Radio Clubs de Centro America.
9	1975.04.16	Costa Rica	1.10 colones	999	C634	16th Convention of Fed de Radio clubs de Centro America.
10	1975.04.16	Costa Rica	2.00 colones	1000	C635	16th Convention of Fed de Radio Clubs de Centro America.
11	1976.10.08	Dominican Rep.	6 centavos	1271	773	50th Anniversary of RCD.
12	1976.10.08	Dominican Rep.	10 centavos	1272	C246	50th Anniversary of RCD.
13	1977.09.24	Japan	50 yen	1476	1312	50th Anniversary of Amateur Radio in Japan.
14	1977.11.05	Brazil	1.30 cruz	1686	1533	Amateur Radio Day in Brazil.
15	1979.01.25	Dominican Rep.	10 centavos	1348	C286	Beata Island DXpedition.
16	1979.02.23	USSR	4 kopecks	4860	4733	RS-1 and RS-2 Amateur Satellites.
17	1979.03.26	Bolivia	3 pesos	1032	638	38th Anniversary of RCB.
18	1979.09.06	Switzerland	70 centimes	983	679	50th Anniversary of USKA.
19	1980.10.03	Dominican Rep.	7 centavos	1418	C320	Catalina Island DXpedition.
20	1980.11.01	Argentina	700 pesos	1689	1287	59th Anniversary of RCA.
21	1981.03.12	USSR	4 kopecks	5089	4917	30th All Union Amateur Radio Exhibition.
22	1981.06.25	Djibouti	250 franc	815	528	Radio Club of Djibouti.
23	1982.02.22	Ascension	25 pence	311	303	Boy Scout Jamboree (Amateur Radio Station ZD8JAM).
24	1982.02.22	Ascension	90 pence	MS313	304a	S/S of Boy Scouts Jamboree (ZD8JAM).
25	1982.12.29	Chile	7 pesos	934	631D	60th Anniversary of RCC.
26	1983.01.17	Sri Lanka	2.50 rupee	785	655	55th Anniversary of Amateur Radio in Sri Lanka.
27	1983.04.28	San Marino	400 lira	1206	1051	World Communications Year (Ham Radio Operator).
28	1983.06.11	Colombia	12 pesos	1684	C735	50th Anniversary of LCRA.
29	1983.08.11	Jordan	10 fils	1375	1156	The Royal Jordanian Radio Amateur Society.
30	1983.08.11	Jordan	25 fils	1376	1157	The Royal Jordanian Radio Amateur Society.
31	1983.08.11	Jordan	40 fils	1377	1158	The Royal Jordanian Radio Amateur Society.
32	1983.08.11	Jordan	50 fils	1378	1159	The Royal Jordanian Radio Amateur Society.
33	1983.08.11	Jordan	100 fils	1379	1160	The Royal Jordanian Radio Amateur Society.
68	1983.09.01	USSR	6 kopecks	5357	5174	Radiotelegraph Championship.
34	1983.10.07	Nicaragua	1 cordoba	2534	1296	FRACAP '83.
35	1983.10.07	Nicaragua	4 cordoba	2535	1297	FRACAP '83.
36	1983.12.19	Solomon Islands	18 cents	509	512	Solomon Islands Radio Society, H44SI.
37	1984.01.30	Venezuela	2.70 bolivars	2524	1323	50th Anniversary of RCV.
38	1984.04.11	Uruguay	7 pesos	1835	1157	50th Anniversary of RCU.
39	1985.07.24	Peru	1300 sol	1615	860	In Honor of the RCP for Service to the Nation of Peru (55th Anniversary of the Amateur Radio Service).
40	1986.12.10	Bulgaria	13 ct	3383	3207	60th Anniversary of Amateur Radio in Bulgaria.
41	1987.01.07	New Caledonia	64 franc	801	C211	25th Anniversary of ARANC.
42	1987.03.09	Luxembourg	12 franc	1201	767	50th Anniversary of RL.
43	1987.06.14	Israel	2.50 pounds	1027	964	40th Anniversary of IARC.
44	1987.11.23	Liberia	10 cents	1650	1061	25th Anniversary of LRAA (Jubilee Emblem).
45	1987.11.23	Liberia	10 cents	1651	1062	25th Anniversary of LRAA (Radio Amateur).
46	1987.11.23	Liberia	35 cents	1652	1063	25th Anniversary of LRAA (Jubilee Award).
47	1987.11.23	Liberia	35 cents	1653	1064	25th Anniversary of LRAA (Flag and Globe).
48	1987.12.23	Oman	130 baisa	347	306	15th Anniversary of Royal Omani ARS.
75	1991.03.01	Bolivia	2.40 Bs		819	50th Anniversary of RCB.
72	1991.04.09	Norfolk Island	43 c	509	501	Ham Radio.
73	1991.04.09	Norfolk Island	1 $	510	502	Ham Radio.
74	1991.04.09	Norfolk Island	1.20 $	511	503	Ham Radio.
76	1991.10.06	Indonesia	300 Rp		1477	The IARU Region III Conference in Bandung.
77	1991	Argentina	4000 Austral			LUSAT-OSCAR19 Amateur Satellite (Flying Mailbox).
78	1993	French Southern and Antarctic Territories	2.00 fr	307	C124	Radio Amateurs.
79	1993.06.15	DPR Korea	50 ch			Kim Young Ok, World Champion on Radio Finding (ARDF)'90.
Post Cards						
84	1970.10.09	Poland	40 Gr			40th Anniversary of PZK.
85	1979.07.25	USSR	4 kop			Amateur Radio Station U0K Reaching the North Pole.
86	1980.02.24	Poland	2 Zloty			50th Anniversary of PZK.
87	1995.04.20	Korea	100 won			40th Anniversary of KARL.
Envelope						
88	1985.05.22	Australia	33 cents			75th Anniversary of Amateur Radio in Australia.

COLLECTORS WORLDWIDE

I BELIEVE THERE ARE several hundred collectors of amateur radio stamps in the World. During my stay in the USA from 1978 to 1988, I found many more Ham Stamp collectors than in Japan. Many replies were forthcoming when I mentioned a new Ham Stamp in *QST*, while only a couple were received following my article in Japanese magazines. Letters came not only from USA but from all over the World, perhaps because English is well accepted as an international language. The late Vic Clark, W4KFC, Past-President of the ARRL and Dr Max de Henseler, HB9RS, former President of the United Nations Staff Recreation Council Amateur Radio Club (4U1UN) were very helpful to me for my research and collection.

I am a member of the Ham Stamp Club which issues a newsletter via enthusiastic Ham Stamp collector DL4UE. If you are interested in this club, write to: Mr Manfred G Bussemer, DL4UE, Eckstr 1, D-66877 Ramstein-Miesenbach, Germany.

NO UK STAMP

The USA issued a stamp in 1964 to commemorate the 50th anniversary of the ARRL. This pre-dated the Japanese Ham Stamp by 13 years. The question remains: why is there no Ham Stamp in the UK where the world's first postage stamp, the Penny Black, was issued? I have urged key persons in the RSGB to promote this matter to the Royal Mail when they have the opportunity. [The Post Office were approached in 1988 when the RSGB held its 75th Anniversary, but they felt that this was not a significant enough event. They would consider a centenary so collectors will have to wait until the year 2013 - *Ed*].

When I became aware that the Marconi stamps were to be issued to commemorate 100 years of radio on 5 September this year (see page 17), I was hoping that this stamp had some relation to amateur radio (it can be counted as a Quasi-Ham Stamp, at least). If so, I will buy large quantities of this stamp and use them to promote amateur radio. I am sure you can get a high return from DX QSL cards if you use this stamp when posting the card.

FURTHER READING

[1] 'The Story of Radio Communication Stamps' by Taizo Arakawa, JA3AER, *JARL News* (in Japanese) Sep 77.

PITCAIRN ISLANDS LATEST ISSUE

ON THE SAME DATE as the UK Communications stamps are issued, 5 September, Pitcairn is introducing four stamps commemorating 'Marconi 100th Anniversary of First Radio Transmission'. Depicting the history of radio from Marconi to satellites, the stamps are designed by Nick Shewring, printed by Lithography at Cartor SA, France, and measure 38 x 30.5mm.

The four Pitcairn Islands stamps being issued on 5 September.

The Pitcairn Islands, a UK Crown Colony, are located in the S E Pacific Ocean and feature high volcanic lava cliffs and rugged hills. With a population of only 61 (1983) the chief source of income is from postage stamps. Pitcairn's most famous amateur is Tom Christian, VR6TC, who is a direct descendent of the *Bounty* mutineer Fletcher Christian.

The stamps can be obtained from any established dealer, or from Sovereign Stamps, P O Box 123, Sutton, Surrey SM1 4WH; tel 0181 770 1373. A series of stamps featuring amateur radio on the Pitcairn Islands are at the research stage.

[2] 'Antique QSL Department' in 'DX World' by John Minke III, N6JM, *Worldradio* Jun 79.

[3] 'Telegraphers' stamp collection' by Max de Henseler, HB9RS/W2, *Worldradio* Oct 70

[4] *cq-DL* Jan 80 front cover.

[5] *Radio (REF)* Feb 81 front cover.

[6] 'Amateur Radio Postage Stamps' by Vic Clark, W4KFC, *Old Timer's Bulletin,* Antique Wireless Association, pp 10 - 12.

[7] 'Amateur Radio Stamps' by Williams S Kelly, *Topical Time* Jul / Aug 82.

[8] *Ham Stamps* Nos.1 - 24 (1982 - 95), Ham Stamp Club.

[9] 'Museum on Book' (Nos 54, 55 & 61) by Miyao Kan, JA1CO, *JARL News* (in Japanese) Aug & Sep 82 and March 83.

[10] 'Amateur Radio Stamps' by Taizo Arakawa, N2ATT, *CQ Ham Radio* (Japanese) Feb 83, Mar 84, Sep 87, Oct 87 and Nov 87.

[11] 'EE Heroes and Happenings: a Philatelic Review' by Donald K deNeuf, WA1SPM, *IEEE Spectrum,* Aug 83.

[12] Part of 'Up Front in QST' by Taizo Arakawa, N2ATT, *QST* Oct 85.

[13] 'Postage Due', *QST* Apr 88.

[14] 'Stamps & Radio' by Raymond Schuessler, *Short Wave Magazine*, Nov 88.

[15] 'Amateur Radio Stamps' by Bill Welsh, W6DDB, *CQ* (USA) Nov and Dec 88.

[16] 'Norfolk Island Stamps', *D-i-Y Radio* Jul-Aug 91.

[17] 'Amateur Radio Postage Stamps' by Bill Welsh, W6DDB, *QST* Jan 94.

[18] *Radio Rivista* (ARI), Apr 95 front cover.

[19] 'Ici Radiophilatélie', *Radio* (REF) Jun 95. ♦

CHARITY BID

BY A REMARKABLE coincidence, whilst we were preparing this article John Hughes, G4KGT, sent in three envelopes bearing radio stamps: Nos:3 and 27 from the Ham Stamp List plus one from Germany with the familiar Marconi picture on it. This latter is one of five, almost identical, stamps issued jointly by Germany, Italy, The Vatican, San Marino and Ireland - the Irish one is shown in the inset mounted on a Centenary of Radio cover.

John has generously offered to donate the envelopes to us so that we can raise a little money for charity. So if you would like the three from G4KGT, plus the Irish cover, make a bid in a sealed envelope and send it to **'Charity Stamp Bid'**, RSGB, Lambda House, Cranborne Road, Potters Bar EN6 3JE, to arrive before the end of September. Please don't send any money until you are asked for it. The person donating the highest amount will receive the envelopes, and the money will go to the Radio Amateur Invalid and Blind Club (registered charity no.802348).

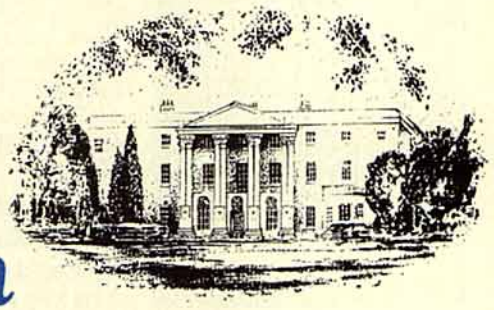
LIMITED EDITION RSGB OVERSTAMPED MARCONI FIRST DAY COVER

AS PART OF THE Marconi Centenary celebrations, and with the permission of GEC-Marconi, Adrian Bradbury has designed the First Day Cover illustrated here. These are available from A G Bradbury, 3 Link Road, Stoneygate, Leicester LE2 3RA, stamped and cancelled in a number of ways, including a limited edition of 1,000 with all four stamps cancelled at Chelmsford, where GEC-Marconi's headquarters are located.

By special arrangement with A G Bradbury, the Society is offering collectors of Ham Stamps the chance to buy from a limited edition of only 500 of the First Day Cover, featuring the two Marconi stamps and cancelled with a unique RSGB mark. The cost is just £7.50 and it is available only direct from RSGB HQ. If you are interested, please contact Marcia Brimson in the RSGB Sales office.

A limited edition of this Adrian Bradbury First day Cover, with the Marconi stamps and an RSGB cancellation mark, is available only from RSGB HQ.

RSGB 1995 International HF Convention



BEAUMONT CONFERENCE CENTRE - OLD WINDSOR - BERKSHIRE

9 & 10 SEPTEMBER 1995

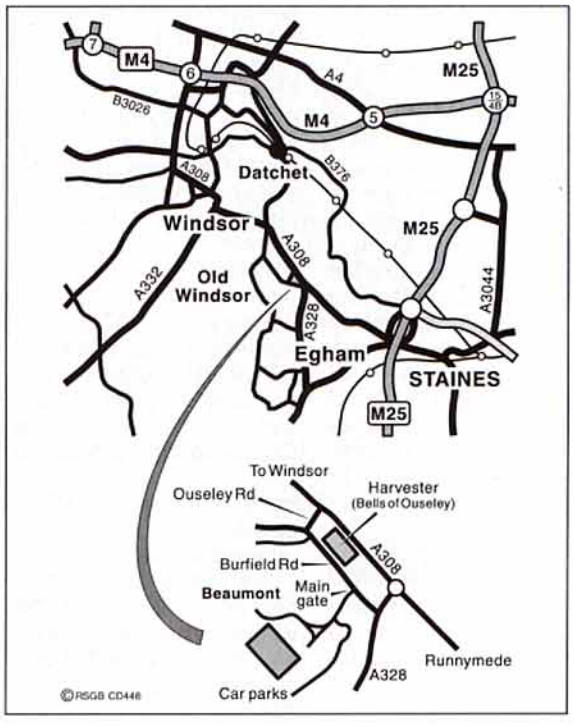
The theme of this year's Convention is 'something for everyone'. Just take a look at some of the talks already scheduled and we think you will agree.

- *The DXCC Program by Chuck Hutchinson, K8CH*
- *Amateur Radio on Internet by Mike Richards, G4WNC*
- *The Conway Reef DXpedition by Mats Persson, SM7PKK*
- *Top Band Antennas for Mere Mortals by Neil Smith, G4DBN*
- *Cluster Forum by John Clayton, G4PDQ*
- *Islands on the Air - the Fastest Growing DX Award Programme by Roger Balister, G3KMA*
- *Sunspots and Propagation by Martin Atherton, G3ZAY*
- *Bhutan - 40 Years of Amateur Radio, by Jim Smith, VK9NS*
- *Operating Techniques by FOC Members*
- *HF Contesting by Chris Burbanks, G3SJJ*
- *Computers in the Shack by Don Field, G3XTT*
- *Activating Islands; the DOs and DON'Ts by a number of island activators*
- *HF Data Modes by Mike Kerry, G4BMK*
- *Low Band Antennas - My Way by Ron Stone, GW3YDX*
- *The Islands on the Air Awards Programme report by Roger Balister, G3KMA*
- *Equipment Reviews by Chris Lorek, G4HCL*
- *Contesting in the Caribbean by Bill Hudzik, WA2UDT*

PLUS *UK Morse tests and talks on Tower Safety with a Novice Forum on Sunday to which all Novice Instuctors and Novices are invited. A special feature of this year's Convention is the checking of QSL cards for DXCC: All claims must be accompanied by a DXCC application form, which also details the rules; this is available from Marcia Brimson at HQ.*

Travelling to the Beaumont - By Road

The Beaumont is at Old Windsor near the junction of the A308 and A328, and within easy reach of the M25, M3, M4, M40, A4 and A30.



DOORS OPEN 0930 SATURDAY AND 0900 SUNDAY

FULL DETAILS FROM MARCIA BRIMSON AT RSGB HQ, LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE, UK

Organising Committee - G3OUF & G0TWW (Joint Chair), G3ZAY, G3KMA, G4XRV, G3NUG, G4BWP, G4IQM, G3RTU, G3PSM & G4PFF.

THIS YEAR'S INTERNATIONAL HF CONVENTION IS SPONSORED BY

TURN TO PAGE 40 FOR LECTURE SYNOPSES

HF NEWS

JOHN ALLAWAY, G3FKM
10 Knightlow Road, Birmingham
B17 8QB

THE RECENTLY launched *DX News Magazine* has quickly established itself as another good reason to subscribe to the *RSGB DX News Sheet*. It should be noted that this new publication, produced on the first Wednesday of each month, is included in the *DXNS* subscription price. The first issue (July 1995) comprised 20 pages of interesting DX news items including several articles on expeditions, the IOTA programme, the Dayton Hamvention, and various other subjects.

SEANET 1995

AS MENTIONED before, this convention will take place in Koh Samui - a beautiful island in Southern Thailand - and will be hosted by the Radio Amateur Society of Thailand. It takes place between 17 and 19 November. This year is the 50th anniversary of His Majesty King Bhumiphol of Thailand's accession to the throne and he is the Patron of RAST. The location is the Samui Orchid Hotel and the special station HS8SEA will be located there. I can supply photocopies of the application form. For further information contact Tony Waltham, HS0/G4UAV, by fax on +66 2 712 5925. All reservations must be made before 15 September.

ARI CONVENTION

THIS DXCONVENTION will take place in Bologna on 13, 14, and 15 October at the Centro Congressi Junior. It seems to be a well organised event being run by the Associazione Radioamatori Italiani (the Italian IARU Member Society). Registration is compulsory and must be made *before 30 September* and access to any of the congress rooms will only be available to registered participants on the Friday and Saturday. The official languages of the Convention are Italian and English and simultaneous translation will be available. Both G3KMA and G3ZAY will be in attendance and will be presenting talks. There will also be a 'Ladies programme' involving a visit to Venice. I suggest that anyone interested should contact PROMOTEAM srl, Via B.Marcello 1, Bologna, for Registration Forms and details. The fax number is +39 51 47 29 10.

DX NEWS

A *DXAC News Release* dated 30 June said that the ARRL DX Advisory Committee has voted 15 to 1 to suspend further study of the DXCC status of Aruba until the Netherlands and Aruba have announced a change in the current move towards independence for Aruba, originally slated for 1996. In the same ballot the DXAC voted 9 to 7 against recommending the addition of Scarborough Reef to the DXCC countries list. Those who voted against the recommendation cited membership opinion within their respective divisions. Some went on to state an opinion that the rocks that comprise the reef do not constitute islands, and for that reason no operation from the reef can be considered 'land based'. The release went on to say that in membership correspondence to the entire DXAC, 157 persons (72%) were against adding Scarborough and 61 were in support of new country status. A *DXCC News Release* dated 6 July announced that **North Korea**, (P5), has been added to the DXCC Countries List. It went on to state that documentation for the recent P5/OH2AM operation had been approved and in accordance with a news release dated 16 July 1991, North Korea (Democratic People's Republic of Korea) will now be added to the DXCC Countries List. The DXCC Desk will accept QSL cards for this new country starting 1 October 1995. QSL cards received at the DXCC Desk before 1 October 1995 will be returned without action.

It is understood that the second visit scheduled by OH2BH will take place before the Beijing DX Convention in October and will be much smaller than his ZA operation because of the delicate situation in the country. Another *DXCC News Release* dated 3 July said that the number of unprocessed applications at the end of June was 282 (39,866 QSLs). 544 applications (67,919 QSLs) were received during the month for endorsements and new awards. Applications being sent out at the month's end were received less than a week earlier. QSLs checked by travelling DXCC staff in Spain and Germany brought up the total number of applications and cards received.

EA1FH is in Kigali, **Rwanda** and has the callsign 9Q5FH. ZS42SQN will mark the 50th anniversary of the 42nd Swarkop Air Base in South Africa between 16 September and 8 October. ON6TT returned to **Angola** early in July and will stay until 28 August as D2TT on all bands 1.8 to 28MHz mostly on SSB and RTTY. He will emphasise the new bands and RTTY. He is a telecom consultant for the Red Cross. During the day when he is at work he intended to run a beacon on 28.203MHz and when he is home during the night it will be on 1.821.5 MHz. The beacon will transmit 'VVVVVV de MYCALL/B de MYCALL/B'. If you hear it please try to let Peter know via E-mail to ifrclad@angonet.gn.apc.org - noting his name clearly in the body of the message.

Until 31 December the special station HG100R will be on the air from **Hungary** to mark the centenary of radio. *RSGB DX News Sheet* says that RX1OX/FJL on **Franz Josef Land** should be active until at least October when he goes on holiday. Further activity will depend on diesel fuel deliveries which are difficult at that time of year. He has only been active on 14MHz but should be on all bands following repairs to an antenna switch. R1FJC and R1FJZ are also active and according to the *Long Island DX Bulletin* are often to be found

Nao, FO0AKI/NX1L (left) and Kan, FO0MIZ/JA1BK seen here during a DXpedition on Nuku Hiva Island. Kan has also taken part in a DX venture to Bhutan (see pages 10 and 11).

near 14.020MHz after 2300. According to *RSGB DX News Sheet* 3A2LZ has reported pirate activity from **Monaco.** 3A2CC and 3A50A have been heard but these callsigns have not been issued. About 140 stations in **Spain** are being authorised to use 50MHz for a new two years period. Power is limited to 30W of CW or SSB and they will use EH prefixes between 50.0 and 50.2MHz. This privilege is not available to foreign visitors under the provisions of CEPT T/R 61-01. The Sundsvalls Radioamatorer station SK3BG will be on the air as 8S3BG until the end of 1995 to celebrate the 50th anniversary of the club. F5XL expects to be on the air from **Corsica** as TK/F5XL for several weeks this month. He will try to activate a number of IOTA and DIFM islands.

BAND REPORTS

The increased 'lead time' for the column has caused some 'regulars' to miss the deadline - I am sorry about this but hope that they will soon readjust.
The loggings cover the period mid-June to mid-July and came from G3GVV, G0AEV, G0MWS, G0SKW, and the UK DX Packet Cluster courtesy of G4PDQ. Callsigns listed in italics are of stations using CW:-

10MHz

0000	*HK0ER, KP4VA, PJ2AM, V31RD, VP9MZ, ZL4WA, 9X/ON4WW.*
0500	*FM/F5PHW, P49T, VK2ADQ, ZLs, 9Y4KB.*
2100	*CU2AR, J3/KB0QNS, S92SS, TU4EY, ZA1AJ, 9X/ON4WW.*

14MHz

0400	FR5DX, J28JA, VK7BC, ZL4AP.
0600	AH8E, FO5IW, KH3AF, KH6CD, KL7XD, *TL8CN,* VK9NS, W6s, ZK3RW.
0700	*AH8N,* FO5NL, *JT1KAA, T20XC,* RX1OX/FJL, S01URE.
0800	KS6DV, *NH2G,* R1FJZ, *3V8BB.*
1300	JA, K6RLS, *VP2VM,* XX9AS.
1400	BY1LH, T20XC, YI0EB, XT2CH, 9M8DJ.
1500	A61AN, BV5GU, HS50A, JT1BG, SU2MT, V85BG, *G4AAL/YA (?)*
1600	BY5RT, *HS0ZAA,* S21YE, TH7OT, TU5DV.
1700	BZ1QL, *HS2NS, JT1CD,* KL7HF, *ZD9BV, 9M8BC,* 9N1RHM.
1800	S92YL, XU95HA, ZD7CTO, 4S7NB, 7Z1IS, 9M2ZA.
1900	ET3AA, J69LU, TU5CE, TZ6LL, VP2CRT, VU2OO, 9L1PG.
2200	FH8CB, HC8KU, JY1, P43ARC.

18MHz

1500	*JA2ANA, OK1EE/OD5.*
0900	A71CT, KL7DTH, *T20XC.*
1000	D44BC, *ET3YU,* JAs.
1300	*A71AN, BV2KI, S79RTF, TA1AR, VP2EM, XU95HA, 3B8CF.*
1400	J28JA, TL8MS, VU2BIX, XT2CH, XX9GD, YB2ARW.
1500	ET3BT, KL7XD, ZS6WB, 7W5J.
1700	CN8MC.
1800	*KH6CC, S92SS, 9Q5MRC, 9X/ON4WW.*
2200	*HC5AI, HK0ER,* J3/N3SIY, *S0RASD, 9Y4/N3SIY.*

NINE BAND TABLE NO 15

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
G3KMA	191	279	320	275	326	306	326	293	320	2636
G4BWP	169	278	312	271	326	300	321	268	311	2556
G3XTT	192	250	297	236	323	279	317	248	294	2436
G4GIR	133	262	303	233	326	280	322	248	310	2417
G3GIQ	78	224	287	181	326	278	326	237	314	2251
G4OBK	136	184	240	199	307	263	282	222	252	2085
G3TXF	104	202	263	186	310	200	307	149	273	1994
G3SXW	89	187	234	199	302	198	284	148	239	1880 CW
G3WGV	86	156	219	223	258	247	259	199	230	1877 CW
GM3PPE	68	175	221	228	279	242	256	185	223	1877
G3NKC	133	170	228	203	252	228	233	196	228	1871
GW3JXN	102	182	241	184	279	238	251	171	206	1854
G3IGW	125	184	305	200	274	224	234	48	207	1801
G3VJP	72	163	237	119	321	170	303	68	262	1715
G3NOH	43	98	175	203	268	240	257	169	211	1664 CW
G3NOF	5	118	117	-	326	248	325	225	299	1663
G4ODV	88	184	307	167	254	123	244	69	200	1636
G4XRX	3	48	133	110	265	188	284	156	232	1419
G3IAR	72	106	132	136	247	168	220	124	150	1355
G4NXG/M	12	45	104	-	238	131	259	137	236	1162
G4CMZ	14	45	103	100	146	84	124	44	101	761
G0DEZ	30	53	90	88	98	64	78	44	66	611
AVERAGE	88	163	221	170	275	214	264	166	235	1796

Next deadline - to reach G3GIQ by 8 October
Prepared by G3GIQ. 8 July 1995

PU1LOK is on **Trindade Is** until October as PU0TRI but only on SSB on 3.5 and 28MHz (between 28.300 and 28.500MHz). TI2JJP will apparently visit **Cocos Is** between 9 and 25 October and is planning to operate on all HF bands plus 1.8 and 3.5MHz. Canadian amateurs are going to be allowed to use special prefixes to mark the 50th anniversary of the end of World War II in Asia between 8 July and 8 September. The prefixes are: VA2 = XK2, VA3 = XK3, VA7 = XK7, VE1 = XK1, VE2 = XJ2, VE3 = XJ3, VE4 = XK4, VE5 = XK5, VE6 = XK6, VE7 = XJ7, VE8 = XK8, VE9 = XK9, VO1 = XO7, VO2 = XO8, VY1 = XN7, and VY2 = XN8. Also from **Canada**, there will be a special station CY3IARU on the air from the site of the IARU Conference at Niagara Falls between 23 September and 1 October.

The information provided in August's *HF News* about the expedition to **Salas y Gomez Is**, which was originally scheduled to follow immediately that to Easter Island, has now been modified and it will now take place between 1 October and 22 October due to a change of schedule by the Chilean Navy. It will be led by NP4IW and the callsign used will be XR0Z. The actual stay on the island will be about one week - the other two weeks will be occupied by the return journey from Valpariso. Another expedition - also mentioned in last month's column - this time to **Juan Fernandez Is** will be organised by K4UEE and K0EU between 13 and 21 September. They will run two stations with emphasis on the low and WARC bands and European contacts are going to be a priority. The antennas will be full sized delta loops on 1.8 and 3.5MHz, a 2-element beam on 7MHz, and a beverage. Special permission for 10MHz operation has now been obtained. The Radio Club of **Haiti** has notified the Society that the licence of Michel Harmoniaux, HH2HM, has been cancelled by the authorities.

N6SS will return to **Chagos** and will be on the air from the club station VQ9SS which he hopes to make work on 1.8MHz. VU2JPS, on the **Andaman Is**, is reported to be keeping schedules with VU2AU on 14.195 or 14.210MHz between 1600 and 1800.

There will be a large expedition to **Heard Is** which hopes to land on 12 November. This is to be led by K0IR who was leader of the highly successful 3Y0PI expedition to Peter 1 Island last year. More details later. T30DW is reported to be likely to remain on **West Kiribati** for about two years.

The 1995 BS7H **Scarborough Reef** expedition made a total of 11,832 contacts with 6,838 different callsigns. 5,539 of the QSOs were with Japan and 2,338 with the US. Before the *DXAC News Release* mentioned earlier and according to KJ4VH, writing in the *Long Island DX Bulletin*, each member of the DX Advisory Committee had been sent a 76 page report which should eliminate any question that Scarborough Reef satisfies the rules to qualify as a separate DXCC country. At the time of writing another visit to the area was being planned despite the ARRL's decision that Scarborough Reef should not be accepted as a separate DXCC country. This time the callsign will be BS7A and N7NG, OH1RY, SM7PKK, and JH4RHF are mentioned in the list of operators. This effort will be supported by PARA and CRSA (the IARU Member Societies representing the Philippines and China). The operation will take place after the typhoon season and will cover the low bands and RTTY. It will also have a beam.

RSGB DX News Sheet reports that Nikolai, 3W5FM, in **Vietnam**, has been found near 14.195MHz around 1330 and 1930 recently.

Until 31 October a special **Australian** station will be on the air to celebrate the end of WWII. The callsign will be VI50PEACE and the Australia Remembers Award is available to those who work the station and send $5 or 5 IRCs for postage (see *QTH Corner*).

Another expedition is being planned - this time it is by the Dateline DX Association who hopes to visit **Wake Is** sometime this autumn - possibly at the time of the *CQ* WW Phone contest at the end of October.

The list of operators includes AL7EL, WB2DND, KC7V, and K4HQI. The Dateline DX Association is open to suggestions from the DX community as to needed bands/modes. It may be contacted via Tom Harrell AL7EL, 27257 Nellis Rd, Evans Mills, NY 13637, USA. Again, more information later.

QTH CORNER

C21NJ	Norman Jeckane, Box 205, Republic of Nauru.
CY3IARU	Dave Digweed, VE3FOI, RR# 1, Rosedene Rd, E/S. St Ann's, Ontario, L0R 1Y0, Canada.
HG100R	via HA1KSA, PO Box 79, Gyor H-9002, Hungary.
PU0TRI	Sergio Mendes, Rua Visconde de Santa Isabel, 692 apto.202, Grajau, 20560-121 Rio RJ, Brazil.
T30DW	PO Box 29, Bairiki, Tarawa, Republic of Kiribati.
VI50PEACE	PO Box 829, Hervey Bay, QLD 4655, Australia.
8S3BG	SM3CER, PO Box 54, S-863 22, Sundsburk, Sweden.

AWARDS

1000 JAHRE KREMS AWARD

The city of Krems in Austria will celebrate its 1000th anniversary in 1995. To apply for the award it is necessary to work two stations in Krems during 1995. The same station may be worked again after 24 hours and any band/mode is valid. Send log extracts certified by two other licensed amateurs - plus US$10 or 10 IRCs - to Michael Neubauer, Limbergstrasse 39, 3503 Krems-Rehberg, Austria. Stations located in Krems include OE3's ATS, AHB, BEA, DTA, ESA, FGA, GSS, GNA, HGB, HY, HZC, I SS, JSC, JTW, JYB, KGS, LJW, LUC, MNU, MS, NEA, OOW, PBU, PNU, PNW, RE, RTS, SAW, SGC, SPS, TFC, TR, WFB, WOC, WPS, YHS, YTW, and YZA. All these stations will use the special suffix /1000 during 1995.

AGCW-DL is organising **Marconi Memorial Month** during September. It is necessary to make at least 100 CW QSOs during the month on any or all bands. Contest QSOs are also valid. Special awards will be given to those who make 100 or more contacts while those who make 50 will receive commemorative cards. Send log details including date, time, band, callsigns and RST reports of both stations to: Otto A Wiesner, DJ5QK, Feudenheimer Str. 12, D-69123 Heidelberg, Germany, *before 31 October 1995.*

This 1000 Jahre Krems Award issued to celebrate the Austrian city's 1000th anniversary this year. To apply for the award, two stations in Krems must be worked during 1995.

CONTESTS

ALL ASIAN DX CONTEST (SSB)

0000 2 September - 2400 3 September

1.8 to 28MHz (no WARC). Single operator single or multi-band, and multi-multi classes. Work Asian stations only and give RS and age (ladies are excused - they send '00'). QSOs on 1.9MHz count three points, on 3.5Mhz two, and on any other band one. The multipliers are the number of *Asian prefixes* worked on each band. Copies of rules/summary sheet/log sheets *may* be available but had not arrived at the time of writing (SASE please).

WAE DX CONTEST (SSB)

1200 9 September - 2400 10 September

3.5 to 28MHz observing the IARU agreed 'contest free' segments. Single operator all bands, multi-operator single and multi-transmitter and listener sections. Only 30 hours of operation allowed by single-operator entrants and the rest time may be taken in up to three parts. Minimum of time allowed on a band is 15m. Work non-Europeans and exchange RS and the QSO number (starting from 001). The multipliers are the countries on the WAE list and they may be multiplied by four on 3.5MHz, three on 7MHz, and two on 14/21/28MHz. Serious participants should study rules closely - there are points to be scored by means of QTCs. I can supply copies of the 1994 rules - the 1995 version had not arrived when this was being written. The WAE list is as follows: C3, CT, CU, DL, EA, EA6, EI,ES, F, G, GD, GI, GJ, GM, GM (Shetland), GU, GW, HA, HB, HB0, HV, I, IS, IT, JW (Bear Is), JW (Spitzbergen), JX, LA, LX, LY, LZ, OE, OH, OH0, OJ0, OK, OM, ON, OY, OZ, PA, S5, SM, SP, SV, SV5 (Rhodes), SV9 (Crete), SY, T7, TA1, TF, TK, UA1-3-4-6, UA2, UB, UC, UA1N, UO, YL, YO, YU, ZA, ZB2, 1A0, 3A, 4J1, 4K2, 4N4, 4U (Geneva), 4U (Vienna), 9A, and 9H. Logs must be mailed before 15 September (CW section) 15 October (SSB section) or 15 December (RTTY section).

In the **1994 ARRL 10 Meter Contest** G0AEV scored 5,082 points, G0TDX 392, and GW0ARK 340. G0AEV was second in the Top DX listing, mixed mode, QRP.

SCANDINAVIAN ACTIVITY CONTEST

1500 16 September - 1800 17 September (CW)

1500 23 September - 1800 24 September (SSB)

3.5 - 28MHz (no WARC). IARU 'contest free' segments should be observed (3.560 - 3.600, 3.650 - 3.700, 14.060 - 14.125, and 14.300 - 14.350MHz). Work Scandinavians only (LA/LB/LG/LJ, JW, JX, OF/OG/OH/OI, OF0/OG0/OH0, OJ0, OX, OY, OZ, SI/SJ/SK/SL/SM/7S/8S and TF). Single operator all band, single operator QRP, multi-operator and listener classes. Exchange RS/T plus serial number (from 001). Each QSO counts one point and the multipliers are *Scandinavian call-number areas (0 - 9)* worked on each band.

ON CONTEST 1995

0700 - 1100 1 October (SSB)

0700 - 1100 8 October (CW)

3.5MHz only and only QSOs with ON and DA stations are permitted. Exchange RS/T plus serial number starting from 001. ON and DA stations will give their club code - ie 59005 MCL. Each QSO with ON or DA counts three points and each club worked gives one multiplier. Send logs no later than three weeks after the contest to: Welters Leon, ON5WL, Borgstraat 80, B 2580 Beerzel, Belgium.

THANK YOU

TO THOSE WHO provided information this month. Special thanks go to the following for news items extracted: the *Lynx DX Bulletin* (EA2KL), the *Long Island DX Bulletin* (VP2ML), the *RSGB DX News Sheet* (G4BUE), and *DXPRESS* (PA0FQA). Everything for the **November** column to reach me no later than **14 September.** ♦

28MHZ COUNTRIES TABLE

G0AEV	120
G4OBK	104
G0DNV	90
G0MCT	55
G0NQC	41
GJ4GG	34
G3XBM	32
G2FQR	17
GM4CHX	16
G3ING	14

1995 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4YVV	73	103	60	236 (CW)
G3ING	69	72	28	169
G0DEZ	66	52	27	145
GJ4GG	40	46	23	109
G4OBK	17	39	17	73
G4CMZ	21	18	29	68
G0SKW	25	22	7	54
G4FVK	13	30	6	49

VHF/UHF NEWS

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

THIS SUMMER has produced some excellent DX so far. The main feature has been the prevalence of Sporadic-E openings on 144MHz, supporting the idea that these occur most frequently in years of sunspot minima. Es openings during VHF NFD weekend produced big scores for some stations.

On 50MHz there were some memorable transatlantic openings with some stations working considerable distances. There was a major tropospheric opening on all bands at the end of June and the first days of July but no significant auroras were mentioned.

PUBLICATIONS

THE 2/95 EDITION of *Dubus Magazine* includes an article by Charles Suckling, G3WDG, describing a 144MHz wideband noise amplifier. He writes: "It has many applications, from noise figure measurement and comparison in conjunction with a calibrated noise source, to sun/moon noise measurements of EME equipment." There are the usual news sections covering EME, tropo, meteor scatter, FAI and auroral events. The UK agent for *Dubus* is Roger Blackwell, G4PMK, who is QTHR.

VHF Communications first appeared in its English version in 1969. The editors were Hans Dohlus, DJ3QC, Robert Lentz, DL3WR, and Terry Bittan, G3JVQ/DJ0BQ. The first UK agent was Don Hayter, G3JHM. In 1990, Mike Wooding, G6IQM, and his wife purchased the title and rights, producing their first issue in 1991. They formed KM Publications expressly for this purpose and now have 3,500 subscribers World-wide. Their postal address is 5 Ware Orchard, Barby, Rugby, CV23 8UF and the E-mail one is 100441.377@compuserve.com.

The *Summer 2/1995* issue includes articles on a VHF/UHF grid dip meter using a TIS88 J-fet transistor in both battery and mains powered versions, a 28/432MHz transverter in modular form, a 28/50MHztransverter and a big wheel antenna for 70cm.

CONTESTS

ELLA TUGWELL, G0FIP, sent a copy of the rules for 13th annual BYLARA Contest. The dates/times to note in your 1996 diaries for this event are: 11 Feb 1900-2200 and 13 Feb 1000-1300UTC. There are HF phone, VHF phone and Mixed HF and VHF phone sections. At least one-third of the operating time must be spent either on HF or VHF. On 2m and 70cm the 'no-go areas' are 144.750-145.175, 145.600-146.000, 432.800-433.375 and 434.600-434.975MHz.

For a copy of the rules send an SASE to G0FIP at 67 Upper Kingston Lane, Shoreham-by-Sea, Sussex BN43 6TG.

The Poole Radio Society is sponsoring the first National Novice Contest which is "designed to give novices their first taste of contests". This event is on 17 Sept, 1300-1500UTC, in the novice sections of the 50 and 430MHz bands. Stations "should be operated by novices throughout the contest although help and encouragement in setting up stations and logging, etc is welcomed from whatever source."

For a copy of the rules send an SASE to Geoff Fowle, 2E1CSR, 12 Lytham Road, Broadstone, Dorset BH18 8JS.

MOONBOUNCE

THE TORONTO VHF Society, VE3ONT, will be active from the Algonquin Park observatory (FN05XW) in the two legs of the ARRL EME contest using the 46m dish. The proposed schedule is: 7 Oct 0000-0907, transmitting on 144.100 listening on (QSX) 144.100-144.110. They will be ready (QRV) before 0000 for testing and random QSOs. 7/8 Oct 2306-1013 on 50.100, QSX 50.100-50.105, and 1296.050, QSX 1296.050-1296.060. The November schedule is: 4th 0000-0804 on 432.050, QSX 432.050-432.060, again QRV prior to 0000, and 4/5 2137-0907 on 144.100, QSX 144.100-144.110. All times are UTC and frequencies are in MHz.

As always use of the dish is subject to last minute cancellation should it be needed for radio astronomy. The times are for a dish elevation limit of 9° in FN05XW. They will use horizontal polarization on 50MHz, RHCP on 144, 432 and 1296MHz but can switch on the latter to accommodate LHCP. Thanks to Dennis Mungham, VE3ASO, for this in-

formation. QSLs go to him at RR #3, Mountain, Ontario, Canada K0E 1S0.

Next some items from the July *432 and Above EME News* edited by Allen Katz, K2UYH. "The 2nd June SW (sked weekend) produced reasonable conditions, especially considering it was an apogee weekend. The excellent libration characteristics seemed to more than make up for the higher-than-usual path loss." British stations reporting activity were G3LTF, G3SEK and GW3XYW. 9H1ES is planning 23cm operation with 100W and a 2.7m dish, so should be workable by many stations. K2UYH's address is: Engineering Dept, Trenton State College, Trenton, NJ 08650-4700, USA. His E-mail address is a.katz@ieee.org.

The only UK activity report is from John Regnault, G4SWX (JO02), who completed with JL1ZCG on random on 2m on 8 July during a 5min window with 529 reports each way. He reports EME as being "poor as predicted".

VHF NFD

AS LAST YEAR, propagation during the VHF National Field Day weekend, 1/2 July, was enhanced by Es on 144MHz. A long opening on the Saturday morning, before the 1400 start, was followed by three short events in the evening. The first occurred between 1720 and 1743 to Corsica, Sardinia, Sicily and mainland Italy. Stations worked included TK5KP (JN41), IC8FAX (JN70), IK0BZY (JN61), IT9JLW/9, IT9SGO and IW9EKK (JM68) and IS0XDA (JM49).

The second, 1816-1847, was to southern France, Spain and north Africa. Stations worked were EA3GDD and EA3KU (JN00), EA3/DL3MGO, EA3DBJ and EB3EDT (JN01), EA3ADW, EA3BHR, EA3CRE, EA3CRI and EA3DXU (JN11), EB3FFF/P and F6KBR/P (JN12), EA5FIC, EA5QZ and EB5CYB (IM98), EA5ANO and EB5IFI (IM99), EA7DBH (IM76), EA6IB (JM09), EA6PS, EA6SA and EA6XQ (JM19) and EA9AI (IM75). The third opening at 1916 only lasted a few minutes and I8MPO (JN70) was contacted.

My thanks to Alec Trusler, G0FIG (SXW), Andy Wyspianski, G1AWF (LDN), Mike Jupp, G1HWY (SXW), Angela Sitton, G1XEO/G0HGA (HFD), John Quarmby, G3XDY (SFK), Ken Osborne, G4IGO (SOM), Andy Stafford, G4VPM (SOM) and Graeme Welch, GM6WBV (FFE), for these reports.

There was some good tropo on the Saturday evening. On 2m G4VPM worked LA2PHA (JO38) and OZ9IT (JO46). Edward Allely, GW0PZT (GDD), reports DL0OU/P (JO43) at S9+ throughout at 968km. He worked many north Germans in JO31, 32, 42-44 and lots of ONs and PAs. OZ9EDR/P (JO64) was a new square. Other DX included DL7AKA (JO62) and DL9GJW (JO54).

Several well known VHF DXers were in attendance at the wedding of Ian Watt, GM4ZRR, to Sandra Gillespie in Edinburgh. From left: Pat Hargreaves, G3TEY; Gareth Davies, GM0CIT/LA0GJ; Graham Knight, GM8FFX; John Rooney, GM1TDU; Kevin Macleod, GM1KFM; Ruth Drinkwater, SWL; Alastair Beaton, GM4BAP; Allan Duncan, GJ4ZUK; Stewart Cooper, GM4AFF; and Alec Allan, G3ZBE.

50MHz

CONTEST FEEDBACK

David Whitaker, BRS 25429 (YSN), the contest manager for the UK Six Metre Group, reports that there were 16 hours of Es in the Summer Contest on 10 June. 6m enthusiasts in at least 58 countries took part.

Over 260 grid squares were logged, mostly European, but with a few Middle Eastern and African ones, too. Over 80 entries were received but although UK activity was the greatest, not many operators bothered to submit logs.

TRANSATLANTIC DX

7 July was a superb day for transatlantic DX. Several contributors reckoned it was the best opening to North America they had ever experienced. G4IGO's report was from 1752 and it was still going well at 2305 when Ken went QRT. He worked many stations in EM29, 40, 48, 77, 88 and 99, EN34, 43, 44, 51, 52, 61, 72, 73, 82, 90, 91 and 99, FM08, 09, 15-18 and 28, FN10, 20 and 65, and GN16. Best DX was KS0F (EM48). Next morning, 1011-1017 and 1104-1200, he worked more Ws in EM95, FM07, 17, 18 and 29, FN10, 41 and 42.

Geoff Brown, GJ4ICD, says he has never heard so many USA stations on the band, even during F2 openings during sunspot maximum years. Many signals were very strong - N9QX (EN61) was S9+40dB, for example. Other DX worked included OX3LX (GP36) and KP4EIT (FK68). Ela Martyr, G6HKM (ESX), made 59 QSOs with Ws and VEs in 33 squares, six of which were new.

Paul Baker, GW6VZW (GWT), called it "a mega W/VE opening" but he did not catch it until 2040, just before he left for work on a night shift. Jamie Ashford, GW7SMV (GWT), made his first transatlantic contact on 5 July with VE1YX (FN74). Next evening he worked KM1H (FN42) for country number 50 and then a couple more Ws on the 7th, all with 25W and an HB9CV antenna.

OTHER DX

A warm welcome to Keven Matthews, 2E1AIU (ESX), who joins the annual table. Countries added in July were EH, HB0, IS0, SM, T9 and YL. Another new contributor is Ken Grover, G3KIP (KNT), who uses an IC-551 and 3-ele Yagi on a 40ft mast. He caught his first Es on 20 June and a second on 16 July making 38 contacts in 17 countries.

The best of Terry Chaplin's, G1UGH (SFK), Es QSOs in July were 1st EH9IE (IM75), 2nd UT6X (KO41), 11th OH1AJ (KP10) and YL3AG (KO26). G4IGO saw his first display of noctilucent clouds on 23 June lasting from at least 2210 to 2300. They were to the north-west, 15° above the horizon and of steel-blue/grey appearance. These have been reputed to be linked to anomalous propagation. Ken submitted a list for the period 4 June to 10 July. Highlights were UT6X, LX1JX and CT/G3SDL (IM56) on 1 July, and T97V (JN84), 5B4AAI (KM64) and SV7/OE3DJL (KN20) on the 2nd.

G6HKM also got T97V on 1 July for a new square. Next day Ela completed with UT6X and 9A6V (JN73); on the 5th with S0RASD (IL56) and WA1AYS (FN42), and on the 15th with LZ1WR (KN22), SV2AOK (KN10) and CS0RCL (IM56). Most were new squares. Mike Wooding, G6IQM (WKS), uses a 144/50MHz transverter running 750 milliwatts to a 5-ele Yagi and his first QSO was with a Polish station. He has since worked DL, I, OH, OZ and SM.

GW6VZW has made well over 1,000 QSOs from Cwmbran this year up to mid-July. Paul sent a four-page list of DX worked from 5 June. In the UKSMG contest on 10 June he made 167 QSOs in 86 squares and 27 countries. Highlights from his detailed list include: 21 June IX1ZZQ in the rare Aosta Valley region; YL/RZ3BW (KO26) and many OHs on 27 June; 4Z4TT and C31HK on 1 July; EH9IB, EH9IE, ZB2IF and CN8NS on 5 July and HV3SJ on the 16th.

GW7SMV lists his best DX as OH0/DJ2PJ (JP90), ES1II/3 (KO18), CT3FT (IM13), SO7URE (IL56), CN2JA (IM64), YL3AG (KO26), SV9ANK (KM25), UT6X, CT/G3SDL, EH9IE, SV1AHX (KM18), 4U/KC0PA (IL46), EH8ACW (IL28) and CU1CB (HM76) - not bad for 25W and a 2-ele antenna.

144MHz

NEWS

G0HGA is planning to sell her FT-480R and buy secondhand transverters for 2m and 6m with the proceeds. She will then be able to use her IC-735 as prime mover, taking advantage of the superior filters. A keen CW operator, she found CW activity during NFD deplorable. She is now using her G1XEO call on VHF and would like to see the return of the annual CW ladder. I think we have enough tables, but let me know if you are interested.

Nick Gregory, G0HIK (CBA), is making two 10-ele DL6WU Yagis which should improve his station performance considerably. Roger Kendall, G0UPU (GLR), is a new

ANNUAL VHF/UHF TABLE
January to December 1995

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total	
Callsign	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Points
G1SWH	21	32	30	5	76	21	47	9	23	5	269		
G6HKM	48	56	-	-	60	27	38	12	15	8	264		
G3FIJ	18	23	25	4	54	11	25	6	10	2	178		
G4VPM	-	-	-	-	74	19	28	10	20	5	156		
G0FIG	-	-	-	-	60	31	29	9	12	3	144		
G1HWY	-	-	-	-	53	23	33	10	17	4	140		
G1AWF	5	7	-	-	64	27	18	5	-	-	126		
G8ESB	-	-	5	2	57	10	22	4	17	3	120		
GW6VZW	49	63	-	-	-	-	-	-	-	-	112		
G0UPU	7	7	27	3	35	6	12	1	4	1	100		
G0HIK	4	21	-	-	30	16	22	4	-	-	97		
GW0PZT	-	-	-	-	56	27	-	-	-	-	83		
G1UGH	2	16	-	-	32	15	-	-	-	-	65		
G4OUT	-	-	23	3	24	4	-	-	-	-	54		
G7CLY	8	11	-	-	12	10	-	-	-	-	41		
G3FPK	-	-	-	-	36	4	-	-	-	-	40		
G3NKS	-	-	31	5	1	1	1	1	-	-	40		
GW7EVG	-	-	-	-	29	6	-	-	-	-	35		
2E1AIU	3	28	-	-	-	-	4	3	-	-	38		
GM6OFO	-	-	-	-	24	3	2	1	-	-	30		
G0HDZ	1	10	-	-	8	1	-	-	-	-	20		

British counties are those listed on page 79 in the January 1995 RadCom; 77 in all. Up to three different stations allowed in each of the 12 GM regions. Do not include EI counties. Countries are the current DXCC ones plus IT9. Deadline for the November issue is 14 September.

contributor who has been QRV with 25W for a couple of years. John Hill, G7CLY (HBS), wrote from County Antrim while on vacation. He had gear for 2m and 6m but had not caught any real DX on his travels through eight counties in the north of Ireland.

Another holiday operator was Brian Higton, GM0VBE (SCD), who was active as G0VBE/P from IO70NN in Cornwall at the beginning of July. He used 80W to a 17-ele Yagi and was lucky enough to catch the big Es opening on the morning of 1 July. After over three years of inactivity, Gary Nicholas, GW7EVG (CWD), is QRV again with an FT-726R and 8-ele Yagi and joins the annual table.

TROPO

The period 23 June to 2 July saw excellent tropo propagation although activity in the first couple of days seemed low. On 26 June, GM4IPK (IO99/SLD), GM0ILB (IP90/SLD) and GM0HTT (IO89/OKE) were very loud in the south for long periods. Over the next few days GM and Scandinavian stations were prevalent. On the evening of the 29th, G4SWX worked 35 SMs, best DX being SM5MIX (JO78).

By 30 June, the lift favoured the east with DLs much in evidence. G1AWF worked SP0AFT (JO73) but the Polish stations were not too strong in London. By NFD weekend, the DL direction was favourite. British Isles stations in GM and EI were also consistent on 1 July.

SPORADIC-E

In the late afternoon of 25 June, 1630-1725, there was a good Es opening to Italy and Greece. Stations worked included IT9IPQ/9, IW8PPJ and IW8PQ (JM78), I8MPO (JN70), IK7HIN and IK7MHI (JN81), I7IWN (JN90) and the star turn, SV3KH (KM07).

The next big event was in the morning of 1 July, when stations all over Europe were setting up for NFD. For most people, the first phase was 0912-1019. Prefixes/countries worked included HA6, HA8, IK0, I4, OE5, OK1/2, OM3, OM9, S5, SP9, YT5, YU7 and 9A. Best DX were probably UT3WWY/P (KN19), UT5DE (KN18) and YO5CBX (KN27). Other squares worked included JN68, 75, 76, 79, 85-89, 94-99, KN08 and KN09.

G4SWX worked I4YNO and IK0YUS (JN63) in a brief opening at 1047. Between 1149 and 1214 John made eight QSOs with EA3 and EA5 stations in IM99, JN00, 01 and 11. GW0PZT reports a continuous opening from Gwynedd, 0923-1212, during which he worked 66 stations - 25 HAs, 7 each YUs and 9As, 6 Is, 5 Fs, 4 each OEs and YOs, 3 S5s, 2 each OMs and DLs and a TK. Edward highlights YO2QC/P (KN15), OM3TRV (JN88), 4N7FK (KN05) and TK5EP (JN41) as the best.

The last event was on 15 July, 1640-1943, mainly to the central Mediterranean, Greece and Bulgaria. Stations worked by several contributors included IS0OZK (JM49), IK7MOI (JN80), IW9DRY (JM67) also reported as IW9BRY, IT9IPQ/P, IT9SGO, IT9VDQ/P and IW9EKK (JM68), LZ1UK (KN12), LZ1WR, LZ2HV (KN23), LZ2AB (KN33), LZ2FT, YO3DAC, YO3DMU and YO3JW (KN34). Maltese QSOs were with 9H1ET, 9H5CL, 9H5L and 9H5SN. Best DX were probably IW0EBY/IH9 (JM66), SV2AOK (KN10) and SV7AII (KM20).

METEOR SCATTER

Bill Thomas, G4AEP (BRK), is another first-time contributor. He is trying some MS and recently completed with LY2BIL (KO14). G0FIG lists July completions with SM3/DL7VBW (JP81), LY2BIL, SM/DL9GJW (JO86), I6WJB (JN72), I4YNO (JN54), 9A3JH (JN75) and LA/DL5DTA (JP21) between the 8th and 19th.

Thanks also to the following readers from whose input these reports were compiled: G1HWY, G1UGH, G4IGO, G6HKM, GJ4ICD and GW7SMV.

430MHZ UP

2E1AIU OPERATES on 70cm. On 28 June, during the good tropo period, Keven worked PE1PXG and DL8BDU but did not mention any station details or the locators of his contacts.

On 70cm, the only new square for G0FIG was F5GXX (IN95) on 19 June. Alec worked the same station on 23cm and on 1 July, G0CFM/P (IO81) was another new one on the band.

G0HIK is making a pair of 18-ele DL6WU Yagis for 70cm. At present Nick is using a long 21-ele Yagi made from parts of an older beam which got damaged. From Cumbria he worked G1SDO (ESX) and G7RRD (LCN) on low power in flat conditions on 18 and 19 July, so intends to be more active on the band.

G0UPU finds little activity on 70cm outside of contests and has never heard any CW despite putting out CQ calls on the mode. Only the repeaters seem active. Roger thinks 23cm will be an interesting band but has not been QRV long enough to form a definite opinion. Gerry Schoof, G1SWH (MCH), notes 23cm QSOs with G3DVV (OFE), G4VPM (SOM) and G0FYM (YSW) but did not state the dates.

G3XDY lists 70cm QSOs over 500km on 1 July with DF0NF (JO44) and OZ9EDR/P. Next day John contacted OZ1ALS (JO44), OZ5BAL/P (JO55), OZ6OL (JO65) and DF0BA (JO42). On 23cm on 29 June he worked DB2BZ (JO42), OZ6OL and DK2NH (JO53). On 1 July DL0OU/P (JO43), DF0NF, DL0MI (JO42), OZ9EDR/P and OZ5BAL/P and next day DG0RG (JO62), DL4OL/P and DK9OY/P (JO52), DG1ROD/P (JO62), DL2NUD (JO63), DL0SHF (JO54) and DL7AKL/P and DF0TEC/P (JO73).

Nothing was heard of the SPs and SMs worked by G0VHF/P on 23cm on the Sunday morning of NFD weekend.

On 26 June G6HKM worked GM1TDU (IO87) and GM0USI/P (IO76) on 70cm. Ela remarks it is not often she hears GMs on the band. On the 29th she worked DL6NVC/P (JO73) on 70cm. On 23cm she contacted five PAs, DC6BC (JO31) and OZ6OL. DL6NVC/P came on 23cm shortly after their UHF QSO to give her JO73 on this band.

FINALE

IT WOULD MAKE editing so much easier if readers would please list activity separately band by band. Most do this anyway but a few do not. It is not necessary to send copies of log pages for the whole month, but if you do, please use a high-lighter pen to point out the interesting QSOs. If using fax or E-mail, please make sure you include your full details. For example, on 18 July there was an Internet message from an A Rowley, but no callsign was stated. There are two in the RSGB *Call Book* - G0TML and G8MYK - so I cannot be certain who sent the message.

The deadline for the **November** issue is **14 September**. The **December** date is **19 October**. The combined telephone answering and fax machine is on 0181 763 9457. My CompuServe ID is 70630,603 and the Internet address is 70603.630@compuserve.com. The BT Gold mailbox number is 87:CQQ083. ♦

Geoff Brown, GJ4ICD, reminds us that UK postage stamps are NOT valid in the Channel Islands. Please use an International Reply Coupon (IRC) instead.

NOVICE NEWS

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

YOU READ about 13-year-old Alex King, 2E0AJS, in the item headed 'Key To Success' in August's *Novice News*. To recap, he hoped to start a CW net with the aim of encouraging new - and possibly nervous - Novices to try out their keying skills in contact with a sympathetic key-user.

He contacted George Longden, G3ZQS, founder of the FISTS CW Club to see if he could establish a link between the aims of FISTS and himself. George welcomed his offer and, after offering help and advice, they decided times and frequencies when Alex would be calling 'CQ QRS DE 2E0AJS'.

He will call on Sundays at 0800 GMT (9.00 am BST) and on Thursdays at 1800 GMT (7.00 pm BST). On both occasions the frequency will be 3.575 +/- QRM as this is within the Novice frequency allocation. His 3 watt signal should be quite adequate for a good contact.

Alex stresses that this is not intended as a Novice-only venture. He is hoping for contacts from anyone new to the bands or returning after a break, anyone needing practice, or just for pure pleasure.

He also told me of his path into the hobby. Listening to a portable airband receiver, interest turned to fascination at the possibility of radio communication. This led to a Novice course and a December Morse test.

Meanwhile, his dad Ray took the RAE last December and went on to learn Morse straight after Christmas. February was eventful - a Morse test and a successful RAE result giving him the callsign G0VSS.

Morse tuition is part of the Novice training. Graham Bennett, G4LJO, Avon's senior instructor, includes it in his course and insists on his students covering it thoroughly. Alex expresses his gratitude to Graham for this and for his patience in teaching him all he needed for his success.

I hope that you will be there when Alex calls - and that he has many answers. If you are not confident enough yet to answer and would like to arrange a friendly sked, both Ray and Alex will be pleased to help. Ring 01934 743787 to arrange this.

OVERCOMING DIFFICULTIES

AMATEUR RADIO is a hobby which knows no boundaries. There are no physical limitations - as has been proved by the many amateurs who are severely disabled in one way or another. There may be difficulties in achieving the licence, but they can be surmounted with determination and sympathetic help. As the next story proves.

Three potential Novices approached Julian Mayfield, G0LXX, and asked if they could become his students. With around 50 successful candidates to his credit, Julian of course agreed. The fact that all three were totally blind did not deter him - although he knew it would be a challenge for all of them. Obviously, some modifications were needed in the training.

John Mills and George Miller had met at a blind training school some 50 years ago when both had lost their sight in separate accidents in their teens. Sadly, George died during the course, so did not fulfil his ambition. A third student, Steven, was unable to complete the course at that time but hopes to pick it up where he left off at a later date.

So, how did they cope? The physical act of soldering the amplifier was not possible, but the components could be identified, described and laid out for someone else to follow detailed instructions given by the student. Enamel paint, judicially placed, helps with recognition and identification of components. Special paper is available, on which a stylus - or even a biro - raises lines so that circuit diagrams can be read. Although a multimeter cannot be read, a working knowledge of its function and uses can be described.

A 2 volt bulb was used in Test set 1 so that the warmth of the lower rated bulb could be felt - so John knew when the bulb was lit. When harmonics were under discussion, an extra absorption wave meter - with the plastic face removed - was put into the circuit.

No time limit was placed on the course, but with students willing to be guided by Julian, first time passes are the norm. Julian, who is QTHR, will give help and advice to anyone who needs it to try something similar.

GIFTED YOUTH

IN JANUARY '94 this column told the story of John-James who passed the NRAE at the age of seven with his eighth birthday arriving just before the results were announced - making him the youngest Novice ever. Although his achievement has not quite been matched, I can introduce you to the current youngest Novice.

Like J-J, Philip Andrews is the son of an amateur who has shown interest in the past in his father's hobby. Then he joined the Cubs. He studied for his communicator badge (among others), took part in the Jamboree and Marconi stations and decided that it was time to follow in Dad's footsteps. But there were problems.

Philip was eight when he joined an NRAE class in Colchester where all the other members of the class were adult and Philip felt reluctant to ask questions and draw attention to himself. Dad could help and encourage but not fully as he is registered blind and is also disabled. Philip failed his first attempt at the NRAE exam, but did not give up.

John Robson, G3HMQ came to the rescue. The youngster had completed the course - and had the completion slip to prove it - so sympathetic help on a one to one basis was needed to fill in the gaps. There could not have been many gaps as it only took four sessions to make the next attempt in June successful.

NRAE RESULTS

REGRETTABLY, the City and Guilds report on the latest NRAE is not complete as there were some unmarked papers outstanding when it was compiled as they had not been returned. Of the 234 candidates covered by the analysis, 181 were successful - a 77.4% pass rate. hopefully the others followed this trend.

There was some confusion about whether SSB was a form of AM or FM - with half wrongly choosing FM. A third failed to choose the tuned circuit as the selector of the required signal and in the next section, 38% thought it was to operate as a detector.

A question on the effect of amplitude modulating a carrier with an audio tone was answered correctly by less than half of the candidates - with nearly a third thinking this would not produce any sidebands. In the Safety section, most candidates correctly placed the mains master switch but almost a third thought the purpose of a transformer was to change ac to dc.

The only question arousing comment in Licensing Conditions concerned operation from a Temporary Location without the use of the suffix /P. 40% would have written to the Secretary of State rather than the Manager of the Radio Interference service (See paragraph 7[2][b]of the Licence)

Questions on Measurements, Propagation and antennas, station layout and construction were all well answered but there were two comments on Operating techniques which deserve mention. One was the use of the abbreviation 'de' with almost a third thinking it stood for demodulator rather than the abbreviation for 'from' as used in Morse.

The other merits wider mention as many fully qualified amateurs, while possibly getting the answer right, do not follow their own advice. An abusive interruption by an unidentified caller should always be ignored - however hard it may be - the 38% who said they would threaten the caller with the DTI would merely give the caller what he wanted - a reacting audience! Ignored, he would never know if he had even been heard. ♦

Philip Andrews who currently holds the title of youngest Novice.

Blind Novice John Mills, 2E1AEA, working his first QSO on HF under the supervision of Julian Mayfield, G0LXX.

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TS-850SAT	list £1959	our price £1625
TS-450S	list £1499	our price £1249
TS-450SAT	list £1649	our price £1435
TS-50S	list £1059	our price £895

YAESU

FT-1000	list £3999	our price £2895
FT-990	list £2399	our price £1795
FT-990/DC	list £2099	our price £1645
FT-900	list £1399	our price £1095
FT-900AT	list £1599	our price £1245
FT-840	list £959	our price £725

ICOM

IC-775DSP	list £3700	our price £PHONE
IC-736	list £1969	our price £1685
IC-738	list £1649	our price £1435
IC-729	list £1325	our price £1175
IC-706	list £1195	our price £PHONE
IC-707	list £889	our price £775

VHF TRANSCEIVERS

ICOM

IC-820H	list £1795	our price £1549
IC-275H	list £1495	our price £1345
IC-281H	list £449	our price £409
IC-2000H	list £369	our price £339
IC-2340H	list £689	our price £629

KENWOOD

TS-790E	list £1959	our price £1625
TM-255E	list £949	our price £829
TM-455E	list £1059	our price £925
TM-733E	list £739	our price £645
TM-251E	list £419	our price £349
TM-702E	list £579	our price £499

YAESU

FT-736R	list £1999	our price £1549
FT-8500	list £749	our price £659
FT-5200	list £729	our price £595
FT-5100	list £679	our price £515
FT-2500M	list £399	our price £295
FT-2200	list £419	our price £329

VHF/UHF HANDI's & PORTABLES

YAESU

FT-11R	list £324	our price £269
FT-41R	list £369	our price £299
FT-51R	list £529	our price £395
FT-416G	list £369	our price £249
FT-290R2	list £599	our price £425
FT-690R2	list £649	our price £445
FT-790R2	list £749	our price £535

ICOM

IC-Z1E	list £529	our price £455
IC-2GXE	list £255	our price £225
IC-2GXET	list £279	our price £249
IC-W21E	list £329	our price £299
IC-W21ET	list £595	our price £545

KENWOOD

TH-79E	list £479	our price £419
TH-22E	list £254	our price £219
TH-42E	list £289	our price £249
TH-28E	list £319	our price £269
TH-48E	list £369	our price £319

STANDARD TRANSCEIVERS

C558	sale offer price	£289
C468	sale offer price	£169
C188	sale offer price	£169

On some items supplies are limited at our offer prices

DAIWA

Proven Reliability for Today's Amateur!

PS120MIIA	PSU 3-15V 9/12A	£69.00
PS140MIIA	PSU 13.8V 12/14A	£72.00
PS304IIA	PSU 1-15V 24/30A	£129.00
RS40XII	PSU 1-15V 32/40A	£169.00
CN101L	1.8-150MHZ 15/150/1500W	£59.50
CN103LN	150-525MHZ 20/200W 'N'	£68.00
CS201	2 Way Switch SO239 1KW	£17.50
CS201GII	2 Way Switch 'N' 1KW PEP	£23.50
LA2080H	2M L/AMP 1.5-5W IN 30-80W OUT	£136.00
DLA80H	2M/70CM Dual Band Amp 0.5-25W IN 80-60W Out Pre Amps	£345.00
DX10N	2m/70cm Duplexer UHF/N	£22.50
CP10Y6	Cigar plug lead for FT530,etc	£6.50

cushcraft CORPORATION

HF Antennas

R5	10/12/15/17/20 vertical	£279.00
R7	10 thru to 40m vertical	£369.00
AV-3	14-21-28MHz vertical 4.3m long	£89.00
AV-5	3-5-7-14-21-28MHz vertical 7.4m long	£159.00
AP8A	8 Band Vertical	£199.00
APR18A	Radial Kit	£49.00
40-2CD	2-ele 40m Yagi	£459.00
A3S	14-21-28MHz Yagi	£349.00
A3WS	12/17m 3-ele Yagi	£275.00
A103	30m Extension A3WS	£115.00
204CD	4 ele 20m Yagi	£459.00
154CD	4 ele 15m Yagi	£259.00
D4	Dipole 10/15/20/40m	£249.00
D3W	Dipole 12/17/30m	£179.00
A4S	3-4 ele Yagi 10/15/20m	£425.00

VHF Antennas

AR-270	2/70 Dual Band Vertical 1.13m long	£60.00
AR-270b	2/70 Dual Band Vertical 2.3m long	£89.00
AR2	2m Vertical 1.2m long	£35.00
AR6	6m Vertical 3.1m long	£52.00
A148-10S	2m 10-ele Yagi 13.2 dBd	£62.00
A144-20T	2m 10-ele Cross Yagi 12.2 dBd	£99.00
13B2	13-ele 2m Yagi	£99.95
17B2	17-ele 2m Yagi	£179.00
A50-3S	3-ele 6m Yagi	£75.95
424B	24-ele 70cms Yagi	£115.00
22XB	2m 22-ele Yagi c/w polarization switching	£199.00
738XB	70cms 38-ele Yagi c/w polarization switching	£189.00

TNC's and Data Modems

PK12 – A new VHF TNC that offers superb performance and simplicity of operation.
ONLY £119.00 INC Carr B

PK12/100K – 100k Mail Drop Memory Upgrade **£47.00** Carr A

PK232/MBx – An old favourite that still offers state of the art performance.
BETTER VALUE THAN EVER AT ONLY £299.00 INC Carr C

PK900 – Deluxe multimode data terminal
ONLY £459.00 INC Carr C

PK96 – 9600 Baud packet TNC with 14K of mail drop memory. **£189.00 INC** Carr B

PAK WIN – Windows based S.W. programme
ONLY £79.00 INC Carr A

MIRAGE KLM

Mirage is not a new name in amateur radio products. We believe that their current range offers outstanding performance at realistic prices.

LINEAR AMPLIFIERS

B108G	2m, 10W input, 80W output preamp	£199	C
B1016G	2m, 10W input, 160W output preamp	£299	C
B2516G	2m, 25W input, 160W output preamp	£269	C
B5016G	2m, 50W input, 160W output preamp	£269	C
D1010N	70cm, 10W input, 100W output	£349	C
D3010N	70cm, 25W input, 100W output	£329	C
RC1	Remote switching unit for Mirage amps c/w 18ft cable run	£38	B

MAST HEAD PREAMPS

KP2/2M	2m GaAs fet 0.6db NF 20–25dB gain or 10–15dB adjustable 165W through power	£165	B
KP2/440	70cm GaAs fet 0.6dB NF 20–25dB gain or 10–15dB adjustable 165W through power	£165	B

POWER METERS

MP2	50–200MHz, 50–500–1500W average and PEP reading + SWR 9–13.6VDC internal battery	£189	B
MP4	1260–1300MHz, 1–10–100 watt average and PEP reading + SWR 9–13.6VDC internal battery	£229	B

HOKUSHIN ANTENNAS

HS-702S	2M/70CM Whip BNC	£14.50
HS430	5⅛ Wave Whip BNC	£10.00
88F	2M 8/8 Wave Mobile Whip	£16.50
DB144	2M F/G ¾ mobile whip	£14.95
VM-727RS	2M/70CM Mobile Whip	£32.00
HS-727SS	2M/70CM Mini Mobile Whip	£17.00
EX104B	2M/70CM Mini Mobile Whip	£22.50
SMC12SE	12M Mobile Whip	£16.50
SMC15SE	15M Mobile Whip	£16.50
SMC17SE	17M Mobile Whip	£16.50
HF3	12/17/30 Base Vertical	£59.00
28HS2HB	10M 2EL ZL Beam	£65.00
HS-GP62	2 X ⅝ Base Colinear	£65.00
GP23	3 X ⅝ Base Colinear	£39.00
SQ44	2M SWISS QUAD	£45.00
WX1N	2M/70CM Base Colinear	£89.00
WX2N	2M/70CM Base Colinear	£115.00
WX4N	2M/70CM Base Colinear	£149.00
WX6S	2M/70CM Base Colinear	£189.00

NEW PRODUCTS

YAESU FT8500

Yaesu's latest dual band mobile with FS10 smart controller.

OUR PRICE **£659** **Save £90.00**

ICOM IC-706

NEW

HF + 6m + 2m mobile transceiver with remote mount capability. 100w on HF & 6m 10w out on 2m. Rx coverage 30kHz-200MHz + FM W

PHONE FOR LATEST PRICE

ALINCO DX-70

NEW

HF & 6m remote mountable mobile transceiver. 100w output HF 10w on 6m. Rx coverage 150kHz-30MHz, 50-54MHz all mode including FM.

£1035 **NOW IN STOCK**

ANTENNA ROTATORS

G-400	Medium duty rotator	£199.00	D
G-400RC	R/C version of G-400	£239.00	D
G-600RC	H/D version of G-400RC	£339.00	D
G-450XL	New medium duty model	£269.00	D
G-650XL	New H/D version of G-450XL	£369.00	D
G-800SDX	450° deluxe model	£419.00	D
G-1000SDX	H/D version of G-800SDX	£479.00	D
G-2700SDX	H/D rotator 450°	£899.00	D
G-500A	Elevation rotator	£279.00	D
G-5400B	AZ/EL rotator	£519.00	D
G-5600B	AZ/EL rotator H/D	£599.00	D
RC5-1	Medium duty create	£329.00	D
RC5-3	Medium duty + preset	£439.00	D
RC5A-3	H/D v/speed + preset	£659.00	D
RC5B-3	V H/D v/speed + preset	£989.00	D
GS038b	Lowes clamp G-400, 800, 1000	£25.00	B
GS038G	Lowes clamp G-600	£25.00	B
MC 2	Lowes clamp create	£49.95	C
GS-050	Rotary bearing up to 1¾ mast	£29.00	B
GS-065	Rotary bearing 2" mast	£45.00	B
CK46	Create rotary bearing 2" mast	£57.00	B

STOCK CLEARANCE BARGAINS

FT411	2m handy 1 only	£189.00
FT811	70cm handy 1 only	£209.00
FT815	70cm handy 2 only	£229.00
FT416G	2m handy 5 watts	£249.00
TH78E	Dual band handy	£379.00
TM441E	70cm mobile	£349.00
TH26E	2m handy 1 only	£199.00
IC735	HF transceiver 1 only	£839.00
IC229E	2m mobile 1 only	£279.00
IC229H	2m mobile 50w	£319.00
IC2SRE	2m handy wideband Rx	£349.00
IC3230H	Dual band mobile	£499.00
IC449E	70cm mobile	£359.00
IC729	HF transceiver + 6m	£1095.00
IC737	HF transceiver	£1269.00
ICF SW7600	Sony receiver	£149.00
AR2000	AOR AM/FM scanner	£259.00
AR500Ex	AOR all mode scanner	£289.00

Most items are brand new some may have had some shelf life all carry 12 months warranty.

ACCESSORY BARGAINS

144TV	2m module FTV series	£59.00	B
430/726	70cm module for FT726R	£169.00	B
144/726	2m module for FT726R	£139.00	B
DCT726	DC lead for FT726R	£10.00	A
8C	Charger FT290R	£11.75	A
Q3000020	Telescopic antenna FT290R	£10.00	A
YHA15	Rubber duck FT290R	£10.00	A
NC15	Desk charger FT209, 203, 727 etc	£59.00	B
FNB4A	Nicad FT209, 203, 727 etc	£56.00	A
CSC10	Vinyl case FT209 + FNB3	£10.22	A
CSC17	Vinyl case FT727 + FNB3	£10.22	A
CSC6	Vinyl case FT203 + FNB3	£10.22	A
CSC7	Vinyl cae FT203 + FNB4	£10.22	A
CSC43	Vinyl case FT470 + FNB9, 17	£12.95	A
CSC44	Vinyl case FT470 + FNB10	£12.95	A
CSC45	Vinyl case FT470 + FNB12/14	£12.95	A
CSC46	Vinyl case FT470 + FNB11H	£12.95	A
NB2	Nicad FT208/708 etc	£32.00	A
FVC5	Vinyl case FT208/708	£7.05	A
NC7C	Desk charger FT208/708	£35.00	B
AMUT77	AM unit FT77	£12.77	A
MMB15	Mobile bracket for FT270	£14.86	A
MMB16	Mobile mount FT77	£17.88	B
MMB21	Mobile bracket for FT203/209 etc	£10.22	A
MMB33	Mobile bracket for FT211/711	£20.56	A
MMB46	Mobile bracket for FT470	£12.95	A
FMUT901	FM unit FT901/2	£19.00	A
DCT901	DC inverter FT901/2	£59.00	B
MMB1	Mobile mount FT901/101 series	£10.22	B
XF8.9GA	AM filter FT901/2, 101Z, 707, 107	£10.22	A
XF8.9GF	FM filter FT901/2	£19.41	A
XF82HC	600Hz CW filter FT102	£15.32	A
XF455C	500Hz CW filter FT102	£22.50	A
XF455CN	270Hz CW filter FT102	£22.50	A
BHFRG7	FRG7 battery holder	£5.75	A
FC420	Remote ATU suitable for conversion for ham use	£99.00	D
NDH518	96 channel memory unit for NRD515	£159.00	D
FRA7700	Active antenna	£69.00	B
FRT7700	Antenna tuner/switch	£79.95	B
FRVWFM	Module for wideband FM	£5.00	A
DCRG8800	12v DC kit complete with DC lead	£4.00	A
MMB38	Mobile mount FT747GX	£15.00	B
MMB42	Metal cases FT747GX	£79.00	B
D3000216	RX mod kit FTONE	£3.00	A
D3000251	NB kit FTONE	£2.50	A
SET ONE	Extender board kit for FTONE	£34.00	A
D3000071	Counter unit FT301 (improved type)	£19.95	A
PA1	DC power adaptor FT207	£34.00	B
FBA1	Battery adaptor for PA1, NC1, NC3	£5.00	A
FBA3	Charging sleeve adapts NC1, PA1, NC3 to charge FT208, 708	£5.00	A
YM48A	DTMF mic 8 pin FT726	£35.50	A
FF5	Low pass filter 500kHz FRG7700	£10.00	A

TCVR £13.50
Handhelds/Mobiles by post £5
Next day £13.50

Carr A = £2.50 B = £5 (handies) C = £9.50 (mobiles) D = £13.50 (base stations) E = £16.50

Showroom/Mail Order 9.30-5pm, 9-1pm Sat Tel: (01703) 251549 Service Dept 9-5 Mon-Fri Tel: (01703) 254247

SMC Ltd HQ Southampton: *S M House, School Close Chandlers Ford Ind Estate, Eastleigh, Hants SO5 3BY. Tel: (01703) 255111 Fax: (01703) 263507*

ARE Communications: *6 Royal Parade Hanger Lane, Ealing, London W5A 1ET. Tel. 0181-997 4476 9.30am – 5.30pm Monday-Friday 9.30am - 1.00pm Saturday*

Reg Ward & Co: *1 Western Parade, West Street, Axminster, Devon EX13 5NY. Tel. (01297) 34918 9.00am - 5.15pm Tues-Sat*

SMC (Northern): *Nowell Lane Ind. Estate, Nowell Lane Leeds. Tel. (0113) 235 0606 9.30am – 5.00pm Monday-Friday 9.00am - 1.00pm Saturday*

SMC (Midlands): *102 High Street, New Whittington, Chesterfield. Tel. (01246) 453340 9.30am – 5.30pm Tuesday – Saturday*

SMC Birmingham: *504 Alum Rock Road, Alum Rock, Birmingham B8 3HX. Tel. 0121-327 1497 9.00am – 5.00pm Tuesday – Friday 9.00am – 4.00pm Saturday*

HF F-LAYER PROPAGATION PREDICTIONS FOR SEPTEMBER 1995

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

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	.....	.....	....1111...	....233332..	...4566667 3.	1.2655556883	7553222246 88	+52.....3++
MALTA	.....	.....	....111112..	....3433451.	...3676678 6.	2216655678 95	8865322346 89	++52.....4++
GIBRALTAR	.....	.....	.....1..	....1211131.	....5654586.	...3765689 4	7746433346 89	+++42....3++
ICELAND	.....	.....	.....	.....1..1..	.....343453.	...1466667 83	5335433346 78	+++32....34+
** ASIA								
OSAKA	.....	.....	.....	....122.....	...234421...	...2322232 2.	....1...1451	.....3.
HONGKONG	.....	.....	....11.....	...12332....	...2454433 1.	....2222466 1	1473	.....4.
BANGKOK	.....	.....	....1211....	...12433....	...2354 5.11.	....1222356 1	1.....1476	244
SINGAPORE	.....	.....	....12221...	...2344442..	...2354567 3.	....122247 8.	1.....1473	244
NEW DELHI	.....	.....	...1122221...	...2344 43...	...3344564 2.	1.1.122247 74	51.....1478	3.....24+
TEHERAN	.....	....1.....	...1232231..	...3344554..	...1434456 84.	3132112247 85	841.....1478	+2.....24+
COLOMBO	.....	....1.....	...123221...	...23445 3...	...2244561 1.	.1..1224575	31.....1478	2.....24+
BAHRAIN	.....	....11111...	...1233341..	...3445563..	..1433456731	5231..224787	851.....1478	+2.....4+
CYPRUS	.....	....121121..	...2344454 1.	...4666677 3.	1.1666667972	6554333457 98	9852111135 89	++2.....2++
ADEN	.....1...	....12122...	...1344551..	...3445673..	...3223567 11	6231..124777	851.....1478	+3.....4+
** OCEANIA								
SUVA/S	.....	.....	.....	.....11....	....11333.41.	...43222.62.	...31....14..	.....
SUVA/L	.....	.....	.....1.	.....4.	...31.....5.	...631...331	...31....41.	.....
WELLINGTON/S	.....	.....	.....	.....	...12221....	...5322211 2.	...31....141.	.....
WELLINGTON/L	.....	.....	.....	.....	....1.....21	.1.51.....42	..131....31.	.....
SYDNEY/S	.....	.....	.....	...122.....	...4542 11...	..1332223 22.	...11....1441	.....
SYDNEY/L	.....	.....	.....	.....	.....	12	11..2.....53	...11.....31	.....
PERTH	.....	....1.....	...123.....	...3451.....	...4553 21...	1.1132223 43.	1.....1472	242
HONOLULU	.....	.....	.....	.....	.....1..	.....141.	...2221.331.	..231....11..	.....
** AFRICA								
SEYCHELLES	.....1...	....121221..	...1344554..	...3445677 2.	...3224568 61	522...124787	841.....1478	+2.....4+
MAURITIUS	.....11...	....122331..	...1344564..	...3456677 2.	...3334568 71	3221...124797	841.....1478	+.....4+
NAIROBI	....11121..	....122342..	...1345675..	...3445788 2.	...4223568 71	6121....24797	863.....1478	+5.....4+
HARARE	....11231..	....123453..	...1345777 1..	...2456788 3.	...4333568 81	5223....24687	874.....1478	++.....4+
CAPETOWN	.....132...	....123541..	....446774 1.	...1556787 3.	...5434568 7.	1114211236 85	7751.....1478	++3.....4+
LAGOS	.....1333..	....113565..	....445688 2.	...1545689 5.	...4422368 91	45.52...3686	7842.....478	5+4.....4+
ASCENSION Is	.....24....	....111246 1.	....433468 4.	....654468 7.	...6432479 1	35..31..1587	7813 1....278	++4.....4+
DAKAR	.....113...	....112236 1.	....344468 4.	....554568 7.	...1642347 91	352431..1487	7864 1....168	++4.....3+
LAS PALMAS	.....1.....	....111131.	....243347 4.	....566568 7.	...1776678 93	5636643346 88	9985 3111379	+++2.....4+
** S. AMERICA								
Sth SHETLAND	.....1...	.....1232..	.....34651.	....1567 64.	3456661	3322221233 55	6863 1....124	4+4.....
FALKLAND Is	.....13...	.....11251.	....144574.	....3566 77.	5445572	3224221222 46	7874 1....15	5+4.....2
R DE JANEIRO	.....12...	....111252.	....443475.	....6545 77.	....1543357 2	3521321..257	8873 1....27	++4.....4
BUENOS AIRES	.....2....	....111142.	....433464.	....6545 76.	5443462	3523.2111136	8874 1....15	++4.....2
LIMA	.....	.....11.	.....21143.	.....43355.	1433343	452.2221..14	7973 1....2	4+5.....
BOGOTA	.....	.....11.	.....21133.	....1422 45.	3432243	542.2221..15	7862 1....2	4+4.....
** N. AMERICA								
BARBADOS	.....	.....11.	....221143.	....4423 55.	5423364	542.222...36	8873 1....4	++5.....2
JAMAICA	.....	.....	.....11122.	.....32234.	1432343	431..221...14	6862 1....2	3+4.....
BERMUDA	.....	.....	.....11122.	.....32244.	3433453	531..2211136	7862 1....13	5+4.....
NEW YORK	.....	.....	.....1.11.	.....22223.	1443353	42...2221135	6851 1....2	3+4.....
MEXICO	.....	.....	.....1.11.	.....2222.	243222	32...221..2	3752 1....	.44.....
MONTREAL	.....	.....	.....11.	.....12222.	1343452	42...2221235	6751 1....12	3+4.....
DENVER	.....	.....	.....	.....	.....111.	33221	21....122112	2552 1....	.34.....
LOS ANGELES	.....	.....	.....	.....	.....1.	13221	11....22111	1452 1....	.24.....
VANCOUVER	.....	.....	.....	.....	.....	.....222.	1.....113212	1342 1....1...	..4.....
FAIRBANKS	.....	.....	.....	.....	.....1122.	...3221233 31	1123 1....11..	.....

The provisional mean sunspot number for July 1995 issued by the Sunspot Data Centre, Brussels was 14.6. The maximum daily sunspot number was 30 on 1 July and the minimum was 0 on 23, 24, 25, 28, 29, 30 July. The predicted smoothed sunspot numbers for September, October and November, are respectively: (classical method) 15, 14,13 (±3); (SIDC adjusted values) 11,10, 9 (±2).

QSL

JOHN HALL, G3KVA
Corfe Lodge, Ipswich Road, Long Stratton, Norfolk NR15 2TA.

THE QSL Bureau Sub-Manager for the G4A and G4H series, Dave Roebuck, G0LJM, has recently moved. His new address is c/o 92 Owlet Road, Windhill, Shipley, West Yorks BD18 2LT. This address was published on the *At Your Service* page in the August *Radio Communication*, although the information was received too late for inclusion in last month's *QSL* column.

Jim Terry, G4GEU, has unfortunately had to give up as Sub Manager for the G4G series after no less than 12 years of sterling service. The new G4G Sub Manager will be Malcolm Slater, G3NML, 46 Ladywood, Boyatt Wood, Hampshire SO50 4RW.

Apologies to Mr S G Bryan, G0SGB, the Sub Manager for the G0S series, whose callsign was given incorrectly in *At Your Service* on page 96 of the July *RadCom*. Knowing your name, we should have been able to work out your callsign correctly!

QSL BUREAU NEWS

DOREEN AT THE RSGB QSL Bureau tells me that the Bulgarian national bureau has agreed to route QSL cards for YU-land. You will remember we have been hanging on to them because of the difficulties out there. We have now sent off 20-odd parcels to Bulgaria via Securicor. That means punters should be getting responses in due course.

The Norwegian bureau has moved address to Norsk Radio Relae Liga, P O Box 20, Haugenstua, N-0915 Oslo.

I very occasionally get a letter from a punter saying that the QSL service isn't what it used to be, is dreadfully slow and not worth the membership fee. Well, all I can say is that we have a number of overseas members who utilise the RSGB QSL Bureau in preference to their own country's service, because of the superior facilities maintained by the RSGB. The saying 'a prophet is not without honour except in his own land' springs immediately to mind! I am not sure where it comes from but I have no doubt someone will put me right on the source.

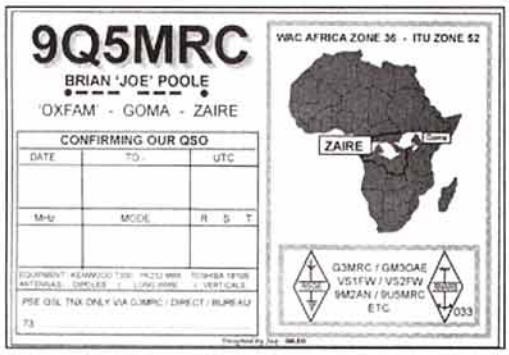
Malcolm Slater, G3NML, wrote to me suggesting that we try and alleviate the uncollected cards problem by trying an experiment he says was conducted some years ago. It involved one of the QSL Sub Managers publishing a list of callsigns in *RadCom* where he had neither an envelope or address in the *Call Book* and asking any amateur who knew the identities of the people to contact them and ask them to send in envelopes. I will contact some of the Sub Managers and see if the idea is worth a run again.

The WAGI award, for working all six counties of Northern Ireland.

AWARDS

GISBORNE, NEW ZEALAND, is unique in that it is the first city in the world to witness the dawn of each new day and, therefore, each New Year. To commemorate that, and the fact that the millennium is approaching fast, Gisborne Amateur Radio Club has instigated an annual award which will be obtainable up to and including the year 2000. The ZL2000 award can be earned by working any station using the ZL2000 call during the month of January in any year until 2000. Phone or CW will do and only one contact is needed. The award is open to SWLs. The cost is US$10 and applications should be addressed to Gisborne 2000 Award, P O Box 1017, Gisborne 3801, New Zealand. If you work a ZL2000 station in four out of five of the years between now and 2000 you will get a special complimentary award.

Here is the beautifully-produced Worked All GI Award, which is available to licensed amateurs and SWLs for all mode contacts on all bands. To obtain it you will need to work all the six counties in Northern Ireland a number of times. The cost is £3 or 8 IRCs and full details of the exact requirements can be obtained from GI3TLT who is QTHR.



'DIY' QSL for 9Q5MRC, designed by G0LEO (see text).

Nigel Collier-Webb's,GJ0VJP, full-colour pictorial QSL card from Jersey.

INTERESTING CARDS

JACK FRIZZELL, G0LEO, produced a card for Brian 'Joe' Poole, G3MRC, who was off to Zaire for Oxfam. Jack used a computer to generate the artwork and he says it can be called up at will and does away with the necessity of holding a quantity of printed cards. Brian, who is secretary of the Bromsgrove Amateur Radio Society, was involved in setting up a base station for Oxfam in Zaire as well as fitting Kenwood TS-50s in vehicles being used for rescue work in Rwanda and Zaire. Brian is a skilful CW operator and has worked as many as 130 contacts an hour as 9Q5MRC from Zaire. He orders 10,000 cards from Jack at a time!

Nigel Collier-Webb, GJ0VJP, sent me his QSL (above) bearing a picture taken on that lovely island and says he enjoys QSLing as much as the QSOing.

QSL COLLECTION

DID YOU KNOW that the world's largest collection of QSL cards is lodged with *QSL Collection*? The curator is Wolf Harranth, OE1WHC, who can be contacted at P O Box 2, A-1112, Vienna, Austria. Wolf is always on the lookout for unwanted cards, bequests or donations of QSL cards to add to the collection of over 500,000, so if you have run out of enthusiasm for collecting cards don't put them on the compost heap - get in touch with Wolf.

A CAUTIONARY TALE

BRIAN ARMSTRONG, G3EDD, sent in the following 'cautionary tale', which makes interesting reading: "I have been using the QSL Bureau for the best part of fifty years with no problems until recently. Not so long ago I realised that I had not received a batch of cards for some time, so I wrote to my QSL Sub Manager and found that he had no envelopes for me. I still had the last envelope received from him, but it wasn't endorsed 'last envelope'. What apparently happened is that my last envelope - no doubt suitably endorsed - got lost in the post, around the end of 1993.

"My Sub Manager told me that if there were no envelopes for a particular callsign, he held the incoming cards for six months, but then threw the cards away. He used to write to the 'no envelope brigade' but the return was only about 10% so since it cost him money, he stopped sending chasers. I can sympathise with him and would probably do the same thing in his shoes. The 'last envelope' system works fine *unless* it gets lost in the post.

"May I suggest that 'one envelope left' is written on the penultimate envelope, in addition to 'last envelope' on the final one, so alerting the recipient that he better take action if he doesn't want his QSLs binned? My loss has resulted in probably three batches of cards being thrown away - just as well I am not collecting for an award!" ♦

SWL NEWS

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

JUST IN CASE you should need reminding, that all important time of year is almost here again. Yes, my SWL Challenge takes place over the weekend of 28 and 29 October coinciding with the *CQ* WW DX Contest. The rules, see the table (right), are quite simple, with the onus on logging what you can hear, and there are few restrictions. Last year I received more than 80 entries from 17 DXCC countries and this time I am hoping for 100 entries. As far as I know, no other SWL contest has gained this much support, and I trust that readers of this column will help boost the number of entries. I also hope to receive my first logs from the USA and from Japan. Rules have been sent to 30 countries this year. Please note that your log need not be spectacular. I appreciate that some listeners would be unable to spend the whole weekend by the receiver. Simply spend what time you can spare doing some logging and send your log to me.

There are bound to be many DXpeditions active and that always adds a great deal of interest. One such DXpedition will be by the crew who operated at C56DX last year. This year they will be QRV from ZC4 - both during the contest and after it. Once again, I am handling the SWL QSL cards and I hope they arrive a little quicker from the printers than the C56 cards! More news about the Challenge and the ZC4 trip next month.

DX ROUND-UP

ON WHICH BAND would you expect to pick up the likes of KP4, 5T5, S0, EA9, D44, CO, CT3, EA8, W, VE, 5B4 and 4X4? On 20 metres or 40 metres perhaps? In fact, according to various reports, these DX stations were all heard on six metres this summer. The usual summer Sporadic-E conditions provided some very good DX. By the time you read this the conditions will be lost for another year. So, are you tempted into getting some receive equipment for the band in 1996?

Let me put some gloss on the bare facts. This summer appeared to have produced some exceptional double-hop Sporadic-E to America and even the Caribbean. I am advised that as well as KP4 and CO, stations in PY were also audible in the UK. During early July, the band was apparently open to the USA on five consecutive evenings though I only caught two of them. The first was a short opening to VE1 and VY2 while the second, on 7 July, was a much bigger event with Ws and VEs audible in London from 2042 to 2242. Stations in W1-4, W8-0 and VE1-3 were heard. David Whitaker, BRS25429, caught the CO at the beginning of one Stateside opening and the KP4 at the start of another. These choice loggings brought his 6m heard score to 104. He was waiting for eight confirmations in order to get the third RSGB 50MHz SWL 100 Countries Award.

David Whitaker, BRS25429, remarked that 6m had, at the time of his letter in early July, provided 50 countries in 186 locator squares since he returned from VK in early June.

Elsewhere at VHF, David mentioned RSGB VHF Field Day. He said that the skip was very narrow for much of the contest as he could hear many DLs in Northern Germany working other Germans in nearby squares. Meanwhile, 2 July provided EA9IB and EA9MH, both in IM85, during a Sporadic-E event.

On HF, we now know that Scarborough Reef will not count for DXCC, but that North Korea will. There is likely to be a DXpedition to P5 in October so listeners can add to their DXCC scores.

Two particularly interesting loggings this time were EW9/UX2MM from Chernobyl (QSL via DL3BQA) and CG7D (Special station from the G7 meeting in June - QSL via VE1FO).

A TEAM EFFORT

READERS MAY recall that some 18 months ago, Ray Cracknell, G2AHU, invited listeners to join in with the Society's Propagation Studies Committee in monitoring certain Beacon transmissions. There were several volunteers and Ray passed on a progress report. A team of five listeners was established: Ern Warwick, BRS20307, (now sadly deceased); Jim Fairgrieve, BRS95324; Bill Hough, G0IHF; Ron Newsome, BRS95138; and Don Law, BRS87742.

Listening commenced in January 1994 and was running smoothly by February. Unfortunately, the Australian Beacon had to close down leaving only LN2A in Norway. By the end of January this year, LN2A started to give trouble and Ron's antennas were blown away in the gales! Despite these problems, the scheme appealed to those who were retired, and the Reporting Club were particularly grateful for these listeners' efforts. Listening provided some interesting occurrences, in particular an unusually high incidence of coronal holes, and some fine reporting of LN2A by BRS95324, during night-time conditions in May 1995 on 5470, 7870, 10407, 14405 and 20945kHz.

For anyone interested in 10 and 6 metre propagation, the Six and Ten Reporting Club has monthly magazine. Ray will gladly send details on receipt of return postage. He is QTHR.

QSL HELP PLEA

A NUMBER OF sources have asked me to provide QSL information. Can anyone help with good addresses for the following? 6Y5X (October 89 and October 91), FR5DX (October 90), 5U7M (October 91), XU2UN (November 92), SU1AH (November 92), TT5BP (October 93), TG0AA (October 93), 5T5MS (October 94), VP5X (March 95), VP8CFM (September 91), TO5GI (March 95), ZD8ZXR (February 94), 5X5A (August 93) and 9Y4VU (March 95).

1995 SWL CHALLENGE

The idea of the Challenge is to log as many countries as possible in the 48 hours from 0001UTC on 28 October 1995 to 2359 GMT on 29 October 1995. The Challenge takes place at the same time as the SSB leg of the *CQ* World-wide Contest.

RULES

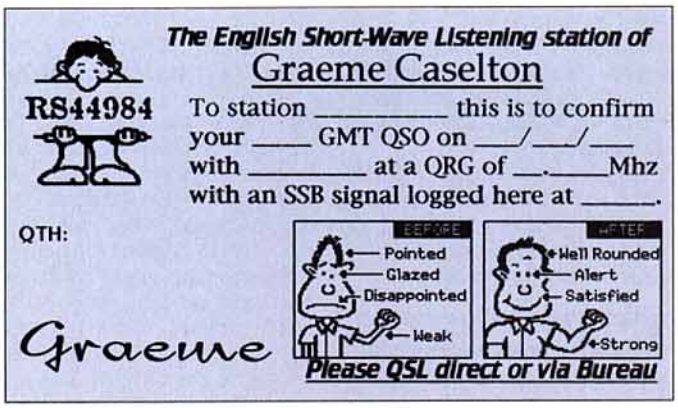
1. An SWL may listen at any time during the 48 hours.
2. Only one station from each DXCC country may be logged on each of the main amateur bands (28, 21, 14, 7, 3.5 and 1.8MHz).
3. Points will be as follows:
   a) Countries in the SWL's own continent score 1 point on each band.
   b) The final score shall be the total of the countries heard on the six bands multiplied by the total number of points from each of the six bands.
4. Entries must show -
   a) Date
   b) Time (UTC)
   c) Callsign of station heard. The callsign of the station being worked is *not* required.
   d) RS of station heard at SWLs QTH. No station may be logged whose RS is less than 4 x 4.
5. A country multiplier check sheet must be provided.
6. Computer generated logs will be welcomed.
7. Logs should be sent to Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, England.
8. Logs *must* be postmarked no later than 27 November 1995.
9. Certificates will be awarded. Entrants wishing to receive a copy of the Results Booklet *must* include at least £1, S1 or 2 IRCs.

QRP SWL

GERALD, G3MCK, asked me to convey that the G-QRP Club is always pleased to receive SWL logs for any events. SWL membership of the club is only 3% of the total. However, if more logs are forthcoming for such events, the club will consider something other than a certificate for the leading entrant. The ball is firmly in your court now.

FINALE

PLEASE REMEMBER that my deadline dates are a little earlier now. The deadline for **November** issue is **6 September**. ♦



Graeme Caselton, RS44984, sent this 'DIY' QSL card. It is computer generated and the gaps are filled in using a Mail Merge together with his database of loggings. Clever stuff, which saves on expensive QSL cards!

NEVILLE CHEADLE, G3NUG
Further Felden, Longcroft Lane,
Felden, Hemel Hempstead HP3 0BN

SEVERAL READERS and cluster users have requested further details about the IOTA computer system. This system has been developed by John Linford, G3WGV, the author of Turbolog. It is a sophisticated database system with three main segments; the central database, the checkpoint system and the members' system (IOTAMEM). The central database contains details of all applications for IOTA awards. These details include members' islands and awards credited. Many enquiries can be made of the database to show, for example, 'Who worked who and where?' or 'Who has activated the islands?' and results can be printed out. Also, various reports can be produced such as the Honour Roll and Annual Listings and most wanted island listings by continent.

The IOTA Committee has found this database to be very secure and reliable. It is an invaluable tool in managing the IOTA Programme. Exception reports are prepared whenever data related to a new island activator is input to the system so that the committee can double check the validity of the data before giving credit.

The checkpoint system is very similar to the central database system except that it contains only the subset of data relating to members using that checkpoint. However, it does include all the data relating to island activations. Thus, when a checkpoint receives QSL cards (hopefully accompanied by a member's disk) he checks the cards and either inputs the data manually or inputs the data from the disk. Comprehensive exception reports are prepared by the computer. These are cleared by the checkpoint before updating his system. QSL cards can then be returned while the central database system is updated and certificates, plaques and shields issued.

The members' system (IOTAMEM) is the third segment of this system and was described in some detail in the May *IOTA* column.

QSL card used by Neville Cheadle, G3NUG, for his IOTA operations from various West Malaysia Island.

KIT CHECK-LIST FOR DXPEDITIONS

I HAVE RECEIVED several enquiries from readers who are thinking about going on an IOTA DXpedition. In view of this I have put together the following list based on my recent operations as 9M2/G3NUG from various West Malaysian islands. Please note these were holiday trips and we were staying in reasonable hotels, so there was no need for batteries or camping equipment. (O) = Optional

RIG
HF transceiver
Transceiver backup (O)
Power supply
Power supply back-up (O)
Connection cables
2 microphones
Keyer
2m / 70cm transceiver - hand-held (O)
2 sets of head-phones + adapters
Carrying case

ANTENNAS
R7 vertical antenna or similar
Wire antennas such as VRDs for 17m and 20m, multi-band trapped dipole
Back-up wire antenna (G5RV)
Coax-cables - 4 x 25m fitted with connectors + joining pieces
2/3 element yagi such as TH2/3 Jnr, mast, guys (O) rotator + cable for yagi (O)
Pulleys, rope, catapult, nylon cord, self-amalgamating tape
Carrying cases for antennas eg ski-bag or tubeholder (fishing rod case) for vertical, soft bags etc
Coax switch
Fibreglass pole

COMPUTER
Portable computer
Power supply + connection cables
Mouse
Key s/w diskettes: DOS, Windows, TL, mouse driver + 10 spares (formatted)
Manuals: Machine + Windows + DOS
Carrying case
Soft bag for hand luggage

TEST EQUIPMENT
SWR meter
Multi-meter
Antenna tuner
2 short lengths of coax cable with connectors

ASSORTED TOOLS
Tool roll comprising:
Soldering iron + solder
Screw-drivers - various
Pliers: long-nosed, bull-nosed, instrument, cutters, large and instrument
Stanley knife
Wire-strippers
Small file
Tape-measure

MISCELLANEOUS
Battery-driven 24 hour clock + spare batteries
Compass
Spare batteries
TVI filters - antenna and mains
Ferrite coils and filters
Battery cable connectors
Beam heading plot, great circle maps
Propagation software + printout + band plan
Electrical tape (some coloured)
Small coils of wire, earth wire
Wallplug adapters
Heavy-duty extension cords / multi-way box
Spare fuses - for equipment & mains
Terminal blocks
Hose clips
Dual headphone plug
Torch
Presents for helpers
Throat pastilles

PAPERWORK
Original + copies of CEPT licence
Customs forms
DX licence
Receipts for equipment
Log books
Pencils, pens etc
Miscellaneous correspondence
Equipment manuals
Post-it notes
Correcting pen

STATION LOAN

THE IOTA Committee has made good use of a portable station, comprising the Yaesu FT-900AT transceiver and accessories, made available to it by Principal Sponsor Yaesu. The equipment is available for loan to DXpeditioners as reported in January's *IOTA* column. Several DXpeditions have already used the rig with considerable success and IOTA is very encouraged by the results so far. The rig is proving to be effective in dealing with major pile-ups. Any potential user should contact me at the above address.

PROOF REQUIRED

THE RISE IN POPULARITY of the IOTA Programme over recent years has led more and more operators to activate islands. Many of these islands have had regular previous operations and are easy to reach and activate. Other islands, meanwhile, are remote, difficult and expensive to reach and present many operating problems.

This is particularly true of the 300 or so island groups listed in the *IOTA Directory* that have not yet been activated as well as those island groups that lead the 'most wanted' list.

The IOTA Programme, along with other major DX programmes, is based on integrity, honesty and fair play.

It is essential that the programme should maintain these values if it is to continue to burgeon and to be supported by the amateur radio community around the World.

To this end the IOTA Committee has decided it will formalise the requirements that island operators submit evidence in support of their operations. Initially, a pilot programme will be put into place which, after development and trial, will be made permanent. In my next column I will set out some of the information we will be seeking in order to validate operations.

CONVENTIONS

THE HF CONVENTION, to be held at Windsor over the weekend of 8/10 September, will include several presentations of interest to both the new and experienced IOTA enthusiast.

The HF and IOTA Convention in Bologna (13/15 October) will be this year's official IOTA Convention. The impressive programme contains much of interest to all DX, HF and IOTA enthusiasts. I have some copies of the programme which I will send on receipt of an SASE. ♦

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PHF-40	40m	£22.95	£20.65
PHF-30	30m	£26.95	£24.25
PHF-20	20m	£19.95	£17.95
PHF-17	17m	£19.95	£17.95
PHF-15	15m	£19.95	£17.95
PHF-12	12m	£19.95	£17.95
PHF-10	10m	£19.95	£17.95
PHF-6	6m	£19.95	£17.95

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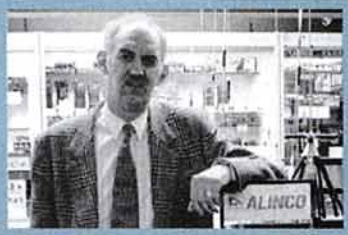

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704	Low pass filter	£46.95	£35.00
1701	6 way coax switch	£44.95	£35.00
912	Remote balunn	£49.95	£35.00
264	1.5KW dummy load	£79.95	£59.00
260	300W dummy load	£39.95	£29.00
203	160-10m dip meter	£119.95	£89.00
931	Artificial ground	£99.95	£75.00
5383	Computer interface	£59.95	£45.00
1278	Multimode data unit	£339.95	£249.00
1278BX	Multimode data unit	£339.95	£279.00

Optoelectronics:-

2810	10Hz-2.4GHz counter	£199.95	£145.00
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Adonis:-

AM708	Desk microphone	£179.95	£139.00
AM608	Desk microphone	£165.95	£125.00
AM308G	Base station mic.	£95.95	£75.00
AM508G	Base station mic.	£115.95	£89.00
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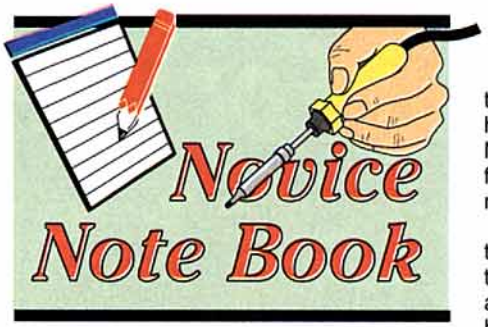


IAN KEYSER, G3ROO
Rosemount, Church Whitfield, Dover, Kent CT16 3HZ

THE 'PINEHAM' RECEIVER

I HAVE BEEN ENCOURAGED by letters from you, regarding the description of the 80m transmitter, to design a companion receiver.

DESIGN

THE CRITERIA OF the design was that it should be simple and as sure-fire as I could make it. This immediately brought to mind the G3RJV 'Sudden' receiver that has proved so popular over the years. As the receiver was to cover only 80 metres CW section several simplifications could be made. Firstly the antenna input filter could be simplified and secondly we could do away with the conventional volume control.

To deal with each of these points in order:

1. The receiver is for novice CW use and 80 metres is far removed in frequency from any strong broadcast stations, unlike 40 metres. For the antenna input filtering we can get away with a single tuned circuit tuned to 80 metres. 2. An audio volume control in a receiver which has only just enough gain to operate properly is an expensive luxury, however simple receivers should always have an input attenuator to help reduce blocking from nearby amateur stations, and this can also be used as an effective volume control when required.

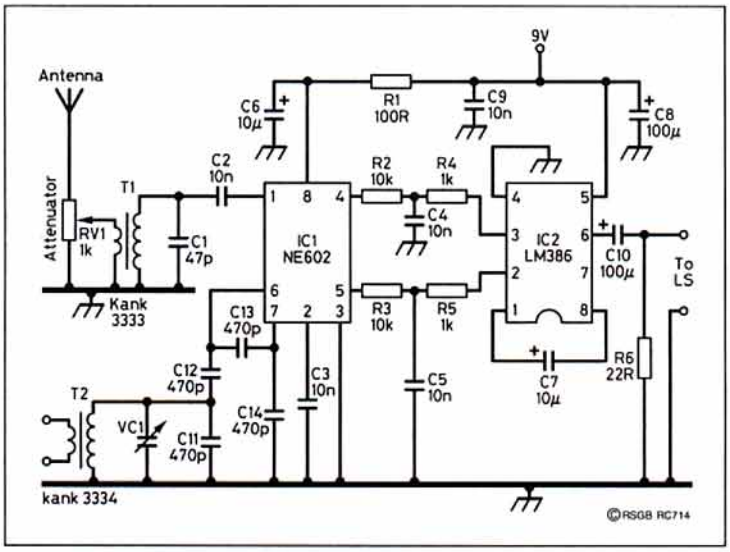


Fig 1: The 'Pineham' receiver, circuit diagram.

The set uses just two integrated circuits as shown in **Fig 1.** The first is an NE602, which takes the antenna signal and mixes it with a built in oscillator to convert it to a frequency that our ears can hear. If the internal oscillator is running on 3,561kHz a signal from the antenna on 3,560kHz will mix to produce a replica signal at 1kHz, audible in the earphones. There is a problem with this because a signal on 3,562kHz will also mix with the oscillator on 3,561 to produce a 1kHz note. The audio signal produced is then passed via a very simple filter to the input of an audio amplifier, the LM386. You may notice that there are two filters from the NE602 to the NE386, this is because the NE602 has two outputs in antiphase and the NE386 has two antiphase inputs - by using both we get an extra 6dB gain for the cost of two resistors and a capacitor.

The internal oscillator is controlled by a tuned circuit consisting of T2, the variable capacitor and the four capacitors C11,12,13, and 14. The four capacitors have the same value (this also simplifies purchasing) and it is very important that these capacitors are polystyrene to get maximum stability.

CONSTRUCTION

THE 'UGLY' CONSTRUCTION technique is the same as used on the 80m transmitter, which is very suitable for novice and experimental circuits; and to my mind is very much more enjoyable method of construction.

The construction and layout of the components is shown in **Fig 2** and photograph. The ICs are fixed to the PCB on their backs and the earthed pins bent until they touch the PCB and soldered into place. Those components that are earthed at one end, such as R6, C4 and C9 etc, are soldered to the PCB and form a support for other components. VC1 is fixed through a hole in the PCB and does not require any soldered connection to earth.

The core of T2 should be removed and coated lightly with beeswax, small blocks of this can be obtained from good hardware shops. The core is then re-inserted into the coil until six threads are exposed.

SETTING UP

THIS IS SIMPLE, especially if you have already built the transmitter. Apply power to the receiver and a slight hiss should be heard in the headphones. Now connect an antenna, 67ft of wire is ideal for 80m and noises should be heard, if not, make sure the attenuator is turned full up.

Now, with the transmitter the other side of the room, key it into a dummy load. With a trimming tool, screw the core of T2 in and out a turn or two and a very loud signal should be heard, that is your transmitter. Leaving the core in that position turn off the transmitter and with a little luck CW signals will be heard. These are other amateurs on the same frequency as your transmitter just waiting to be worked. Prior to doing that we need to finish the receiver off. Adjust T1 so these signals are as loud as possible. The tuning of this core is very flat, but try and find the best position and then lock it in place with a drop of beeswax.

Finally we need to calibrate the tuning knob. To do this close the variable capacitor until 90 percent of the vanes are meshed. Now fire up the transmitter again with a 3560kHz crystal plugged in and adjust T2 until the signal is again heard in the phones. That point of the dial is now 3560kHz, the QRP calling frequency and the LF end of the novice band. As the capacitor is further unmeshed we tune HF over the novice band. If we are fortunate enough to have a 3579kHz crystal this can be plugged into the transmitter and used to mark that frequency on the dial. It is then an easy job to interpolate between these points and get reasonable calibration.

To cover the whole of the CW section, or even the whole band, it is necessary to use a larger tuning capacitor. These are listed as VC1 for novice VC1b as CW and VC1c as whole band. Tuning rates without a reduction drive on the capacitor are ideal for the novice band only, for the CW band it is acceptable without a drive providing a large knob is used. If the whole band is to be covered it is necessary to fit a reduction drive of at least 3:1, if not 10:1 to get adequate tuning rates.

General view showing the construction of the 'Pineham' receiver.

HINT OF THE MONTH

BEESWAX IS FAR superior to any other coil fixing agent. As well as being inexpensive (a small block will last many years), it can be melted using your soldering iron without polluting the tip. If later adjustments are necessary, hold the iron near the core for a few seconds and it will easily turn to allow adjustment. It is also extremely useful for holding a component in oscillator circuits where mechanical stability is imperative. Just a few drips from the soldering iron tip will 'glue' components together! Hand wound coils can also be coated in beeswax to hold the windings in place. ♦

COMPONENTS LIST

Resistors
(all resistors 1/4watt)

R1	100R
R2, R3,	10k
R6	22R
RV1	1k linear

Capacitors

C1	47pF
C2, C3, C4, C5, C9	10nF
C6, C7	10uF
C9	1nF
C8, C10	10uF
C11, C12, C13, C14	470pF polystyrene
VC1	20pF (Novice band only, see text)
VC1b	50pf (CW section only, see text)
VC1c	150pf (whole of 80m band, see text)

Inductors

T1	Toko Kank 3333
T2	Toko Kank 3334

Semiconductors

IC1	NE602
IC2	LM386

Additional Items

X1	3.2768MHz computer crystal

Components are available from JAB Electronics Components, 1180 Aldridge Road, Great Barr, Birmingham B44 8PB.

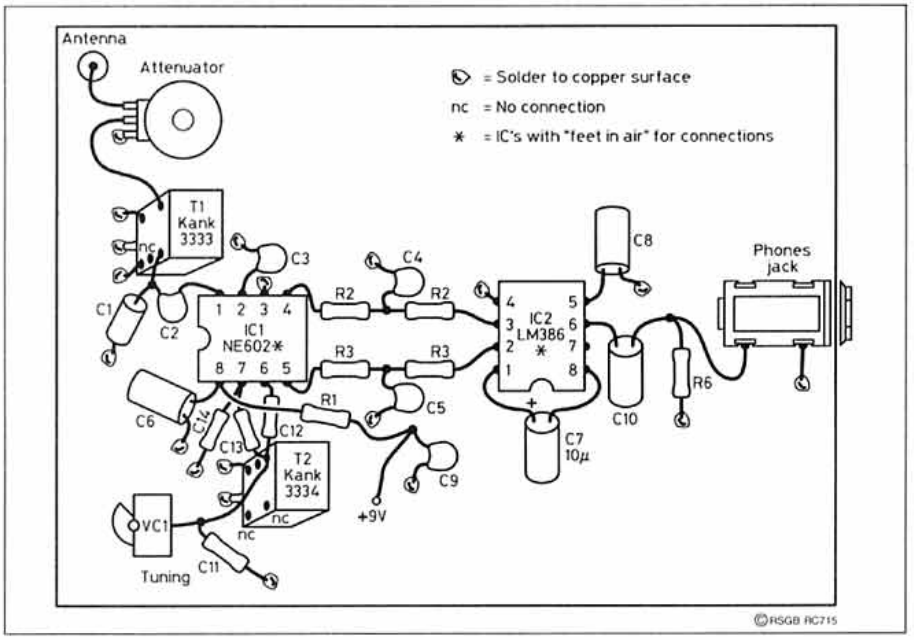


Fig 2: The 'Pineham' receiver, component layout.

RADCOM HELPLINES **Helplines** FOR MEMBERS

- Fred Sammon, GI4PCY, would like help to identify the **equivalents** for the following **transistors**: UK Government numbers CV9297, CV9507, CV9936, CV10253, CV10254. He would also like to know more about the following eight-pin **integrated circuit** devices: D3748 SGM7704, and D3748A SGF7840. If you can help, please call Fred on 01365 324993.

- Trevor Page, GW0VSC, would like help from anyone who has built the **G4WIM dual-band multimode** as described in *RadCom* May - June 1990. Contact Trevor at 12 Ffordd Cadfan, Tywyn, Gwynedd LL36 9EE if you can help.

- Dennis Wood, G3EAY, requires information and circuit diagrams of the **GEC Kenilworth** (10-channel highband AM?). Also required information and a circuit of the **Halicrafter S-210** receiver. If you can help please contact Dennis, QTHR, 01799 530763.

- Having purchased a **Heathkit GDIU** Dip Meter without coils G3GMM would like to hear from anyone who has this instrument; for details of the coils (diameter and number of turns etc). Please phone 01477 537708 or write QTHR.

- Information is required on the **Storno TX860** spec.7462. If you can help please contact R W Hopley, G0NDH, QTHR.

- Peter Gascoyn, RS92452, requires a service manual or a circuit diagram for a **NordMende FG3360** PAL colour signal generator and for a **Rohde and Schwarz HUZ-BN 15012/2** VHF field strength indicator. Peter can be contacted QTHR or by telephone 01235 868695

- Teny Cooper, G4CBY, would like to hear from anyone who has experience of using the **HX240** 2Metres to HF transverter. He is disabled and cannot use the modern transverters because the controls are too close together. Teny can be contacted QTHR.

- Information is required, (service sheet or circuit diagram) of a 1957 **vintage radio Bush VHF64**. If you can help please contact Stan Caspard, G3XON, QTHR, or telephone 01483 36953.

- Laurie Brettingham wishes to thank members who assisted him with information for his book *Confusion to their Enemies*, a history of No. 80 (Signals) Wing, RAF. As a sequel to this book he is researching **No. 100 (Bomber Support) Group, RAF**, and would appreciate help from any members who were involved with the group. Laurie can be contacted at 12 Duncan Close, Welwyn Garden City, Herts, AL7 3XP, or tel: 01707 371488.

RADCOM TECHNICAL FEATURE

A Variable IF Selectivity Unit

By A R Thomson, GM3AHR*

THE UNIT DESCRIBED below provides variable IF selectivity for older commercial or home brew transceivers with a 9MHz IF. It was originally designed as an add-on for the G3TSO transceiver but it could be used in other designs and with other IF frequencies with a change in the value of some of the components. It operates by superimposing a second filter response over that of the receiver IF filter. By altering the position of the second response, relative to the first, the effective selectivity can be made variable. No originality can be claimed for the design which is a derivation of circuits found in some commercial and home-brew amateur radio equipment.

THEORY

A BLOCK DIAGRAM of the unit is shown in **Fig 1**. The output of the receiver SSB filter is mixed with the output of a variable 19.7MHz crystal oscillator and the output of the mixer passed through a second filter of 10.7MHz. This filter should have the same bandwidth and shape as the SSB filter for best results.

An attempt was made to construct this second filter from 10.7MHz crystals using published data for ladder crystals filters but the results were disappointing, due probably to the shape and the high passband ripple which was evident. A commercial crystal filter was obtained at a reasonable price and has proved entirely satisfactory.

The output of the filter is mixed with the 19.7MHz oscillator resulting in the original 9MHz signal. By varying the oscillator above and below 19.7MHz ie, plus or minus 2.5kHz, the signal applied to the second filter will be outside its passband and effectively blocked from the IF stages. Varying the oscillator by smaller amounts, interfering signals can be eliminated and still retain sufficient intelligibility from the wanted signal, as well as SSB signals CW reception is much improved.

*Meadow Rise, 4 Lawview Gdns, Bonnybank, Leven, Fife KY8 5SW

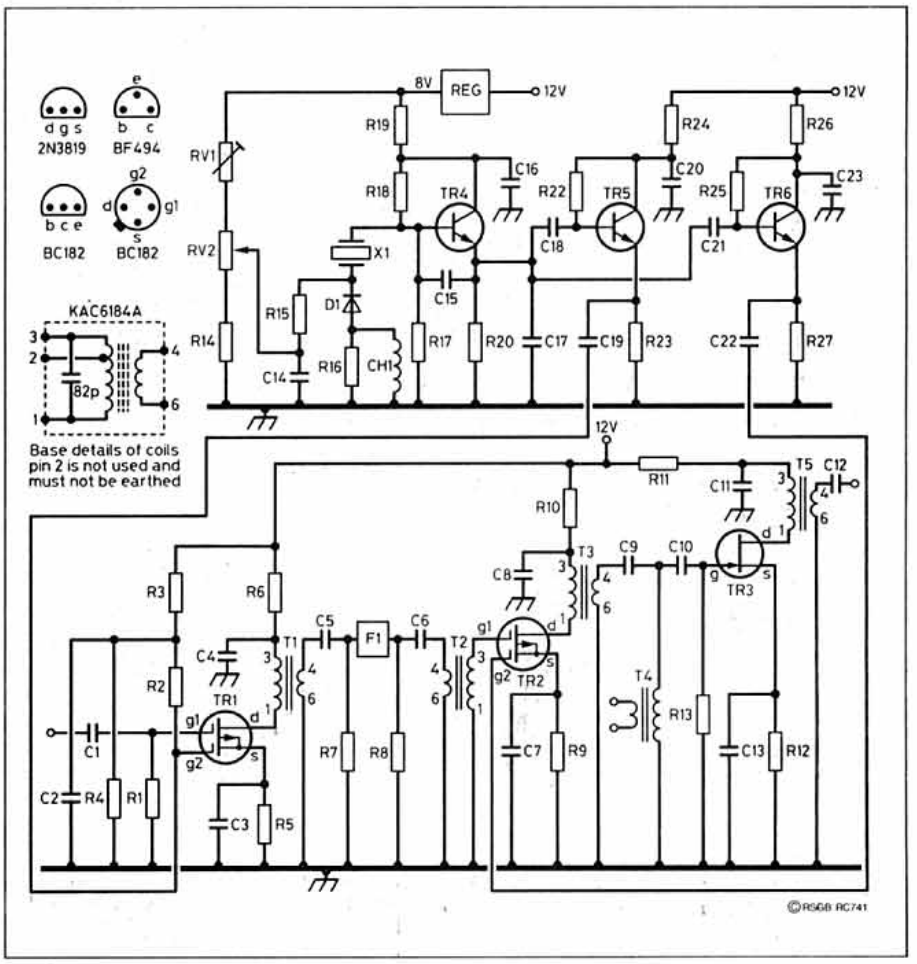


Fig 2: Variable IF selectivity unit, circuit diagram.

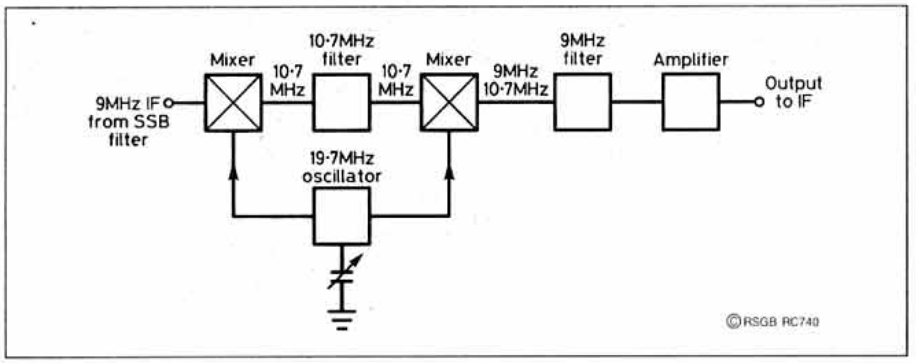


Fig 1: Variable IF selectivity unit, block diagram.

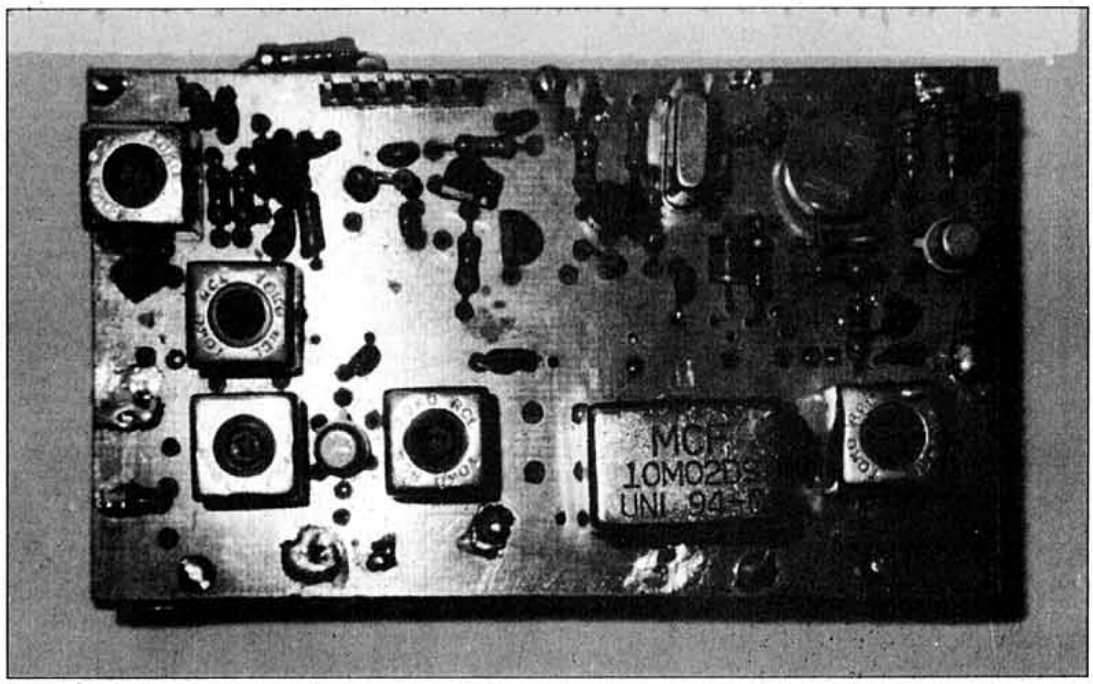
The circuit is given in **Fig 2**. A design for a PCB is not included but a suggested board layout is given since it was felt that individual layouts of receivers would require different PCB sizes and shapes. My own PCB, which is double sided to aid stability measures three inches by two inches and the layout basically follows the circuit diagram. An 8 volt stabilised supply is required for the oscillator to ensure frequency stability.

Frequency shift is obtained by the varicap diode D1. All transformers are the same type. An 82pF capacitor is connected internally and it may be necessary to connect an extra 10pF across T4 externally to bring it into tune. The output of the second mixer contains signals at 9MHz and 10.7MHz and the latter must be removed before it reaches the receiver IF stages. Ideally a filter with a band-

width of about 10 to 15kcs at 9MHz should be used but could not be obtained at a reasonable price.

By using loosely coupled T4 and a further stage of amplification and tuned circuit, T5 satisfactory results were obtained.

If other IF frequencies are considered it would be advisable to retain the 10.7MHz filter since it is readily obtainable. The 19.7 xtal would need to be changed for one to give the required 10.7MHz from the first mixer. All the transformers are of the same type - KAC6148As. They have parallel 82pF capacitors fitted across the high impedance winding inside the can as standard and are designed for 10.7MHz. T1 and T2, used in the 10.7MHz section of the circuit can use these transformers unmodified.



PCB layout of the variable IF selectivity unit.

T3, T4 and T5 are used in the 9MHz section of the circuit and the manufacturer claims that they will tune to this frequency. However, additional capacitance may be required to tune the transformers to 9MHz, particularly T4 because it is very lightly coupled, see Setting Up, below.

The supply to the board and the connections to the panel potentiometer VR2 is by plug and socket, shown in the photo above, and the input and output connections are by soldered pins at each end of the board.

SETTING UP

CONNECT THE UNIT to the receiver with the system fitted between the output of the SSB filter and the following IF stages. Ensure that the supply is between 12 and 14 volts

Use a receiver or frequency meter and check that the 19.7MHz oscillator is working.

Set the panel control midway and adjust the preset control until signals are resolved normally. Peak all transformers for maximum signal. Varying the panel control, RV1, should result in signals disappearing about halfway from the centre position in each direction.

The panel control should have a reasonably stiff action to prevent accidental movement of this control, and a sudden dead receiver!

The value of R14 was selected so that the full range of frequency shift of the second filter equals 180° rotation of the potentiometer, ie, 90° each side of centre. There is no reason why the travel could not be made greater, to give greater resolution, as long as the signal disappears before the end of travel at each end. With the value of R14 given the signal does disappear as plus and minus 90° and I find this is not too coarse.

The PCB should be fitted as near as possible to the receiver if board and short coax connections made between the two. The panel control wiring may need screening but I found this to be unnecessary.

The DC supply to the PCB is taken from the receiver 13 volt line, and in my own case this supply is disconnected and earthed on transmit. The use of switching diodes is not therefore necessary to isolate the new board but this may be necessary in some cases.

On tuning up once the potentiometer has been set midway and VR1 adjusted to give a normal signal, the transformers can be peaked for max signal. This can be done by injecting a 9MHz signal at the input from a signal generator but the frequency must be set accurately to 9MHz. In my own case I connected the new circuit into my receiver and observed the output on the S meter. T1 and T2 should be peaked first and then the other three, repeating the process. It should be possible to find two tuning positions for each coil, one with the slug well into the coil and the other with the slug beginning to come out of the coil. This occurs because the tuning slug is moving out of the coil in the other direction.

With regard to using a GDO as the signal source difficulty may be experienced with drift. The best method for tuning is the receiver method which uses the IF frequency of the unit it is to be used with. The GDO can be tuned to any desired frequency the receiver covers and drift is easily corrected by the receiver tuning control. If the receiver has a RF gain control this should be reduced until the S meter is about half scale. Alternatively move the GDO further away from the antenna input. ♦

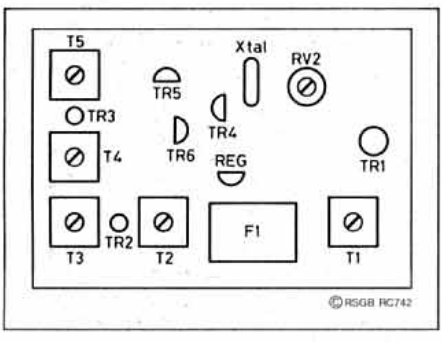


Fig 3: Variable IF selectivity unit, component layout.

COMPONENT LIST

Resistors	
R1, R9, R12, R2	
R23, R27	1k
R3, R15	47k
R4	2.7k
R5, R19	100R
R6, R10, R11, R24, R26	200R
R7, R8	560R
R13, R22, R25	180k
R14, R16, R21	10k
R17, R18	15k
R20	330R
RV2	10k Linear
RV1	10k Preset
Capacitors	
C7, C9	1nF
C8	10nF ceramic disc
C10	0.1uF polyester
Inductors	
RFC	3 turns on FX1115 bead
C9, C10	2pF
C12	1nF
C1, C2, C4, C7, C13 C14, C16, C19, C20 C22, C23	10nF
C3,	47nF
C8, C11	.1µF
C5, C6, C15	100pF
C18, C21	33pF
REG.	78LO8
C17	39pF
Semiconductors	
TR1 TR2	MFE20
TR3	2N3819,
TR4	BF494
TR5, TR6	BC182
D1	BB105
Additional Items	
F1	10MO2DS
CH1	5.6uH
X1	19,7MHz
T1, T2, T3, T4, T5	KAC6184A

Components are available from JAB Electronics Components, 1180 Aldridge Road, Great Barr, Birmingham B44 8PB.

RSGB 1995 International HF Convention

SYNOPSIS OF LECTURES

The DXCC Program by Chuck Hutchinson, K8CH

ARRL Membership Services Manager, Chuck Hutchinson, will show a series of 35mm slides that will take us on a tour of ARRL HQ and W1AW. He will also share the basics of today's DXCC program and explain how the DXCC rules are made and changed. Are you confused by the DX Advisory Committee and the Awards Committee? Who are they? How do they relate to one another? To whom do they answer? Will there be field checking of DXCC applications outside the USA? Chuck will explain all that and tell us what's on the agenda these days and share with us plans for the future of DXCC. There will be time for questions and Chuck says he will try to answer them all.

Amateur Radio on Internet by Mike Richards, G4WNC

Although most people have heard of Internet, few understand its workings and potential. Mike Richards gives an overview of the Internet from its origins through to its present day form. Perhaps more importantly, the lecture will illustrate how all radio amateurs can use the Internet to increase their enjoyment of all aspects of the hobby. The lecture will conclude with a run down on how to link with the Internet, including tips on the best software and how to choose your information provider. As a further bonus, Internet FactPacks will be available to all attendees.

Top Band Antennas for Mere Mortals by Neil Smith, G4DBN

Neil Smith relates his experiences in getting the best DX performance from low budget 160m antennas. His talk is a mixture of science and engineering mixed with anecdotal solutions. Included will be modelling, loading, feed methods, using balloons, making your own hydrogen; with experimental results from the amazing EWEs and snakes, plus the Minooka special and variants, Beverage and magloop receiving antennas. In early 1995 G4DBN worked over 100 countries on 160 metres in 8 weeks using small but practical antennas that really work.

Cluster Forum by John Clayton, G4PDQ

Packet Clusters; the modern equivalent of the old telephone and VHF FM DX alerting nets where dedicated DX operators combined their skills to help each other get that rare DX station. You either love Clusters or hate them, but whatever your feelings the Cluster Forum is the place to express them. This is your opportunity to ask all those questions that you have been holding back from your local SysOp. Most of the UK SysOps will be at the Forum and there will be the opportunity to find out how to connect to your local Cluster as a user or fine tune some of the more advanced features of the network. Find out about the latest software and everything you need to know to get the best out of the system.

Computers in the Shack by Don Field, G3XTT

Don Field, a leading expert in Information Technology, will talk about hardware and software selection, software applications and will also look into the future. This talk is a must if you are thinking of buying hardware or amateur radio software or upgrading.

Islands on the Air - the fastest growing DX award programme by Roger Balister, G3KMA

If you are a casual island hunter or a DXer looking for a new challenge this talk will interest you. Find out how to enter the IOTA awards programme and learn how IOTA has become one of the top awards programmes in the World today; plus the answers to all your other questions.

Sunspots and Propagation by Martin Atherton, G3ZAY

Martin Atherton will describe how sunspots affect HF propagation. He will explain what they are and why they run in an 11 year cycle. He will tell you how to measure them and explain how to know when a new cycle has started. They mysteries of the 'A' and 'K' indices will also be unravelled so that you can always get the most from your HF operating.

Bhutan - 40 Years of Amateur Radio, by Jim Smith, VK9NS

The HF Committee is delighted that one of the best known DXpedition operators in the world is able to talk at the 1995 HF Convention. Jim has activated a great many rare countries, especially around the Pacific, but is probably best known at present for his work in getting the Kingdom of Bhutan (A5) back on the world amateur radio map. The A51MOC operation in 1994 was an important step forward. By 9/10 September, the dates of this year's HF Convention, amateur radio activity in Bhutan may have moved further forward. Watch this space and be at the Convention to see Jim's unique and refreshing presentation.

Activating Islands; the DOs and DON'Ts by a number of Island activators

Obtaining permission to land and permission to operate can be two quite separate issues. Experienced Island activators will describe their experiences including operating techniques, taking suitable equipment and personal safety. An equipment checklist is essential and will be discussed. If you are thinking of activating an Island this presentation is a must.

HF Data Modes by Mike Kerry, G4BMK

Mike Kerry has been involved with HF Data Comms for 12 years including writing and marketing software for amateur radio use. This talk will cover the salient features of the main HF Data Modes of RTTY, AMTOR, PACTOR / PACTOR-II, and Clover. Hardware and software requirements will be discussed and where possible illustrated. The world of HF Data Communication has seen many changes over the past few years. This talk will appeal to everyone interested from the beginner to seasoned data user.

The Conway Reef DXpedition by Mats Persson, SM7PKK

Mats Persson, the team co-ordinator, will talk about the adventures of this DXpedition. Conway Reef was selected as a new DXpedition location after the team saw their plans for T31 'go down the drain' before it had even started. They only had 2 months to reorganise the entire DXpedition. Conway Reef is about 200 by 50 metres in size, lying about 300 miles from the closest island. The team turned over two dinghies landing on the reef, losing a lot of equipment as well as causing risks to the operators. Despite being at the bottom of the sunspot cycle and despite many hardships, after a delay of 2 days, the group managed to make some 30,000 QSOs in 7 days.

Low Band Antennas - My Way by Ron Stone, GW3YDX

Ron Stone gained his 5 band DXCC (no 587) from a suburban site in Essex in 1977. The move to Wales provided more real estate and an opportunity to work over 250 countries on 160 metres. This presentation will cover low band antennas, verticals, wires and beams, literally from the ground up. It includes a discussion of the current antenna system at GW3YDX and of the antennas that are currently available commercially.

The Islands on the Air Awards Programme, a report by Roger Balister, G3KMA

Roger Balister, G3KMA, the Director of the IOTA awards programme, will describe the events of the most successful year in IOTA's 30 year history. This will be followed by a short presentation and demonstration on the new computerised application system that now puts IOTA into the forefront of awards administration. The session finishes with a question and answer session which is your chance to raise any issues about the programme. These and other talks are scheduled for the 1995 HF Convention

Equipment Reviews by Chris Lorek, G4HCL

Chris Lorek regularly reviews the latest amateur radio equipment in the *Ham Radio Today* magazine. He has a wealth of experience in the field and will not only describe the tests he carries out but will guide you towards the sort of features that you will need in a transceiver. Chris has multi-page hand outs for those attending and a complete list of the reviews that he has carried out, plus copies of some of the very latest reviews.

HF Contesting by Chris Burbanks, G3SJJ (Chairman RSGB HF Contests Committee)

A guide to maximising enjoyment and success for newcomers and established entrants wishing to climb the ladder in this exciting area of amateur radio. Alternative methods of gaining experience, including the concepts of guest operating, restricted sections, and part-time entry will be explained, as well as the differences between single operator and group events. Contesting consists of three important aspects, pre-event work, including research and preparation, the contest period itself and post-event administration; each of these will be discussed in detail. Computer logging and the current software available will also be discussed.

Other planned talks include: Tower Safety, Novices Forum, Contesting in the Caribbean and Operating Techniques by FOC members.

TURN TO PAGE 21 FOR MORE DETAILS ON THE HF CONVENTION

RADCOM TECHNICAL FEATURE

A Calibrator for Electronic Keys

By Terry Grice, G4PSL*

ACCURATE CALIBRATION of an electronic keyer speed control can prove difficult without the aid of an oscilloscope or frequency meter. The arrangement provided here overcomes this need. The Keycal, or key calibrator, counts a preset number of Morse dots from a dot stream generated by the keyer over a specifiedperiod of time. Use of a simple formula and/or reference to a conversion table gives keying speed in WPM.

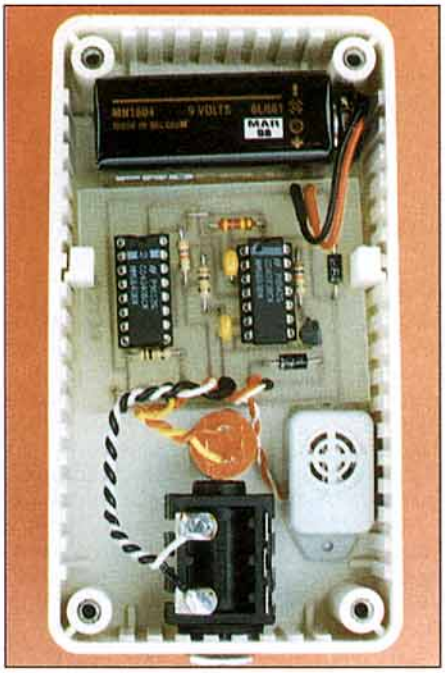
CIRCUIT OPERATION.

THE KEYCAL CIRCUIT, shown in **Fig 1,** is a pulse counting circuit based around IC1, a CMOS 4040B 12-stage binary ripple counter. IC2 is a quad two-input schmitt NAND gate.

The circuit is powered by a single 9V PP3 battery with D1 guarding against reverse polarity connection. No power on off switch is required as in the quiescent state the circuit draws less than 1uA.

The electronic keyer positive keying output is connected directly to the KEY IN socket SK1. IC1 reset input, pin 11, is normally held low by R3 but momentary operation of the RESET button SW1 takes it high and forces all twelve Q outputs low to register a binary count of zero. Production of a Morse dot stream from the keyer reaches pin 6 of IC2a

*11 Durham Street, Wallsend, Tyne and Wear NE28 7RZ



which, in conjunction with R1, R2 and C1, forms a switch debounce circuit necessary when relay keying is used. It may be required to increase C1 up to a maximum value of 100nF to suit the relay in use. The inverted output signal emerging from pin 4 is used to strobe the clock input, pin 10, of IC1.

Each negative-going transition, that is each pulse or dot, increments the binary count at the Q outputs by one. Q10, pin 14, will go high on completion of the 512th pulse.

With input pins 1 and 2 of inverter IC2b high the output pin 3 feeds a low signal back to input pin 5 of IC2a to inhibit the count.

A logic low is also fed to input pins 12 and 13 of inverter IC2c via C2 as this capacitor starts to charge via R4. The high on pin 11 sources base current to TR1 via current limiting resistor R1 saturating the transistor which activates the audio sounder BZ1. Freewheeling diode D1 is included to protect TR1 from back EMFs should an inductive sounder be used.

After approximately 250ms the voltage developing across C2 will reach the positive logic threshold of IC2 inputs causing IC2c to revert to its original state and as TR1 ceases to conduct BZ1 is deactivated. Thus a short audio pip has been produced to mark the end of the count. As the 512 counted dots are interleaved with 511 spaces of equal time duration to a dot, the elapsed time from the onset of the first pulse to output Q10 going high is:

1023 x dot duration time (seconds)

Using 10 WPM as a benchmark; at this keying rate a single dot has a duration of 0.12 seconds thus the time to output Q10 going high is: 1023 x 0.12s = 122.76 seconds. Speed is in inverse proportion to time so for some arbitrary keyer speed:

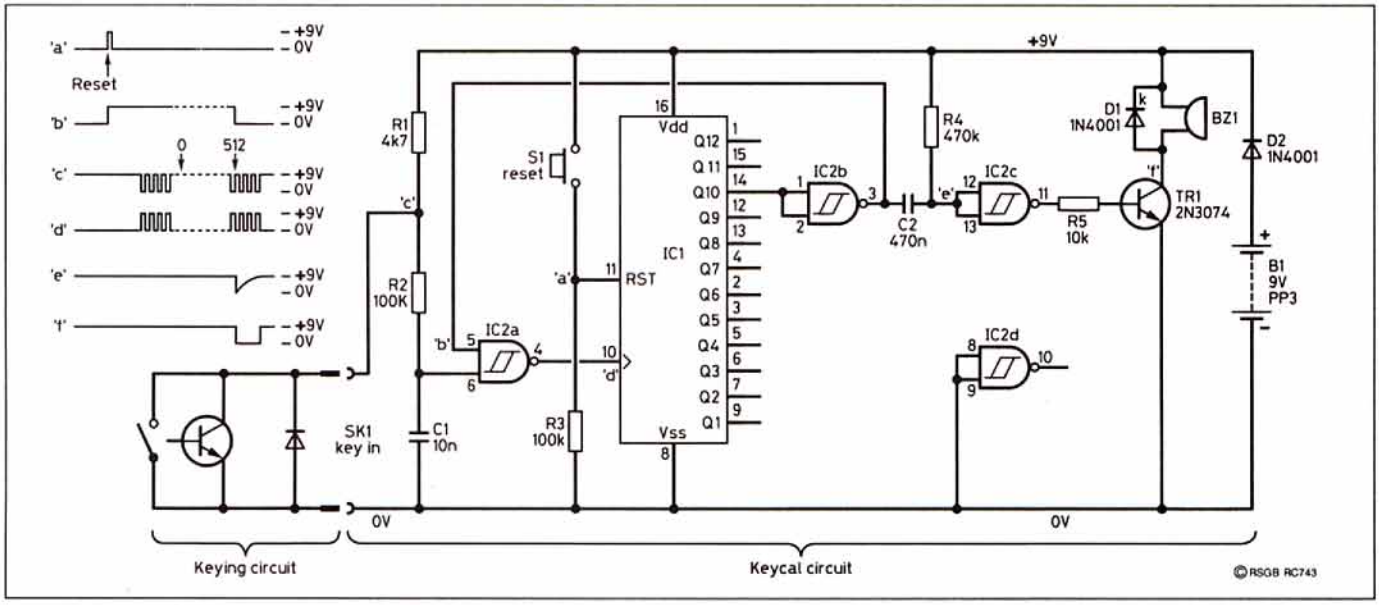


Fig 1: Keycal, circuit diagram.

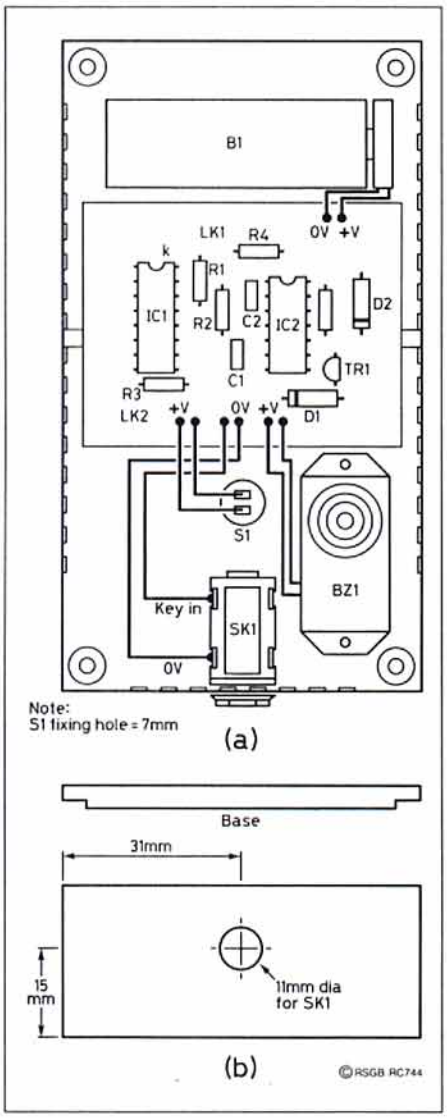


Fig 2:(a) Component layout and wiring diagram (b) Case detail.

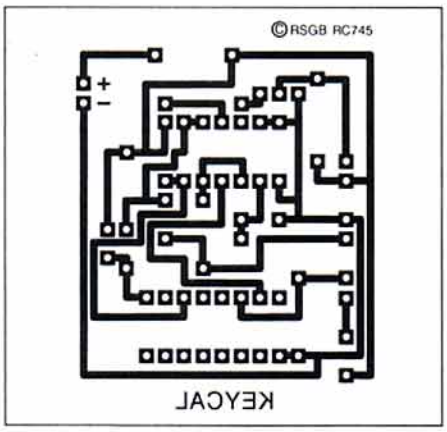


Fig 3: PCB artwork.

WPM = 122.76s x 10WPM / elapsed time.

In practice the elapsed time will be the actual time measured, Tm, by the operator using a timepiece so this becomes:

WPM = 1227.6 / Tm seconds.

As an example, to calculate the keyer speed in WPM when Tm is 61 seconds:

WPM = 1227.6 / 61 = 20.17 WPM.

Unused input pins 8 and 9 are strapped low and output pin 10 is not connected.

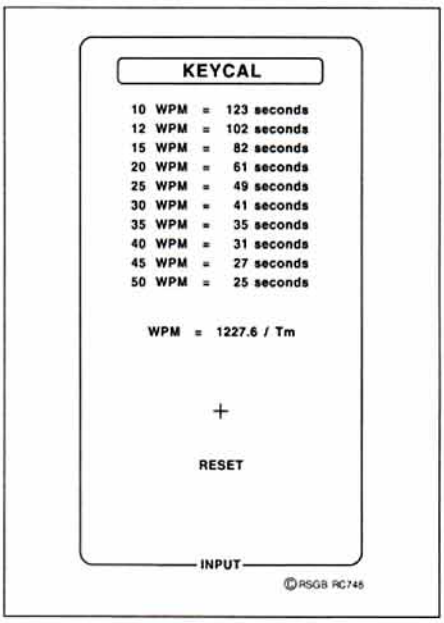


Fig 4: Case label.

CONSTRUCTION.

DETAILS OF THE case for fixing SK1 is shown in **Fig 2a** and the PCB layout and wiring is shown in **Fig 2b**. The PCB artwork is given in **Fig 3**. The fixing point for SW1 is marked on the case label, see **Fig 4**. All PCB holes need to be 0.8mm diameter with the exception of those for D1, D2 and veropins, if used, which should be 1.0mm diameter.

IC sockets are recommended for IC1 and IC2 and CMOS handling precautions should be observed during installation. Check polarity of all semiconductor components prior to soldering. When assembled, check the PCB for dry joints and solder bridges then locate the PCB using the guides provided with the case. BZ1 can be held in place with a strip of double-sided adhesive tape.

When wiring is complete check polarity to B1, SK1 and BZ1. Once assembled, the unit is ready for use.

USE

MOST COMMERCIAL KEYERS exhibit a graduated scale set around the speed control knob and such an arrangement could be attached to a homebrewed unit.

The intention here is to calibrate some or all of the scale increments in WPM. With the keyer connected to the Keycal circuit the procedure is:

1) Set keyer speed control to first increment.

2) Depress the reset button momentarily.

3) Operate the keyer dot paddle and commence timing.

4) Release the paddle when the audio pip sounds and record the measured time, Tm.

5) Convert Tm to keying speed using WPM = 1227.6 / Tm.

6) Calibrate panel scale with result : this may be rounded to nearest WPM.

7) Repeat for next increment. An alternative method is to calibrate the keyer in fixed steps of equal amounts and the timing for 5 WPM steps is given.

The procedure here is similar to that above but upon reaching step four it is necessary to repeatedly adjust the keyer speed until the prescribed time, in seconds, is recorded.

No conversion is therefore necessary but this second method is more time-consuming and requires the production of a tailor-made scale. Both methods offer similar calibration accuracy. A stopwatch is desirable for timing. The error is no greater than half a percent at 10 WPM and less than two per-cent at 50 WPM (allowing for rounding to the nearest whole WPM). It will be noted that timing for 12 WPM is given. Those employing the first method may wish to provide this point on the scale because it its useful for QRS working with novice operators and for tuition purposes. At no time should the Keycal circuit be connected to a transmitter keyline but only directly to a electronic morse keyer positive keying output that keys to ground. Other keying systems can be interfaced to the unit through a relay. ♦

COMPONENTS LIST

Resistors

All resistors 5% 0.25W.

R1	4k7
R2,R3	100k
R4	470k
R5	10k

Capacitors

C1	10nF ceramic
C2	470nF ceramic

Semiconductors

IC1	CD4040B
IC2	CD4093B
TR1	2N3704
D1	1N4001

Additional Items

Sounder	Maplin, FL40T
SW1	Switch, Maplin, FH59P

1/4in jack socket, Maplin, BW78K

Battery, 9V PP3

Case	Electromail:502-635

Battery clip

Components are available from JAB Electronics Components, 1180 Aldridge Road, Great Barr, Birmingham B44 8PB.

Electromail, PO Box 33 Corby, Northants, NN7 9EL. Tel: 0536 204555

Maplin Electronics. PO Box 3, Rayleigh. Essex. Tel: 01702 556751.

RSGB CONTESTING GUIDE 1996

RSGB Contesting Guide 1996

WELCOME TO THE first annual *RSGB Contesting Guide*. The purpose of this guide is to provide a single source for the rules of all the RSGB HF and VHF / UHF / SHF contests, together with the General Rules for these contests. This will save having to thumb through several month's copies of *Radio Communication* in order to find the particular set of rules for the contest you want to operate, only then to have to locate the January *RadCom* for the General Rules!

The rules of a number of RSGB contests, especially HF ones in which there are overseas sections, are also published in many overseas societies' publications. We wish to encourage this, as it will lead to greater participation in RSGB contests by overseas stations. However, in the past, it has often been the case that by the time the *RadCom* containing the appropriate rules appears at the overseas societies' magazine production office, it is already beyond their deadline for publication in the month of the contest. By having all the rules published four months before the start of the year, we hope that this will fix this particular problem, and will eventually lead to greater interest in RSGB contests by overseas stations.

Publication of all the contest rules in this *RSGB Contesting Guide 1996* will allow more space to be devoted to contest results in *Contest Classified*. This will enable the results to be published more promptly, since in the past it has occasionally been necessary to hold results over for a month or two due to the necessity of publishing rules in a particular month's *RadCom*, which then did not leave sufficient space for all the results. It should also allow the HF and VHF Contests Committees to either provide more detailed accounts of the results, or an increase in the size of the type face. We hope this will make reading the reports and tables more easy on the eyes!

The rules of the Islands on the Air (IOTA) contest, which will take place on 27/28 July 1996, have not yet been fixed, as it has always been the intention to revise the rules after the 1995 event. The rules for the 1996 IOTA contest in this guide are a brief summary only, and the full rules will be published in *Contest Classified* after they have been revised in the light of the outcome of the 1995 IOTA contest.

Contest log, summary and cover sheets can be found in the 1996 RSGB *Call Book*, which is due to be published next month. These may be photocopied from the *Call Book* for your own personal use. Alternatively, sets of HF and VHF log sheets are available from RSGB Sales at a member's price of £3.40 for each set.

Please pull out the *RSGB Contesting Guide 1996* and leave it by your operating position for reference throughout the year.

Good luck in the contest!

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COVER PICTURE:

Main picture: Chris Swallow, G3VHB, operating as G3VHB/P in the RSGB National Field Day contest, June 1994. Insets, from left to right: Roger Western, G3SXW, Nigel Cawthorne, G3TXF and Ian Pritchard, G3WVG, at the G0AAA/P 1994 NFD site; Chris Burbanks, G3SJJ, operating G3VHB/P during the 1994 NFD; Chris Burbanks, G3SJJ, operating at GW8GT during the RSGB 7MHz DX CW Contest; Raising the TH7 beam at G3VHB/P.

HF CONTESTS

RSGB HF CONTESTS CALENDAR 1996

14 Jan	AFS	CW
17 Jan	LF Cumulative	CW
20 Jan	AFS	SSB
21 Jan	LF Cumulative	CW
22 Jan	LF Cumulative	CW
25 Jan	LF Cumulative	CW
28 Jan	LF Cumulative	CW
29 Jan	LF Cumulative	CW
2 Feb	LF Cumulative	CW
4 Feb	LF Cumulative	CW
5 Feb	LF Cumulative	CW
10 / 11 Feb	1.8MHz	CW
24 / 25 Feb	7MHz DX	CW
9 / 10 Mar	Commonwealth	CW
1 Apr	Slow Speed Cumulative	CW
7 Apr	RoPoCo 1	CW
9 Apr	Slow Speed Cumulative	CW
17 Apr	Slow Speed Cumulative	CW
21 Apr	Low Power Fixed	CW
25 Apr	Slow Speed Cumulative	CW
3 May	Slow Speed Cumulative	CW
1 / 2 Jun	National Field Day	CW
22 / 23 Jun	1.8MHz	CW
14 Jul	Low Power Field Day	CW
27 / 28 Jul	Islands on the Air (IOTA)	SSB / CW
4 Aug	RoPoCo 2	CW
2 Sep	Slow Speed Cumulative	CW
7 / 8 Sep	SSB Field Day (IARU Reg 1)	SSB
10 Sep	Slow Speed Cumulative	CW
18 Sep	Slow Speed Cumulative	CW
26 Sep	Slow Speed Cumulative	CW
4 Oct	Slow Speed Cumulative	CW
6 Oct	21 / 28MHz	SSB
20 Oct	21 / 28MHz	CW
9 Nov	Club Calls	SSB / CW
16 / 17 Nov	1.8MHz	CW

AFFILIATED SOCIETIES TEAM CONTEST

This popular club event has something for everyone. What better way to start contesting than in AFS. YOU can contribute by just participating and gathering points for your team and Club. Enjoy the local rivalry, it's great fun! You don't need to have a high or complex antenna either, a simple dipole or doublet works well.

Date	Time UTC	Frequency	Mode	Exchange
Sun 14 Jan	1400 - 1800	3510 - 3590	CW	RS(T) +serial number
Sat 20 Jan	1400 - 1800	3600 - 3750	SSB	

1. Eligible Entrants: (a) Each entering club must be affiliated to the RSGB. (b) Each operator of a team station must be a member of the club they represent. The operator is not required to be a member of RSGB. (c) All stations representing a club must be located within a radius of 50 miles of the normal meeting-place of the club. Where a club has 'branches', eg RNARS, it may define separate 'branch' meeting-places, and the team(s) entered by each branch will be considered to be entirely separate from those entered by other branches, except in respect of affiliation. (d) Each station may be single or multi-operator, but no station or operator may represent more than one affiliated club or branch.

2. Teams: Teams comprise of up to FIVE stations for the CW section and THREE for the SSB section. A club may enter as many teams as they wish. Which stations make up each team is determined by the club entering the event, as defined on the summary sheet.

3. Contacts: In the CW section, 3570 to 3590kHz is reserved for slower-speed contacts. It is intended that operators less experienced in CW and contest techniques should be able to make contacts here in a more relaxed environment. Experienced contesters using the segment are required to keep their speed down.

4. Scoring: 10 points per contact including overseas.

5. Entries: (a) Entries must be accompanied by a Summary Sheet signed by an officer of the affiliated society, showing: name of team, callsign of each station in each team, individual scores, team score, the normal meeting place of the club / branch and a declaration that each operator is a member of the affiliated club. Each log within the entry should include a completed Summary Sheet.

6. Awards: CW: The Edgware Trophy to the leading team. The Marconi Trophy to the leading individual station. A particular operator will be eligible for the trophy only once in any period of five years; if the leader is not eligible they will receive a certificate of merit, the trophy passing on to the next highest scoring entrant who is eligible. **SSB:** The Flight Refuelling ARS Trophy to the leading team. The RSGB Lichfield Trophy to the leading individual station. Certificates of Merit to the three leading teams, individual stations and the highest placed Scottish team and individual.

LF CUMULATIVE CONTESTS

This series of short contests, each of just two hours duration, will enable you to sharpen your operating skills and develop antenna systems for the three lowest frequency bands. As the events count towards the HF Contests Championship, you will find a good mix of experienced and lesser experienced operators taking part.

Date	Time UTC	Frequency	Mode	Exchange
Tues 17 Jan	2000 - 2200	1830 - 1870 & 1950 - 1960	CW	RST + serial number commencing with 001 for each session and band
Wed 25 Jan Thurs 2 Feb				
Sun 22 Jan Sat 28 Jan Sun 5 Feb	1600 - 1800	3530 - 3580	CW	
Sat 21 Jan Sun 29 Jan Sat 4 Feb	1000 - 1200	7015 - 7040	CW	

1: The contest is single or multi operator. There is a speed limit of 12WPM maximum in the sub-bands 3560-3580 and 1950-1960kHz.

2. Scoring: 3 points per contact with any station in each session, except contacts with Novices score 20 points. The final score for each contest is the sum of the best two sessions on that band, as chosen by the entrant.

3. Logs: One cover sheet is required for each band. Entrants should submit logs for every session that they are active to assist in cross checking against other entries.

4. Awards: The 1989 HF Contests Committee Trophy and a Certificate of Merit to the entrant with the highest aggregate score from all three contests combined. Certificates of Merit will be awarded to the leading station in each contest, band leaders and the highest placed Novice station entrant and station licensed during 1995 or 1996. The contest counts towards the HF Contests Championship.

1.8MHZ CW CONTESTS

Competitive and closely fought events. Long haul DX is available during the winter sessions, where there will be other European 1.8MHz contests running at the same time, increasing activity and interest. The Summer event has been shortened to three hours. A challenging band for antennas and receiving skills.

Date	Time UTC	Frequency	Mode	Exchange
1st 10 / 11 Feb	2100 - 0100	1820 - 1870	CW	RST + serial
Summer 22 / 23 Jun	2100 - 0000	1820 - 1870	CW	number &
2nd 16 / 17 Nov	2100 - 0100	1820 - 1870	CW	county code

1. Sections: Single-operator entries only except for the Summer event which is single or multi operator. (a) UK. (b) Overseas including EI.

2. Scoring: Section (a) Three points per contact plus a bonus of five points for the first contact with each UK County worked and the first contact with each Country outside the UK worked. Section (b) Three points per contact plus a bonus of five points for the first contact with each UK County worked. Overseas stations may only work UK stations.

3. Awards: 1st The Somerset Trophy to the leading UK station. **2nd** The Victor Desmond Trophy to the leading UK station (c) Certificates of Merit to the first three entrants in section of each event. (d) The Maitland Trophy and a certificate to the Scottish entrant with the highest aggregate number of points in the 1st and 2nd events.

7MHZ DX CONTEST

A chance for you to experiment with simple or complex antenna systems and to gain knowledge of propagation during daylight and darkness conditions. This year a Restricted section has been introduced. An excellent insight into the efficiency of various antennas was given by G3HCT in his article in the July 1995 edition of *Radio Communication*.

Date	Time UTC	Frequency	Mode	Exchange
24/25 Feb	1500 - 0900	7000 - 7030	CW	RST + serial number and county code (UK)

1. Eligible entrants: UK and Overseas (including EI). Single and Multi operator entries will be accepted.

2. Sections: (a) UK Open (b) UK Restricted (c) Europe including EI (d) North America, South America, Africa, Asia (e) Oceania. Open section has no antenna limitations. In the Restricted section, only one antenna is allowed which must be a single element with a maximum height of 15m, and a maximum of 100W output.

3. Scoring: UK stations contact only overseas stations. Contacts with stations in section (c) score 5 points, in section (d) 15 points and in section (e) 30 points. Multipliers as per General Rules. **Overseas stations** contact only UK stations. Stations in section (c) score 5 points, section (d) 15 points and section (e) 30 points. **Multipliers:** 1 for each UK County worked. The final score is the total of contact points times the number of Multipliers worked.

4. Closing Date for logs: 31 March 1996.

5. Awards: Single-operator: The Thomas (G6QB) Memorial Trophy to the leading UK station. Certificates of Merit to the leading Open and Restricted section stations, and to the leading entrants in each overseas section. Multi-operator: Certificates of Merit to the leading groups in each section.

COMMONWEALTH CONTEST

The Commonwealth Contest is intended to promote contacts between stations in the British Commonwealth and Mandated Territories. A more relaxed contest environment which gives you the opportunity to work some choice DX.

Date	Time UTC	Bands	Mode	Exchange
9/10 Mar	1200 - 1200	3.5, 7, 14, 21, 28MHz	CW	RST + serial number

1. Eligible entrants: UK entrants must be members of RSGB. Overseas - Licensed Radio Amateurs within the British Commonwealth or British Mandated Territories. Single operator. Entrants may not receive any assistance whatsoever during the contest, including the use of spotting nets, packet clusters or other assistance in finding new bonuses. Headquarters stations, GB or other special event callsigns and maritime / aeronautical mobile not eligible.

2. Sections: (a) Multi-band (b) Single-band, entrants should claim points for contacts made on one band only, but are requested to submit details of contacts made on other bands, for adjudication purposes. Multi-band entries will not be eligible for single-band awards.

3. Frequencies: Entrants should operate in the lower 30kHz of each band, except when contacting Novice stations operating above 21030 and 28030kHz.

4. Scoring: Contacts may be made with any station using a British Commonwealth prefix except those within the entrant's own call area. Note that for this contest, the entire UK counts as ONE call area, and therefore UK stations may not work each other. Each completed contact scores 5 points with a bonus of 20 points for each of the first three contacts with each Commonwealth Call Area on each band.

5. 'Headquarters' stations: A number of Commonwealth Society HQ stations are expected to be active during the contest and will send 'HQ' after their serial number, to identify themselves. Every HQ station counts as an additional call area and entrants may contact their own HQ station for points and bonuses.

6. Logs: Separate logs and lists of bonuses claimed are required for each band. Each entry must be accompanied by a summary sheet indicating the section entered and the scores claimed on each band

7. Closing date for logs: Logs must be postmarked no later than 8 April 1996.

8. Awards: (a) Multi-band: The Senior Rose Bowl to the overall leader, and the Junior Rose Bowl to the runner-up. The Col Thomas Rose Bowl to the highest-placed UK station. Certificates of Merit to the first three entrants overall, and to the leading station in each Call Area. (b) Single-band: Certificates of Merit to the leading Overseas and UK entrants on each band.

COMMONWEALTH CONTEST CALL AREAS

3B6 / 7	Agalega and St Brandon
3B8	Mauritius
3B9	Rodriguez Is
3DA	Swaziland
4S	Sri Lanka
5B	Cyprus
5H	Tanzania
5N	Nigeria
5W	Western Samoa
5X	Uganda
5Z	Kenya
6Y	Jamaica
7P	Lesotho
7Q	Malawi
8P	Barbados
8Q	Maldives
8R	Guyana
9G	Ghana
9H	Malta
9J	Zambia
9L	Sierra Leone
9M0	Spratly Is
9M2	W Malaysia
9M6 / 9M8	E Malaysia
9V	Singapore
9Y	Trinidad and Tobago
A2	Botswana
A3	Kingdom of Tonga
AP	Pakistan
C2	Nauru
C5	Gambia
C6	Bahamas
CY0	Sable Island
CY9	St Paul Island
G, GB, GD, GI, GJ, GM, GU, GW	United Kingdom (all one area)
H4	Solomon Is
J3	Grenada
J6	St Lucia
J7	Dominica
J8	St Vincent
P2	Papua New Guinea
S2	Bangladesh
S7	Seychelles
T2	Tuvalu
T30	W Kiribati
T31	C Kiribati
T32	E Kiribati
T33	Banaba
V2	Antigua and Barbuda
V3	Belize
V4	St Kitts and Nevis
V5	Namibia
V8	Brunei
VE1	Nova Scotia
VE2	Quebec
VE3	Ontario
VE4	Manitoba
VE5	Saskatchewan
VE6	Alberta
VE7	British Columbia
VE8	North West Territories
VE9	New Brunswick
VK0	Antarctica
VK0	Heard Is
VK0	Macquarie Is
VK1	Australian Capital Territory
VK2	New South Wales
VK3	Victoria
VK4	Queensland
VK5	South Australia
VK6	Western Australia
VK7	Tasmania
VK8	Northern Territory
VK9C	Cocos (Keeling) Islands
VK9L	Lord Howe Is
VK9M	Mellish Reef
VK9N	Norfolk Is
VK9W	Willis Island
VK9X	Christmas Is
VO1	Newfoundland
VO2	Labrador
VP2E	Anguilla
VP2M	Montserrat
VP2V	British Virgin Is
VP5	Turks and Caicos
VP8	Antarctica (together with VK0, ZL5)
VP8	Falkland Is
VP8	S Georgia
VP8	S Orkney Is
VP8	S Sandwich Is
VP8	S Shetland Is
VP9	Bermuda
VQ9	Chagos
VR6	Pitcairn Is
VS6 / VR2	Hong Kong
VU	India
VU4	Andaman and Nicobar Is
VU7	Laccadives
VY1	Yukon
VY2	Prince Edward Is
YJ	Vanuatu
Z2	Zimbabwe
ZB2	Gibraltar
ZC4	Cyprus (Sovereign Bases)
ZD7	St Helena
ZD8	Ascension Is
ZD9	Tristan da Cunha, Gough Is
ZF	Cayman Is
ZK1	North Cook Is
ZK1	South Cook Is
ZK2	Niue
ZK3	Tokelau
ZL0 or /ZL	New Zealand Reciprocal Calls
ZL1	New Zealand
ZL2	New Zealand
ZL3	New Zealand
ZL4	New Zealand
ZL7	Chatham Is
ZL8	Kermadec Is
ZL9	Auckland and Campbell Is
ZS1	Cape District
ZS2	Cape Province
ZS4	Orange Free State
ZS5	Natal
ZS6	Transvaal
ZS8	Marion and Prince Edward Is
GB5CC	RSGB HQ Station + various other Commonwealth HQ Stations.

SLOW SPEED CUMULATIVES

The aim of this event is to provide training and encouragement for those less experienced in CW and contesting. It is intended primarily for Novices and newly licensed operators; more experienced contesters are asked to support the event by inviting an entrant to guest-operate their station.

Date	Time UTC	Frequency	Mode	Exchange
Mon 1 Apr Tues 9 Apr Wed 17 Apr Thurs 25 Apr Fri 3 May	1900 - 2030	3540 - 3580	CW	RST + First Name
Mon 2 Sept Tues 10 Sept Wed 18 Sept Thurs 26 Sept Fri 4 Oct	1900 - 2030	3540 - 3580	CW	RST + First Name

1. Sections: (a) Transmitting, single or multi operator. No limit on the number of operators in a team, nor need they be the same for each session. (b) Receiving, single operator only.

2. Speed Limit: No faster than 12WPM, and never faster than the other station is sending. Please join in with the spirit of the contest - don't use a keyer; don't use a computer: get out that straight key and keep your log on paper (at least during the event).

3. Exchange: RST and First Name. Multi-operator stations must send only one name during any particular session, regardless of who is operating, although different names may be used during different sessions.

4. Maximum Power: 3W RF output for Novices, 10W RF output for Full licencees.

5. Scoring: Section (a) Any station may be worked once during each session. Any contact with a Novice callsign at either or both ends scores 20 points. Contacts between two Full licence-holders score 5 points. The overall score is the total of the best three sessions, as chosen by the entrant. Section (b) Listeners may log only stations actively participating in the contest. Each Novice logged scores 20 points, each Full callsign counts 5 points.

6. Logs: Entrants are requested to submit logs for all sessions during which they are active to assist with checking other entries. The name of the operator worked / heard should be recorded in column 5.

7. Awards: Section a: Certificates of Merit to the leading Novice and Full licence-holder, and also to the highest placed station entering any RSGB HF CW Contest for the first time (please note on your Cover Sheet if you qualify for this last award). Section b: Certificate of Merit to the leading listener.

ROPOCO

A real test of of your CW operating skill. Chinese whispers using Rotating Postcodes!

Date	Time UTC	Frequency	Mode	Exchange
1 Sun 7 Apr	0700 - 0900	3520 - 3570	CW	RST + Postcode
2 Sun 4 Aug	0700 - 0900	3520 - 3570	CW	Rcvd

1. Exchange: RST plus for the first contact, the entrant's own postcode. For each subsequent contact, the postcode received from the previous contact.

2. Scoring: Ten points for each contact with another UK station.

3. Awards: Trophy and certificate to the highest scoring entrant with the most accurate log; in RoPoCo 1 the Verulam Silver Jubilee Trophy and in RoPoCo 2 the G3XTJ Memorial Trophy. The G5MY Trophy to the entrant with the highest aggregate score from both events. Certificates of Merit to the leading entrants in both contests.

LOW POWER FIXED CONTEST

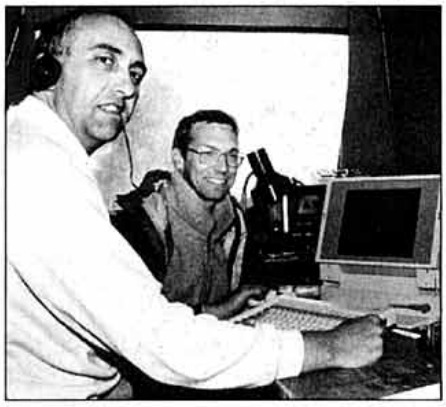
A real opportunity to check out the efficiency of your antenna and QRP equipment.

Date	Time UTC	Frequencies	Mode	Exchange
Sun 21 Apr	0700 - 1100	3510 - 3560 & 7000 - 7030	CW	RST + serial number + output power

1. Power: Maximum power 5W RF output.

2. Scoring: Each contact with a QRP station 15 points, all other contacts 5 points. The same station may be worked on both bands.

3. Awards: The 1930 Committee Cup to the winner. Certificates of Merit to the first three stations and to the highest placed entrant using completely home-made equipment. A further Certificate to the highest-placed entrant using 1W or less RF output power.



Winners of NFD for a record four years in a row: the Reading & DARC, G3ULT/P; operators Don Field, G3XTT, and John Linford, G3WGV.

NATIONAL FIELD DAY

An excellent club activity with varied areas of expertise required, such as antenna design, construction and erection, generator maintenance and, increasingly, computer expertise. Give your CW operators some support!

Date	Time UTC	Bands	Mode	Exchange
1/ 2 Jun	1500 - 1500	1.8, 3.5, 7, 14, 21, 28MHz	CW	RST + Serial Number

1. Notification: Each group intending to compete must send details of the site to be used to: D L Hill, G4IQM, 14 The Garrones, Worth, Crawley, West Sussex RH10 7YT, to arrive no later than 9 April 1996. Details must include the name and address of the person responsible for the entry; section to be entered; name of group; callsign(s) to be used; national grid reference and sufficient access information for an inspector to locate the site. Contest stationery

will be sent on request. Entries to be postmarked no later than Monday 17 June 1996.

2. Sections: All sections are multi-operator. Maximum of 100W output power. This is a Portable Contest as defined in General Rule 7. (a) Open. One transmitter and one receiver (or one transceiver) plus a second receiver. There is no restriction on the number or type of antennas, but the maximum height must not exceed 20m. Power is limited to 100W output. (b) Restricted. One transmitter and one receiver (or one transceiver) plus a second receiver. One antenna only which must be a single element having not more than two elevated supports and not exceeding 11m above ground at its highest point. (c) Low Power. Same equipment and aerial limitations as the restricted section. Power is further restricted to 5W output.

Notes: (i) A transceiver with a second receiver, eg FT-1000, counts as two receivers. (ii) Stand-by equipment is allowed on site, but may not be connected to a power source when the main equipment is in use. (iii) All stations are subject to inspection by representatives of the HF Contests Committee, whose brief will be to ensure that the rules and spirit of the contest are being observed. Should the inspector be unable to locate the site to due inadequate or incorrect information, the entry may be disallowed. In the event of a late change of site, it is the responsibility of the members of the group to make suitable arrangements for the inspector to find the new 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. The inspector may also visit in the 24 hours before the start of the contest. The presence on site of any amplifier or modified commercial equipment capable of excess power may result in the entry being disallowed, and in the event of such an infringement being proven, all operators listed as being associated with the group in operating the station may be disbarred by the HF Contests Committee from entering any RSGB HF contest for five years.

3. Frequencies: Contest preferred segments, as recommended by the IARU, should be used, ie 3510 - 3560 and 14010 - 14070kHz.

4. Scoring: For contacts with:

Fixed stations in Europe (including UK)	2 points.
Fixed stations outside Europe	3 points.
Portable and Mobile stations in Europe (including UK)	4 points.
Portable and Mobile stations outside Europe	6 points.

Contacts on 1.8MHz and 28MHz should be scored as above and then multiplied by two to obtain the band score. Points must not be claimed for contacts made by a competing station with members of its own group.

5. Awards: The National Field Day Trophy to the overall leading station. The Bristol Trophy to the station having the leading score in the other section. The Scottish Trophy to the leading Scottish station. The Gravesend Trophy to the runner-up in the Restricted section. The G6ZR Memorial Trophy to the runner-up in the Open section. The Frank Hoosen G3YF Trophy to the leading station on the 14MHz band. Certificates of Merit will be awarded to the first three stations and to the band leaders in each section. A Certificate of Merit to the overseas station in each continent whose checklog shows the most contacts contributed to competitors.

LOW POWER FIELD DAY

This a serious event for the QRPer, providing outdoor fun. We even give you a lunch break!

Date	Time UTC	Frequencies	Mode	Exchange
Sun 14 Jul	0900 - 1200 & 1300 - 1600	3510 - 3560 & 7000 - 7040	CW	RST + Serial No + Power + County Code

1. Sections: (a) 10W RF output maximum. (b) 3W RF output maximum. Single or multi operator.

2. Frequencies: Both bands may be used during each session. Any station may be contacted once on each band.

3. Special conditions: (i) Antennas must not exceed 11m above ground and may have no more than two elevated supports. (ii) The station must be Portable as defined in General Rule 7.

4. Exchange: RST, serial number, county code and RF output power in Watts. Serial numbers commence at 001 and continue through both sessions. Output power should be expressed as one or two digits plus 'W' in place of the decimal point, eg 1W, 1W5. Participants using more than 10W should send 'QRO'.

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

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

ISLANDS ON THE AIR CONTEST

The object of the contest is to promote contacts between stations in qualifying Island groups and the rest of the world and to encourage expeditions to IOTA Islands. Many IOTA Islands are very accessible and it is relatively easy for individuals and small groups of amateurs to mount Island expeditions for the contest. A special interest for UK stations is that mainland Britain counts as an Island (EU-005) and GI / EI count as EU-115.

Date	Time UTC	Bands	Mode	Exchange
27/28 July	1200 - 1200	3.5, 7, 14 21, and 28MHz	SSB & CW	RS(T) + serial number + IOTA number

The first Islands on the Air Contests were organised by famous British SWL Geoff Watts between 1966 and 1972. The IOTA Contest was first held in its modern format in 1993 and has seen a rapid rise in popularity since then. Since the rules were devised for the 1993 event it has always been the intention to carry out a rules revision after the contest has run for three events. The 1995 contest will be the third event and so there will be a rules revision in time for the 1996 event. Hence it is not possible to publish the detailed 1996 rules in this booklet but an outline is given above. Following the review the full rules will be published in *RadCom* and of course will appear on the DX Cluster and on the Internet.

IARU REGION 1 SSB FIELD DAY

An increasingly popular club activity. Finding the best ratio of contact rate to country multipliers provides an intriguing back drop to weekend outdoors. The more competitive you are, the greater the fun!

Date	Time UTC	Bands	Mode	Exchange
7/8 Sept	1500 - 1500	3.5, 7, 14, 21, 28MHz	SSB	RS + Serial No

1. Sections: All sections are multi-operator. This is a Portable contest as defined in General Rule 7. Entrants in both sections may keep standby equipment on site, but it may not be connected to a power source or antenna at the same time as the main equipment. (a) Open: Maximum licensed power. Equipment: one transmitter and one receiver (or one transceiver), plus a second receiver. No antenna restrictions. (b) Restricted: One transmitter and one receiver (or one transceiver) plus a second receiver. One antenna only, which must be a single element having not more than two elevated supports and not exceeding 15m above ground at its highest point. Maximum of 100W output power.

2. Scoring: For contacts with:

Fixed stations in IARU Region 1	2 points.
Stations outside IARU Region 1	3 points.
/P or /M stations in IARU Region 1	5 points.

IARU Region 1 countries include those in Europe, Africa, USSR, ITU Zone 39 and Mongolia. For a more precise definition refer to the RSGB *Amateur Radio Operating Manual*. Points must not be claimed for contacts made by a competing station with members of its own group.

3. Multiplier: ONE for each DXCC Country worked on each band.

4. Awards: The leading station in the Open section will receive the Northumbria Trophy and in the Restricted section, the G3PSH Memorial Trophy. Certificates of Merit will be awarded to the first three stations and to the band leaders in each section. A Certificate of Merit to the overseas station in each continent whose checklog shows the most contacts contributed to competitors.

The Plymouth Radio Club on NFD. Left to right: G0IVZ, G4HTD and G0JNZ.

21 / 28MHZ CONTESTS

At the minimum of the sunspot cycle, this contest is a challenge to exploit the often short propagation openings on these two bands. We have now added a Restricted section to enable less complex antenna systems to be used.

Date	Time UTC	Frequencies	Mode	Exchange
Sun 6 Oct	0700 - 1900	21150 - 21350 & 28450 - 29000	SSB	RS + Serial No + County Code (UK)
Sun 20 Oct	0700 - 1900	21000 - 21150 & 28000 - 28100	CW	RST+ Serial No + County Code (UK)

1. Sections: (a) UK Open (b) UK Restricted (c) UK QRP (d) Overseas Open (e) Overseas Restricted (f) Overseas QRP (g) UK Receiving (h) Overseas Receiving. QRP stations must use 10W RF output maximum. Open section has no antenna limitations. In the Restricted section, only one antenna is allowed, which must be a single element with a maximum height of 15m, and a maximum of 100W output. Single or Multi operator entries accepted in the transmitting sections. Entrants are reminded that stations using packet or other spotting facilities must enter as multi operator stations.

2. Frequencies: CW: Entrants are requested not to operate in the sub-band 21.075 - 21.125MHz.

3. Scoring: The same station may be contacted on both bands for points and multipliers (a) UK. 3 points per contact with Overseas stations. Multipliers as per General Rules. (b) Overseas. 3 points per contact with UK only stations. 1 Multipliers for each UK County worked on each band.

4. Closing date for logs: to be postmarked by 14 November 1996.

5. Awards: Certificates of Merit to the first three in each section, overall and on each band, also to the highest-placed multi operator entries from UK and Overseas. CW: T E Wilson, G6VQ, Trophy to UK single operator overall winner. SSB: the Whitworth Trophy to the UK single operator overall winner. The Powditch Transmitting Trophy to the leading single operator entry on 28MHz.

RECEIVING SECTION

Single-operator entries only will be accepted. General Rule 11 and transmitting section rules apply except where specified below.

1. Scoring: UK SWLs log only Overseas stations in contact with UK stations participating in the contest. Overseas SWLs log only UK stations in contact with Overseas stations participating in the contest. Scoring and multipliers as for the transmitting section.

2. Logs: Columns to be headed: time UTC; callsign of station heard; report / serial number sent by that station; County Code sent by that station (if applicable); callsign of station being worked; multiplier (if new); points claimed. NOTE: in the column headed 'station being worked' the same callsign may only appear once in every three contacts except when the logged station counts as a new multiplier.

3. Awards. SSB: the Metcalf Trophy to the overall leading UK entrant. The Powditch Receiving Trophy to the leading 28MHz entrant. Certificates of Merit to the leading entrants from each section and to the leading entrant from each Overseas country.

CLUB CALLS CONTEST

The aim of this event is to encourage contacts between Affiliated Societies, to give their Callsigns an airing and to encourage Class B licensees to operate under appropriate supervision.

Date	Time UTC	Frequencies	Mode	Exchange
Sat 9 Nov	2000 - 2300	1870 - 1990	SSB & CW	RS(T) + serial no + other data

1. Eligible Entrants: All licensed Amateurs and SWLs in UK. Multi-operator entries accepted in the Transmitting Contest.

2. Frequencies / Mode: CW operation to centre about 1955kHz to encourage QSOs with Novices. Entrants should avoid the JA DX window and should take care to avoid causing unnecessary QRM to non-contest users of the band.

3. Exchange: RS(T) + serial number + name of Club + 'Club Station', 'Club Member' or 'No Club', as appropriate. NB: the name of the club may only be reduced to initials for CW contacts, otherwise it must be given in full. A Club Station MUST use a callsign which is specifically issued to a Club or Society which is affiliated to the RSGB.

4. Scoring: 3 points per contact, plus bonuses of 5 points for the first ordinary member from each club, 25 points for each Club Station and 50 points for RSGB HQ Station. Each station may only be worked once regardless of mode.

5. Awards: The Ariel Trophy to the leading Club station. Certificates to the leading club, individual club and non-club member.

Receiving Section

General Rule 11 and transmitting section rules apply except where specified below.

1. Log column 'Other Data' to show name of Club + 'Member', or 'No Club', or name of Club + 'Club Station' as appropriate. Any station may appear only once in the 'station heard' column, regardless of mode.

2. A certificate will be awarded to the leading entrant.

HF CONTESTS CHAMPIONSHIP

Every UK single operator station entering two or more of the events listed will automatically be entered for the Championship. For each event, the entrant will be awarded points according their score, expressed as a percentage of the score achieved by the leading UK station in that event. These points will then be multiplied by the appropriate factor for the contest. The winner will be the station with the highest number of points at the end of the year and will be awarded the G2QT Trophy. Certificates of Merit will be awarded to the winner and second placed station.

Event	Factor
LF Cumulatives	20
1st 1.8MHz	10
7 MHz DX	20
Commonwealth	30
RoPoCo 1	10
IOTA	30
RoPoCo 2	10
21 / 28MHz SSB	20
21 / 28MHz CW	20
2nd 1.8MHz	10

GENERAL RULES FOR RSGB HF CONTESTS

1. These rules apply to all RSGB HF Contests, except where superseded by the specific Contest Rules.

2. UK means England, Scotland, Wales, Northern Ireland, Channel Islands and Isle of Man.

3. Entrants must abide by their licence conditions.

4. Contacts:

a. A contact consists of an exchange with incrementing serial number commencing from 001 and acknowledgement of receipt of callsigns and contest data. Incomplete contacts must be logged with zero points claimed. Points are not lost if a non-competing station does not send appropriate information, but a report MUST be logged and any other exchange sent by that station must be recorded. The full contest exchange must be sent to all stations worked.

b. One contact only with the same station per band counts for points, regardless of that station's operator or callsign. More than one contact with the same operator using different callsigns may not be claimed. Contacts with stations who have no other contest contacts may be disallowed. b. Duplicate contacts must be logged, with zero points claimed.

c. Cross-band contacts do not score.

d. Contacts scheduled before the contest do not count for points. Schedules may only be made during the contest.

e. Simultaneous transmissions on more than one frequency are not permitted.

f. Proof of contact may be required.

g. For contest purposes, /AM and /MM stations are treated as /M stations in their own country. Other stations are regarded as being in the call area/country indicated by their callsign as sent.

5. Multipliers, where applicable, are scored per band, and consist of (a) for UK stations: Countries as per the DXCC countries list, except that JA, W, VE, VO, VK, ZL and ZS call areas count as separate countries. (b) for non-UK stations: one for each UK county (c) IOTA and SSB FD contests, see specific rules.

6. Scoring. Where multipliers are applicable the Final Score is the total QSO points for all bands added together, multiplied by the number of multipliers from all bands added together. Where multipliers are not applicable, the Final Score is the total QSO points for all bands plus the total Bonus points (if any) for all bands added together.

7. Portable stations:

(a) entrants must operate from the same site for the whole contest;

(b) stations must not be located in a permanent building or shelter;

(c) no permanent building or structure may be used as an aerial support (trees are acceptable);

(d) power must be obtained solely from on-site batteries, portable generators or solar cells, without use of mains;

(e) All equipment, aerials and supports must be transported and set up on site no more than 24 hours before the start of the contest. This does not apply to short term storage of equipment on site.

8. All operators of UK stations must be RSGB members except visiting amateurs, not resident in the UK. UK stations may not use special (eg GB, GX etc) callsigns nor be /MM or /AM.

a. A single-operator station is operated by one person, who receives no assistance whatsoever from any other person in operating, log-keeping, checking and so on, and who does not receive notification from others by radio (including packet), telephone or any other method, of band or contest information during the contest.

b. Multi-operator entries are those not covered by 8a. One operator must act as Entrant and sign the Summary Sheet.

9. Adjudication.

a. Errors in sending / receiving callsigns are penalised by loss of all points for the QSO. Errors in sending / receiving other data result in loss of one third QSO points per error.

b. Duplicate contacts with non-zero points claimed are penalised by deduction of ten times the QSO points. Excessive numbers of such contacts may attract other penalties, including disqualification.

c. Points may be deducted or entries disqualified or excluded for any breach of the rules or spirit of the contest. The decision of the RSGB is final.

10. Entries must be sent to RSGB - G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England and postmarked no more than 16 days after the end of the contest, unless superseded by specific contest rules. Checklogs are welcome where an entrant does not wish to make a formal entry. Acknowledgement will be sent if a stamped, addressed postcard or IRC is enclosed. Logs become the property of the RSGB. Entries consist of:

A Summary Sheet (RSGB form HFC2 or equivalent) showing: Contest; Date; Final Score; Station Callsign and address; Name of Club or Group (if applicable); Exchange (County Code) sent; Entrant's Name, Address and Callsign; Equipment and Antennas (and height) used for each band; Output Power; Callsigns of all operators and a Signed Declaration, **plus either:**

Logs on Computer Disk:

a. All files must be on an MS-DOS formatted disk, 3.5in (720kb or 1.44Mb) or 5.25in (360kb or 1.2Mb).

b. The disk label must indicate the contest name and the name of the log files(s) in the form of (callsign).LOG, eg G9XXX.LOG or G9XXX-P.LOG, (for portable stations).

c. Acceptable formats are CT .Bin, NA .QDF, Super Duper .LOG, G3WGV .LOG, and RSGB standard format for disk logs.

11. Receiving Contests. The above rules apply, but also:

(a) Only SWLs or holders of licences to transmit ONLY ABOVE 30MHz may enter.

(b) Entrants should use RSGB SWL Contest forms if possible. The Callsigns of both the 'station heard' (for which points are to be claimed) and the 'station being worked' must be logged.

(c) The same callsign may appear only once in any group of three consecutive entries in the 'Station being worked' column.

(d) The Summary Sheet declaration to include: "I do not hold a licence to transmit on frequencies below 30MHz."

or

Logs on paper:

a. UK stations must use log sheets in RSGB format. Sample forms are printed in the RSGB *Call Book*. Others may use their own National Society's format.

b. Separate logs, with separate page numbers, for each band.

c. Log sheets must be headed with Name of Contest, Date, Band, Callsign and Page x of n.

d. Log pages should contain 40 QSOs, with columns as follows: Time, Callsign worked, RS(T) / serial sent, RS(T) / serial received, Other Data (specific to the contest), New bonus / multiplier, QSO points. Any RS(T) column left blank will be taken as 59(9).

e. A list of multipliers / bonuses for each band.

f. A Duplicate Sheet for each band. This comprises a list of all callsigns worked, sorted into alphabetical order (or alphabetical order of suffix) together with the serial number sent to that station, or the time of the QSO.

Wherever practical, logs on disk are preferred, as this eases the adjudication process.

Paul Martin, EI2CA, logging using the 'Super Duper' program written by EI5DI.

NOTES

The equipment cooling system, RSGB standard for contest log data on computer disk and UK County Codes which follow are all used in both HF and VHF/UHF/SHF contests.

Entrants should note that, wherever possible, logs are preferred on computer disk rather than on paper. However, entrants are assured that the same degree of scutiny is applied to all similar logs regardless of whether they are submitted on paper or disk. Your attention is drawn to the note that the *present* counties and county codes should be used throughout 1996, irrespective of any boundary changes which may occur during the course of the year.

EQUIPMENT CODING SYSTEM

This has been designed to give an easily identifiable indication of a station's power and antenna system and will be used in Contest reports.

First character	**power:**
0	0 - 1W
1	1.1 - 5W
2	6 - 20W
3	21 - 100W
4	101 - 400W
Second character	**antenna**
C	Centre-fed (dipole, doublet, G5RV etc)
G	Ground Plane or Vertical
Y	Yagi
Q	Quad or Loop
W	Wire (any other type)
Third character	**number of antenna elements**
Fourth character	**max height of antenna above ground**
0	0 - 9ft
1	10 - 19ft
2	20 - 29ft
8	80 - 89ft
9	90 plus ft

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h. *It employs a Spectrum Scope*
i. *It tunes in 1Hz tuning steps*
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It's very big, (about the same size and weight as the competitors), has 200 watts of power output, houses its own heavy duty power supply and auto ATU. It has excellent SSB transmit signals, that analog methods can't compete with, are produced through control of signals at the modulation stage; noise reduction at the demodulation stage results in crystal clear signals - revolutionary DSP technology at work for the serious DX'er. In short it is the most beautifully built technically advanced HF transceiver to come out of Japan - BAR NONE. To find out more, call Martin Lynch personally on 0181 566 1120.

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AEA	PK232MBX	TNC	£195.00
AEA	PK88	TNC	£99.00
ALINCO	DJ180	2M HANDIE	£129.00
AOR	AR1500E	SCANNER	£199.00
AOR	AR3000	SCANNER	£579.00
AOR	AR3030	RECEIVER	£499.00
AOR	AR8000	SCANNER	£349.00
BNOS	LPM144/3/50	2M 50W AMP	£89.00
BNOS	LPM432/3/50	70CM 50W AMP	£129.00
BNOS	LPM50/10/100	6M 100W AMP	£159.00
DRAKE	TR7+PSU	HF TCV'R	£499.00
ICOM	IC28E	2M 25W TCV'R	£169.00
ICOM	IC2E	2M HANDIE	£99.00
ICOM	IC735	HF TCV'R	£695.00
ICOM	IC736	HF+6M TCV'R	£1495.00
ICOM	IC765	HF TCV'R	£1495.00
ICOM	IC901E	2/70 FM MOB	£425.00
ICOM	ICR7000	BASE SCANNER	£749.00
ICOM	ICR7100	BASE SCANNER	£1100.00
ICOM	ICW21E	DUALBAND H/H	£395.00
ICOM	ICPS55	25 AMP PSU	£129.00
ICOM	ICRM3	CONTROLLER	£45.00
KENWOOD	TS130V	10W QRP HF	£349.00
KENWOOD	TS140S	HF TCV'R	£649.00
KENWOOD	TS680S	HF TCV'R	£695.00
KENWOOD	TS940S	HF TCV'R	£1100.00
KENWOOD	TS530S	HF TCV'R	£495.00
KENWOOD	TS830S	HF TCV'R	£525.00
KENWOOD	TS950SD	HF TCV'R	31995.00
KENWOOD	TL922	2KW HF AMP	£1150.00
LOWE	HF150	SW RECEIVER	£325.00
LOWE	HF225	SW RECEIVER	£349.00
STANDARD	C500	DUALBAND H/H	£225.00
STANDARD	C528	DUALBAND H/H	£249.00
YAESU	FRG100	SW RECEIVER	£399.00
YAESU	FT1000	TOP HF TCV'R	£2295.00
YAESU	FT101ZD	HF TCV'R	£395.00
YAESU	FT107M	HF TCV'R	£399.00
YAESU	FT2200	2M 50W FM	£249.00
YAESU	FT221R	2M M/M BASE	£295.00
YAESU	FT225RD	2M M/M BASE	£525.00
YAESU	FT290RMK1	2M M.5W M/M	£269.00
YAESU	FT290RMK2	2M 2.5W M/M	£399.00
YAESU	FT41	70CM H/H	£239.00
YAESU	FT840	2M 10W M/M	£349.00
YAESU	FT780R	70CM 10W M/M	£395.00
YAESU	FT530R	DUALBAND H/H	£369.00
YAESU	FT707	HF TCV'R	£295
YAESU	FT790RMK1	1W 70CM M/M	£295.00
YAESU	FT736R	QUADBANDM/M	£1100.00
YAESU	FT23R	2M HANDIE	£125.00
YAESU	FT73R	70CM HANDIE	£145.00
YAESU	FT747GX	HF TCV'R	£549.00
YAESU	FT757GX	HF TCV'R	£549.00
YAESU	FT767GX	HF TCV'R	£895.00
YAESU	FT840	HF TCV'R	£675.00
YAESU	FT990DC	HF TCV'R	£1395.00

ANTENNAS

TONNA ANTENNAS *LOWEST PRICES!*

2 METRES

20804	4 ELE FIXED	£36.95
20809	9 ELE PORTABLE	£44.95
20089	9 ELE FIXED	£41.95
20818	11 ELE FIXED	£68.95
20811	9 ELE CROSSED	£72.95
20817	17 ELE FIXED	£79.95

70CM

20909	9 ELE FIXED	£39.95
20919	19 ELE FIXED	£45.95
20438	19 ELE CROSSED	£53.95
20921	21 ELE FIXED	£59.95

6M

20505	5 ELE FIXED	£62.95

23CM

20623	23 ELE FIXED	£42.95
20635	25 ELE FIXED	£50.95

CUSHCRAFT ANTENNAS

R7 VERTICAL	£369.00	A3S 3ELE BEAM	£349.00
R5 VERTICAL	£279.00	A3WS 18/24 BEAM	£278.00
A4S 4ELE BEAM	£428.00	D3WS 10/18/24	£179.00

TS SERENE ANTENNAS

BASE *THE LOWEST PRICES, HIGHEST QUALITY*

TSB-3315	2/70 BASE 8.5/11.9db	£119.95
TSB-3304	2/70 BASE 6.0/8.4db	£79.95
TSB-3303	2/70 BASE 3.0/6.0db	£42.95
TSB-3301	2/70 BASE 6.5/9.0db	£74.95
TSB-3302	2/70 BASE 4.5/7.2db	£59.95
TSB-3302	2M BASE 6.5db	£37.95

MOBILE

TSM-1005	2M 7/8TH 5.2db MOBILE	£39.95
TSM-1320	2/70 2.1/3.8db MOBILE	£19.95
TSM-1328	2/70 2.1/5.0db MOBILE	£27.95
TSM-1332	2.70 4.5/7.2db MOBILE	£42.95
TSM-1607	2/70/23 2.8-8.8db MOBILE	£49.95

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AS FEATURED IN RADCOM

PHF-160 Enormous 160M Centre Loaded Whip	£34.95
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PHF-40 The mutts nuts on 40m, at a mere	£22.95
PHF-20 The way to DX, (safely) on 20m	£19.95
PHF-15 You guessed it, the same but on 15m	£19.95
PHF-10 I'll give you one guess	£19.95
AB-5 5 bander 10-80 in one antenna. It works!	£89.95
BB-2 Massive Spring mount for L.F. Whips	£49.95
116-NP gutter mount with 3/8 thread	£8.95
142-ADP Body mount with 3/8 to SO239	£9.95

Heil Sound

At last the excellent range of Bob Heil's Headset and Boom microphones, together with his famous replacement microphone inserts are now available.

Heil Proset-5

Professional Quality Boom Headset, dual padded earphones, flexible mic boom, includes HC-5 "Full range" insert for superb speech quality. Requires AD-1 cable ADAPTOR for KENWOOD/ICOM.
£119.95 incl. VAT

Heil Proset-4

Identical to Proset-5, but includes HC-4 "DX" microphone insert. Ideal for punching through the pileups.
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Heil HC-4

Replacement microphone insert for existing fist or base microphones. With 10DB peak at 2KHZ and the low end rolled off sharply at 500HZ, (12DB per octave), the HC-4 is the ultimate DX mic insert.
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Heil HC-5

Identical to HC-4, but High Articulation, offering superb SSB quality, rolls off sharply under 350HZ and above 3100HZ, peaking at 2.4KHZ. "Hi-Fi" SSB Audio.
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Heil AD-I/K/Y

Adapter leads to interface the proset Headset/boom microphones to 8 pin Yaesu, Icom or Kenwood transceivers.

AD1-I "Blue" Lead for Icom	£11.95
AD1-Y "Yellow" Lead for Yaesu	£11.95
AD1-K "Red" Lead for Kenwood	£11.95

AR-8000 + SCOUT = REACTION TUNE

What is Reaction Tune? Simple. Connect a suitably modified AOR-8000 (or AR-2700), to the latest Optoelectronics SCOUT and when the counter "sniffs" a transmission out of the air it INSTANTLY puts the scanner to that frequency! The AR8000/SCOUT combo instantly removes the frustration of seeing Two-Way communications happening before your eyes and wondering which frequency they're on!
The SCOUT will also allow you to capture up to 400 frequencies and 255 hits per frequency. The SCOUT's Memory Tune captures frequencies, will then log into memory and tune your AR-8000 at a later time. In addition, the SCOUT frequencies can be downloaded to a PC with the Scout Utility Disk for reference and building your own database.

The SCOUT will also REACTION TUNE the ICR7100, ICR9000, ICR7000, AR2700 & PRO2005/6.

This months package deal:

Package 1 New AR-8000 Scanner + Scout + Interface = £873.95
Deposit £73.95 and 12 payments of only £66.66, ZERO APR

Package 2 New AR-2700 Scanner + Scout + Interface = £723.95
Deposit £69.95 and 12 payments of only £54.95, ZERO APR

Package 3 Your existing AR8000 + New Scout + I/F = £424.95
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Package 4 A new Scout complete with Nicads Charger & Antenna £399.95
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IF YOU DON'T WANT TO TAKE ADVANTAGE OF MY FREE FINANCE AND WOULD RATHER PAY CASH, CHEQUE, CREDIT CARD OR TRADE-IN, THEN CALL 0181 - 566 1120 TODAY FOR EXPERT ADVICE. I promise you the best overall deal in the U.K. Get ringing, or you'll miss the bargains!
***Please NOTE prices & monthly payments are based on 17.5% VAT & no more price increases! E&OE. £10 p&p on all major items.**
Martin Lynch is a licensed credit broker. Full written details are available on request.

Linear Amp UK

As used by the award winning contest group, GWORDI on the recent RSGB 6M Trophy.

Peter Rodmell has been busy refining his excellent range of high power LINEAR AMPLIFIERS. Please call for full details.

1 *Explorer 1000, 1kW out, 160-10m dual Eimac 3-500Z* **£1450.00**
£250 deposit, 12 payments of £100.00 INTEREST FREE

2 *Hunter 6000, 600W out, 80-10m single Eimac 3-500Z* **£995.00**
£95 deposit, 12 payments of £75.00 INTEREST FREE

3 *2m Discovery, 800W out, single Eimac 3CX800A7* **£1295.00**
£191 deposit, 12 payments of £92.00 INTEREST FREE

4 *6m Discovery, 800W out, with relays fitted* **£1295.00**
£191 deposit, 12 payments of £92 INTEREST FREE

5 *70cm Discovery, Minimum 600W out, using Eimac 8874* **£1450.00**
£250 deposit, 12 payments of £100.00 INTEREST FREE

MICROWAVE MODULES

MICROWAVE MODULES ARE BACK! FIRST - FROM MARTIN LYNCH

MML432-30LS	25-30W 70CM LINEAR WITH PREAMP, 1/3 DRIVE	£169.95
MML432-50S	50W 70CM LINEAR WITH PREAMP, 10-15W DRIVE	£169.95
MML144-30LS	30W 2M LINEAR WITH PREAMP, 1/3W DRIVE	£99.95
MML144-100S	100W 2M LINEAR WITH PREAMP, 10W DRIVE	£179.95
MML144-200S	200W 2M LINEAR WITH PREAMP, 10W DRIVE	£289.95
MML 70-100S	100W 4M LINEAR WITH PREAMP, 10W DRIVE	£179.95
MML 50-30LS	30W 6M LINEAR WITH PREAMP, 1/3W DRIVE	£99.95
MML 50-100S	100W 6M LINEAR WITH PREAMP, 10W DRIVE	£179.95
MML 50-100LS	100W 6M LINEAR WITH PREAMP, 1/3W DRIVE	£199.95

THEIR TWO, FOUR & 70CM TRANSVERTERS ARE ALSO STILL AVAILABLE.

Here's why people keep using Martin Lynch!

"

Dear Mr & Mrs Lynch
Just a note to thank you very much for your hospitality and service last Thursday evening. Also my thanks to Chris, Brian and Graham for their expertise.

Dear Sir
Please pass on my sincere thanks to all members of your staff for the kind, informative and pleasant manner in the way they conduct themselves, it makes a pleasant change firstly not to be talked down to, and secondly, no take it or leave it attitude. I will have no hesitation in recommending your company to all my fellow club members. Again, thank you.

Dear Brian
Thank you for all your help with the FT707. How fine it would be if all firms gave the quality of service I have had from Martin Lynch

Dear Martin
I am enclosing the copy of the Operators Manual for the FRG-9600 which you so kindly lent to me at the Leicester Show last week. Your help was much appreciated and characterises your approach to anyone with a problem, ie. you will help even though you are not directly getting a sale for equipment at the time. Please accept my best wishes for your new venture in opening new and enlarged premises at a time when other amateur radio outlets are marking time or even cutting back. This illustrates your confidence in retaining and building on your customer base through friendly service.

Dear Chris
Further to our telephone conversation and your literature kindly sent. Having obtained the specs of the h.f. rigs I cannot see a rig (which I can afford) that offers an improvement on the 725. I will wait a few years and look again. However, I would like to thank you for the prompt and courteous manner in which you dealt with my enquiry.

Dear Martin
Thank you for your extremely nice letter ref the Valor PRO-AM-80 mobile aerial. I assure you that so far I am pleased with the aerial. I certainly will use your company in the future, you are doing a much wanted service for the radio amateur.

Dear Sirs
I would also like to take this opportunity to thank you for the prompt action you took in having my Drake receiver repaired recently. I am pleased to inform you that the repaired set is again in good working order.

Dear Martin
Thank you so much for the excellent service given to me by your staff at Ealing. I have had two longish 'nets' since its return and all stations gave very good reports on the audio

Dear Mr Lynch
Thank you very much for dealing with the repair, under warranty, of my Yaesu FT-840 transceiver - it was returned safely to me last Wednesday October 12th by Citilink. All your time and patience was greatly appreciated.

Dear Mr Lynch
My thanks to you and your staff for your prompt attention to my order for the Yaesu FT-736R. I am highly delighted with the equipment. You were recommended to me by G6MJN and I shall be delighted to recommend you to my friends. I shall most certainly use your services again in the near future. The equipment was ordered on the 4th July, modified to my instructions and delivered to me by 10.30am on the 7th July. That is a record to be proud of. Once again, many thanks.

I do not think you could improve on the excellent service you already provide.

Great service, polite, speedy delivery.

Excellent service, p.s.u. arrived before 9am.

Excellent service on the repair of the backlight radio collected at 5pm Wednesday, delivered at 10.30am Friday morning.

Living in the country and using mail order, most of the times I am very impressed with the standard of service you offer.

Impressed with speed of delivery - 24 hours or less.

Thanks for an excellent service

"

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

Europe's biggest independent retailer

The 'shack' at GM6NX/P, with Cushcraft A4S beam at 40ft using 7MHz extension on driven element.

RSGB STANDARD FOR CONTEST LOG DATA ON COMPUTER DISK

1. All files must be in standard ASCII format (ie no tabs or other control characters).

2. All files must be on an MS-DOS formatted disk, 3.5in (720k or 1.44Mb) or 5.25in (360k or 1.2Mb).

3. The diskette label must clearly indicated contest name and the name of the log file(s).

4. The log file must consist of one logical line of data per QSO. Each contact line MUST be terminated with a carriage return character.

5. The QSO data defined below must appear in each line, except that a hyphen in any field, or a field which is all blanks (spaces) will be taken as indicating a data item which is the same as in the previous contact. Each field except the last MUST be padded out to the correct length with blank characters and neighbouring fields MUST be separated by a blank character. Exact adherence to the start and finish columns given below is not mandatory but all data must be column-aligned within the specified field limits, eg: every callsign must start in the same character column and all must fit between character columns 22 and 36.

Char	
1- 6	Date in YYMMDD format
8- 11	Time in HHMM format
13- 16	Band in MHz (Embedded periods are allowed, eg 1.8)
18- 20	Mode (A1A, J3E, F3E etc)
22- 36	Callsign (ieft aligned)
38- 40	RS(T) sent
42- 45	Serial number / Power / Zone / State sent
47- 49	RS(T) received
51- 54	Serial number / Power / Zone / State received
56- 59	New Bonus / Multiplier (country prefix / county code etc)
61- 64	Points
66- 71	Operator / Station Callsign for multi-op events
73-128	Further contest specific data, eg postcode, county code or QTH locator received. THIS FIELD MUST BE TERMINATED BY <CR>. Zero point QSOs such as Duplicates, unfinished contacts etc may be explained here. This field should be left justified and contain spaces but not tabs.

6. Logs must be submitted as a single contiguous file (in chronological order of contact) for each station. Separate files for each band are NOT required. The log data filename must consist of the call sign and the extension '.LOG', eg: G9XXX.LOG. Entries in contests where more than one callsign is used, eg VHF Field Day or AFS, should contain all the entry's logs on one disk, as separate files. In contests where the same station submits multiple logs on the same band, such as LF Cumulatives, the filename should be suffixed with a distinguishing numeral eg G9XXX1.LOG, G9XXX2.LOG. Only .LOG files should be put on the disk.

7. Standard abbreviations must be used, eg RSGB three-letter county codes, ITU Country prefixes, US Postal Service two-letter State abbreviations, ARRL sections, etc.

UK COUNTY CODES FOR HF & VHF CONTESTS

Alderney	ALD
Co Antrim	ATM
Co Armagh	ARM
Avon	AVN
Bedfordshire	BFD
Berkshire	BRK
Borders	BDS
Buckinghamshire	BUX
Cambridgeshire	CBE
Central	CTR
Cheshire	CHS
Cleveland	CVE
Clwyd	CLD
Cornwall	CNL
Cumbria	CBA
Derbyshire	DYS
Devon	DVN
Dorset	DOR
Co Down	DWN
Dumfries and Galloway	DGL
Co Durham	DHM
Dyfed	DFD
Essex	ESX
Co Fermanagh	FMH
Fife	FFE
Mid Glamorgan	GNM
South Glamorgan	GNS
West Glamorgan	GNW
Gloucester	GLR
Grampian	GRN
Guernsey	GUR
Gwent	GWT
Gwynedd	GDD
Hampshire	HPH
Hereford and Worcester	HWR
Hertfordshire	HFD
Highlands	HLD
Humberside	HBS
Isle of Man	IOM
Isle of Wight	IOW
Jersey	JER
Kent	KNT
Lancashire	LNH
Leicestershire	LEC
Lincolnshire	LCN
Greater London	LDN
Co Londonderry	LDR
Lothian	LTH
Greater Manchester	MCH
Merseyside	MSY
Norfolk	NOR
Northamptonshire	NHM
Northumberland	NLD
Nottinghamshire	NOT
Orkney	ORK
Oxfordshire	OFE
Powys	PWS
Shropshire	SPE
Sark	SRK
Shetland	SLD
Somerset	SOM
Staffordshire	SFD
Strathclyde	SCD
Suffolk	SFK
Surrey	SRY
East Sussex	SXE
West Sussex	SXW
Tayside	TYS
Tyne and Wear	TWR
Co Tyrone	TYR
Warwickshire	WKS
Western Isles	WIL
West Midlands	WMD
Wiltshire	WLT
North Yorkshire	YSN
South Yorkshire	YSS
West Yorkshire	YSW

Entrants should use their current county code throughout 1996, irrespective of any boundary changes which may occur during the year.

VHF CONTESTS

GENERAL RULES FOR RSGB VHF / UHF / SHF CONTESTS 1996

1. Entries.

a. All entries should be addressed to P O Box 29, Bridgend, Cardiff CF35 5YA.

b. Entries should be postmarked not later than 16 days after the end of the contest, or, for cumulative contests, the last activity period.

c. Entries become the property of RSGB and cannot be returned.

d. Proof of contact may be required. Any station may be approached, without notice to the entrant, for confirmation of contact details.

e. In case of dispute, in the first instance, the Chairman of the VHF Contests Committee (VHFCC) should be contacted in writing. The VHFCC may refer cases of appeal to RSGB Council. Council's decision shall be final.

f. In multi-band contests, single band entries are always acceptable.

g. Queries about the contests may be addressed to the VHFCC Chaiman, David Johnson, G4DHF, 65 West Street, Bourne, Lincs PE10 9PA, tel 01778 425367 12.10 - 12.40pm / 5.00 - 7.00pm.

2. Paperwork

a. All entries should be accompanied by a VHF / UHF contest cover sheet (form 427) for each band used. Please include a contact telephone number in case of query.

b. The logs for contest entries should be made out on current RSGB VHF / UHF log sheets or a close replica. These forms may be photocopied from the RSGB *Call Book*, or small quantities are available from members of the VHFCC upon receipt of an SAE. Larger quantities may be purchased from RSGB HQ. If computer listings are to be submitted, these should be cut to A4 size, and be in RSGB log format, line spaced to contain 25 contacts per sheet, and be correctly collated (not Z fold). Each sheet should be headed with the entrant's callsign, IARU locator, contest title and sheet number. Logs should be tabulated as follows:

i. Date / time (UTC)

ii. Callsign of station worked

iii. My report on his / her signal and serial number

iv. His / her report on my signal and serial number

v. IARU Locator received

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

vii. Points claimed.

c. In contests with a multiplier scoring system, please also submit a list of multipliers worked, showing at least the callsign, and either serial number sent or time of QSO, for each contact claimed as a new multiplier.

d. Alternatively, entries are encouraged on floppy disk. The VHFCC guarantees that such entries will receive the same level of scrutiny as similar logs submitted on paper. A paper copy of the log is not required, but a VHF / UHF contest cover sheet (form 427) is required.

i. All files must be on an MS-DOS formatted disk, 3.5in (720kB or 1.44MB) or 5.25in (360kB or 1.2MB).

ii. The disk label must clearly indicate the contest name and the name of the log file(s), which must consist of the callsign and the extension .LOG, eg G9XXX.LOG or G9XXX-P.LOG.

iii. The log file must consist of one logical line of data per contact. Acceptable formats are CT .BIN, NA .QDF, Super Duper .LOG and RSGB standard log format for disk logs. Details of the RSGB format may be found in the first column of this page.

iv. All diskettes become the property of the RSGB.

e. Any complaints received or made about signal quality must be recorded in the comments column of the paper log or disk log.

3. Station / Operators

a. All operators must be RSGB members except in VHF NFD and the Affiliated Society contests - see individual rules.

b. Stations entering a fixed station section or contest must operate from permanent and substantial buildings located at the main station address as shown on the licence validation document. The spirit of the contest will be paramount.

c. In multi-band events, all stations forming one entry must be located within a circle of 1km radius. Entrants must not change their location or callsign during the contest.

d. Stations located outside the UK (G, GW, GM, GI, GD, GU, GJ) may enter a contest, and will be tabulated within the overall results tables, but will only be eligible for their own awards.

e. Entries will not be accepted from stations using special event callsigns (eg GB), or special club callsigns (eg GX, GS etc). Normal club callsigns can be used - ie G4DSP is OK, but GX4DSP is not.

f. There must be only one frequency used for transmit on any band at any one time.

g. The lower of the contest power limit or the standard licence power limit must not be exceeded during the contest. Contacts made under a high-power permit will not count for points. Severe action may be taken against infringements of this rule.

h. Stations which persistently radiate poor quality signals, cause deliberate interference to other stations, or otherwise contravene the code of practice for VHF / UHF / SHF contest operation may be penalised.

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

4. Contacts

a. The contest exchange consists of at least both callsigns, RS(T) signal reports followed by a serial number, and the IARU locator. Particular contests may require additional information to be exchanged as described in the individual contest rules.

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

c. Crossband contacts do not count for points below 2.3GHz. On 2.3GHz and above, crossband contacts are scored at 50% of the two-way score.

d. No points will be lost if a non-competing station cannot provide an IARU locator, serial number, or any other information that may be required. However, the receiving operator must receive and record sufficient information to be able to calculate the score.

e. Contacts with callsigns appearing as operators on any of the cover sheets forming an entry will not count for points or multipliers.

f. Only one scoring contact may be made with a given station on each band, regardless of suffix (/P, /M, etc) during an individual contact or cumulative activity period. All non-scoring contacts must be clearly marked in the log, and unmarked duplicates will be penalised at ten times the claimed score for that contact.

g. Contacts made using repeaters, satellites or moonbounce will not count for points.

h. The IARU / RSGB band-plans must be observed.

i. All information must be copied off air at the time of the QSO. Databases must not be used to fill in missing information.

j. The DX Cluster may be used in all sections of the contest.

k. Any band may be used for setting up contacts or talkback. No confirmation of QSO details must take place on the talkback frequency. All exchanges for the contest band in use must be made on that band. The talkback channel can be used for antenna alignment signals and confirmation that signals are audible, but not for giving reports and serial numbers.

5. Scoring

a. Scoring will normally be by the radial ring method. Contacts made between stations separated by the distance shown in the table will score as indicated:

km	Points
0 - 50	1
>50 - 100	3
>100 - 150	5
>150 - 200	7
>200 - 250	9
>250 - 300	11 and pro-rata

b. For computer purposes a conversion factor of 111.2 km / degree must be used.

c. Multi-band contests will contain an overall results table in addition to the individual band results. The scores in this final tabulation will be formed by taking the sum of the normalised scores on each band. The normalised scores will be calculated by:

Normalised score for each band / session = Score achieved x 1000, divided by band / session leader score

6. Awards and Results

a. Certificates will be awarded to the leading and second placed station in each section of the contest. Additional certificates of merit may be awarded at the adjudicator's discretion.

b. In all contests / sections where the power limit is above 25W, a certificate will be awarded to the leading fixed station using 25W or less into a single antenna.

c. Placement certificates showing the result achieved in the contest can be obtained by including an A4 SAE with the entry marked with callsign, contest and (if applicable) group name.

7. Multipliers

a. Where a contest uses multipliers, the score for each band will be the number of points made on that band multiplied by the number of multipliers contacted on that band.

b. The type of multiplier scheme for a particular contest will be referred to in the individual rules for the contest. Not all contests will use multipliers.

c. Each new multiplier must be clearly marked in the log and a summary sheet provided (see rule 2c.)

d. In county multiplier contests, each Scottish Region may be worked up to three times for multiplier credit.

e. In co-operation with the HFCC, we have agreed that for 1996, the county to be exchanged in the contest is that which would have been your county at the start of 1995, irrespective of current boundary changes. This situation will be reviewed when the boundary change process is sufficiently mature.

Special Rules

Certain of these rules are invoked for individual contests as listed in the individual contest rules.

S1. Instead of radial ring scoring (rule 5a), scores will be calculated at 1pt / km.

S2. In addition to the IARU locator, QTH information must be exchanged. This should be given as a point identifiable on an Ordnance Survey route planning map or equivalent (scale 1:625,000) or as a distance not greater than 25km from such a point, and a cardinal direction from that point, eg 10km north-west of Skegness.

S3. This is an Affiliated Societies contest and is open to both individual entrants (who must be RSGB members), and to teams made up of a number of operators who must all be members of the same affiliated society, but not necessarily RSGB members themselves. All members of the team must operate from within 50km of the normal meeting place of the society. No station may represent more than one society. No operator is allowed to use more than one callsign during the contest. In the case of national societies, each team must define a separate meeting place, and each team member must operate within 50km of that designated meeting place. Multiple teams are encouraged from both local and national societies. The best 3 or 5 scores (determined in individual contest rules) of each team will be used to form an entry, but please submit all logs so that the adjudicator can form teams appropriately after checking of the logs is complete. Please mark your RSGB Zone (which can be found in the *Call Book*) on the cover sheet. Logs should be sent as a single package for each club and should include a declaration signed by a club official that all operators are members of the Affiliated Society, and listing the QTH locator of the normal meeting place of the club.

S4. This contest runs concurrently with a Backpackers contest. Stations entering the Backpackers contest only may be worked once from a fixed location and once from their portable location for points.

S5. This is a cumulative contest. The following special rules apply:

a. For cumulative contests the overall score will normally be calculated from the best three normalised session scores - the normalised score being calculated as above in rule 5c. It is impossible for you to determine your best sessions without knowing everyone else's scores, so please submit your logs and scores from all sessions in which you were active and allow the adjudicator to calculate your best sessions.

b. Stations may move location between individual cumulative activity periods.

c. For cumulative contests, please summarise your scores from each session on the reverse of the cover sheet.

S6. This contest runs concurrently with the first few hours of an RSGB 24-hour event. You may submit entries to both contests with a single set of logs, but please include two cover sheets - one for the shorter contest and one for the 24-hour event. Entries may be automatically submitted into the 24-hour event unless you specifically request otherwise.

S7. This contest runs concurrently with all or part of an IARU co-ordinated contest. You may submit a single set of logs for entry to both the RSGB and IARU events, provided that you include on your log sheets the score at 1 pt / km. Please submit two cover sheets - one for the RSGB, normally with radial ring scoring (except where noted otherwise in the individual contest rules), and the other scored at 1pt / km for submission to the IARU. Entries may be submitted to the IARU event unless you specifically request otherwise.

Multiplier Types

One of the following rules as defined in the individual contest rules will apply to any contest using multipliers.

M1. County and Country Multipliers. The multiplier for a band is the sum of the number of different DXCC countries and UK counties worked on that band. You can work your own country and county for credit, and an appropriate QSO can count as both a county and country multiplier.

M2. QTH Locator Multiplier. The multiplier for a band is the sum of the number of different large locator squares (eg JO01, IO91 etc) worked on that band.

M3. County, Country and QTH Locator Multiplier. The multiplier for a band is the sum of the number of different DXCC countries, UK counties, and large QTH locator squares (eg JO01, IO91 etc) worked on that band.

M4. Country and QTH Locator Multiplier. The multiplier for a band is the sum of the number of different DXCC countries, and large QTH locator squares (eg JO01, IO91 etc) worked on that band.

THE VHF CONTESTS' CHAMPIONSHIP

1. The VHF Contests' Championship aims to provide an overall result for the year, based on a representative selection of contests. The contests which count towards the championship are:

i. March 2m / 70cm (The overall two band normalised score)

ii. 432MHz Trophy

iii. May 144MHz

iv. 50MHz Trophy

v. 144MHz Low Power

vi. 432MHz Low Power

vii. 144MHz Trophy

viii. 70MHz Trophy

ix. 1.3GHz Trophy

x. 2.3GHz Trophy.

2. There is a Single Operator Fixed Station section (SF), and a section for All Others (O).

3. The overall score is calculated from the sum of the normalised scores for each event listed above. The normalised scores are calculated as in general rule 5c.

4. Stations entering the single operator fixed section of a contest may elect to submit their score towards an All Others score if they wish.

5. The John Pilags Memorial Trophy is awarded to the winner of section SF, and the Racal Radio Cup to the winner of section O.

CODE OF PRACTICE FOR VHF / UHF / SHF CONTESTS

1. Obtain permission from the landowner or agent before using the site and check that this permission includes right of access. Portable stations should observe the Country Code.

2. Take all possible steps to ensure that the site is not going to be used by some other group or club. Check with the club and last year's results table to see if any group used the site last year. If it is going to be used by another group, come to an amicable agreement before the event. Groups are advised to select possible alternative sites.

3. All transmitters generate unwanted signals; it is the level of these signals that matters. In operation from a good site, levels of spurious radiation which may be acceptable from a home station may well be found to be excessive to nearby stations (25 miles away or more).

4. Similarly, all receivers are prone to have spurious responses or to generate spurious signals in the presence of one or more strong signals, even if the incoming signals are of good quality. Such spurious responses may mislead an operator into believing that the incoming signal is at fault, when in fact the fault lies in his own receiver.

5. If at all possible, critically test both receiver and transmitter for these undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all in-amateur band spurious radiation, including noise modulation, to a level of -100dB relative to the wanted signal. Similarly, every effort should be made to ensure that the receiver has adequate dynamic range.

6. Above all, be gentlemanly and polite at all times. Be helpful and inform stations apparently radiating unwanted signals at troublesome levels, having first checked your own receiver. Try the effect of turning the antenna or inserting attenuators in the feedline; if the level of spurious signal changes relative to the wanted signal, then non-linear effects are occurring in the receiver. Some synthesised equipment has excessive local oscillator phase-noise, which will manifest itself as an apparent splatter on strong signals, even if there is no overloading of the receiver front-end. Pre-amplifiers should always be switched out to avoid overload problems when checking transmissions. If you receive a complaint, perform tests to check for receiver overload and try reducing drive levels and switching out linear amplifiers to determine a cure. Monitor your own signal off-air if possible. Remember that many linear amplifiers may not be linear at high power levels under field conditions with poorly-regulated power supplies. The effects of over-driving will be more severe if speech processing is used, so pay particular attention to drive level adjustment. If asked to close down by a Government Official or the site owner, do so at once and without objectionable behaviour.

VHF / UHF LISTENERS' CONTESTS

1. Listeners contests are open to all non-licensed members of the RSGB and foreign SWLs. Only one entrant may operate the receiving station. Every VHF contest is open to listeners' entries.

2. Logs must show in columns:

i. Date / time (UTC)

ii. Callsign of station heard

iii. My report on his / her signals

iv. Report and serial number sent by station heard

v. Callsign of station being worked

vi. IARU Locator given by station heard

vii. QTH given by station heard (if appropriate)

vii. Points claimed.

On 144MHz, the callsign in column (v) may occur once in every ten contacts logged. CQ and test calls do not count for points and should not be logged. If both sides of the QSO can be heard, both can be claimed for points.

3. The Hanson Trophy will be awarded to the entrant with the highest aggregate score in all SWL contests between March and September inclusive of each year. The aggregate score will be calculated in accordance with General Rule 5c.

THE BACKPACKERS SERIES OF CONTESTS

Aims:

a. To promote the fun of contesting and to develop skills in contesting and operating.

b. To increase access to major contesting events.

c. To encourage low power portable operation with operators working fellow low-power enthusiasts from a variety of hill-top sites within the UK.

d. To introduce the art of contesting to those who, for various reasons are unable / unwilling to form / join contest groups or those who simply do not have the time for 'full-blown' contests.

e. To promote innovation, home construction and an awareness of how equipment actually works, particularly in the development of receivers, transmitters, antennas, pre-amplifiers and feeder systems.

It is in the spirit of the contests that the equipment should be capable of being carried to the operating site by the operator(s) or being transported / erected outside a car.

Times

'Socially-acceptable' FOUR hour periods. Timing of the contests should allow participants time to (walk) reach their destination, set-up, operate, clear away and return home with a good margin of daylight. Times will be staggered to co-ordinate with existing contests. For dates and times, see the individual contest rules table.

Modes: SSB or CW.

Sections:

a) 10W Single Operator Portable. **b)** 10W Multi-Operator Portable. **c)** 3W Single Operator Portable. **d)** 3W Multi-Operator Portable.

The listed power is output from the transmitter. Participants will be expected to demonstrate how their power level was determined, particularly where the basic commercial equipment is rated at higher output power.

Restrictions

1. All operators must be RSGB members.

2. The contest is open to all stations, but only portable stations may submit a contest entry.

3. Although any number of antennas or groups are permitted, no fixed or mobile towers, cranes or any other 'significant structure' (in excess of 2in outside diameter) is to be used as support. The highest feed-point of the antenna(s) driven element will be limited to 30ft (9m) above ground level.

4. All equipment must be battery powered. If a mains rotator is envisaged, they must also be powered from a single source battery (with suitable converter circuitry) supply not exceeding 28V.

5. Petrol / Gas / Diesel generators for charging are not permitted. This includes a motor vehicle engine. If operating from a vehicle supply, the engine must be switched off for the duration of the contest. Wind and solar power generation and charging is permitted.

6. In addition, the 1996 General Rules apply.

Scoring

This is by the radial ring system (general rule 5a) with a multiplier applied. The multiplier type differs between individual contests in order to match the exchange in the main contest running at the same time - check the individual rules table carefully.

Award

Each session should be treated as a separate contest. Please submit an entry after each session. Session winners and runner's-up certificates will be awarded. In addition, a certificate will be awarded to the leading station running one watt or less into a single antenna for each session. On 144MHz, The Backpacker's Trophy will be awarded to the leading stations in either category, the best three placings out of a maximum of four sessions. Scores will be normalised as in general rule 5c. In the event of a tie, if appropriate, the remaining session will be taken into consideration. The 50MHz Trophy will be determined from the two sessions.

Recommendation

If stations intend to enter any of these Backpackers contests, they are requested not to call stations in the major events which run alongside from home before the contest as they may, in effect, appear to be working the same station twice. This in fact is not the case, as the Backpackers series should be seen as separate, independent events. However, the reality of the situation is such that stations operating in the major events will effectively register the second, portable contact as a 'dupe', thereby causing some confusion and delay. Should this happen, the second contact should be corrected and scored at a later time. This anomaly has arisen as a result of attempting to create more activity by co-ordinating two quite different contests simultaneously. Backpacker's participants, in particular, are requested to bear this in mind in order to help both contests to run as smoothly as possible.

VHF FIELD DAY 1996 RULES

General Rules Apply

1. Site Notification.

Each Group intending to compete must send two copies of a completed site registration form (available in the *Call Book* or from G4DHF) to: VHF Contests Committee, c/o D Johnson, 65 West Street, Bourne, Lincs PE10 9PA, to arrive no later than 10 June 1996. Each group may only register one site although changes can be made provided G4DHF is informed: tel 01778 425367 at 12.10 - 12.40pm or 5.00 - 7.00pm.

2. Bands.

Up to four separate stations may operate simultaneously on the 70, 144, 432 and 1296MHz bands. 70MHz will be CW only from 1400 - 2200UTC, and SSB only from 0600 - 1400UTC, with close down between 2200 and 0600UTC. Each station may be worked once on SSB and once on CW on 70MHz.

3. Operators.

Any RSGB member or group of members operating from the British Isles (excluding Eire) may enter. Also, affiliated RSGB societies may enter (operators MUST be members of the Affiliated Society (AFS), but not necessarily members of RSGB themselves). In this case, a declaration signed by an officer of the AFS that the operators are members of the society is required with the entry. RSGB members are allowed to operate in AFS groups whether or not they are actually members of that AFS group.

4. Stations.

All equipment including antennas, must be installed on site not more than 24hrs before 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.

5. Contest exchanges.

a. On each band report, serial number and locator must be exchanged.

b. Additionally, on 70MHz only, QTH information must be exchanged (special rule S2). It must be given in a different form on each mode.

6. 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 (ie 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.

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 (ie 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.

Open section (O): as per general rules.

SWL section (S): as per general rules.

7. 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 may be disallowed. In the event of a last minute site 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.

8. Entries.

(a) All entries must be postmarked no later than 31 July 1996.

(b) Entries must be addressed to: VHF Contests Committee, P O Box 29, Bridgend CF35 5YA.

(c) Please enclose a 427 cover sheet for each band, including separate ones for the 70MHz SSB and CW sections.

9. Awards.

The Surrey, Martlesham, and Arthur Watts Trophies will be awarded to the overall winners of the Open, Restricted and Low Power sections respectively. The Tartan Trophy will be awarded to the leading resident Scottish entry in the Open section, and the Scottish Trophy to the leading Scottish entry in the Low power section. Certificates will be awarded to the winners and runners-up on all bands in each section, and to the leading stations in each country.

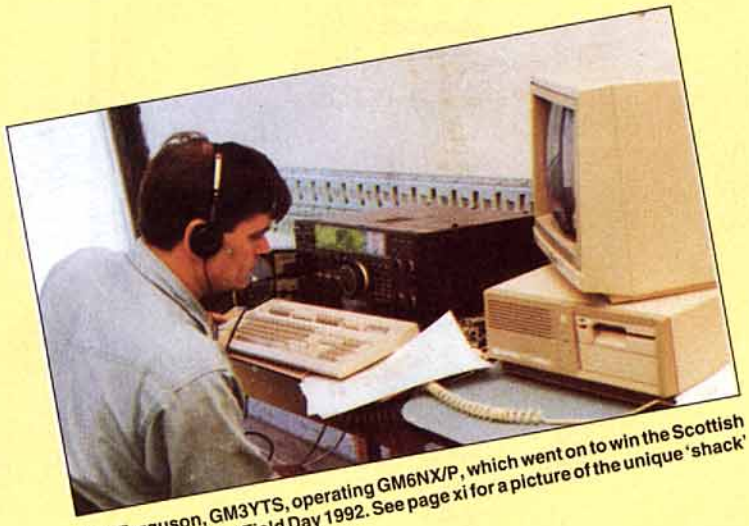
A typical VHF Field Day Scene!

SUMMARY OF RSGB VHF CONTESTS

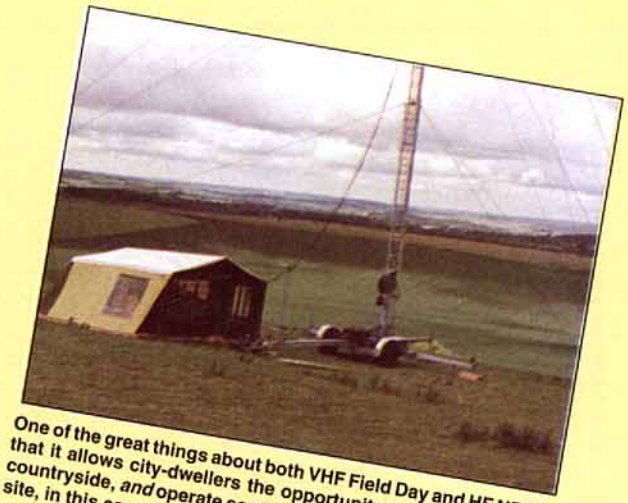
Date	Time UTC	Contest Name	Sections	Notes / Special Rules
14 Jan	1000 - 1600	144MHz CW	SF, O	CW only to be used during this contest. County / Country Multipliers (M1)
21 / 28 Jan 11 / 25 Feb 10 Mar	1000 - 1200	70MHz Cumulatives	SF, O	Full QTH Information to be sent (S2)
4 Feb	0900 - 1500	432MHz Fixed / AFS	SF, MF	AFS rules apply (S3), 3 stations per team
2 / 3 Mar	1400 - 1400	March 144 / 432MHz	S, M, SS	Low power stations running 25W or less at the transmitter will be specially identified in the results and the leading and second placed low power stations in each section will receive certificates.
24 Mar	0900 - 1300	70MHz Fixed	SF, MF	Full QTH Information to be sent (S2)
2 / 10 / 18 Apr	1900 - 2100	144MHz SSB Fixed Station Cumulatives	SF, MF	SSB only to be used during this contest. Section 1 for stations with 25W maximum output at the transmitter and section 2 for full legal power. Cumulative rules (S5) apply, but the best 2 sessions count to the final score.
7 Apr	1700 - 2100	1.3GHz / 2.3GHz Fixed	SF, MF	These run as separate contests - there will be no overall tabulation.
4 / 5 May	1400 - 1400	432MHz - 248GHz	S, M	All bands scored at 1 pt / km (S1).
4 May	1400 - 2200	432MHz Trophy	S, M	This contest runs concurrently with the first 8 hours of the 432MHz - 24GHz event (S6). Score at 1pt / km (S1). The 1951 Council Cup is awarded to the overall winner of this contest.
4 May	1400 - 2200	10GHz Trophy	O	County and Country Multiplier (M1). Crossband contacts will count for multiplier credit. Scored at 1 pt / km (S1). The 10GHz Trophy is awarded to the overall winner of this contest.
18 / 19 May	1400 - 1400	144MHz	SF, SP, M, SS	County / Country Multiplier (M1).
19 May	1100 - 1500	First 144MHz	S, M	County, Country and QTH Locator Multiplier (M3). See separate Backpackers rules.
1 / 2 Jun	1400 - 1400	IARU 50MHz	S, M	Score at 1pt / km (S1) - no multipliers. If a station is only able to provide a 4 character locator (e.g. JO01), score to the nearest point of that square. Entrants must send the full 6 character IARU locator. A Backpackers contest runs during part of this event (S4).
1 Jun	1400 - 2200	50MHz Trophy	S, M	This contest runs concurrently with the first 8 hours of the IARU 50MHz contest (S6). County and Country Multiplier (M1). The Telford Trophy is awarded to the overall winner of this contest, and the Six Metre Cup to the highest scoring UK single operator entrant. A Backpackers contest runs during part of this event (S4).
1 Jun	1300 - 1700	First 50MHz Backpackers	S, M	County, Country and QTH Locator Multiplier (M3). See separate Backpackers rules.
9 Jun	0900 - 1200	70MHz CW	SF, O	CW only to be used during this contest. County and Country multiplier (M1). Full QTH Information to be sent (S2).
16 Jun	0900 - 1300	Second 144MHz Backpackers	S, M	Country and QTH Locator Multiplier (M4). See separate Backpackers rules. This event is co-ordinated with the first 4 hours of the Practical Wireless QRP contest.
23 Jun	1800 - 2200	432MHz FM	SF, O	FM only to be used in this contest. County and country multiplier (M1)
6 / 7 Jul	1400 - 1400	VHF NFD		See separate rules. A Backpackers contest runs during part of this event (S4)
7 Jul	1100 - 1500	3rd 144MHz Backpackers	S, M	Country and QTH Locator Multiplier (M4). See separate Backpackers rules.
14 Jul	1100 - 1500	2nd 50MHz Backpackers	S, M	County, Country and QTH Locator Multiplier (M3). See separate Backpackers rules.
20 Jul	1400 - 2200	144MHz Low Power	S, M	25W maximum output from the transmitter. County, country and QTH locator multiplier (M3).
21 Jul	0800 - 1400	432MHz Low Power	S, M	25W maximum output from the transmitter. County, country and QTH locator multiplier (M3).
18 Aug	1700 - 2100	432MHz Fixed	SF, MF	County, country and QTH locator multiplier (M3).
3 / 18 Sep 3 / 18 / 28 Oct	2030 - 2300 LOCAL	144MHz CW Cumulatives	S, M	CW only to be used in this contest. Cumulative contest rules apply (S5).
7 / 8 Sep	1400 - 1400	144MHz Trophy	S, M, SS	Co-ordinated with IARU contest (S7). A Backpackers contest runs during part of this event (S4). The Thorogood Trophy is awarded to the winner of section S, and the Mitchell-Milling Trophy to the winner of section M of the contest.
8 Sep	1100 - 1500	4th 144MHz Backpackers	S, M	Country and QTH Locator Multiplier (M4). See separate Backpackers rules.
29 Sep	0900 - 1500	70MHz Trophy	SF, O	County and country multipliers (M1)
5 / 6 Oct	1400 - 1400	432MHz - 248GHz IARU	S, M	Co-ordinated with IARU contest (S7). Score at 1pt / km (S1)
5 Oct	1400 - 2200	1.3 / 2.3GHz Trophies	S, M	These contests run concurrently with the first 8 hours of the IARU contest (S6, S7). Score at 1pt / km (S1). The VHF Contests Committee cup is awarded to the winner of the 1.3GHz contest, and the G6ZR Memorial Trophy to the winner of the 2.3GHz event.
1 / 16 / 31 Oct 15 Nov 2 Dec	2030 - 2300 LOCAL	1.3 / 2.3GHz Cumulatives	SF, O	The 1.3GHz and 2.3GHz events are separate contests - there will be no overall 2 band tabulation. Cumulative contest rules apply (S5).
9 / 24 Oct 8 / 25 Nov 10 Dec	2030 - 2300 LOCAL	432MHz Cumulatives	SF, O	Cumulative contest rules apply (S5).
27 Oct	1800 - 2200	1.3 / 2.3GHz Fixed	SF, MF	The 1.3GHz and 2.3GHz contests are separate contests - there will be no overall 2 band tabulation.
2 / 3 Nov	1400 - 1400	144MHz CW Marconi	S, M	The RSGB and European Marconi Memorial events run concurrently (S7). Score at 1pt / km (S1).
3 Nov	0800 - 1400	6 hour 144MHz CW	S, M	This event runs in the last 6 hours of the European contest (S7). Score at 1pt / km (S1).
1 Dec	0900 - 1700	144MHz Fixed / AFS	SF, MF	AFS rules apply (S3), 5 stations per team.
26 / 27 / 28 / 29 Dec	1400 - 1600	70 / 144 / 432MHz Christmas Cumulatives	SF, O	Cumulative contest rules apply (S5). County, country and QTH locator multiplier (S3) applies, and the same multipliers may be claimed for credit on each band on each day.

Key to sections: S - Single Operator; M - Multi Operator, O - All Others, SF - Single Operator Fixed, MF - Multi Operator Fixed, SP - Single Operator Portable, SS - Six Hour Single Operator Fixed.

. . . Some Famous Contest Stations

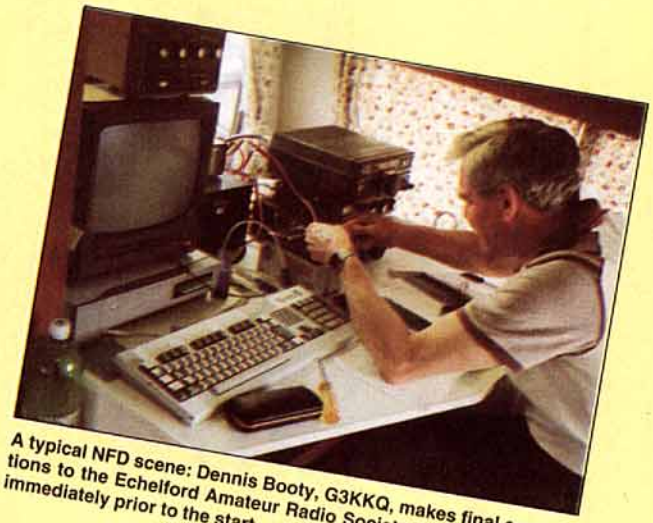


Rob Ferguson, GM3YTS, operating GM6NX/P, which went on to win the Scottish Trophy in National Field Day 1992. See page xi for a picture of the unique 'shack' of GM6NX/P.

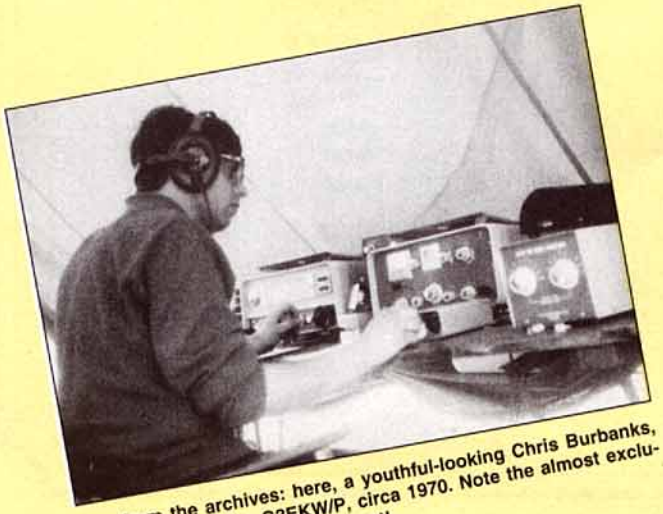


One of the great things about both VHF Field Day and HF NFD is that it allows city-dwellers the opportunity to get out into the countryside, *and* operate some radio! Here is a typical field day site, in this case G3KLH/P.

From left to right: GW3KYA and G3SWH, operating the famous Welsh multi-operator contest station GW8GT. This particular operation was during the *CQ* World Wide DX phone contest. Note the computer logging, in this case using the *CT* program by K1EA.



A typical NFD scene: Dennis Booty, G3KKQ, makes final connections to the Echelford Amateur Radio Society station, G3UES/P, immediately prior to the start.



One from the archives: here, a youthful-looking Chris Burbanks, G3SJJ, operates as G3EKW/P, circa 1970. Note the almost exclusively British-made KW equipment!

G3OAY operating as GW8GT/P in 1992.

IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

In many holiday spots, wire dipoles are difficult to install. **Fred Schultz, DL1OAW**, built this 7MHz **magnetic loop** which can be disassembled for easy transport. From *CQ-DL* 7/95

THE LOOP ANTENNA described here can be taken apart and reassembled **(Photo 1)** and is designed so that losses at the joints are minimised. It can be operated from ground level up, but care must be taken that people or animals cannot touch it. A low SWR makes an ATU superfluous. It must, however, be protected from rain.

CONSTRUCTION

FOUR STRAIGHT LENGTHS of square aluminium tubing, 50x50x2mm, are used to make up the loop, which measures 1.40m a side. The ends are cut as shown in **Photo 2** and joined with eight nuts and bolts at each of three corners. The mating surfaces at each corner have a surface area of 40cm^2 to provide a low contact resistance.

The use of straight tubing for the sides of the loop suggested a piston-type capacitor for tuning the loop. This was achieved using one section of the loop as the 'cylinder' of the capacitor and a 370mm length of 40x40x2mm square tubing as the 'piston'. The construction of the capacitor is shown in **Photo 3.**

Strips of plexiglass are used to centre the capacitor piston, which slides in or out with little friction or play. The air gap is 3mm, sufficient for a 100W transceiver.

A 0.5mm thick and 40mm wide flexible sheet-copper strap is used to connect the piston to the other side of the loop. **Photo 2** shows how the copper is firmly squeezed against the aluminium.

A nut, centred on the copper bracket at the end of the piston, permits the latter to be driven by rotation of a threaded rod which is connected, through an insulated coupling, to a small (22mm OD) reversible DC motor with integral gear reduction.

A 20mm thick PVC board [1] was used to assemble the components at the open end of the loop, as can be seen in **Photo 4**. The U-bolts holding the loop ends to that board were home made of M5-threaded galvanized-steel rod, flame-heated at the bending spots.

The coax coupling loop can slide up and down on a PVC tube to obtain minimum SWR in different operating environments.

To tune to 7MHz, approximately 300mm of piston is within the cylinder and a movement of 10mm will cover the band.

OTHER BANDS

THOUGH THIS WAS NOT tried, the loop should be usable on 10.1 and 3.5MHz.

To tune to 10.1MHz, withdrawing most of the piston from the cylinder should be sufficient.

For 3.5MHz, an additional fixed capacitor is required. [It must be a high-voltage high-current type. How much capacity is needed is easily established by clipping one or two 365pF sections of a receiver-type tuning capacitor across the piston capacitor and tuning them for resonance while *listening* (not transmitting) with the loop on 3.5MHz. Then measure the C value. The 3mm air gap of the variable capacitor, however, will probably limit the transmitting power to well below 100W - *G4LQI*]

NOTE

[1] Scraps of suitable glass-reinforced plastic board can sometimes be found where fibreglass boat hulls are built or repaired - *G4LQI*♦

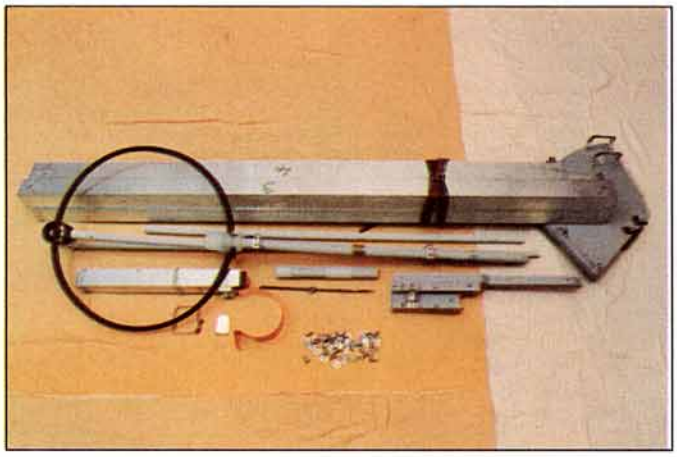


Photo 1: The antenna disassembled, ready for transportation.

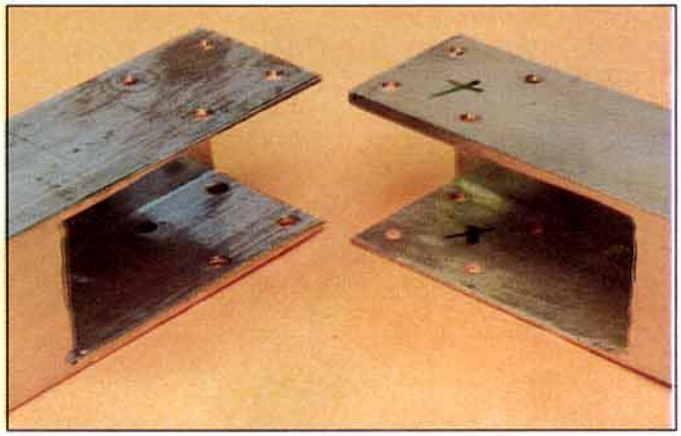


Photo 2: The ends of the loop sides are cut and drilled for assembly with maximum contact area.

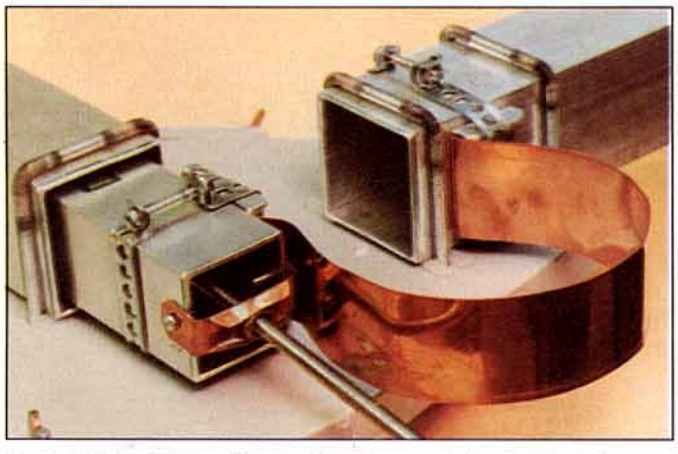


Photo 3: The tuning capacitor consists of a square 'piston' sliding into one of the square sides of the loop.

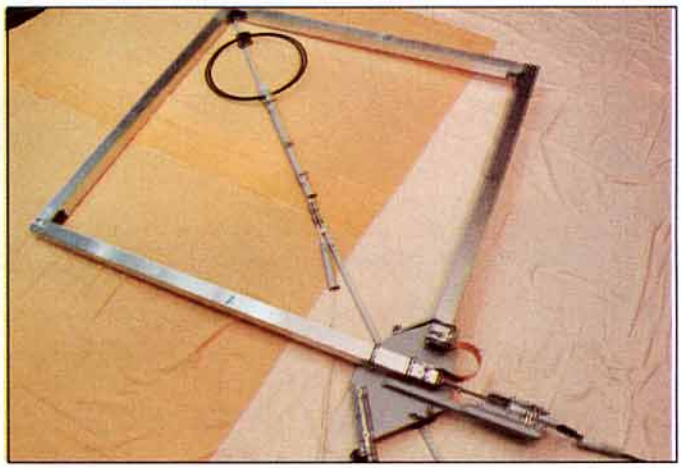
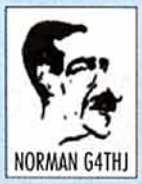


Photo 4: The loop assembled at the camp site.

ARE COMMUNICATIONS



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R7	vertical 7 band	£369
A3S	3 ele beam	£349
A4S	4 ele beam	£425
A3WS	12/17m Yagi	£275
D4	4 band dipole	£229
D3W	10,17,30m dipole	£169

Cushcraft VHF		
AR6	6m vertical	£52.00
148-10S	2m 10 ele yagi	£62.00
13B2	2m 13 ele yagi	£99.95
17B2	2m 17 ele yagi	£169
A50-3S	6m 3 ele yagi	£75.95
2m	22 ele oscar yagi	£199
70cm	38 ele oscar yagi	£189

BASE ANTENNAS

WX1/N	2m/70cm colinear 5.8'	£89
WX2/N	2m/70cm colinear 9'	£115
WX4/N	2m/70cm colinear 14'	£149
GP9N	2m/70cm colinear 17.5'	£135
GP95	2m/70/23cm colinear 10'	£109
CA350DB	6m/10m colinear 22.7'	£149

ANTENNA ACCESSORIES

DX10N	2m/70cm Duplexer	£22.50
TSA6001C	2m/70cm Duplexer	£25
CFX314	6m/2m/70cm Triplexer	£49
CFX431	2m/70/23cm Triplexer	£49

MOBILE WHIP ANTENNAS

EX104B	2m/70cm mini	£22.50
HS727SS	2m/70cm mini	£17
TSM1316	2m/70cm mini	£18
SB2	2m/70cm mini	£17.50
SB7	2m/70cm 1.4m	£41
Z740	2m/70cm lock fixing	£35
HR50	6m 1/2 wave 2.13m	£46
DB144	2m 5/8 F/G 1.25m	£14.95
VM144HP	2m 7/8 1.79m	£38
TSM1312	2m/70cm 0.89m	£23
TSM1309	2m/70cm 0.93m	£25
TSM1339	2m/70cm 0.89m	£22.50

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2m Handi
Keypad controlled
Only £169

Also C468 70cm Handi - Only £169

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ARE

BIASING TRANSISTOR POWER AMPLIFIERS

WHEN BIASING AN RF power transistor for linear operation, is the end result a fixed base voltage or a fixed current? An application note mentions a 0.63-0.67 volt typical value, but construction projects say to adjust bias to a given standing current, say 100mA. Which view is right?

WHY DO WE NEED a base bias supply at all? The answer is that the base-emitter junction of a bipolar transistor has a turn-on voltage of about 0.65V, below which very little current flows.

This is not a problem for FM operation, where the drive level is constant, and FM-only PAs usually have an RF choke to provide a DC return path directly from the base to ground (**Fig 1**). This is sometimes called 'Class C' operation. But for SSB modulation, this delayed turn-on at low drive levels is disastrous: it means that all the low-level parts of the modulation are severely distorted and the amplifier only delivers RF power in bursts on speech peaks. This is why you must *never* use an FM-only power amplifier on SSB - the splatter is horrendous!

For linear operation, the answer is to use a fixed DC bias to make sure that the transistor is already 'turned on' before any RF drive arrives (so-called 'Class AB'). Typically, if the transistor is drawing 100mA or so in 'standing current' with no RF drive, distortion will be quite low, provided that the bias supply can also cope with the higher demands of peak modulation. There's nothing magical about 100mA, by the way; it's just a good figure to aim for in many cases. The standing collector current depends on the current flowing from the bias supply into the base, and on the beta of the transistor (ratio of collector current to base current). For a typical RF power transistor with a beta of 50, a standing collector current of 100mA needs a base current of 2mA. However, beta is not a very well-controlled value, so the next transistor might need only 2mA; or maybe 7mA. That's one reason why the bias supply has to be adjustable. Another is that the tiniest change in base voltage can make a very big difference to the collector current. You occasionally see base bias supplies that are not adjustable at all, which is a true trademark of the Arthur Daley School of Electronic Design (motto: *Well, it worked OK for me*).

When you drive the transistor with RF, the collector current rises to several amps. At maximum drive the base current can be as high as hundreds of milliamps, which the bias

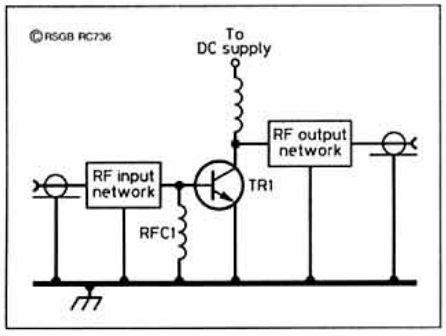

Fig 1: Transistor PA with 'Class C' or zero base bias via RFC1. *never* use this for SSB!

IAN WHITE, G3SEK
52 Abingdon Road, Drayton, Abingdon, Oxon OX14 4HP – or @ GB7AVM
g3sek@ifwtech.demon.co.uk

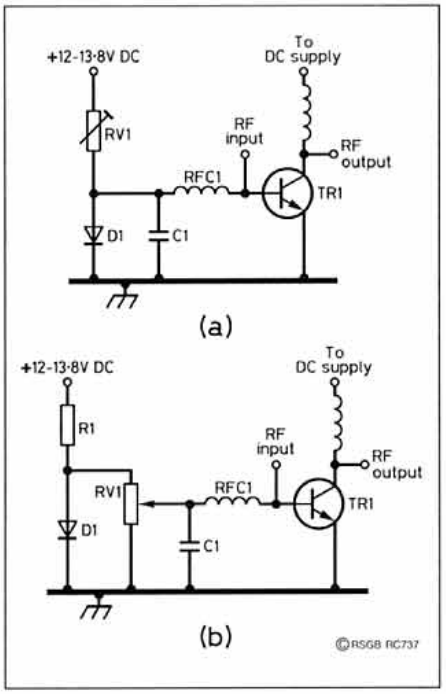

Fig 2: (a) Simplest base bias supply, with many problems. (b) Slightly better but still inadequate. C1 and RFC1 provide RF bypassing to the bias circuit; other RF components are not shown.

supply must provide. It is very important that the bias supply maintains a fairly constant output voltage, even at maximum current demand; if it fails to do that, the RF drive will bias the transistor back towards Class C, causing heavy splatter on speech peaks. Another distinctly awkward fact is that the base-emitter voltage of a transistor decreases as the transistor heats up. If the bias supply voltage remains constant, the transistor will draw more base current - and hence more collector current - when it's hot than when it's cool. More collector current means more power dissipation, which means more heat, which means more base current, which means more collector current... which can very quickly mean "goodbye transistor" due to thermal runaway. The solutions to this problem are a large, effective heatsink and a base bias supply whose output voltage *decreases* with temperature so that the PA collector current remains fairly constant.

Let's look at some typical circuits. **Fig 2** is a basic form with many variants. The voltage drop across the forward-biased diode D1 is approximately the same as the voltage drop across the transistor's base-emitter junction, and by adjusting RV1 to send the correct current through D1, the collector current in TR1 can be set to the desired value. If D1 is in thermal contact with TR1, the voltage across D1 will drop as TR1 and D1 heat up together. There are many drawbacks with this simple arrangement. The main one is that in order to maintain a constant voltage across D1, the base current drawn by TR1 can only be a small fraction of the permanent current through D1; this completely fails when peaks of RF drive create a heavy demand for base current. It also requires an enormous permanent current through RV1 and D1 - 1A or even more - which designers almost always fail to provide. Some of them even use low-current signal diodes such as 1N914s! Oh yes, and the PA standing current in this circuit also depends on the main DC supply voltage - is it 12.0V, 13.8V or what?

Fig 2 is a variant in which the bias voltage is derived using a potentiometer across the diode D1. This often fails to work because there isn't enough voltage across D1, except right at the top end of the potentiometer's travel where the adjustment is very critical. An often-attempted 'fix' is to use two diodes in series instead of D1. This will always provide enough voltage to set an adequate standing current; but the output impedance of the base bias to TR1 can be as high as half the potentiometer resistance. This means that when you apply RF drive, the base bias supply cuts off and can even be driven negative.

Fig 3 is a useful circuit that can be applied as a modification to many existing transistor PAs, up to the 10-25W level. The 7805 IC voltage regulator takes care of sensitivity to the main '13.8V' DC supply voltage, and can provide up to 1A through D1. Note that D1 is no longer a simple diode, but the base-emitter junction of a PNP LF power transistor. This functions as a diode, but a TO-220 flat-pack housing is much more convenient for bolting to the heatsink close to TR1; the collector tab is grounded and needs no insulating washer - just a smear of that white heat-conductive compound. Also note the RF bypass capacitor C2 across D1 to prevent rectification (yet another important point that the Arthur Daley School doesn't teach). R1 can be chosen in the range 10-22Ω to provide an adequate standing current through D1. Regardless of the value of R1, the voltage drop across it is always about 4.35V (5.0 minus 0.65), and

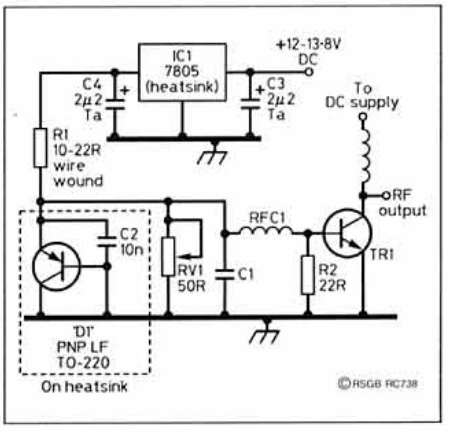

Fig 3: A useful modification for existing transistor PAs up to the 25W level (designed by G4DGU for Mutek transverters).

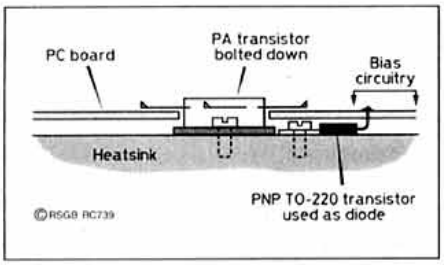

Fig 4: Use a PNP LF transistor for the bias diode (Fig 3) and bolt it to the heatsink, as close as possible to the PA transistor flange. Note corners of PA transistor tabs, bent up to aid future repairs.

when you work out the current and the dissipation in R1 you'll find that you need a hefty wirewound component. Also IC1 will require a heatsink. Unlike RV1 in Fig 2, the variable control RV1 in Fig 3 is not connected as a potential divider, but a direct shunt across D1. Decreasing RV1 will bleed more current through it, and hence reduce the current through D1. This in turn reduces the voltage across D1, and the collector current of TR1, but it does so without significantly affecting the output impedance of the bias supply. The circuit of Fig 3 gives quite comfortable adjustment of bias current without the need for a slow-motion drive on the trimming tool, and it also means that if RV1 fails completely, the standing current probably won't rise dangerously high.

Altogether, Fig 3 is quite a civilised bias circuit. But for amplifiers above the 10-25W level, you really have to stop pretending that a shunt diode regulator is any use at all, and go for an active voltage regulator with electronic feedback. This needn't be elaborate - two transistors can do the job - but it's going beyond the scope of this short piece. Look at the bias circuits for really hefty bipolar PAs, and use one of those. See references [1-4], and also the excellent Motorola Application Notes, available from many dealers and often reprinted with PA kits.

A few more notes about thermal runaway: what D1 is trying to compensate is the temperature of the PA transistor junction. This is deep inside the package, and heat takes a certain time to flow across to the diode junction of D1. Therefore D1 can never accurately track the temperature of the PA transistor junction, except over timescales of several minutes. Thermal runaway, on the other hand, can be all over within a few tens of seconds. The two essentials are a hefty heatsink and very good thermal path between D1 and TR1, which can only be achieved by using a diode or PNP transistor in a package that allows it to be bolted-down to the heatsink as close as possible to the flange of TR1 (**Fig 4**). So please can we see an end to the pathetic practice of draping a wire-ended diode across the top of the power transistor? How well can you expect heat to flow through plastic and ceramic? ("Ah, but it keeps 'em coming back for replacements," says Our Arthur...)

TIP: If RF power transistors ever need to be replaced, the large flat tabs can be very difficult to unsolder without damaging the PC board. When installing a new transistor, bend up the corners of the tabs to aid future repairs.

MORE TIPS

A THIRD HAND

We've seen this one before, but it's so useful that it deserves to be repeated. "When I first started my apprenticeship, in the drawer where all the handy bits and pieces were kept was a device called a 'Third Hand': a wooden clothes peg glued on to a 10cm square block of wood. It is really useful for holding all sorts of things, such as connectors while being soldered. I soon made one for the shack." (Nick, G0HIK)

LOOKING GOOD, SMELLING GREAT

"The black, domed cap from Lynx deodorant aerosols is an exact fit on 40mm white plastic waste water pipe (sink outlet). The cap slides over the outside of the pipe and has an inner tube which is also a slide fit on the inside diameter. With a cap fixed on each end of the pipe by a smear of adhesive it makes an excellent watertight housing and looks very professional. I've used these for dipole traps, and vertically as a dipole centre insulator with coax coiled inside the pipe to act as a choke balun. Since visiting a couple of crowded rallies this year, anything that encourages amateurs to purchase deodorant has got to be a good thing!" (Malcolm, G7SGF)

RF FEEDBACK INSIDE HF RIGS

THERE IS RF FEEDBACK via the audio input/output port of my HF rig when the data modem is plugged in. How can I cure it?

IT'S A COMMON PROBLEM, usually detectable by faint croaking sounds from the loudspeaker when on transmit, or similar sounds and severe audio distortion when you listen to the transmitted signal on a separate receiver. There seems to be no single universal cure, but the easiest way to begin is by winding several turns of the audio lead around a large ferrite ring, close to the HF transceiver. If that doesn't cure the feedback, check whether the audio input/output socket you're using is grounded directly to the case of the transceiver. I found RF feedback in an FT990DC whenever the extension speaker lead was plugged in. It turned out that the jack socket was deliberately not grounded to the case of the transceiver, and that the shielded lead only found its ground deep inside the rig. This practically invites RF feedback since the screen of the coaxial lead will conduct and radiate RF inside the case. A ferrite ring on the external lead didn't do much, but grounding the socket to a nearby screw was a complete cure. Presumably these sockets were left ungrounded for a reason; perhaps to prevent hum loops or pickup of noise from an internal switch-mode PSU. However, hum loops depend a lot on local circumstances, so you may be lucky and find that grounding the socket cures the RF feedback in your rig without any unwanted side-effects.

If you do find hum or noise due to grounding the socket to the case, try using a bypass capacitor of 1-10nF instead. This may ground the socket to RF without creating a loop at lower frequencies. An alternative, suggested by G3NYY, is that if a ferrite ring or grounding the socket fail to do the trick, make small chokes by winding fine, enamelled wire through ferrite beads. Connect these in series with each conductor in the audio lead, inside the DIN socket or as near as possible to the point where they enter the HF rig. If this works and there's space immediately behind the multipole socket, you could fit these chokes permanently inside the rig [3].

REFERENCES

[1] Guidelines for the design of semiconductor VHF power amplifiers, by John Matthews, G3WZT, *RadCom*, September and December 1988.

[2] A single-stage linear amplifier for 50MHz, by John Matthews, G3WZT, *RadCom*, June 1986.

[3] *The VHF/UHF DX Book*, Chapter 8 (obtainable from RSGB).

[4] In Practice: Heatsinks, by John Nelson, GW4FRX, *RadCom*, October 1989. ♦

CONDUCTIVE GREASE FOR ALUMINIUM

HAVE SEEN SEVERAL mentions of using conductive grease or paste when assembling aerials, but no mention of brand names or where to buy them.

WHEN JOINING SECTIONS of aluminium tubing in antenna elements and other situations where a good electrical joint is necessary, you always need to clean both metal surfaces very thoroughly with sandpaper or steel wool, and then clamp them tight together. But it's also very helpful to use some kind of conductive grease which both promotes electrical conduction and protects the surfaces from longer-term corrosion. 'Penetrox' is supplied with Moseley antennas and is known to work well under UK conditions. It contains zinc particles in a grease-like base and is available from Eastern Electronics (01692 650077) at £7.95, incl. VAT and P&P, for a small sachet.

Fortunately, a very little goes a long way, and one sachet would be enough to assemble up to three triband beams. Where possible, also cover the joints between aluminium antenna sections with self-amalgamating tape - or at least PVC tape - for additional protection against the weather.

IF YOU HAVE NEW QUESTIONS, or any comments to add to this month's column, I'd be very pleased to hear from you by mail, packet or E-mail (see head of column). But please remember that I can **only** answer questions through this column, so they need to be on topics of **general** interest.

Pat Hawker's Technical Topics

PAT HAWKER, G3VA
London 37/SE22 8SS

SOLAR FLARES - PREDICTING EFFECTS?

IT APPEARS THAT an improved model has been created into the way that solar flares interact with the Earth's magnetic field and affect the ionosphere. The model stems from Ashok Kumar and David Rust of Johns Hopkins University, Baltimore, USA, as reported by Kurt Kleiner in the *New Scientist* (17 June 1995, p21, 'A twist in the tale of magnetic storms').

It is suggested that Kumar is able to make accurate predictions about the temperature, shape, strength and orientation of the storms originating on the surface of the Sun, where filaments of twisted magnetic fields are generated. But although most of these filaments, carrying trapped hydrogen gas, spread out into space, as shown in **Fig 1**, only a few come close enough to Earth to interact with its magnetic field, affecting radio communication and sometims even damaging electrical power transformers and space satellites.

Because of the frequent 'disturbances' to HF propagation, it seems worth reviewing briefly some of the fundamentals of solar flares as outlined in a recent survey paper 'The effect of solar and geomagnetic activity on ionospheric propagation' by Jed A Sutton (University of Maryland) resulting from work while assigned in 1994 to Voice of America (*IEEE Transactions on Broadcasting*), March 1995, pp28-33).

This points out that the solar flare is the phenomenon which causes the most direct disturbances in the ionosphere, representing an explosive release of energy and particles within a relatively small region of the solar atmosphere. Radio communication may be affected immediately after the flare or this may not occur until one or two days after the onset of the flare: see **Fig 2**.

By convention, solar flares are divided into three classes: C, M and X depending on the amount of X-ray energy flux associated with it. A C class flare is the least poweful and does not immediately affect the ionosphere, although the particles from it may disturb the ionosphere several hours later. The flux of M class or X class (the most powerful) flares is sufficient to disturb the ionosphere immediately following a flare as well as producing delayed effects from solar particle radiation.

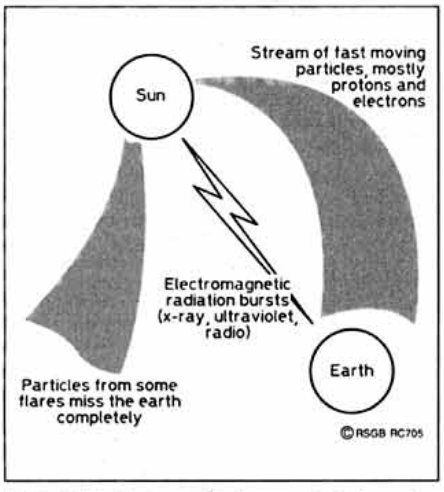

Fig 1: Solar flares emit streams of fast moving particles, mostly protons and electrons that later impact on the Earth's magnetosphere and result in geomagnetic storms, but the emissions from the flares may miss the Earth completely so that they produce no delayed effects on the ionosphere. The electromagnetic radiation from flares reach the Earth's ionosphere with the speed of light and if severe can cause the complete black out of HF signals

Level	A-index	Potential for impact
Quiet	0 - 7	Low
Unsettled	8 - 15	Low
Active	16-29	Moderate
Minor storm	30-49	Moderate
Major storm	50-99	High
Severe storm	>100	Very high

Table 1: Levels of Geomagnetic Activity

k-index	0	1	2	3	4	5	6	7	8	9
A-index	0	3	7	15	27	48	80	140	240	400

Table 2: Conversion from k-index to the A-index.

Electromagnetic radiation from an active flare - ultraviolet, X-ray, visible light and radio noise - all reach the Earth's ionosphere with the same delay of 8.3 minutes so that disturbances to the ionosphere from an X flare may begin at the same time as the flare is observed visual. This may result in ionospheric disturbances to HF and noise bursts on VHF and UHF. Another 'instant' effect of a major solar flare is the 'sudden ionospheric disturbance (SID)' also known as a 'short wave fade (SWF)', resulting from a large increase in the absorption of the D-layer. An SID may block out virtually all sky-wave signals over a large part of the HF spectrum and produce a severe black out of HF signals (particularly on the lower frequencies). Since SIDs and SWFs are caused by intense bursts of X-rays, they occur only on the daylight side of the globe. During an intense SID, an operator may span through many MegaHertz without hearing a signal!

Particle radiation, made up mostly of protons, causes the ionosphere, and hence HF signals, to weaken or disappear entirely on some paths and may result in multiple delayed effects including polar cap absorption (PCA), magnetic storms, visible auroras, and ionospheric storms. PCA results from an increase in enhanced ionisation of the D-region. Magnetic storms cause a fluctuation in the Earth's geomagnetic field which in turn causes ionospheric storms which limit ionospheric propagation. Magnetic storms may also result in auroras which may or may not be visible as far south as the UK but provide changes in the conductivity of the air and result in the reflection of radio signals up into the UHF region.

The energetic stream of charged particles, mainly electronics and protons, are carried through the solar wind towards Earth, increasing the velocity and composition of the solar wind. These take one or two days to reach the Earth's ionosphere where they may cause similar effects to the faster-moving high energy particles noted above. It may take several days (and nights) for the ionospheric layers to return to normal.

Ionospheric storms cause the lowest usable frequency (LUF) to rise and the maximum usable frequency (MUF) to fall, narrowing the spread of frequencies on which communication may be established. A band which may be wide open on undisturbed days may be devoid of sky-wave signals during disturbed days, or received only very weakly. Thus, from one day to the next, the MUF may vary by some 15% regardless of the mean sunspot level. A primary means of defining the disturbed days is the A-index (**Table 1**) which is related to the commonly used K-index as shown in **Table 2**.

As noted by Jacobs and Cohen: "With few exceptions, the higher the value of solar flux and the lower the level of magnetic activity, the better will be ionospheric propagation conditions on the HF bands."

The variation of conditions from day to day shows a strong correlation with solar and geomagnetic activity with the MUF dropping significantly on disturbed days. Unfortunately, it has always been difficult to tell how strong the magnetic storm will be and how it will be orientated in relation to the Earth's magnetic field - information critical to predicting how severe the effects will be.

To return to the recent work at Johns Hopkins University,

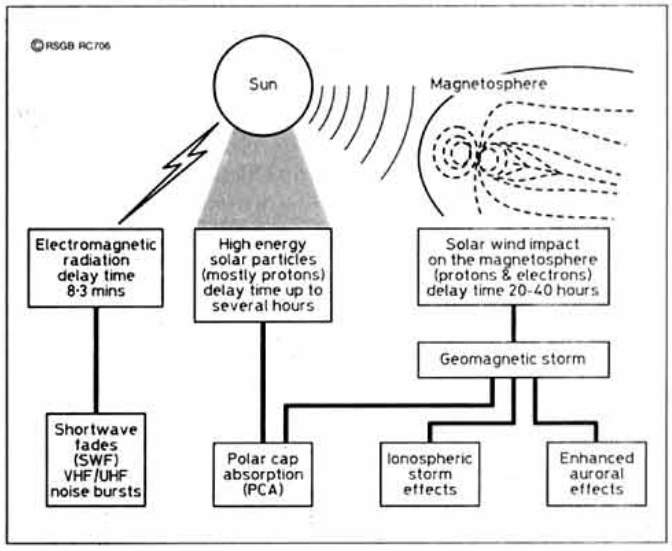

Fig 2: Effects on the ionosphere that are caused by solar flares and related activity on the Sun.

the new model tackles the problem by assuming that the magnetic storms conserve their original 'twist' in space. When filaments originate on the surface of the Sun they form helices; those formed on the Sun's northern hemisphere twist to the right. By assuming that the direction of twist stays the same as the storm travels through space, Kumar is able to make more accurate predictions. It is claimed that such predictions could be used to warn when to take steps to protect satellites in space and power transformers on the ground. They could also help warn astronauts working in deep space, outside the protection of the Earth's magnetosphere plus, of course, better information on likely affects on radio communication.

During May, June and July, 1995, there was plenty of confirmation of the theory that Sporadic E occurs most frequently and most pronounced during the mid-months of low sunspot years. While such conditions are welcome to VHF operators on 50, 70 and occasionally 144MHz, it seems seldom mentioned that the effects are also pronounced on the bands from 14 to 28MHz, bringing in strong European and inter-G/GM/GW signals on these bands even in sunspot minimum years, but also tending to blanket out completely or severely weakening the DX signals that would normally be expected on 14 and 18MHz. Sporadic E is thus a mixed blessing for HF operators.

SEEKING BETTER BATTERIES

JUNE'S *TT*, p70, reported how the search for improved batteries has encouraged the current development of new types of lithium rechargeable 'rocking chair' polymer cells which could be in production later this year. However, this is only one of several recent developments in better batteries, some of which - such as nickel-metal hydride rechargeable batteries - are already available and gaining an increasing share of the market formerly dominated by nickel cadmium (NiCad) batteries. At the same time, new developments in one of the oldest forms of cell - the zinc-air cell - promise to minimise the problem that once these cells are put into use there is a rapid rate of self-discharge.

Two useful survey articles in the American publications of the IEEE discuss the widening range of rechargeable cells available for use in such applications as hand-held transceivers and consumer appliances. One of the pressing reasons for this spurt of research interest in a mature and 'unfashionable' branch of electrochemical products is the laptop computer which often imposes a load of some 10W on the battery, with the result that a typical NiCad battery provides only about two hours of operational use without recharging (take advertising claims of about double this figure with a pinch of salt).

Michael J Riezen-man, a senior editor of *IEEE Spectrum* (May 1995, pp51-56) writes of "the Search for Better Batteries" stressing that "to handle small, power-hungry electronic systems, researchers are exploring air and lithium electrodes and solid electrolytes". An invited paper 'Batteries for Low Power Electronics' by Robert A Powers appears in *Proceedings of the IEEE* (April 1995, pp687-693). Both provide information on the new generations of batteries at a thoroughly practical level, and the following notes are based on them. See **Table 3**.

It is made clear that the small rechargeable battery market is experiencing a near 20% growth rate fuelled by the explosion in cellular phones, portable computers, camcorders and entertainment devices all of which require more power than can be provided economically by primary cells. The most rapid growth is for nickel-metal hydride and lithium-ion types, with a promising future for lithium-polymer batters when these reach the market. However, there have also been useful developments in most types.

Several new constructions have appeared for small sealed lead acid cells. Small cells about the size and shape of a pack of chewing gum in 1-2Ah capacities are being marketed. These offer about 200 cycles of life at discharge times as short as an hour (1C), with larger sizes being offered to power notebook computers. They offer the attraction of relatively low initial cost, low self-discharge, and can cope with relatively heavy loads. It is stated that small cylindrical sealed lead-acid cells are under development which can be charged and discharged in as little as 10 minutes.

The most common type of small rechargeable battery for electronics remains the NiCad battery, with over 1000-million produced worldwide in 1993. Major improvements have been made recently in energy density resulting from both better electrodes and better packaging. A small 'AA' NiCad cell can now have a capacity of 800-850mAh, compared to 500mAh only a few years ago and some have passed the 1000mAh mark. NiCad cells are capable of being charged and discharged in 10 minutes or less (ie a rate of 10C rather than the usual 1/10th C) and remain attractive for power tools. A prime objection to nicad cells is the bad environmental reputation of cadmium with the result that some manufacturers have initiated the collection and recycling of expended nicad batteries.

To eliminate cadmium, the nickel-metal hydride cell was first marketed around 1991 and now accounts for more than 10% of the nicad market. Metal hydride is the result of incorporating hydrogen ions and electrons or hydrogen into a metal or alloy. In addition to overcoming the environmental problem of cadmium, the hydride electrode increases capacity for the same cell size. AA cells with a capacity of 1200mAh are on the market and this is expected to rise soon to around 1600mAh. However, self-discharge is greater than for nicad cells; rate capability (2C) and performance at low temperatures are poorer. Proper charging is even more critical than for standard nicad cells with 'smart charger' chips built directly into some Ni-MH batteries. The main thrust for Ni-MH battery research is for large-capacity batteries for electric vehicles.

Lithium rechargeable batteries have had a rather chequered history. A considerable number based on solid lithium anodes with various liquid organic electrolytes have been announced but only one (Li-MoS2) was put into production and later withdrawn due to safety problems. However, for the lithium ion battery, the solid lithium anode is replaced by a carbon material which stores electrons and lithium ions on charge and gives them up on discharge. Similarly, the cathode consists of an oxide which can store electrons and lithium ions on discharge and give them up on charge. Thus there is no lithium metal. Up to 1200 recharging cycles can be achieved with none

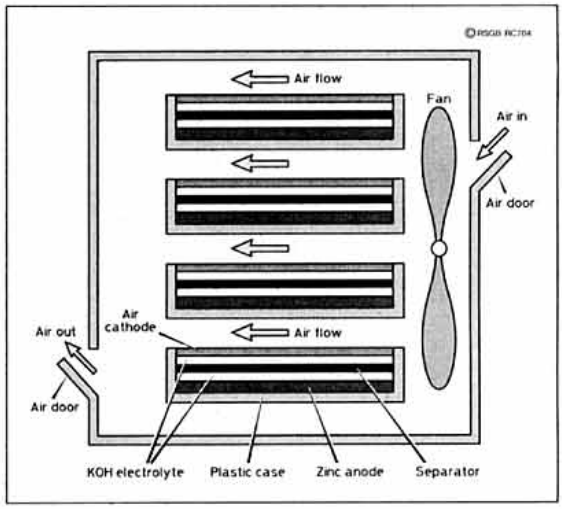

Fig 3: Air-management schemes are regarded as critical for the successful operation of modern zinc-air batteries. When no current is being drawn, the air doors seal the battery from the ambient air and so greatly reduce the self-discharge rate - the old bugbear of this type of battery.

Cell type	Nominal Voltage (v)	Energy density (Wh/L)	Power density (W/L)	Self discharge (% per month)	Cycle life	Comments
Lead-acid	2.0	70	<400	4-8	250-500	Lowest cost
Nickel-cadmium	1.2	60-100	220-360	10-20	300-700	May exhibit memory effect
Nickel-metal hydride	1.2	220	475	30	300-600	Possible slight memory effect
Lithium-ion	3.6	260	400-500	5-10	500-1000	Intrinsically safe; no metallic lithium
Lithium-polymer	3.0	150-350	>350	<1	200-1000	Not yet on market contains metallic lithium
Zinc-air	1.2	204	190	<5	<200	Requires air manager to limit self discharge

NOTES

Cycle lives are strongly dependent on how the battery is treated. Lithium-ion cells with petroleum coke anodes drop from about 4.0V to about 3.0V fairly linearly as they go from fully charged to fully discharged. Figures for lithium-polymer cells are predicted (and pre-date the announcement of Ultralife cells). Power density figure for lithium-polymer cells apply at full charge and will drop as cell is discharged. Ni-MH data apply to 2.9Ah 4/3A cells of the kind made by Duracell and Toshiba. Zinc air data are for a cell that Zinc-Air Power is about to use in a prototype battery for electric vehicles.

It should be emphasised that these figures give at best only a rough idea of how the technologies compare.

(Source: abridged from a table in *IEEE Spectrum*, May 1995, p56).

Table 3: Comparison of some rechargeable batteries.

of the safety problems associated with high area lithium deposits. Operating voltage is 3.6V per cell so that one lithium-ion cell can replace three nicad or NI-MH cells. Strict control of charge and discharge is required for both safety and long cycle life, preferably with 'smart charger' chips in control.

Rechargeable lithium-ion cells using lithium cobalt oxide as the cathode were developed in Japan and marketed in 1991.

Initial energy density was 180Wh/L but this has risen to about 330Wh/L depending on cell size and construction, with a target of some 360Wh/L. Apart from the large production capacity in Japan, all major battery companies in Europe and North America intend to introduce such batteries. A potential problem is the availability and cost of cobalt with the result that many firms are researching lithiated oxides of nickel and manganese which also reduce environmental problems.

Rechargeable lithium polymer electrolyte cells using a solid polymer as electrolyte are also attracting considerable research effort, offering high speed production using web equipment, thin flexible cells, safety, shelf life and energy density. One of the major difficulties is the low conductivity of the electrolytes when at room temperature; even for very thin layers a temperature of some 60°C may be required to achieve a reasonable current. In some cases an organic solvent is added to the polymer but this reduces cycle life and introduces the safety problems of liquid electrolytes.

The answer appears to be in combining the electrodes of the lithium ion cell with highly conducting polymers and this appears to be the approach adopted in the Ultralife Battery described in June's *TT* (p70). Performance has still to be assessed in practice since no batteries of this type are yet on the market.

Other forms of rechargeable cells listed by Robet Powers include:

- Solid lithium anode cells using a solid lithium anode and a manganese dioxide cathode with a patented electrolyte which becomes nonconductive if the cell is abused by overcharge, cell reversal or overheating (not yet on the market).
- Secondary Zn-Manganese dioxide cells. Rechargeable alkaline manganese dioxide cells were marketed in the 1960s but proved unable to recover from deep discharge and had poor cycle life. These problems appear to have been overcome in a range of units marketed since 1993 in the USA under the 'Renewal' trademark with which special 'smart chargers' must be used; cycle life is put at 25 cycles by which time capacity is halved. Construction is similar to standard alkaline-manganese primary cells and cost is relatively low but power density lower than nicad although self-discharge is also lower. Initial capacity is better than nicad although less than for primary alkaline cells.
- Secondary Zinc-Air cells. A rechargeable zinc-air battery has been announced by one company intended for portable computers based on a patented 'bifunctional' air electrode and an air management system. Energy density at 170Wh/L similar to Ni-MH batteries but energy per unit weight more than twice as much (about 155Wh/kg). Claimed cycle life of 50-plus cycles with 100 as the objective. Zinc-air primary cells have been around for very many years and the rechargeable version is basically similar. Both have a zinc negative electrode, a potassium hydroxide electrolyte, and a carbon positive electrode which is exposed to the air. The difference is that the oxygen electrode in the rechargeable cell allows the reaction to be reversed. Not only can it absorb oxygen from the air and convert it into oxygen ions but also evolve oxygen while the battery is being charged. Air management schemes (**Fig 3**) are needed to cope for the increase in volume that occurs when the zinc is oxidized and also to restrict or completely block the air flow when little or no energy is being drawn, vastly reducing the self-discharge which occurs with the older forms of primary zinc-air cells. (see **Table 3**).

SAW VCOS ABOVE 120MHZ

THE USE OF a surface-acoustic-wave filter to provide a VHF voltage-controlled-oscillator is described by Di Paolo Franco (Ericsson Fatme, Rome) in an item in *Electronics World + Wireless World* (July 1995, p580), reprinted from EDN's Designer's Companion. It is pointed out that SAW filters are now available from US, European, and Japanese manufacturers in an increasing range of frequencies and styles at a cost in the region of £20. Di Paolo Franco states: "They permit the direct implementation of VHF and UHF high-stability oscillators without the doublers or triplers needed with crystals, and with a wider pulling range."

Fig 4 shows an VCO based on a Siemens 180° phase-shift SAW filter with a free running frequency of 140MHz. A VCO suitable for use with a 0° phase-shift filter is also described. The operating frequency is solely dependent on the centre frequency of the SAW filter and with suitable filters can be as high as 1000MHz.

Drawing about 20mA from a 5V supply, the oscillator has a pull range of nearly 500ppm when the control voltage of the BBY31 varactor diode is varied by 4V. It provides an output of about 600mV pk-pk output into a 50Ωload. It is claimed that all harmonics are at least 25dB below carrier and has a temperature variation of about 100ppm in the free-running mode. While the stability is rather less than with a crystal oscillator, SAW filters are available with centre frequencies starting at 120MHz to more than 1GHz. The SAW filter is the only expensive component.

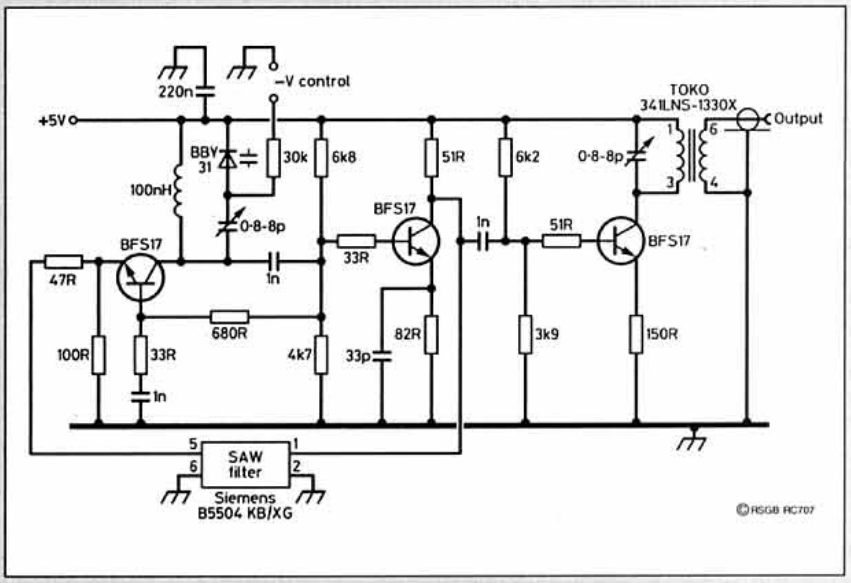

Fig 4: Voltage-controlled oscillator based on a 180° phase shift SAW filter with a free running frequency of 140MHz. SAW filters with frequencies up to about 1GHz are available.

SEALING COAXIAL CABLES

DAVID APPLETON, ZL2DA, was surprised to read recently in both *TT* and *In Practice* that some amateurs still recommend or use glues and sealing compounds to waterproof coaxial connectors.

He writes: "Equally surprising to see are antenna designs that use open-ended coaxial connections, joined directly to antenna elements. Admittedly, RTV silicone sealer is certainly valuable in some applications, such as the waterproofing of coaxial cable terminations on mobile antenna bases. In this application, I have seen no signs of corrosion problems with hundreds of mobile antennas, throughout the past 20 years.

"But surely, anything other than temporary, experimental antennas warrant a well-engineered cable-to-antenna junction. Good quality coaxial cable is not cheap and, as many amateurs have discovered, water gaining access at the antenna junction soon appears at a lower point, even in the shack. Air-spaced cable functions quite well as a miniature drainpipe, with the wet braid soon decaying and the cable rapidly becoming severely degraded.

"While it is not too difficult to craft a weatherproof and mechanically reliable dipole centre-piece (see, for example, February's *TT*, p70 - G3VA) or Yagi connection box, using modern plastic mouldings or boxes, some

may prefer to purchase such items. For example, SMC has, for many years, retailed reliable and relatively low-cost dipole units that have an S0239 connector moulded into them.... I have used these in both a tropical environment and in high-UV light zones, without problems.

"Self-amalgamating, butyl-rubber insulation tape has, for more than 20 years, eliminated any need for sealing coaxial connectors with glues, etc. If applied as directed, such tape makes a completely water-proof and UV-light resistant moulding that can easily be removed with a sharp knife. This tape is clean and easy to use, provides an instantly effective joint sealer and remains flexible. Protected by such tape, coaxial connectors remain in new condition indefinitely and can be re-used, if required.

"There is nothing more annoying than antenna failure during a very wet day, especially if a gale happens to be blowing, and that is just when shoddily made antenna connections will fail."

LOW-DISTORTION, CONSTANT OUTPUT AF PRE-AMP

IN MAY'S *TT* I revisited the parametric up-conversion mixer which, some 25 years ago, Walter Schreuer, K1YZW/G3DCU (ex VK2AWU), had described in *TT*. This came to his notice and writing from Ipswich, Mass, he admitted to being pleased at being remembered. One of the other items in May's *TT* that interested him was the AC audio pre-amp developed by Dave Miller, N9ZE, for such applications as providing a constant level signal to a DSP filter or TNS.

He writes: "Many years ago in the late 1970s when developing the VOMAX speech processor, I had need for a constant output pre-amp with extremely low distortion. This was needed to make the device idiot-proof and ensure constant 12-15 dB of compression on SSB. Any distortion produced in the pre-amp in such units can, in some cases, be amplified by the same 12-15dB. The schematic of the AGC section of the VOMAX unit is shown in **Fig 5**.

The device uses a P-type FET to control the gain of the gain of IC2 (one section of the quad op-amp type LM324). As is well known the distortion caused by non-linearity of a FET can be greatly reduced by negative feedback. The two 470k resistors at the gate of the E177 FET achieve this nicely. Manual gain control is easy; the green LED should light frequently, the red one only occasionally. Distortion is low at inputs 10dB above the red LED threshold; however, background noise may be excessive. If the indicators are not needed, omit op-amps 4, 5 and 6 and the associated components".

The VOMAX SBP-4 low distortion, SSB compatible speech processor was designed to overcome the problems associated with applying considerable compression to an SSB signal, increasing the 'talk power' by as much as 10 to 12dB. It seems to have adopted the technique - as used for the professional LINCOMPEX system developed by Post Office Research and Bell in the 1960s and also by the original Dolby noise reduction system - of dividing the audio spectrum into four separate channels and processing each channel independently. It was, like a clipper, an instantaneously acting peak limiter, yet its distortion was very low.

As outlined in **Fig 6**, the original audio frequency spectrum is amplified, level detected, AGC controlled and passed through four branching pre-limiter active band-pass filters. The split band signals are limited to reduce the voice peaks by 16dB, fed through the post-limiter band-pass filters to remove the distortion products produced by limiting or clipping. The signals are combined in the phase equalizer section and connected to an exciter via a 3-wire (PTT) cable. This approach was claimed to provide very sharp cut off below 400Hz and above 2400Hz at an increase 6-12 dB of 'talk power' depending on the nature of the difficulty, ie noise, fading, interference, etc of the communications link.

MODERN RECEIVER DESIGN

THE 1994 SERIES of articles in *QST* by Dr Ulrich Rohde, KA2WEU, continue to attract comment. Henry Rech, writing from Victoria, Australia to the Technical Correspondence feature of *QST* (June 1995 pp73-74) endorses the view that the second-order intermodulation distortion (IMD) of a receiver is an important but often neglected characteristic of the signal-handling capabilities of modern receivers. In particular, he stresses the need for better pre-mixer RF selectivity than is usually provided in current receivers too often based on low-pass, octave or sub-octave filters.

He writes: "I believe the trend to broadband, sub-octave front-end filters in particular - and wideband filters in general - to be the most deleterious development in receiver design in many years... It is sometimes difficult to believe that receiver manufacturers in general have succumbed to this trend and do not have the design skills to implement satisfactory narrowband-filter tracking schemes, mechanical or electrical. Perhaps their consideration is the usual one of cost against efficacy. It appears to me that front end performance is (now) almost subsidiary to the

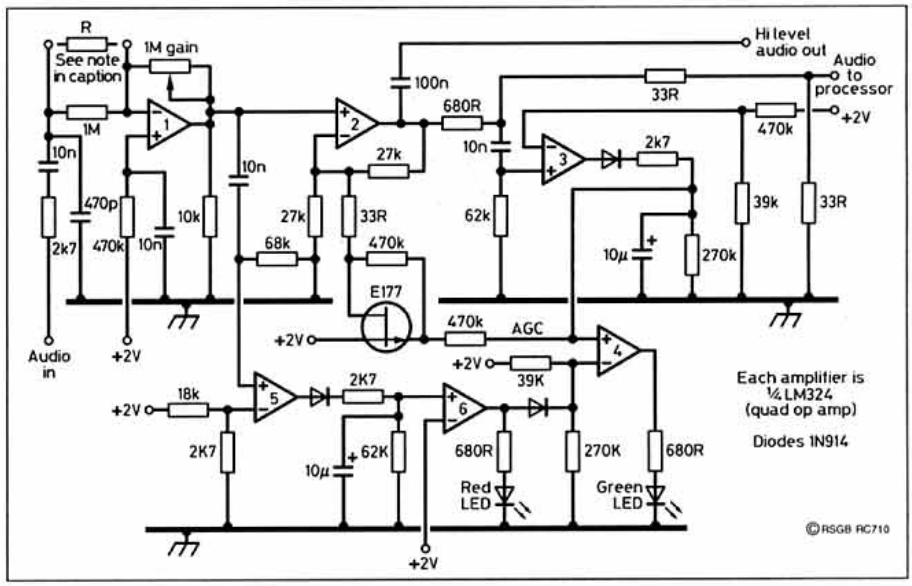

Fig 5: The audio pre-amplifier with AGC and low distortion that formed a part of the VOMAX model SBP-4 SSB speech processor developed by Walter Schreuer in the late 1970s. For high-Z microphones omit resistor R. For low-Z types R should be 120k. Input for Green LED to turn on 12mV pk (for low-Z input 2mV pk). For Red LED to turn on 90mV pk (for low-z input 15mV pk). Power for SBP-4 10-16V DC to ground, 40mA. Ripple less than 50mV p-p.

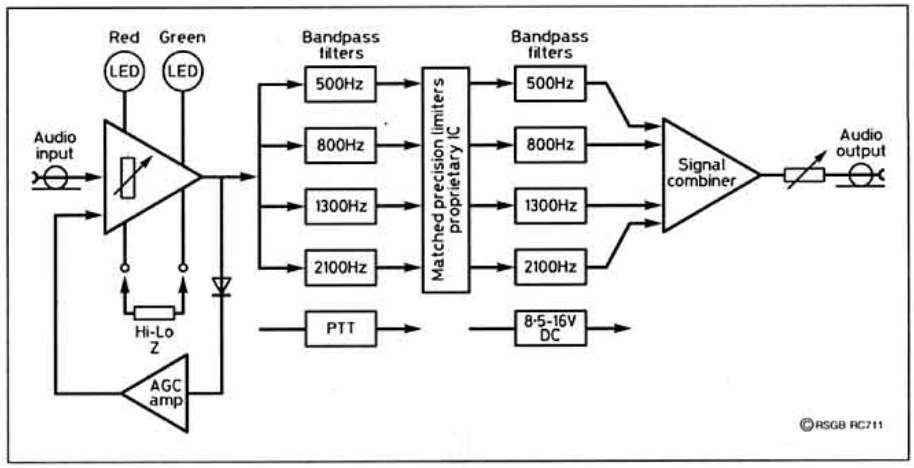

Fig 6: Functional block diagram of the VOMAX unit Model SBP-4 with split band processing designed to cause less IMD and distortion than RF type speech processors, providing a talk-power gain of some 10dB with low distortion.

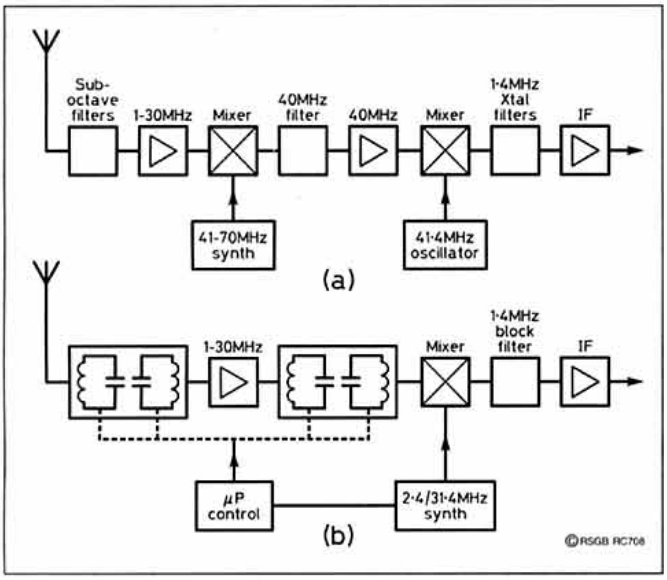

Fig 7: (a) Representative outline of the front-end of typical professional communications receivers of the 1980s using a frequency synthesiser and up-conversion to a first IF of 40MHz. (b) The 'ideal' single-conversion front-end proposed by R A Barr in 1981-2 and implemented in a Rediffusion (Redifon) receiver of that era. It used four ganged-tuned RF circuits to provide good pre-mixer selectivity and is 'ganged' to the frequency-synthesiser by means of microprocessor control.

development of rear-end 'bells and whistles' eg, DSP magic boxes. Front-end narrowband filters would go a long way to ameliorating the ills of modern receivers."

He reminds us that while it is generally claimed that sub-octave filters mitigate the problem of second-order IMD, this is correct (only) to the extent that they have very steep skirts; since otherwise they may not be sufficiently selective to reduce troublesome out-of-band signals. "Remember, too, that second-order IMD begins to appear at lower input levels than third-order IMD."

Henry Rech also points out that wideband front-end filters have a deleterious impact not only on the large-signal-handling capacity of receivers but also on the noise performance which comes about by the mixing of strong in-band, extra received-channel signals with the noise 'sidebands' of untuned RF amplifier and mixer stages, such that the mixed products fall within the wanted channel, increasing the noisiness of receivers - an important consideration on the higher frequency bands. This, he stresses, is in addition to, but very much related to, reciprocal mixing, which is a phenomenon related to the local oscillator sideband noise.

He is not happy with the present practice of describing receiver performance in terms of dynamic range, intercept points and MDS (minimum detectable signal). He writes: "I have always found it curious that a fictitious number (the intercept point) is so used. It might be better to characterise the second and third-order IMD performance by reporting the input-signal level at which the IMD products appear (at some defined level) above the noise floor. This would reinforce the notion that the intercept point is fictitious, and - more relevantly - reinforce the notion that the post-compression-point characteristic of a given receiver is more important than the intercept point. This is because receivers being compared may have similar intercept points, but completely different compression characteristics. Similarly dynamic range is an ambiguous calculation. Being the arithmetic difference between the MDS and the blocking level, of itself it does not allow one to tell whether the particular receiver is either particularly good at weak-signal reception, strong-signal reception or both. Two receivers with similar dynamic range may be totally different receivers."

While it is probably too late to change the present methods of specifying receiver performance, the points made by Henry Rech about the benefit of having narrowband RF tuned filters that are tracked with the local oscillator echo comments made a number of times in *TT*, dating from the report (*TT*, October 1981) of a classic paper presented by R A Barrs of Rediffusion Radio Systems at a 1982 IERE conference ('A reappraisal of HF receiver selectivity', *The Radio and Electronic Engineer*, vol 52 no 7 pp315-320, July 1982) in which he advocated a front end selectivity on the signals applied to the mixer of the order of -37.5dB at five per cent off-tune, and -20dB at 2.5per cent. **Fig 7** shows the differences between the front-ends of a typical modern professional receiver, with up-conversion and sub-octave mixers, and the approach advocated in1981-2 by R A Barr using four mechanically tuned RF circuits ganged to the frequency synthesiser by means of microprocessor control.

He noted that the configuration shown in **Fig 7 (b)** achieved and bettered the pre-mixer selectivity specification given above using four tuned circuits each with a working Q of 30 to 40. He admitted that such an arrangement, requiring a matching accuracy of the tuned circuits of about one per cent over the tuning range is difficult, and very expensive, to achieve. This is one reason why so much effort has been put into improving the performance of packaged doubly-balanced mixers of which G3SBI H-mode mixer (*TT*, October 1993, correction November 1993) has unquestionably advanced the state of the art. However, as noted in the early 1980s, premixer selectivity can be added to existing receivers with an external, low-gain or no-gain pre-amplifier provided that any devices used are capable of handling strong signals. A possible arrangement would be to use a Cohn tuneable three-pole minimum loss filter of the type suggest by William Sabine in 1970 for use as a roofing filter in double conversion receivers; **Fig 8.**

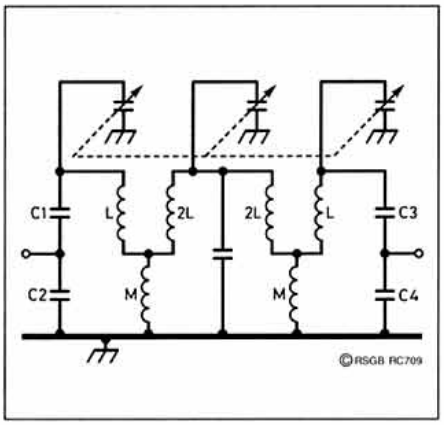

Fig 8: The Cohn tuneable three-pole minimum-loss RFor IF bandpass filter can provide a high degree of selectivity before a first or second mixer. Ratios C1/C2 and C3/C4 govern input and output impedance matching.

In July's *TT*, I quoted Dr Rohde's suggestion that "the best way to avoid switching-diode IMD is to switch the filters with relays instead of diodes, and military and commercial gear generally take this approach".

Harry Leeming, G3LLL, strongly disagrees, at least as far as amateurs are concerned. He writes: "Relay switching is the ultimate example of excellent new performance but poor long-term reliability.

"In the receiver RF chain, the average transceiver has one antenna change over relay. On average it goes intermittent and needs the contacts cleaned or replacement once every five or ten years. Fit 12 and the chances are that at least one would need attention every year!

"A prime example of this is the FT102. When this rig first appeared I thought it was the best thing since sliced bread, but with six relays in the RF signal switching chain, the trouble with intermittent problems has been horrendous (particularly when operated by smokers). On average, for smokers, a new set of relays is needed about every two years; for non-smokers about 2-4 years.

"Professional equipment gets heavy use and is only expected to have a lifetime of a few years and may have expensive non-oxidising relay-contact materials such as gold. Amateur equipment is built to a cost, used intermittently and expected to last some 20 years.

"Again, for relays that switch DC or the volts of the transmit signal there will be few problems of oxidation since this will be broken down. It is a different matter with the microvolts of RF signal which need absolutely clean contacts. Putting loads of relatively inexpensive relays into the RF chain is virtually certain to be a major cause of unreliable operation after a few years. If you want to avoid switching diodes, how about a good rotary wave-change switch with rotary self-cleaning contacts. New ideas are not always the best!

TT FEEDBACK

July *TT*, Fig 6. The insertion loss scale should be 0 to 9dB *not* 0 to 0.9dB as shown. Note this greatly increases the power loss in ATU networks! The efficiency formula should be:

$$\eta = \frac{Q_{UNLOADED} - Q_{LOADED}}{Q_{UNLOADED}}$$

July *TT*. G3ROZ's 32-page details for modifying the KW2000 series can be obtained from G3VA (QTHR) and not from G3ROZ. £2 covers the cost of copying and postage. ♦

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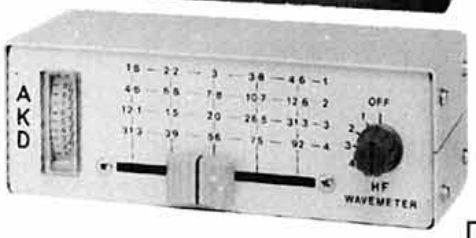

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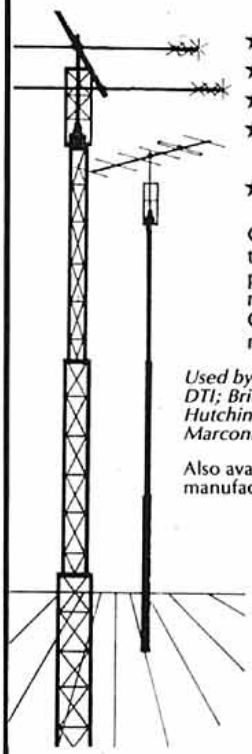

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RADCOM EQUIPMENT REVIEW

The Miniature CommSlab µ-Modem

Reviewed by Roger J Cooke, G3LDI*

POLICEMEN are getting younger and modems are getting smaller. This is becoming more noticeable as I get older! There is a price to pay for the progress of technology, however. My focal length is gradually increasing and I can barely read the printing on small resistors and capacitors. I suppose I should swallow my pride and get an eye test!

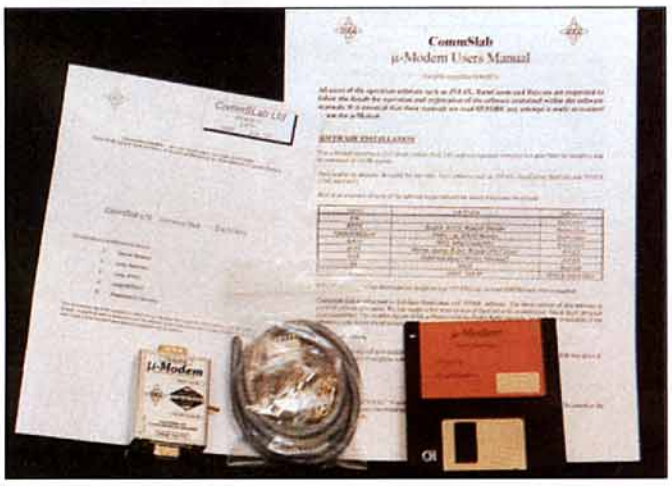
The µ-Modem is an all-mode device which is built into a robust aluminium case no larger than a matchbox. There are two 9-way D-type connectors, one for connecting to the RS232 port of the computer and the other for connecting to the transceiver. The modem comes complete with leads and a full set of software. The modes of operation covered are: ARQ AMTOR, FAX, CW, RTTY, SSTV, ASCII and PACKET.

Professional surface mount technology is used in the construction and there are two audio level controls, one for packet and the other for non-packet modes, accessible on the side of the unit. They are miniature trimmers, one either side of a miniature toggle switch to select packet or non-packet modes. The unit contains a 1200 Baud modem and a comparator converter / low pass filter for reception and transmission of AFSK signals. It is specifically designed for use with software such as HamComm, JVFAX, as well as packet programs such as BayCom and TFPCX (TNC Emulator).

Currently, CommSlab have the authority to supply the latest versions of HamComm and JVFAX and these are included on a disk. Permission is being sought to supply an English version of Graphic Packet. This would be ideal for a first time user.

The only minor criticism I would make is that after a period of constant plugging and unplugging, D-type connectors have a habit of working loose. It would have been perhaps prudent to mount the sockets using posts to allow the plugs to be fixed more securely.

*The Old Nursery, The Drift, Swardeston, Norwich NR14 8LQ.



The µ-Modem, cables, software and manual.

THE MANUAL

IT IS NOT SO much a manual as a leaflet, but the information contained therein is quite comprehensive. There are two leaflets, the first one contains the installation information, both for the hardware and software.

The hardware installation consists of the connections to the transceiver port of the modem. These are:

Pin 1: RX audio at a level not greater than 100mV.

Pin 2: TX audio (mic) - level adjustable by a trimmer.

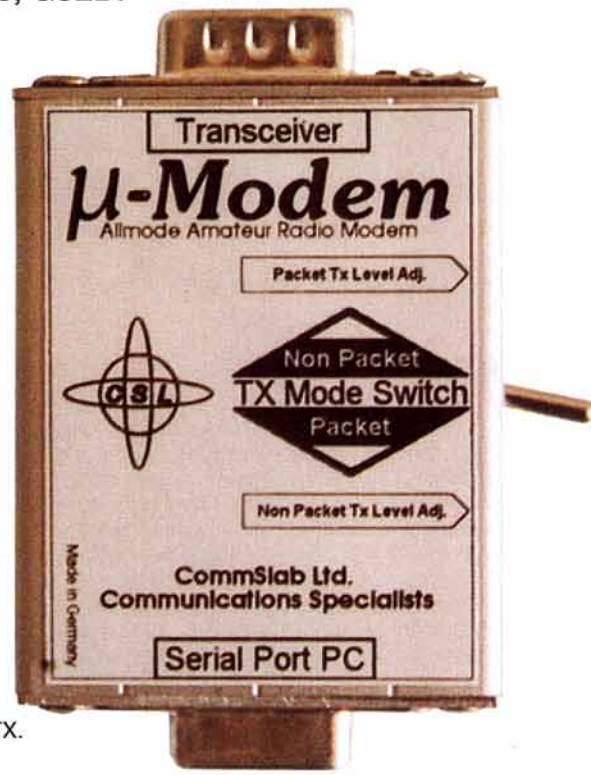
Pin 3: PTT line - switching to ground on TX.

Pin 4 / 5: Ground.

Pin 9: TX-FSK (for HF TX with FSK input)

A 9-pin D-type connector with a length of screened cable is supplied. The modem can be plugged into the RS232 port directly, but this would mean diving round the back of the computer every time the user wished to change from packet to other modes or vice versa. I would prefer to see it connected in line so the switch is easily available.

It can be used with most amateur transceivers, but with some hand-helds, such as the Icom IC-2E, it will be necessary to connect a resistor, from 2kΩ to 33kΩ, between pins 2 and 3. This is because the IC-2E uses a mixed microphone and PTT line. The value to use is the highest that will reliably key the transmit PTT line. This can be tested using Ham-Comm with the CTRL T command. The resistor can then be placed inside the shell of the D-connector.



SOFTWARE

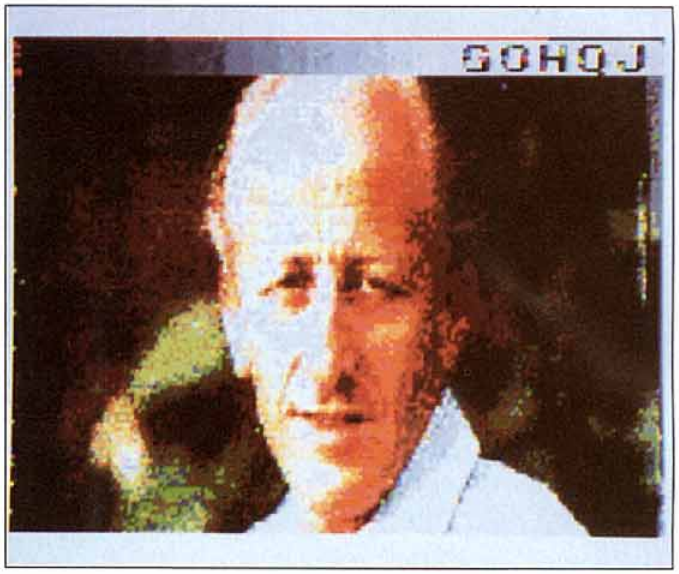
FULL INSTRUCTIONS are included regarding the installation of the software, and there should be no problems. However, if any problems are encountered, the second leaflet is a 'help' file with typical questions and situations the user might want to ask about. In this leaflet there are a series of questions and answers with each program and it should be very helpful to the user. As useful as this is, I would advise anybody using the programs for the first time to print out the DOC files and thoroughly read them first, before trying to install them. A complete understanding of the way the program works, and how to edit the configuration file will save a lot of time and aggravation. We all do this anyway don't we?

It is suggested that all users of Ham comm and JVFAX register with the appropriate fee. This will enable future versions of the programs to be made available.

At the back of the leaflet there is a list of frequencies for the various modes. If you are interested in FAX, your local BBS will probably be holding a much more comprehensive list of frequencies that you could download.

To be able to use JVFAX, you need, as a minimum, an SVGA card with more than 512k of on board memory. The optimum would be a 1Mb VESA True Colour card. This would enable the user to utilise the 800 x 600 x 256

Example of picture from Gordon, G0HQJ, received in FAX mode.



Example of picture from Gordon, G0HQJ, received using Slow Scan TV mode.

and the 1024 x 768 x 256 colour modes, and all hi-colour modes.

MEMORY

IF YOU USE JVFAX with a slow 386 or even a slow 486, it is important *not* to load any Extended Memory Manager, such as EMM386.EXE. This program causes lots of interrupts that appear as snow and ugly pixelation across the picture. On some machines, SMARTDRV.EXE may also cause problems. If you have a multimedia machine, you probably have lots of TSR drivers loaded. Most of these conflict with JVFAX, and will have to be disabled. With DOS 6.22 you can have separate AUTOEXEC.BAT and CONFIG.SYS files to help get over this problem. Alternatively, if you boot from a floppy each time you run JVFAX, you could have a basic AUTOEXEC.BAT and CONFIG.SYS as follows. Put a system on the floppy first to make it bootable. These are the basic CONFIG.SYS and AUTOEXEC.BAT suggested:

CONFIG.SYS

DEVICE=C:\DOS\HIMEM.SYS

COUNTRY=44,,C:DOS\COUNTRY.SYS

SHELL=C:\DOS\COMMAND.COM

BUFFERS=20

FILES=30

BREAK=ON

AUTOEXEC.BAT

@ECHO OFF

ECHO System will be booted without EMM for optimum JVFAX performance.

PATH C:\DOS;C:\BAT

C:\DOS\KEYB GBR

PROMPT PG

SET COMSPEC=C:\DOS\COMMAND.COM

SET TEMP=C:\TMP

SET TMP=C:\TMP

The help booklet is 10 pages long so should cover any problems the user might have regarding software installation, although the RTM technique should always be adopted first!

INSTALLATION AND OPERATION

THE INTERFACE cable takes approximately 15 minutes to make up and installation is simple, merely plugging into COM port 1 with the PC switched off. The transceiver was connected and the PC switched on, booting up from the floppy as described above. Once booted, I changed directories into HamComm, and altered the configuration file with XTGOLD, my favourite editor. Having done this, I ran the program and tried CW, RTTY and AMTOR. All these modes worked perfectly with no adjustment needed on the preset. As I was working to a deadline, I did not take the advice given above, and tried to run the programs without reading the DOC files first! It took a while to find out the necessary control keys, it would have been easier had I the time to read first! I did not have the Baycom program so could not check the packet side, but I don't forsee any problems.

Then I tried JVFAX. This presented me with a problem in that the transceiver came on in permanent transmit. The configuration file has to be edited from the program, and I could not change the IRQ of COM port 1. After several attempts, I eventually managed to alter it by a discussion with another local who had been using the program for some time. It is imperative that HAMCOMM appears in the demodulator window of the configuration file and SERIAL AUDIO has to be in the modulator window. Failing to set these two parameters prevents entering the correct IRQ for the Com port. Having set the configuration files properly, it is then advisable to do some checks on both FAX and SSTV with a local station so a final tweak can be made to enable as near perfect pictures as possible to be both transmitted and received.

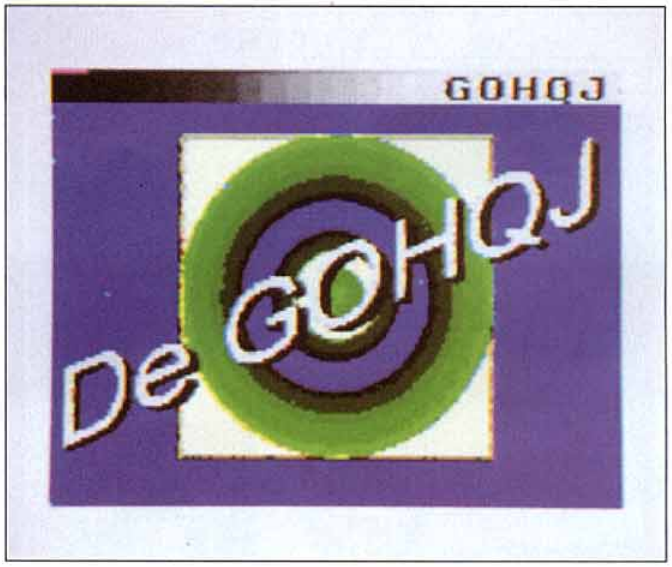
CONCLUSIONS

THE MODEM, priced at £89.95 inclusive, would be an ideal way for someone getting into multi data mode operation on a budget. The other major multi-mode modems are much higher priced although more sophisticated.

This unit would be ideal for portable operation too, with a Notebook or Laptop PC and small transceiver.

As an addendum, CommSlab also market PKTCOMM, an enhanced Baycom compatible modem, JVFAX simple inerfaces an other computer interface cards. One of these is a serial card that allows multi COM and IRQ options, ideal for packet node operators using BPQ, since this software cannot be used with shared IRQs.

The CommSlab µ-Modem is available from CommSlab Ltd, P O Box 19, Erith, Kent DA8 1LH, tel: 01322 330830. ♦



Another example of an off-screen pictured received using the CommSlab µ-Modem in Slow Scan TV mode.

RADCOM SOFTWARE REVIEW

ARRL Radio Designer Software

Reviewed by Ian White, G3SEK*

WHAT HAS CHANGED in the last two decades of amateur radio? First and most important, our expectations of equipment performance are much higher than they were a generation ago, and equipment is much more complex. Although most of us use ready-made 'black boxes', there's still a widespread feeling that the real roots of amateur radio are in home construction.

Transmitters and receivers used to be simple enough that you could build your own and get them working by a process little better than trial-and-error. Not any more, because we're applying higher expectations to home-built projects too. The other major problem with trial-and-error is that even though we can learn by our mistakes, too many junked projects will grind down anyone's enthusiasm. We all learn far better from successes than from failures! There's no shortage of new ideas in amateur radio, but more and more newcomers fall into despair of even becoming 'technical enough' to follow up their own inspirations. Maybe traditional trial-and-error has finally had its day. Maybe we need a new approach to home construction.

DESIGN FIRST

THERE IS ANOTHER WAY. That is to put much more effort into the design phase, before you ever switch on the soldering iron. The aim is that when you do build the circuit, it will perform exactly as you want. That isn't a foregone conclusion, of course, but careful design does help to side-step much of that testing and trouble-shooting phase which so sorely stretches our amateur resources.

One of the best ways to design and understand a circuit is to simulate it on a computer. I don't mean to simulate a whole radio, with signals coming out of the computer's speaker, but to predict and understand how various modules should perform. When you build the circuits, a few basic tests will then show whether everything is performing as expected. If so, you score a success, learn something positive and move on to the next step. If everything is not working as predicted, you also have a very good chance of finding out why. For example, a good computer simulation will even tell you what RF voltages you should be measuring at various points around the circuit, so you can quickly find the fault and get your project back on track. Used in this way, with the right kind of software, a PC can be an effective substitute for a lot of advanced testgear.

Naturally, there's something you need to learn before you can enjoy the benefits. A computer won't have ideas for you, and it won't translate your ideas into circuit diagrams. For that you have to understand something about RF design, and two of the best books for that purpose are the classic *Solid State Design for the Radio Amateur* [1] and the more advanced *Introduction to Radio Frequency Design* [2]. You also need to remember that computer software isn't foolproof. Like any tool, you have to learn how to use it skilfully and avoid its particular pitfalls.

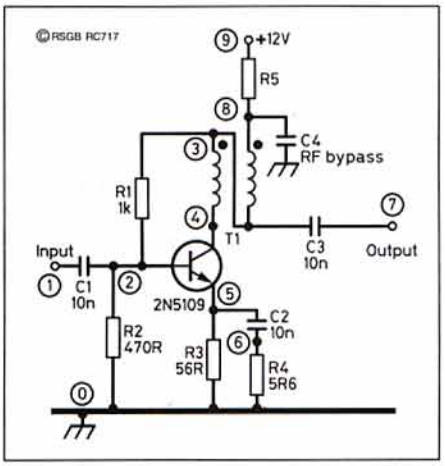


Fig 1: A bipolar broadband amplifier. Circled numbers show nodes at input, output, ground and wherever else two or more components join.

Computer-aided circuit design isn't an instant solution to all our problems, but if we want amateur radio to survive as a creative pastime amid all the other attractions of 21st-century technology, it's certainly something we'll need to know more about.

With this in mind, ARRL, the US national amateur radio society, has done a deal with Compact Software, one of the industry leaders in circuit simulation, to bring a professional-standard circuit design package down to amateur prices. The only difference between *ARRL Radio Designer* and the professional product, *Super Compact*, is that certain functions are missing, and circuit simulation is not integrated with circuit drawing and PC layout design. On the other hand, you're only being charged a discounted price for amateurs, and not the considerably higher price of the full professional product.

As well as introducing most of the features of *ARRL Radio Designer*, this review explains how you'd use the software as an aid to home construction. There are many rather similar general-purpose circuit simulation packages available, as well as a multitude of more specialised programs - many of them free (see 'Alternatives', left).

NODAL ANALYSIS

IMAGINE CONSTRUCTING a circuit using wiring pins in a perforated board. Everywhere

*52 Abingdon Rd, Drayton, Abingdon, Oxon OX14 4HP.

ALTERNATIVES

ARRL RADIO DESIGNER is competing against a variety of other general-purpose circuit modelling packages. Shareware catalogues, bulletin boards and above all the Internet are the main sources of low-cost products. *Introduction to Radio Frequency Design* [2] now includes a diskette of useful programs related to specific topics in the text, and many other books do likewise.

The main attraction of the big general-purpose programs such as *ARRL Radio Designer* is that once you've learned how to use that one program, it will meet most of your future needs.

Many of the low-cost general-purpose programs are demonstration versions of expensive software intended for the professional market. These cut-down versions are aimed primarily at educational institutions, in an effort to create 'brand loyalty' in the next generation of professional engineers - and we amateurs can sometimes take advantage of these offers. Probably the best-known program of these heavyweights is *SPICE*, a demonstration version of which is available free; but the demo program has far fewer functions enabled than *ARRL Radio Designer*, and you'd probably need to buy a book in order to use it. You'll also probably have seen the adverts for the commercial *Analyser III* software from the UK firm Number One Systems. Like *ARRL Radio Designer* this is a linear AC-only program.

Perhaps the best value of all is the demonstration version of the *APLAC* program suite from the Helsinki University of Technology - it contains an astonishing range of functions and is completely free. Well, it's free if you have access to download it over the Internet (ftp.funet.fi /pub/cae/aplac; expect almost 10MB) and you'll need a Postscript printer for the manuals.

Finally, if you want to try out a simple but effective AC nodal analysis program, a good 'freeware' example is *MACE* by G4PMK. This and many other free and shareware circuit analysis packages are obtainable from shareware dealers such as Venus Electronics and the Public Domain and Shareware Library, or can be downloaded from somewhere-or-other on the Internet.

that two or more components join, you insert a pin and solder all the components to it. When completed, a typical circuit will have an input pin, an output pin, a ground pin and a power supply pin. In additional there will be several pins acting as connection points for the 'internals' of the circuit. **Fig 1** is a typical example of a broadband RF amplifier with internal feedback to give controlled gain and input and output impedances near 50**ohm**. The circled numbers show where you might use a wiring pin - note that you'd use fewer pins than there are junctions on the more formally-drawn circuit diagram of Fig 1.

Pin-and-wire construction is very close to the way you describe a circuit to be analysed by *ARRL Radio Designer* and many similar software packages. The computerised equivalent of a circuit pin when two or more components join is a 'node'. The only important difference between construction and analysis is that *ARRL Radio Designer* is an RF-only program; it only deals with the AC aspects of the circuit, and doesn't say or know anything about the arrangements for providing DC power. Since the DC power rail is supposed to be 'dead' to RF, we simply connect it to ground, which is always allocated as node 0. This transforms Fig 1 into the simplified circuit in **Fig 2**, which dispenses with C4, R5 and the +12V supply; what was node 8 has now been connected to RF ground, node 0. The next step is to describe this 'nodal network' as an input file for *ARRL Radio Designer*. This simply involves listing each component and the nodes between which it is connected. Tell the program which are the input and output nodes, and away we go.

Well, it's a bit more complicated than that, but you get the basic idea. **Fig 3** shows the component listing for the circuit in Figs 1 and 2, with a few extra lines added as comments. Obviously this circuit-description language is something you have to learn, but *ARRL Radio Designer* comes with lots of examples and excellent get-you-started instructions.

ARRL Radio Designer runs under Microsoft Windows, so calling up a circuit file is simply a matter of point-and-click. There's also a built-in file editor. When you click on the **Analyze** button on the program's toolbar (**Fig 4**) the performance is analysed over the frequency range specified in the input file.

At this point you're faced with a vast array of options for output. I'll return to some of these options later, but probably the simplest example is to plot the gain of the circuit as a function of frequency as shown in **Fig 5**. You can choose any frequency range, and display it on either a linear or a logarithmic scale, according to the coverage and level of detail you require.

CIRCUIT ELEMENTS

ARRL RADIO DESIGNER offers a wide range of circuit elements besides those used in the above example. As well as passive circuit elements there is a large library of named active devices, including bipolar and field effect transistors, and operational amplifiers. There are also 'generic' bipolar, FET and op-amp models into which you can insert suitable details, and also an option compatible with the S-parameters that are widely used in datasheets for VHF and microwave devices. Coaxial and other transmission lines can be connected between circuit nodes, and are described in terms of their physical length, characteristic impedance and loss. However, they are not modelled as physical layouts, so *ARRL Radio Designer* cannot predict the performance of structures such as coupled transmission lines.

Passive devices include not only the simple R, C and L, but also combinations such as an inductor with a built-in series resistance. You could have modelled this as two separate components joined at an additional node, but the predefined combination offers a simpler way to specify a real-life lossy inductor. You can specify the losses in terms of a fixed resistance, or as a Q value which may also be frequency-dependent. The same applies to lossy capacitors, although at frequencies up through the VHF range you can generally assume that most types of capacitors are lossless. However, as the frequency increases the effects of lead inductance become more important, so it's useful that *ARRL Radio Designer* has the option to include this within a single circuit element. Classical circuit design tends to ignore these real-life losses and parasitic reactances, but sometimes they make all the difference between a circuit working or not. It can be very revealing to model a circuit using ideal components, and then see how the performance changes when you 'switch on' the losses and parasitic reactances. Instead of having to build something in order to discover that it can never work, a circuit model can help you avoid such pitfalls and speed you on the way to a workable design.

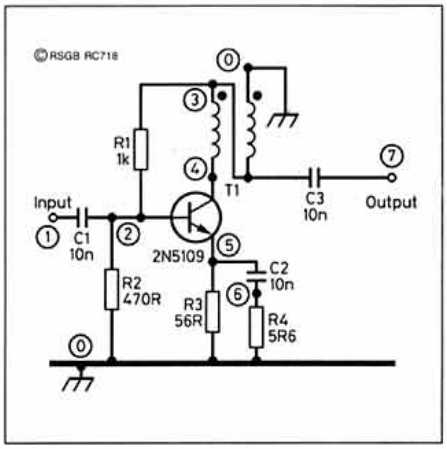


Fig 2: RF equivalent of Fig 1, joining the top of transformer T1 to RF ground at node 0

```
* A Bipolar Post-Mixer Amplifier with Feedback                *
* Copyright 1994 by the American Radio Relay League Inc       *

* Transistor data for later use in "BIP":
* The FT, Ic and B (beta) values shown simulate a 2N5109
* operating at a collector current of 30 mA.
FT:1.4E9 ; GHz
Ic:30  ; mA
Rd:(26/Ic)
B:49

* This circuit block models the amplifier
BLK
* Component format is "Type Node1 Node2 Value"
CAP 1 2 C=0.01UF
RES 2 0 R=470
RES 2 3 R=1000
* Bipolar transistor:
BIP 2 4 5 A=(B/(B+1)) RE=RD CE=(1/(FT*2*PI*RD)) RB1=7.5
* Transformer modelled as two mutually-coupled inductors:
MUI 4 3 3 0 L1=46UH L2=46UH K=.999
CAP 3 7 C=0.01UF
RES 5 0 R=56
CAP 5 6 C=0.01UF
RES 6 0 R=5.6
* The complete amplifier is a 2-port network, with input
* at node 1 and output at node 7.
* The circuit is given the name "BJTAMP".
BJTAMP:2POR 1 7
END

* Calculate the performance from 1MHz to 200MHz
* in 100 logarithmically-spaced frequency steps
FREQ
ESTP 1MHZ 200MHZ 100
END
```

Fig 3: Circuit file for Fig 2. Lines beginning with a star are explanatory comments, not used by the program.

ADVANCED OPTIONS

YOU HAVE MANY OPTIONS when plotting the performance of your modelled circuit, including voltage gain and phase angle, input and output impedances, S, Y and Z parameters and a range of Smith-chart options - if you've ever heard of it, be assured that *ARRL Radio Designer* can plot it! It's also very easy to copy any of your displays to the printer. If you need more precise values than you can read from the graphs, it's easy to pop-up a table of numbers in its separate window.

One of the display options is to overlay the results from repeat runs of the same model, to see what happens as you change one or more parameters. For example, you can increase the value of a tuning capacitor in steps, and watch the resonance peak change frequency and amplitude.

The tuning option can be very useful when trying to find the right value for a variable component which you'll only need to adjust once in the real circuit. Better still, why not let *ARRL Radio Designer* do the tuning for you? For example you can tell the program to 'adjust C42 for maximum gain at 7.05MHz' and it'll do that. However, simple 'tweaking' is only a minor application of *ARRL Radio Designer's* very powerful optimization feature. You can set quite complicated optimization objectives such as 'adjust these six component values for 20dB of gain and input VSWR no worse than 1.05 from xMHz to yMHz' and *ARRL Radio Designer* will try to do that - within the limits of what's possible, of course. Computer optimization can sometimes be tricky and needs some skill and experience, but *ARRL Radio Designer* can handle it.

One of the biggest disappointments in home construction is to copy something from a magazine article and then find it doesn't work.

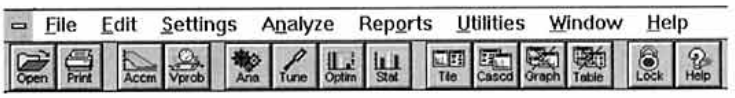


Fig 4: *ARRL Radio Designer's* menu and toolbar offers point-and-click circuit

One kind of reproducibility problem is where the prototype design only just works, and stops working if the component values aren't exactly the same as in the original. Since normal manufacturing tolerances can produce variations of 5, 10 or even 20% either side of the nominal value printed on each component, and tolerances in semiconductor performance can be even wider, it's important to make sure that a circuit design can cope with any combination of real-life components.

ARRL Radio Designer can help by using its 'Monte Carlo' function. The name comes from the gambling casinos that made Monte Carlo famous, and what the program does is to 'roll the dice' to make random variations from the nominal component values in the input file. Each new set of component values is followed by a performance analysis, so by repeating a large number of these random trials *ARRL Radio Designer* can build up a statistical picture of the circuit's tolerance to component variations. Monte Carlo analysis can quickly reveal which components are critical. The designer then has a choice, either to specify a tighter tolerance (say a 5% resistor rather than 10%) or to go back to the drawing board and use a less finicky circuit.

MANUAL

THE MANUAL IS VERY important in a complex piece of software such as this (well, I would say that - manuals are my profession). You need help from the manual to get you started and to understand the general features of the software, and you'll also need to return to the manual for information about details that may only crop up after months or even years of use. The manual for *ARRL Radio Designer* falls into two very different parts. The first part is truly excellent. Written by ARRL's Dave Newkirk, WJ1Z, it leads you through all the steps of installing the software and learning how it works, using a carefully graded series of detailed worked examples. The input files for these are provided with the program itself, and there's even a file full of all kinds of mistakes to teach you how to correct them. WJ1Z also includes a much-needed chapter on the realities of circuit modelling, showing many of the mistakes to avoid - after all, a circuit modelling package is only a tool, and there are right and wrong ways to use it.

However, the rest of the manual is taken directly from the existing documentation for *Super Compact*, and is much less helpfully written. In contrast to WJ1Z's opening chapters you're left very much on your own, with far fewer explanations and examples to help you understand the more specialised features and component models.

LIMITATIONS

THE MOST OBVIOUS limitation of *ARRL Radio Designer* is that despite the name, it doesn't actually design radios for you, so please don't expect that! What it will do is analyse your designs, and help you to optimize their performance.

Otherwise, the two main limitations of *ARRL Radio Designer* are that it doesn't consider DC levels, and that it doesn't consider non-linear behaviour. You always need to make

CONTINUED ON PAGE 86

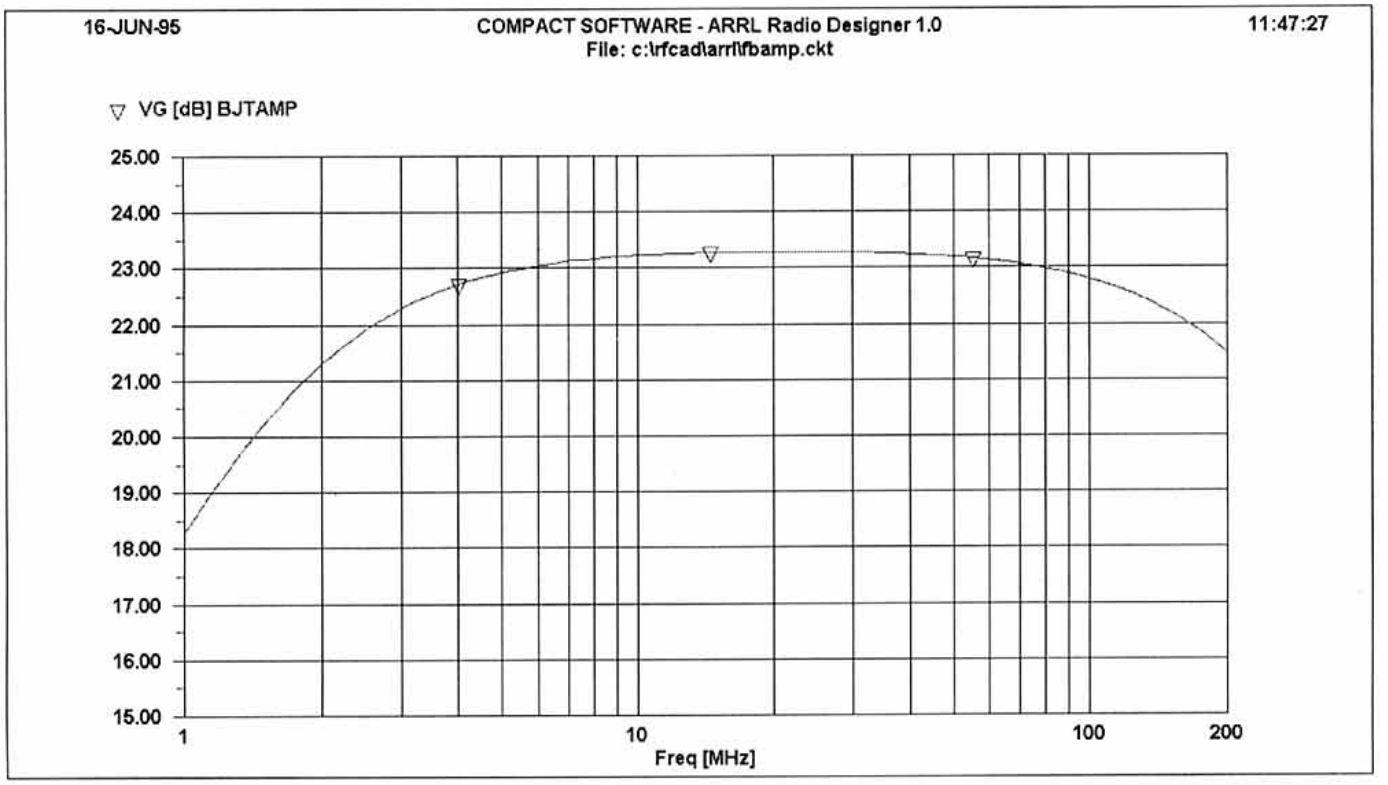


Fig 5: Voltage gain analysis shows that the feedback amplifier is truly broadband.

Communications Centre (Photo Acoustics Ltd.)

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73 from Dave G4KQH, Technical Manager.

THE PETER HART REVIEW

The MFJ-1798 Multiband HF Vertical

by Peter Hart, G3SJX*

THE MULTIBAND vertical is a very popular antenna and for very good reason. Upwards of five bands are usually provided with no switching or tuning between bands, coax fed with no ASTU required, and the ability to fit into a small garden. The efficiency of most antennas is good, with low angle radiation for enhanced DX performance and omni-directional coverage.

Traditional designs were usually designed around base-fed quarter-wavelength radiators with loading inductors / capacitors, traps or stubs to achieve resonance on several bands with one set of hardware. Radials are needed with this configuration which frequently governs the ultimate performance and can be a problem with limited space.

More recently, several 'no-radial' designs have appeared on the market, based on different configurations such as half-wave radiators, or elevated feed systems. One of the latest offerings of this type is the MFJ-1798 from MFJ Enterprises.

DESCRIPTION

THE MFJ-1798 covers a total of 10 bands - all eight HF bands from 3.5 to 28MHz with, in addition, 50 and 144MHz. The radiating element is basically an inverted quarter wavelength on the HF bands, fed at the top against an elevated counterpoise. Fig 1 shows the configuration of the antenna. Having the feed at the top of the antenna places the highest current portion also at the top, where maximum radiation occurs. This places the maximum radiation portion away from the lossy ground and results in lower radiation angles. The bottom of the antenna is the high voltage end and needs to be elevated sufficiently above the ground to avoid detuning (5ft is the minimum height). At this minimum mounting height, the top of the antenna is about 22ft above ground level. No ground connection or radials are required, these are replaced by a 12ft diameter counterpoise placed at the top of the antenna.

The thick tube, providing the central support for the antenna, is about 16ft long and provides the radiating element on 14MHz. Adjustable horizontal rods placed at the bottom allow for fine tuning the resonant frequency on this band. On 10, 7 and 3.5MHz, the antenna is shorter than one quarter wavelength and is brought into resonance by end loading. Three separate in-line loading inductors are wound on a fibreglass mandrel

DIAGRAM COURTESY OF MFJ

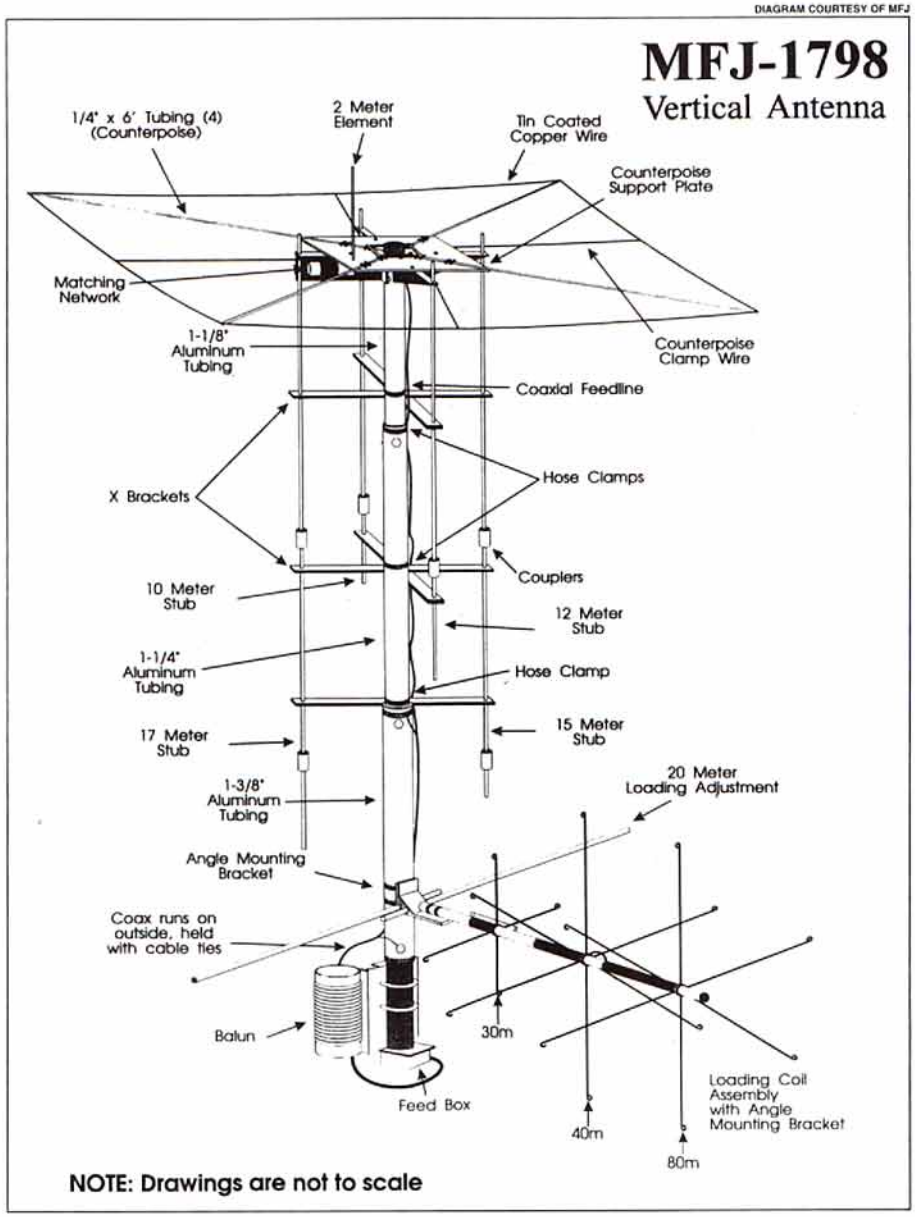
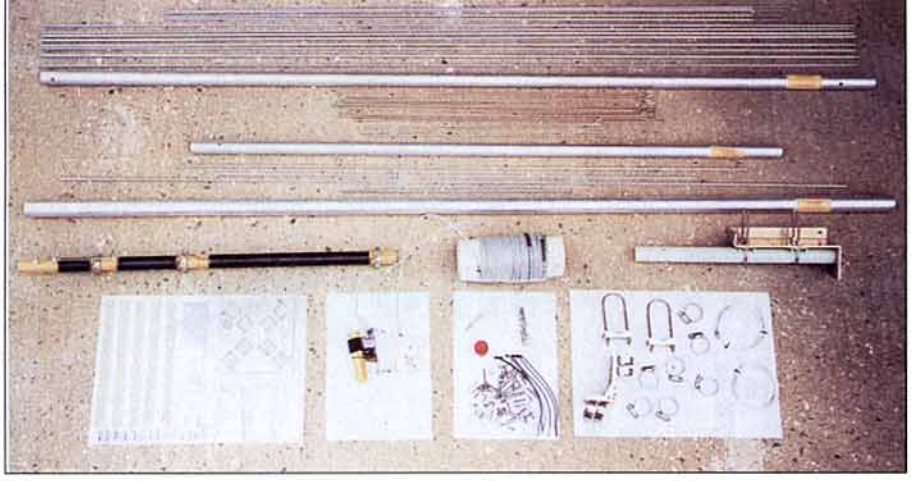


Fig 1: The MFJ-1798 Vertical Antenna.

and each has an associated capacity hat. This assembly is mounted at the bottom of the antenna. Separate quarter-wavelength radiators are provided for 18, 21, 24 and 28MHz. These are connected to the main tube at the top (the feed point) and run down parallel with it, supported on insulating X brackets. According to MFJ, the active radiating element forms a stub with the main tube and decouples the unwanted parts of the antenna beyond the stub end. In addition, in-phase currents in the parallel radiator sections increase the effective radiator diameter and gives a wider bandwidth.

On 50MHz, the 18MHz stub is used as a three-quarter wavelength radiator. In theory, this gives a slight gain but not such a low radiation angle. 144MHz operation is really more of a gimmick than of real practical use. A separate quarter wavelength vertical radiator protrudes above the counterpoise. However, the loss in the thin coax feed will be

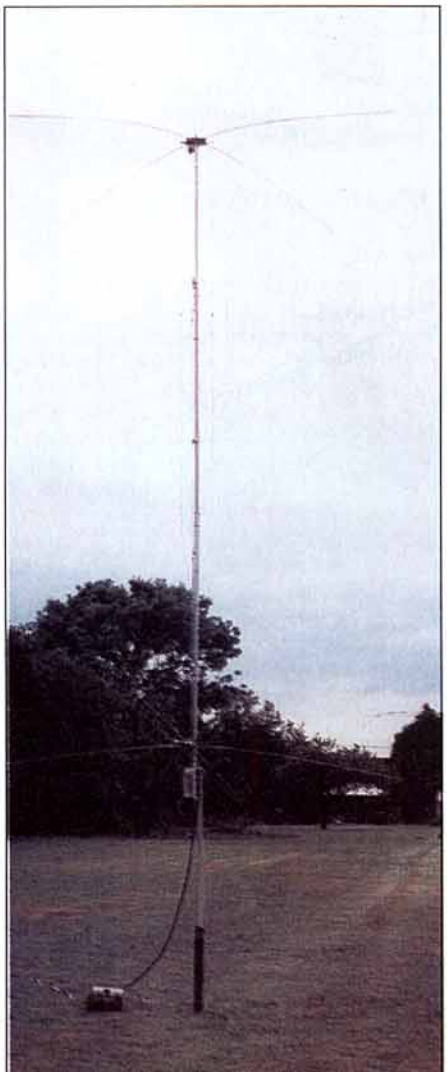
*The Willows, Paice Lane, Medstead, Alton, Hants GU34 5PR.



Antenna components after unpacking.

ever, the loss in the thin coax feed will be significant on this band.

The antenna is fed at the top through a small LC network to improve the match. 4mm diameter thin Teflon insulated coax (RG58/U) is run down the outside of the main tube to an air cored balun mounted at the base. This balun is essential as the rising coax forms part of the radiating element. The power rating of the antenna varies from band to band but is in excess of 1000W CW on the HF bands, 300W on 50MHz and 200W on 144MHz. An SO239 antenna socket is mounted at the very bottom, beneath the balun. The antenna is self supporting with a mast clamp fitted at the base. No guy wires are needed for the antenna itself but may of course be needed for the support. The antenna weighs 20lb and has a wind load of approximately 3sq feet. A reasonably sturdy support is needed. The antenna is well constructed using substantial aircraft-strength aluminium tubing and stainless steel hardware.



ASSEMBLY AND INSTALLATION

THE ANTENNA COMES well packed in a cardboard box measuring 7 x 4 x 76in. There are quite a large number of pieces and stages to assembling the antenna and all the pieces should be identified before assembly starts, in particular the various American-sized screws. I know this may seem obvious, and it is tempting to get straight on with the task, but there are potential pitfalls if the parts have not been properly identified and laid out. With very few exceptions there are no spare screws, nuts or washers provided, so be careful with assembly, particularly on grass. Replacement American sizes are not so easy to obtain in Europe. I found insufficient wire provided for the counterpoise and some screws were missing, even though the packing check-list had been ticked.

The bulk of the 28-page instruction manual describes the assembly procedure and most of the remainder on tuning the antenna. The instructions are very explicit in words and detailed drawings and should be followed exactly. It took me about 1 hour to unpack, identify and lay out the components and then about 6 hours to fully assemble the antenna. Although the instructions are very detailed and comprehensive, there are pitfalls. The instructions fail to mention the importance of mounting the top plate with the rectangular bracket directly above the balun. The consequences of this were not discovered until much further on in the assembly, necessitating a certain amount of dismantling and reassembly. The counterpoise is very floppy and it is not possible to pull the wires taut without bowing the supporting arms. However, the counterpoise hangs in a better shape when the antenna is erected into the vertical. It seems that there is a possible danger of the counterpoise clamp wires shorting to the stubs in very windy weather.

The MFJ-1798 is a very 'three-dimensional' antenna. Although assembly can start on a flat surface, it is necessary to lean it against a support (eg step ladders) to assemble the counterpoise and have it fully supported on a mast before the LF band loading coil assembly can be mounted. This mast can conveniently be a temporary support for the tuning process, or the final support if accessible.

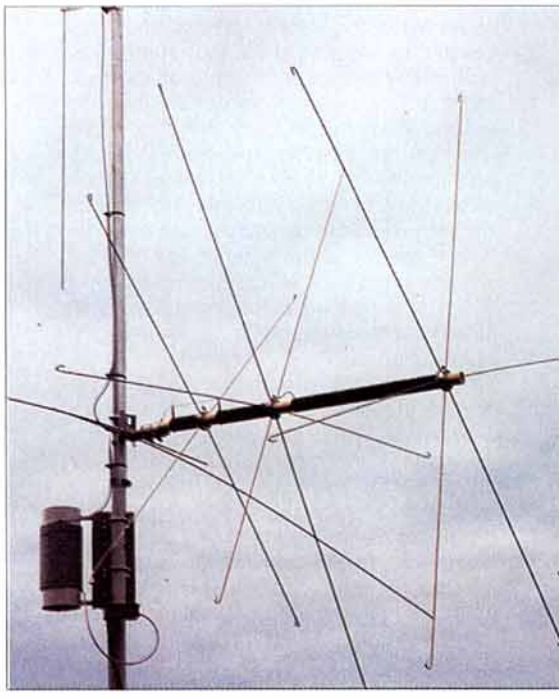
The antenna is provided with a clamp at the base which will fit masts of 1 to 1.5in diameter. The wind loading is quite high and certainly nothing less than 1.5 in thick walled tubing should be used. It would have been preferable, in my opinion, to have adopted a larger clamp which would allow 2in masts, eg scaffold pole. The minimum height for the mast is 5ft but better results are likely when mounted in a more elevated position. For safety reasons, access should be restricted to the base of the antenna if mounted at the lower heights. Apart from the possibility of a poke in the eye from the capacity hat spokes, there is the danger of RF burns from the high RF voltages which exist on these and other parts of the lower antenna structure on certain bands.

Unlike some antennas, the MFJ-1798 is not really suitable for dismantling and reassembly for portable and expedition operations.

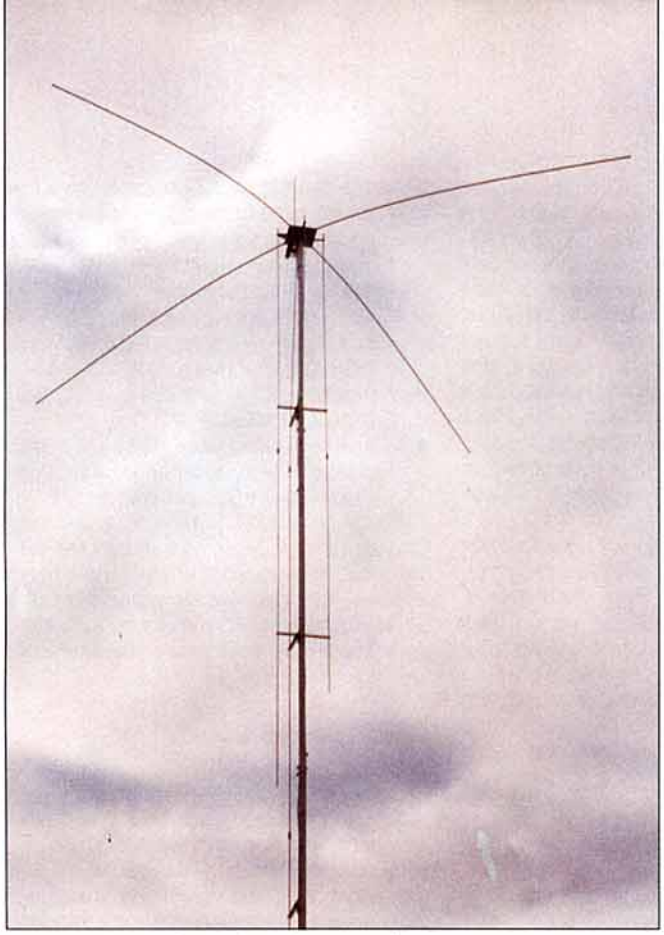
TUNING

THE ANTENNA IS supplied resonating slightly low on each band as it is easier to raise the resonant frequency rather than lower it. Tuning is performed to obtain the lowest VSWR at the desired frequency on each band. Tuning should commence on the lowest frequency band and progress to the highest and in this order there is little interaction between bands. The 3.5, 7 and 10MHz bands are tuned by pruning the length of the relevant capacity hat spokes. A couple of spare spokes are provided in case too much is removed. 14MHz is tuned by sliding the relevant tuning rods in or out. 18/50, 21, 24, 28 and 144MHz are tuned by trimming the length of the relevant band radiators or by screwing them in or out. 50MHz cannot be tuned independently of 18MHz. Tuning on 14MHz and below requires just access to the base of the antenna but the higher bands need to have the antenna lowered. The bandwidth is narrow and tuning critical on the lower frequency bands but quite broad on the higher frequency bands.

Having tuned the antenna on a short stub mast, raising the antenna on to a higher mast



Left: The antenna erected on a 6ft pole.
Right: Lower section showing end loading and capacity hat.



Upper section showing stubs and counterpoise.

COMPETITION TIME

Win an MFJ-1798 Antenna, worth nearly £300!

*WATERS & STANTON Electronics have generously offered the review **MFJ-1798 antenna** as a prize in our competition.*

All you have to do to enter is answer these three simple questions:

1. How many bands does the MFJ-1798 operate on - (a) 8 (b) 9 (c) 10?
2. What is the electrical length of the radiator used by the MFJ-1798 on 50MHz - (a) quarter-wave (b) three-eighths wave (c) three-quarters wave?
3. Where is the electrical feed-point of the MFJ-1798 located - (a) at the top of the antenna (b) at the bottom of the antenna (c) next to the balun?

Ten runners-up will receive Alinco key-rings, and pens.

Send your entries *on a postcard or on the back of a sealed envelope* (no letters accepted) to arrive no later than 30 September 1995. The winner will be the first correct entry drawn at random. The Editor's decision is final. Send your entries to: MFJ Antenna Competition, *RadCom*, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Please indicate if you do NOT wish to receive further promotional material from Waters & Stanton Electronics.

should only result in a marginal increase in the resonant frequency.

PRACTICAL RESULTS

THE ANTENNA WAS evaluated while mounted on a 6ft stub mast, well in the clear, away from trees, and several hundred feet from any other antennas, buildings or metal objects. After tuning the antenna, the VSWR figures given in the table below were arrived at. These were measured using a battery-powered rig a short distance from the base. The particularly narrow bandwidth on 3.5MHz at 2:1 VSWR is due to the minimum VSWR being 1.8. There is little margin before the VSWR of 2 is reached. The usable bandwidth is nearer 35kHz.

The bandwidth on all frequencies 10MHz and above is sufficient to cover the complete bands. However, on 3.5 and 7MHz, the usable bandwidth is only about 35kHz. Most moderately-sized verticals just about achieve full coverage on 7MHz (100kHz Region 1 allocation) although 3.5MHz is always a problem. Why this antenna is quite so narrow on 7MHz is unclear.

The tuning arrangement on the MFJ antenna is a once-only irreversible process. A possible method of providing variable tuning across the band would be to replace one or more of the capacity hat spokes with short telescopic whip antennas. One should be sufficient to cover the whole of 7MHz and possibly two to cover 3.5MHz. It should also be possible to fix a calibrated scale to return quickly to any frequency in the band.

A comparison was made between the performance of the MFJ-1798 and my ground-mounted Butternut HF6V-X. The two antennas were mounted 300ft apart to avoid any possible interactions and fed with cables and a coax relay system, ensuring that the cable losses to the two antennas were equal.

On 28MHz, the Butternut was marginally better on the few signals heard, which were largely sporadic E. The Butternut, however, uses a three-quarter wavelength radiator as against the one quarter wavelength of the MFJ. On 21, 14 and 10MHz both antennas gave very similar results on both short range European and low-angle DX signals. The MFJ gave better results than the Butternut on 18 and 24MHz by up to one half of an S point. I have always found the 18 and 24MHz resonances on the Butternut to be rather sharp and VSWRs on these bands not so good.

On 7MHz, both antennas gave similar performance at the resonant frequency of the MFJ, but away from this resonant frequency the performance of the MFJ dropped away noticeably.

Similarly on 3.5MHz, there was little to choose between them at the resonant frequency and, although both antennas are quite sharp, the MFJ off-tune performance dropped away more rapidly than the Butternut.

The review period happily coincided with some summer sporadic E conditions on 50MHz. The band sounded quite lively and several European QSOs were made. Unfortunately it was not possible to compare the performance with any other antenna. Similarly on 144MHz, local FM stations and repeaters were workable but no comparisons were made.

Some mild winds were experienced during the review period which showed that the wind loading area is somewhat higher than most multiband verticals.

CONCLUSIONS

THE MFJ-1798 has two main assets - it covers 10 bands from 3.5 to 144MHz with no tuning or switching needed, and it needs no ground radials. Its total height, if mounted at the minimum recommended height, is about 22ft, which must make it about the shortest multiband vertical which also covers 80m. It is the only antenna which covers 10 bands, although the 144MHz performance is only equivalent to an elevated 19-inch length of wire. Covering HF plus 50MHz should be particularly attractive to the owner of an HF + 50MHz transceiver who wishes to keep antennas to a minimum.

The antenna performs similarly to other multiband verticals on the market and is strongly constructed, although a sturdy support should be provided to accommodate the relatively high wind loading area. The physical arrangement of the counterpoise and capacity hat may prove inconvenient in some situations.

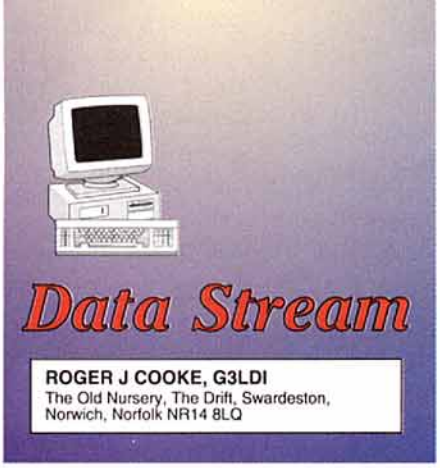
The antenna costs £299 which is equivalent to £30 per band.

VSWR MEASUREMENTS OF THE MFJ-1798 ANTENNA

BAND	MIN VSWR	MAX VSWR BAND EDGES	BANDWIDTH 2:1 VSWR	BANDWIDTH 3:1 VSWR
3.5MHz	1.8	-	12kHz	38kHz
7MHz	1.2	-	21kHz	37kHz
10MHz	1.0	-	340kHz	500kHz
14MHz	1.1	1.4		
18MHz	1.1	1.2		
21MHz	1.1	1.4		
24MHz	1.4	1.5		
28MHz	1.1		880kHz	1800kHz
50MHz	1.1		2MHz	

ACKNOWLEDGEMENT

I WOULD LIKE to thank Waters & Stanton Electronics for the loan of the antenna. ♦



Data Stream

ROGER J COOKE, G3LDI
The Old Nursery, The Drift, Swardeston, Norwich, Norfolk NR14 8LQ

MOST OF YOU are by now aware that Richard Sterry, G4BLT, has retired from writing the *Data Stream* column. With effect from this issue I shall be taking over from Richard and I am sure that you join me in wishing him the best of luck with his future projects. I hope I can maintain the high standards that he has set over the past four years. I also write the 'Packet Panorama' column in *Practical Wireless* which is dedicated to packet radio. However, with *Data Stream*, I will try to diversify and cover all the digital modes. Obviously, to do this I will need your support and would appreciate any information on any data mode. If you have any ideas or suggestions regarding topics you would like to see covered, please let me know.

It would perhaps make sense to start with a brief summary of my background, interests and activities. I was licensed in 1956 and became interested in RTTY shortly afterwards. I was among the first few G stations active on that mode and remained so for many years, running most of the available mechanical teleprinters of the day. I finally ended up with a dedicated, home brew G3PLX RTTY VDU that served me well, until I read about packet radio. Then a few of us in Norwich sent to the USA for the TNC1 board and built them, acquiring some of the components from the USA. This project cost us £250 each in 1984! By 1985, with a Xerox 820 CPM computer I was running my HF BBS on packet radio. I have been hooked ever since. Now, I am using a 386DX to run the BBS, and trying to get a 486DX networked to it to run my Satgate. However, I have experienced quite a few problems with the 486, which I bought at the Dayton Hamvention last year. One parcel containing the video card, CD-Rom and soundblaster did not arrive, the I/O card was faulty and there appeared to be a fault on the motherboard itself. Despite writing two airmail letters to the firm concerned, they have declined to respond. So, should you buy equipment at Dayton, make sure you bring it back with you! I have learned my lesson the hard way.

SPOTLIGHT ON BARTG

THE BRITISH AMATEUR Radio Teledata Group (BARTG) started in the late 1950s and was, of course, then purely for the teleprinter enthusiast. However, this has all changed with the 'Teledata' replacing 'Teleprinter' in the name. BARTG has become the special interest group in the UK for any data mode whatsoever. It produces a quarterly magazine, *Datacom*, a 100 page-plus compendium of technical features, tutorials, news and more, plus a supplement called 'Packet International', catering for all things packet. BARTG also produces *A Guide to RTTY*, *A Guide to Packet Radio*, and *A Guide to AmTOR*. These three booklets are an ideal way for the beginner to obtain his initial information. There are also several kits available, including the Multyterm terminal unit, for use on RTTY, AmTOR, CW, FAX and SSTV, plus a host of software. If you would like to find out more, write to the membership secretary Peter Adams, G6LZB, 464, Whippendell Road, Watford, Herts WD1 7PT or telephone him on 01923 220774. Please remember to enclose an SASE.

The annual BARTG rally will take place on Sunday, 10 September at Sandown Exhibition Centre, Sandown Park Racecourse, Esher, Surrey. Emphasis will be on data communications, but the intention is to cater for most aspects of the hobby. The rally will be open from 1030 until 1700. Admission is £2.00 for adults, £1.50 for senior citizens and under 14s accompanied by an adult get in free. There will be on-site catering, and well over 250 tables.

PACKET IN RUSSIA

RK9CWW IS THE CLUB station of the Ural Technical University in Ekaterinburg. Former callsigns for the club were UA9KCE, UK9CAE, UZ9CWW and now RK9CWW. Packet activities started in 1991. To start the activities, RK9CWW received a gift of a ZX Spectrum from friends in Newcastle-on-Tyne, Russ Cook, G3OTH, and the late Eamon Malone, G4MRT. Derek Daniels, G4XHP, John Price, G4OIL, and many other UK amateurs gave invaluable help.

Activity is on the HF bands as the nearest packet station is several hundred miles away. The original TNC was with PK88 and a PMS-based mailbox set up using 19k of the PK88 maildrop. Two years later, following a gift of an AT286 from Serge, DL1ABD, a full service BBS started.

Today, FBB 5.15c runs on the AT, and a Yaesu FT-902DM with a home made computer-controlled VFO. This, together with a 200W home made linear, forms the mainstay of the station. The antenna is a two element cubical quad, the VHF port has a TNC2 and an Icom IC24G transceiver into a vertical.

Packet radio in Russia is very different from Western Europe in that the territory is huge. There is a low density of population, (three times lower than the USA, and 30 times lower than the UK) and there is a low percentage of amateurs. This is due to a lack of equipment and the low level of technology. Despite such problems, Mike handles traffic for Asiatic Russia, and the Pacific, including Australia and New Zealand. He is also very articulate in his use of the English language, which is very helpful. Mike is one of my forwarding partners on 20 meters.

DX CLUSTER SERVICE

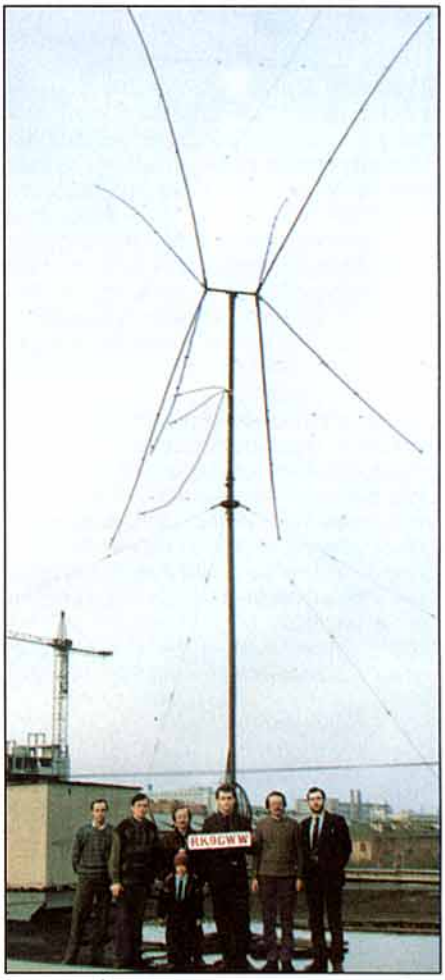
JOHN DUNDAS, GM0OPS, the sysop of GB7SDX, has sent some information about a recent meeting in Perth. The object of the meeting, held on June 11, was to answer the requests made of the SDX Support Group. This is for a DX Cluster service into the general areas of Perth, Brechin, East Fife, and Aberdeen. After an introduction to DX Cluster a thorough discussion followed. An agreement on the following proposal ensued.

- A multi-port forwarding and user access node will be installed at the QTH of GM4WZY in Brechin.
- At a location yet to be established a dual port node will be provided to cover the Perth and Dundee area.
- Brechin will link to a site that GM4AFF/GM0JCM will source.
- An inter-linking route will be put in place in North Fife to feed these nodes into the existing SDX Group network.

It is a good idea to provide a dedicated Cluster network. Passing traffic on the existing BBS network can prove problematical and raise blood levels! However, the setting up of such a network does require much dedication, not to mention the necessary funding.

NETWORKS 95

I RECENTLY ATTENDED the Networks 95 exhibition at the NEC in Birmingham. I was lucky enough to receive a free ticket, which was just as well in view of the £15.00 entrance fee. For somebody not professionally involved with networking and computing, it would be prohibitive. Nevertheless, I found it very interesting. Although primarily aimed at the business market, the exhibition demonstrated just how far computing has come in the last 10



Members of the Ural Technical University club under the cubical quad antenna. Left to right: Serge, RZ9CO, sysop; Nick, RZ9CN; Alex, RA9CB with his son Vlad; Igor, RA9CMO; Mike, UA9CIR, sysop; SWL Victor.

The operating position at RK9CWW BBS in Ekaterinburg. Left to right: AT286 in home made case, Yaesu YVM-1 monitor, 2 x 12V power supply, PK88, home made synthesised VFO, Yaesu FT-902DM and a home made linear.

years. A PC is almost a mandatory item now for anyone setting up a business. In fact, I would go so far as to suggest that most households, having bought a computer, would be hard pressed to manage without one. I know I would!

With more than 450 exhibitors, it was difficult to see everything. However, with the emphasis on networking, there were several organisations who specialise in this sphere, some of which I had never heard of. Major players were there, such as Novell, who, with Novell Netware, claims to have more than 40 million users Worldwide.

Stands varied from the Computer Bookshop, where I sometimes buy goodies, through UPS power supplies and earthing solutions for networked buildings, to hardware, including network cards, modems, printers, computers, security systems, plug sockets and cabling. This alone is a world of its own, with specialist connectors for fibre optic systems, patch panels and much more.

Then there is the software battle, with operating systems competing against each other, including Unix, Windows 95, Windows NT, OS/2 Warp, all with stands demonstrating their particular system, running mini seminars all the time. There are miscellaneous software houses, offering security packages, virus checkers, LAN and WAN configurations. It makes my small networking problems seem tiny by comparison.

One stand which caught my attention had about 50 computers all hooked up to the Internet. I did not take part, but it was possible for anybody to sit at a terminal and receive instruction on how to 'Surf the Internet'. I am attracted by the facilities offered and the impressive turn around time with E-mail. However, until the local telephone calls are free, as they are in the USA, I cannot see myself getting involved with this. The problem is that one can become so engrossed with the session that the mounting telephone costs tend to be ignored. A huge bill can be a nasty price to pay for playing the system.

There's also the much publicised matter of weirdoes, paedophiles, racists and political extremists using the system to spread their rubbish. However, a program has been developed to take care of this sort of thing, called Net Nanny. It can be set up to operate without the user knowing, can prevent definable words or phrases from being sent or received by the computer. It can also have a user defined dictionary of words and phrases. It can also prevent the system phone number from being transmitted.

There were several stands offering incentives such as the chance to win a free holiday. All that was required was the completion of a form with my name and address, which I readily supplied. I think I will be paying for this later with mail-shots from these places. I have never won in the past, but the odds must be getting shorter! I also picked up the usual array of goodies, in a supplied bag, including a stress ball. I have retired now, so at least I do not need that! All told, it was a pleasant day.

PASSWORDS AGAIN?

IN A RECENT letter in *Communications Quarterly*, Ross Wille, N6SJD, sheds new light on the much discussed topic of passwords. He addresses the problem of impostors on a BBS system assuming somebody's callsign to access. Ross believes an authentication mechanism could help ensure that messages actually originate from a particular station, rather than the impostor. This would relieve the first forwarding station from all responsibility for the content of messages sent through his BBS. It would also ensure that mail waiting to be read could not be read and / or deleted by a third party. Ross goes on to suggest two possible schemes, the first of which is in regular use at my BBS with several users who have requested it.

CHALLENGE-RESPONSE

When a user connects to a BBS the BBS offers a challenge, usually a series of numbers. The user takes the challenge and computes a response using a unique cryptographic algorithm and sends it back to the BBS. If the BBS verifies that this is the correct response, access is allowed. If, however, the response is incorrect, the user is disconnected. The algorithm can be quite a complicated one and issued personally by the Sysop to the user, thus maintaining security.

ONE TIME PAD

This scheme is similar to the challenge-response method, except that when a new user joins a BBS, he or she is given a print-out of code words. These would generally be large, randomly generated numbers. Whenever the user logs onto the BBS he or she would enter the first unused code word from the sheet and then erase it. The BBS would ensure that the code words for each user were used in sequence.

Either of these systems can be fully automated by special software by the user. The use of TPK is an example, although the automation via a node has not been solved yet, unless you know different of course?

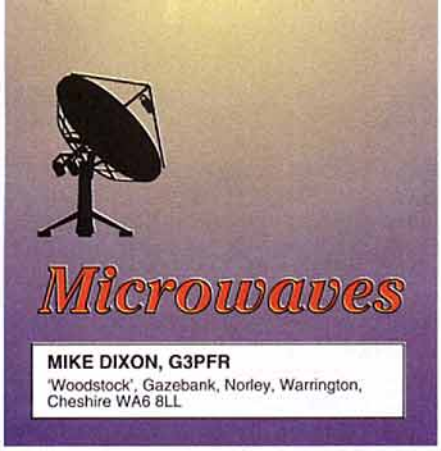
I feel it would be a good idea if all future BBS software included the password system as a mandatory part of the scheme. I realise that even this is not 100 per cent foolproof, but it would at least eliminate most of the problems that Sysops encounter at present. Moreover, it would provide peace of mind to the end user.

WINDOWS TNC DRIVER

IN THE JULY *Data Stream* column it was suggested that perhaps Ultrapak by G4WFT was the first British Windows TNC driver to be produced. I have received news from Mike Marriot, G0OPC, that he has been the distributor for WINPACK, written by Roger, G4IDE, for some time. It is freeware and if anybody would like a copy, please send a 1.44M disk with the customary return postage and packing to Mike, G0OPC. Also included on the disk will be a copy of OPCLOG 2.1 written by Mike, G0OPC, for you to try.

Roger is currently developing a new version of WinPack which is nearly finished. The version that Mike currently distributes does not have any support for mail handling, it was written purely as a fairly simple packet terminal program for Windows. The idea behind it was very much that you could start it going and leave it running while you did other things with your PC. It has a built-in editor, script files, YAPP file transfer (including automatic YAPP receive and FBB style crash resume). It was written mainly so that a connection to the DX cluster could be made to see what was going on while doing other things. If you run it as an icon then the callsign and frequency of each 'spot' is put on the icon.

The new version (version 3) has full support for both sending and receiving personal mail. It also allows you to build up the local BBS message list on your PC and has support for automatic selection and downloading of bulletins by 'to', 'from' and 'title' fields. It allows the user to set up a schedule of times at which the program connects to the BBS, downloads any waiting mail, uploads any mail that is waiting to be sent, does an 'l' to update the message list, and downloads any selected bulletins. It's similar to TPK, but it does not use the FBB beacons. Of course, all this can go on in the background while you are doing something else. This program seems to be ideal for somebody using Windows and requiring support for mail and bulletin handling like TPK. It is also completely free with no charge other than sending your 1.44Mb disk with return postage to Mike. And note that no 'donation to my node' is requested, no 'un-registered copy' messages are appended to your output and no 'UK agents' will chase you if you have not paid for it. ♦



Microwaves

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

THE DATE FOR the next Southern Round Table of 1995 has been set for Sunday, 15 October and will take place at the Flight Refuelling ARS clubhouse, Merley, Wimborne, Dorset, starting at 1000hrs. Further details may be obtained from Mike Scott, G3LYP, QTHR or telephone 01494 881928 - at any reasonably sociable hour please!

TROPOSPHERIC OPENINGS

UK MICROWAVE ENTHUSIASTS will now be well aware of some of the quite phenomenal results being obtained by mainly fixed stations on both the 10 and 24GHz bands, as reported by Peter Day, G3PHO, in August's *RadCom*, (page 16). Peter's article outlined the *Known, Recorded* happenings in the 'Big Opening' of October 1994. For several years now the Microwave Committee has been collecting, collating and analysing propagation data and perhaps the reader will have noted that, year by year, the minimum distances shown on the 10 and 24GHz summary maps have been steadily increasing. This year, Peter - who is one of the *Microwave Newsletter* editors - has produced his customary map with the minimum distance set at 400km, otherwise the map would have been too black and crowded with paths to mean very much!

He commented that this Big Opening might be a one-off event and questioned whether we will experience similar events in years to come. He also went on to remark that monitoring UHF TV channels and watching TV weather reports can often give a clue as to whether openings are imminent or already in progress. Peter also pointed out the value of amateur beacons as being amongst the first real indicators of unusual conditions.

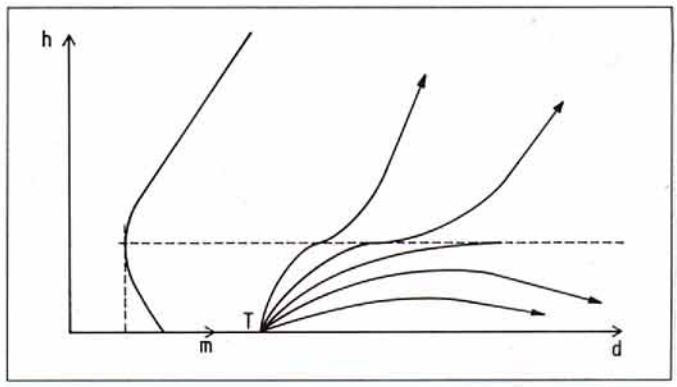


Fig 2: Paths of rays launched from the ground at various angles into a ground-based duct. From *The Physics of Microwave Propagation* by Donald C Livingston. Reprinted with permission of Prentice-Hall Inc, Engelwood Cliffs, NJ, USA.

It is extremely unlikely that this is a one-off situation and it is probable that openings, though perhaps not quite so widespread and spectacular, occur much more frequently than suspected. It may be that increased, regular amateur fixed station activity is now revealing more openings, just as it did in the Fifties and Sixties on the 2m and 70cm bands. These are more likely to occur most frequently in the settled, prolonged anticyclonic weather which often occurs in September and October, although similar weather can occur at other times of the year, of course!

It is also probable that openings occur more frequently on the higher bands than on the lower bands, since the vertical depth of inversion layers responsible for ducting determines their effectiveness at different frequencies, as shown in **Fig 1**, taken from the RSGB *Microwave Handbook, Volume 1*. Inversions can occur at any level, from ground level to well into the troposphere. The effectiveness of an inversion at different frequencies depends to a great degree on its vertical extent but also on the refractive index gradient (or 'lapse rate') across the inversion. The larger and deeper the inversion, the lower the frequency it will propagate, very similar to a waveguide. The sharper the refractive index gradient, the less the propagation loss in the duct, but this is dependent on other factors as well. A really good 'duct' seems to behave rather like a leaky waveguide!

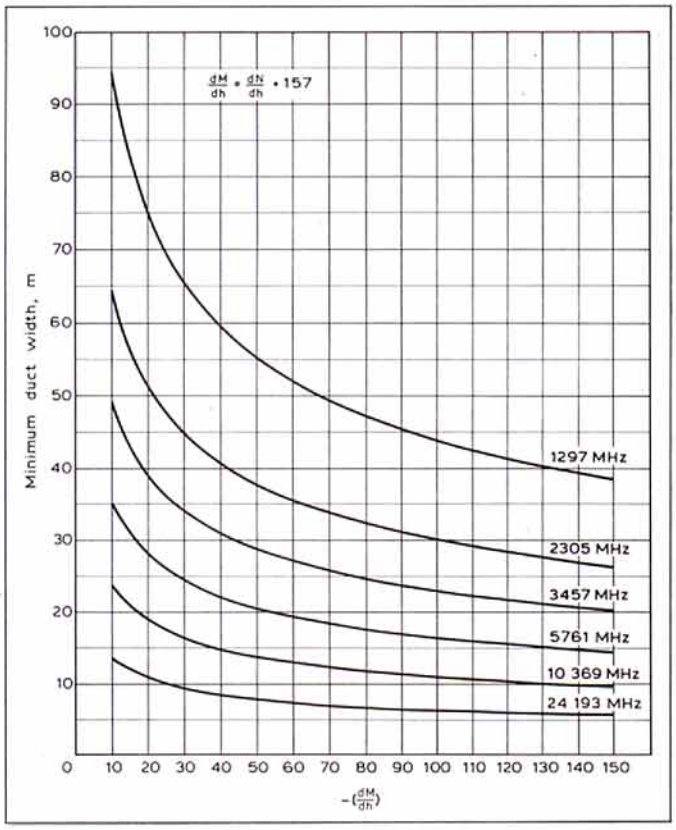


Fig 1: Dependence of minimum duct width on the lapse rate dM/dh.

At any tropospheric frequency (VHF up), the prime requirement for widespread ducting (where signals are propagated over big distances with almost no loss, and thus with phenomenal signal strengths) seems to be the need for sharply defined 'boundary layers' at the lower and upper limits of the duct coupled with a sharp gradient in the RRI (radio refractive index) across the layer.

This, of course, is refraction or bending of the radio wave so that it is largely trapped or contained within the layer. This ducting effect decreases the attenuation of the wave and is also dependent on the angle at which the radio wave enters (or leaves) the layer, the so-called 'angle of incidence'. This is well illustrated in **Fig 2** (also from the RSGB *Microwave Handbook, Volume 1*) which explains why the effectiveness of ducts seems to be critically dependent on where you happen to be relative to the duct - either vertically or horizontally!

What is singularly frustrating is that you may be in the wrong place to exploit a duct because your QTH is in the 'wrong' place and the angle of incidence is wrong to allow you to either transmit to or receive signals from a distant station. This explains why you may receive very strong signals over a big distance or almost nothing at all. The difference between the 'right' place and the 'wrong' place may only be a few km horizontally and possibly a few tens of metres vertically!

It should be apparent that the probability of the formation of deep layers is less than that of shallow layers, since their formation is often dependent upon settled weather (or at least, very slow changes in prevailing weather conditions) when there is little or no vertical turbulence and lateral wind shear. Shallow layers of limited extent may only take a few hours to form and stabilise while deeper layers may need several days. Thus, although DX UHF TV signals may give an indication that something is happening at UHF, enhanced microwave propagation may have been in full swing long before this! This is not to suggest that useful clues can't be gathered from TV weather reports and abnormal TV reception; it plainly can, but just be careful how you interpret the signs. Forecasts can help in predicting openings - abnormal TV reception may already be too late. Don't give up too soon either! The answer is probably to monitor distant stations (such as microwave beacons) constantly, which is one reason we would like to encourage beacon building, either formal beacons or personal beacons.

Smaller scale, shorter lived tropospheric

anomalies (those which only take a few hours to form) are believed to occur very frequently, especially late after sunset and just before sunrise. The mechanism of formation of local anomalies, perhaps extending only for a few tens of km, can be similar to that of larger scale phenomena, or they may arise from advection effects near large stretches of water or radiation effects due to rapidly cooling (evening) or warming (morning) land masses. Local inversions tend to be shallow and short-lived while big openings, which take much longer to form, are likely to be much deeper and hence more effective at lower frequencies. Whether your results are good, bad or indifferent, the Microwave Committee and the *Microwave Newsletter* editors would like to hear from you so that we can extend next year's maps further. And we also need more beacons (on any band), personal or formal please!

TRIBUTE TO A PIONEER

LES SHARROCK, G3BNL, who was widely known in UK microwave circles, died suddenly at his home on the evening of 10 July, not long after completing a 3cm QSO with another 'old timer', Bill James, G6XM. All who knew Les will remember him as friendly, helpful and a true gentleman.

Along with Alan Wakeman, G3EEZ, Les was pioneering narrowband contacts on all the bands from 1.3GHz to 24GHz, long before most of the present operators knew that microwaves even existed! Many of these contacts set UK records which have stood for many years. Les was well known for his work on phase-locked narrowband techniques at 10 and 24GHz, setting the first UK record at 150km on the 24GHz band.

MICROWAVE DIRECTORY

READERS ARE REMINDED that Microwave Committee member Martyn Kinder, G0CZD (QTHR, E-mail M G Kinder @wal0103.wins.icl .co.uk, BBS GB7PMB or Fax 01924 812050) is currently collecting data for the 1996 *Microwave Directory*. If you wish to be included in the directory, can you please let him know your details, such as which bands you can operate on, which bands you have interest in, whether you operate from a fixed location or portable and whether you are interested in setting up skeds, either portable or fixed and, of course, your telephone number for contact in the case of a sudden DX opening! It is intended that the new directory will be published in the December issue of the *Microwave Newsletter*, as well as being available as a software version when the update is complete.

It may also be timely to remind you that the latest updated version of the *Microwave Bibliography* (now well in excess of 1400 entries) is also available from the same source. All you have to do to obtain a copy of either (or both) database(s) is to send a PC formatted 3.5in disk and an SASE for the return postage to Martyn Kinder, 12, Jessop Way, Haslington, Crewe CW1 1FU.

OPERATING NEWS

A NEW UK DX record was set by a 24GHz narrowband contact between Sam Jewell, G4DDK and Arie Dogterom, PA0EZ, on 29 June. Signals were exchanged at RST419 from PA0EZ and 529 from G4DDK, over a path of 268km. It should be noted that the contact took place on 24192.09MHz, not on the IARU 'preferred' frequency of 24048MHz. Sam used 125mW output and Arie 80mW. The contact was remarkable insofar as Arie's location is some 50km inland and he had never worked beyond 40km on 24GHz before this contact. The Schiphol 24GHz beacon was not audible at the time. Congratulations to both operators.

The opening which enabled this contact appeared to have lasted from 26 June through to 2 July (at least), coinciding for once with the RSGB VHF NFD and an IARU Region 1 all band VHF/UHF/microwave contest, thus creating unusually good conditions for both these events.

Peter Day, G3PHO, sent these two photographs to illustrate how the microwave scene has changed over the past ten years. The inset photo, taken in September 1985, shows Peter with lightweight portable equipment on Bleaklow Hill, Derbyshire. The second shot was taken recently at Alport Height near Matlock, Derbyshire. Peter commented: "The development of moderate power 10GHz narrowband systems has meant greater battery drain, the need for two metre talkback capability, with 8-ele yagi and a minimum of 10 watts output on 144MHz, plus a bigger dish to cope with the very obstructed paths."

Band GHz	Pos	Callsign	Stations Worked	Best DX (km)	Multiplied Score
10	1	G0VHF	71	877	62267
	2	G4DDK	41	901	36941
	3	G4BRK	55	561	30855
	4	G3FYX/P	49	390	19110
	5	G3PHO/P	47	330	15510
	6	G(W)4BRK/P	26	509	13234
	7	G4EQD/P	30	423	12690
	8	G3FYX	34	332	11288
	9	G8APZ	22	426	9372
	10	G3JMY	30	307	9210
	11	G3ZME/P	31	284	8804
	12=	G3JMB/P	31	282	8742
	12=	G8LSD/P	31	282	8742
	14	G3GNR	22	382	8404
	15	G1MPW/P	21	277	5817
	16	G8DKK	13	390	5070
	17	G4JNT	19	202	3838
	18	G3UKV	10	252	2520
	19	G3CU/P	11	203	2233
	20	G3PHO	2	469	938
	21	G8AYY/P	7	93	651
	22	G3JMB	2	87	174
24	1	G4KNZ/P	12	154	1848
	2	G4DDK	6	268	1608
	3	G3FYX/P	8	154	1232
	4	G3PHO/P	5	126	630
	5	G8AYY/P	3	93	279
47	1=	G4KNZ/P	1	25	25
	1=	G8KMH/P	1	25	25

Table 1: Operating Ladder positions for July 1995.

Meanwhile, Steve Davies, G4KNZ/P and Lehane Kellett, G8KMH/P have had 47GHz contacts over three successive paths of 5.3, 12.5 and 16.0km in the same general area, just to the north of the Chilterns used in 1992 by Arnold Mynett, G3HBW, and Brian Hummerstone, G3HBR, to make a 14km contact. Two days later G4KNZ/P and G8KMH/P went on to work a 25km path which is a new UK record.

The tests were conducted in the early evening after a very hot and humid day, with the temperature estimated to be 24°C. Signals were estimated to be about 16dB above 'just detectable' and with about 9dB in hand to be able to copy the wideband FM speech. Measurements suggested that the losses due to water vapour and oxygen were not as high as had been suggested, maybe about 0.1dB/km, but careful measurements over longer paths will be needed to confirm this.

The equipment in use at each end consisted of 100mW Gunns (in WG23), a 15dB cross-coupler and WG22 detector mount. Dual horn antennas of about 23dBi gain were used, enabling full duplex working.

THE TABLES

I MUST APOLOGISE for the errors in the last All Time table, probably the result of translation errors from the text disk to typesetting. The 1995 table (**Table 1**) looks quite healthy with several high scores on 10GHz in terms of stations worked but, so far, unlike last year, no 1000km+ contacts. Perhaps this is counterbalanced to some extent by improved performances on the 24GHz band and the inclusion of the first entries at 47GHz. ♦

Satellites

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

WITH THE ANTICIPATED launch of Phase 3D next April, speculation is rising over the demise of OSCAR 13. Phase 3D is expected to fill the gap left by OSCAR 13's departure from the scene. OSCAR 13 was launched on 15 June 1988 from Kourou in French Guyana, as the first test launch of the ARIANE-4 rocket. During the past seven years it has served the amateur satellite contingent well and has introduced these enthusiasts to satellites in highly elliptical orbits. It reached an 'apogee' - the highest point in an orbit - of 36000km. The lowest point on its orbit - called 'perigee' - is 1500km above the earth. This gave a satellite which could 'see' a large portion of the earth's surface and was available in the northern hemisphere for up to 11 hours a day.

Some are now attempting to predict the date of re-entry of the satellite at the end of its life, and various experts in orbital calculations have come up with possible dates.

Following a discussion on one of the Sunday morning nets recently (1015 clock time, 3780kHz) on this topic, Jack Ward, G4JJ, kindly sent me the following: "I want to make it perfectly clear that I am not making any forecasts about OSCAR 13 - I have neither the brains nor the knowledge for such a weighty matter. All I am doing is stating what has been happening over the past few years and what the current position is as I see it. I am indebted to my good friend John Branegan, GM4IHJ, who a few years ago gave to me the formula for compiling the information.

"The graph (**Fig 1**) shows how OSCAR 13's perigee took a previous dip, then recovered and now is on the downward path again. It is dropping at the rate of approximately 1.7km per day and is approaching the previous low. I put this into the (Sunday AMSAT-UK) net, so that anyone interested will be able to follow what happens over the next few weeks.

"I understand several good papers have been written explaining what happened last time and what will happen in future, but as usual different conclusions have been reached. I am quite happy to sit back and see whether it will again recover or whether it will continue to drop until it burns up in the earth's atmosphere."

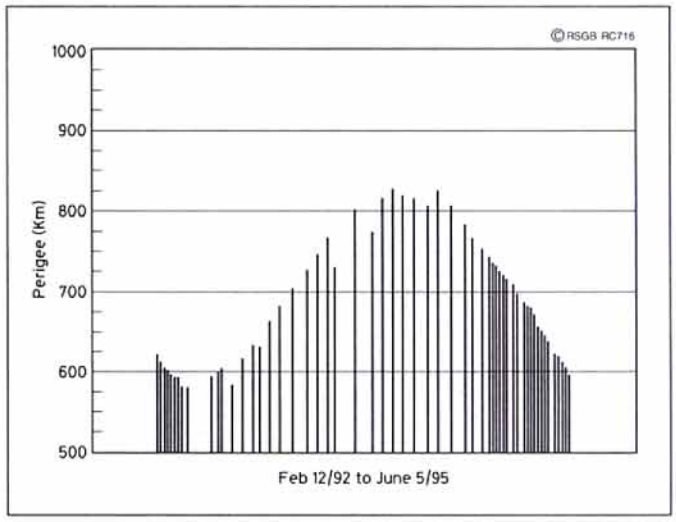


Fig 1: The path taken by Oscar 13 in orbit.

PROMOTING MODE 'A'

IMAGINE MY delight when, on perusing June's *Oscar News*, I found an article by Doug Loughmiller, G0SYX/K05I, entitled 'The Mode A & K Operator's Corner'.

Doug writes: "As the state of amateur satellite art has evolved over the past decade or so with the advent of Phase 3 spacecraft in highly elliptical orbits offering wide coverage, 'bent pipe' communications and the highly popular store-and-forward microsats that offer global near real-time communication with a single spacecraft, Mode A satellites have been overshadowed in the eyes of many radio amateurs, particularly those who have been tracking spacecraft for a few years now. But Mode A satellites [2m up, 10m down - *Ed*] have many attractions: Ground station equipment is relatively inexpensive with no need for computer or data handling apparatus and they tend to be easy to operate."

Doug is keen to raise the profile of Mode A, convinced that Mode A satellites have a meaningful place in the amateur satellite hobby, particularly for newcomers. He is to write a regular column in *Oscar News* on current events in the world of Mode A to be supplemented with tips about equipment, useful circuits, operating conditions etc. Doug is also planning a Mode A Operators Club, to bring together those who share his views on the future of amateur satellite progress. Those who are interested should contact Doug at 193 Arethusa Way, Bisley, Woking, Surrey GU24 9BT. Packet G0SYX @ GB7GFD. Internet ko5i@msat.org. Fax +44 (0)1483 259503.

Doug concludes: "Mode A & K analogue satellites are well within the grasp of virtually every radio amateur. They're interesting, easy to operate and, most of all, they're fun! The amateur satellite community owes a great debt of gratitude to our Russian friends and colleagues for providing such useful and enjoyable satellites for all of us to use."

My sentiments exactly! Ever since I became associated with AMSAT-UK, which was practically from its beginning, I have been convinced that amateur satellites must be regarded as just another mode of amateur radio communication; to be used as the other modes such as CW, FM, SSB, RTTY, FAX, SSTV. Each of these modes has its own characteristics and appeals in its own way to particular participants. Each has its own difficulties, special characteristics, technology, expense level and so on. As such, they cover a very wide spectrum of amateur radio activity. There is a place within the amateur radio scene for everyone whose interests extend from straightforward 'communication' through to the heights of technical innovation and technical development.

Amateur radio satellite development certainly started in this way, appealing to those with an experimental bias, giving them a wonderful new field to take up the gap from the early days of amateur radio when one had to build all one's equipment, which provided much of its appeal, to the stage where almost every item needed can be 'bought off the shelf'.

Professional satellite technology developed so quickly it became almost impossible to keep up with it, particularly from the amateur radio point of view. Many of those amateur radio enthusiasts with the necessary skills, found a place in the rapidly expanding professional field and the amateur satellite field itself carried along into 'high technology'. This has been to its credit as examples of technical development in the sphere made by essentially amateur enthusiasts are legion.

SUNSAT LAUNCH DATE

FROM RICHARD Limebear's satellite news review, which he gives on the last Sunday in the month (10.15 clock time, 3780kHz +/- QRM) I learned that the South African satellite SUNSAT should be launched in January. More on this next time. ♦

STALWART AMSAT-UK member Roddy Clewes, G3CDK, died on 23 July aged 78. A full obituary, produced by Ron Broadbent, G3AAJ, MBE, appears in the latest *Oscar News*. It is abridged here:

"I first worked G3CDK some 30 years ago when we belonged to that band of amateurs known as the Night Owls on 80 metres ... Roddy was, as he did right up to the Saturday I last spoke to him, asking questions and finding answers about satellite working ... He had without doubt a very keen mind right up to the last...

"Roddy was a staunch member of AMSAT-UK ... He was always willing to help others to get onto the birds, and had some down to earth opinions about our hobby..."

He was a "true worker for over 30 years as chairman and then president of the Sutton and Cheam Radio Society. He was always interested in new ideas, modes and operation of everything to do with amateur radio ... Even at the age of 78 he would pursue a technical or practical problem until he got it correct. He was by trade an insurance man and had no formal radio, electronics or computer training.

"I am sure AMSAT members will miss him on the birds and the nets. Always a true friend to myself and dozens of our members World-wide. As a person, a true gentleman in the finest tradition of amateur radio."

TELFORD RALLY

3RD, SEPTEMBER

The 18th consecutive Telford Amateur Radio Rally will be held at the usual venue the Telford Exhibition Centre on September 3rd. For those of you who have been before we have listened, so the catering has been improved and there will be concessions for OAP,s. So come along and bring plenty of friends with you.

Features for this year include the conventional Bring and Buy also Home Construction with the necessary stands that cater for those bits that are hard to find. Also something for those who prefer to buy in "Kit" form., we have managed to persuade some of the kit traders to attend. So don't miss out on the fun. There will be plenty of the specialist and affiliated groups like RAIBC, RNARS,RAFARS the UK Six Metre Group and many others.
However if you are one of the 23% of potential brand new and very welcome visitors then read on. The Telford Rally has always been one of the very best since it's inception 18 years ago. Don't take my word for it - just ask any Radio Amateur who has been to it.
This event is remaining in the same halls as last year with first class facilities for disabled visitors. Plenty of room to move around no more shoulder to shoulder jostling unlike some rallies you may have attended. Adequate sitting areas for that snack or pint you look forward to.
Loads of Traders - large and small and some of the Major amateur radio suppliers are there too, plenty of parking a major presence by the R.S.G.B. Morse Tests will again be available this year. Plenty of attractions for the non-Amateur family members. So please put the date in your diary to avoid disappointment.

Info from Dave G4EIX 01952 588878 or John G0GTN 01743 249943
BRING AND BUY, FLEA MARKET
DOORS OPEN AT 10.30 earlier if inclement. - SEE YOU THERE.

THREE COUNTIES
RADIO RALLY

Sunday 24th September.
Opening at 10.30 am.
Lecture programme.

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Contact: G4PQZ. Tel: 01905 73181.

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Peterborough Radio & Electronics Society

SUNDAY 17th SEPT

East of England Showground
Oundle Road, Peterborough
Doors Open 10:30am

* Superb Location – Adjacent The A1 *
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GERMANIUM DIODES OA73 @ 20p, OA90 @ 20p, OA91 @ 20p, CG64 @ 15p.
R.F. POWER TRANSISTORS 2N5641 @ £7, 2N2553 @ £4, 2N2950 @ £4, PT31983 @ £4, BFW16 @ 75p, 2N3553 @ £1, 2N3866 @ £1, 2N4427 @ £1, BFR64 @ £2.50, BLY89A (2N6082) @ £8.95, £16 Pair.
12 To 1 SLOW MOTION DRIVES @ £2.95. ¼" Flexible Couplers @ £1.
FETS 2N3819 @ 35p, MPF102 @ 45p, J304 @ 25p, J230 @ 20p, 2N4869A @ 45p, Low Noise VHF-UHF J309 @ 55p, BFW11 @ 30p, BFW12 @ 30p, Dual Gate MOS Fets Like 40673 @ 80p, BF981 @ 35p, 4 for £1.20.
PHILLIPS ELECTROLYTICS 10,000uf 40v.w. @ 60p, 4 for £2, 1500uf 200v.w. @ 3 for £2.
2GHz STRIPLINE TRANSISTORS @ 8 for £1, 5GHz Type @ 5 for £1.
X BAND GUNN DIODES @ £1.65, DETECTOR DIODES like 1N23 @ 50p, GEM1 @ £3, CS10B @ £3.
ASSORTED CRYSTALS HC6U TYPE 20 for £1, HC18U @ 15 for £1.
B7G 100KHz with Base @ £2.55, 10XAJ 1MHz @ £1.50.
VHF POWER FET VM1L20FT (41109) 175MHz, 20Watt, 28 volt with date @ £5.95 each, UHF POWER TRANSISTOR 41114 No details @ £6.95, Power FET BLF244, 15 Watt, 400MHz @ £7.
FERRITE 2 Hole Block @ 25p, 6 Hole Ferrite Bead @ 3 for 50p, Sub-Min Bead @ 12 for 50p, FX1115 Bead @ 10 for 60p.
TEXAS FETS TIS14 No Details @ 6 for £1, SEMCO R.F. Capacitors 300pf @ 55p.
HIGH POWER R.F. TRANSISTORS BLW50F @ £6.95, BLX13 @ £15, BLX14 @ £17, BLX15 @ £19.

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NEW VENUE

SOUTHEND & DISTRICT RADIO SOCIETY
1995 RADIO & COMPUTER RALLY

NEW VENUE

To celebrate the clubs 75th anniversary, the rally will be held at a new prestigious venue over looking Southend Seafront with over 10,000 square feet of exhibitors and traders all in one hall. Easy access from M25 Junction 29. Bring the family for all the Southend Seafront attractions.

Free Raffle with £100 worth of prizes – Morse tests on demand (2 photos required) – RSGB in attendance. Large bring and buy – Display of historic Police Radios – 3 Bars, Hot and Cold Snacks, Pub Grub and Restaurant. Facilities for disabled – Talk in S22 – Entrance only £1.50 (Concessions £1.00) – Open 10.00am until 5pm.

Sunday 10th September, Cliffs Pavilion, Southend-on-Sea

Telephone 01702 353676, Fax 01702 602271, E-Mail 100530.1740@compuserve.com

CONTINUED FROM P73

sure that a real-life circuit containing active devices is operating under the correct DC conditions to deliver the AC characteristics that the model is assuming. The restriction to linear behaviour means that you can't predict the effects of strong signals, and *ARRL Radio Designer* gives only a limited view of devices such as mixers and diode detectors that rely on non-linearity as part of their normal behaviour.

Oscillators are another class of circuits that rely on non-linear behaviour somewhere in the feedback loop, to regulate the amplitude of the output signal. However, a package such as *ARRL Radio Designer* can make a useful start on oscillator design by determining the available gain when the feedback loop is opened, using the techniques described in [2].

It is no fault of the software that modelling VHF / UHF circuits isn't as straightforward as at HF. The same laws of circuit theory apply from VLF to the highest microwave frequencies, but you do need to take much greater care with the choice of component models at VHF. For example, even a humble resistor may need to be modelled as a resistance in series with its lead and package inductance, the whole being shunted by parasitic capacitance (**Fig 6**). These details usually don't matter below about 50MHz, but become increasingly important at higher frequencies. Also, you need to ensure that the layout of your real-life circuit doesn't introduce any feedback paths that cannot be described in the model, and once again this becomes more difficult as the frequency increases. As a result, until you become expert at including all the details that are relevant at VHF and above, the output from your circuit models may have to be treated as more of a guide than a prediction.

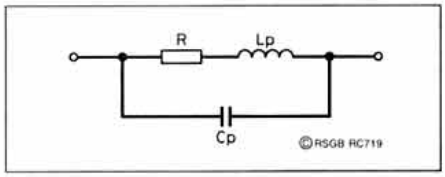

Fig 6: VHF / microwave equivalent circuit of a simple resistor. The parasitic inductance and capacitance can significantly affect performance.

I've already mentioned that *ARRL Radio Designer* is a cut-down version of a much more expensive integrated software package, and that its input has to be via a hand-entered circuit description file. But another limitation is that it cannot read device data from an external file - this too has to be entered in by hand as shown in Fig 3. I found it very irritating to be unable to say 'the transistor is a 2N5109 - go look up the data for yourself', or computer-speak to that effect, because this is a standard feature of every other circuit analysis package I've ever seen - even the home-written 'freeware' ones. I hope that ARRL will be able to renegotiate the deal with Compact Software to remove this arbitrary restriction.

CONCLUSIONS

ARRL DESERVES PRAISE for its forward-looking motives in introducing powerful RF design software into the amateur consciousness. *ARRL Radio Designer* is a powerful package, and very reasonable value compared with professional pricing. However, with the present state of the pound, $150 represents better value in USA than in this country, and the software also has to face competition from other free or low-cost offerings (see 'Alternatives' on page 71). If you haven't used RF nodal analysis software before, you might find the power and complexity of *ARRL Radio Designer* rather daunting, and I'd suggest that you try one of the simpler alternatives first until you can tackle a full-specification package such as *ARRL Radio Designer* with more confidence. If you are interested in designing and developing new circuits in the 21st century, this kind of computer software is something you should be looking at right now.

REFERENCES

[1] *Solid State Design for the Radio Amateur* by Doug deMaw, W1FB, and Wes Hayward, W7ZOI. Published by ARRL and available from RSGB Sales. Contact Marcia Brimson at RSGB HQ for details.

[2] *Introduction to Radio Frequency Design* by Wes Hayward, W7ZOI. ARRL reprint of the original Prentice-Hall publication, now with software diskette, ISBN 0-87259-492-0, 1994. ♦

CONTEST CLASSIFIED

All rules should be read in conjunction with the General Rules published in *Contest Classified*

HF RESULTS

2ND 1.8MHZ CONTEST 1994

Over the last few Topband contests, it has been unusual for entrants to describe propagation as good. Nevertheless, that is exactly what most commented this time. With the pan-European event running concurrently, there was plenty of European activity coupled with a welcome opening to USA from around 2330 with 10 W / VO callsigns appearing in the leaders' logs.

Competition for leading places is always very keen and this year antenna heights of the top ten varied from 90ft for G3ZEM, 80ft for G3KDB, G3OZF and GM3POI, 75ft for G3TBK and G4BJM, to 60ft for the rest. With such intense competition, it is perhaps not surprising that the first five places were only separated by six contacts. Dave Cree, G3TBK, has been beavering away at this event for many years and is to be congratulated for taking top spot and the Victor Desmond Trophy.

Regarding the pan-European contest, the HF Contests Committee have considered whether or not to join in but in the end decided it would be against the interests of the UK contesting fraternity. The event is scheduled for some 12 hours, 1800 Saturday to 0600 Sunday. Not only would this deter those with more modest antenna systems, but it is felt that the better-equipped stations would not spend the time on the band just one week before the *CQ* WW CW contest. Checklogs gratefully received from OZ8QW, G2AFV, GW0KZW, GW3JI. GW3SB, GW3SYL and G4VXE/P.

G4VXE

UK SECTION

Posn	Callsign	QSOs	Bns	Score
1	G3TBK	216	74	1016
2	G4BWP	214	74	1006
=	GM3POI	212	74	1006
4	G3SJJ	210	71	985
5	G3ZEM	210	71	983
6	G0IVZ	207	70	969
7	G3KDB	210	66	960
8	G4BJM	193	71	928
9	G4IFB	195	65	909
10	G3OZF	188	69	851
11	G3VYI	152	60	755
12	G4TLS	139	64	737
13	GM4DGT/P	145	60	726
14	G0ORH	138	65	725
15	G3XTT	130	64	710
16	G4OBK	136	56	688
17	G4NOK	136	56	682
18	G4OGB	119	62	666
19	G3KNU	115	59	638
20	G2HLU	111	59	622
21	G3YAJ	105	55	589
22	G4CZB	105	52	575
23	G4EBK	104	54	574
24	G3VRY	108	49	567
25	G4IUZ	101	51	558
26	G3ZGC	95	50	532
27	G4BJQ	89	52	527
28	G3JSR	95	49	526
29	G3UFY	88	43	478
30	G3VNG	70	44	427
31	G3MA	64	58	370
32	G3ULN	53	35	333
33	G4FOC	51	35	321
34	G3FVW	50	34	313
=	G3GMM	52	32	313
36	GM3UM	46	30	287
37	G4JSN	43	28	259
38	G3GMS	36	26	238
39	G3NKS	31	24	213
40	GW4KVJ	16	15	123

OVERSEAS SECTION

1*	EI6GF	71	45	438
2*	SP2DX	55	34	335
3*	DJ9WH	54	32	322
4	EA6ZY	50	34	320
5	LA2UA	51	32	310
6	RX3DRU	44	32	286
7	LA2KD	41	29	268
8	DF3OL	33	28	239
9	LA1IE	34	25	227
10	OK2BMU	35	24	213
11	SP5GKN	20	16	140
12	UR5TA	19	16	137
13	SP4EAK	11	9	78
14	EA8CN	44	-	32

SWL SECTION

1	ONL383	353

= Victor Desmond Trophy, * = Certificate of Merit

CLUB CALLS CONTEST 1994

Once again there was plenty of activity, with more Club stations available to work. All the comments received indicated that participants enjoyed the three-hour session, with several groups indicating that this was either their first competitive effort, or that most of the operators were new to contesting.

Perhaps one of the most intriguing aspects of contesting as in any competitive arena is the ingenuity generated by experienced operators in order to retain their leading places. G0JBX, The Evets Commmunication Ltd group, having already changed their name to ECL to comply with the rules (a point noted with some disdain by many entrants) have added computer technology to their already sophisticated high dipoles and second receiver system. Logging software was supported by a second computer containing a database of club information! That shows some dedication when you realise that apart from the main 150ft mast, all the rest of the equipment has to be taken up to this repeater station situated on high hilltop on the outskirts of Derby. G3WOI, the Newbury and District ARS, set out to find a new site for their effort, having specified that it should contain two 70ft supports. A local cricket ground provided the ideal answer with two tall trees at the required height and around 270ft apart. What clinched the deal was the pavilion positioned midday way between the two trees. The only minus point being the lack of heating!

Several other ingenious antenna systems were listed in the logs, including a kite-supported vertical and several horizontal full-wave loops. For good inter-UK working on 160m, a half-wave at a reasonable height, say 50ft plus, makes an effective antenna. For each additional 10ft in height, an increase in efficiency will be noted. A fact worth noting is that for any antenna, the maximum radiation takes place a quarter wavelength from the far end and it is this point that needs to be the highest.

G4VXE

Posn	Callsign	QSOs	Score
1	G0JBX	186	2103
2	G3WOI	164	1997
3	G6RC	173	1974
4	G2BBC	154	1858
5	G0OAU/P	129	1802
6	G4NOK	148	1723
7	G3PFM	116	1658
8	G3VRE	131	1648
9	GW5NF	115	1640
10	G0RGH/P	108	1588
11	G4FRS/P	128	1579
12	GW0VJS/P	127	1570
13	G4DDC/P	109	1546
14	G4HRS/P	95	1471
15	G4ENA	95	1457
16	G3RAL/P	88	1434
17	G4OGB	77	1378
18	GW4CC	100	1373
19	G0JJN	79	1372
20	G4MRS	123	1305
21	G4ADV	110	1269
22	GW4BRS/P	98	1241
23	G0ORH	82	1251
24	G3KNU	56	1158
25	G5FZ	56	1153
26	G0ERA/P	59	1146
27	G3XYZ	50	1070
28	G3FNM	47	1062
29	G3SAD	54	1047
30	G4DDX	41	1028
31	G3CNX	51	1023
32	G0SWI/P	82	1016
33	G4WEY	56	1001
34	G8CA/P	80	991
35	G3SQX	50	985
36	G4TLS	50	975
37	GW0SYG	52	971
38	G3SRC/P	60	969
39	G3NJA/P	64	968
40	G3ULT/P	40	940
41	G4OYY	43	934
42	G4FBS/P	40	910
45	G4AYM	49	889
44	G3XTT	40	730
45	GM0GNK	51	812
46	G3BIT	38	879
47	GM4TMS	54	877
=	G3VNG	39	877
49	G4OBK	41	786
50	G0ACK	31	768
51	G0GAZ	29	744
52	G4POF	32	776
53	G3GMM	28	729
54	G3NKS	31	718
55	G4CZB	37	676
56	G3WTP	26	597
57	G0CZG	21	483
58	G3SZS	22	482
59	G0DHZ	23	425
60	G3JSR	20	424
61	G0FYX	15	360
62	2E0ACY	30	342
63	G0NIF	17	353
64	G3PRC	14	320

SWL SECTION

1	RS95258	63	1204

Checklog gratefully received from G4ALE.

1ST 1.8MHZ CONTEST 1995

In a winter season which produced some of the best Topband DX openings for many years, it was unfortunate that conditions for this event were very flat. Only two USA stations plus PY and 4S7 were worked by the leaders. On the other hand, the low noise level and good short skip enabled the more modestly-equipped stations to enjoy good contact rates with many European QSOs. The Somerset Trophy has been won by G3ZEM with a margin of 51 points. Of the top 20 entrants, only G4BUO submitted a perfect log - no mean achievement on this band. Both this contest and the 2nd Topband contest in November share the band with contests from other societies who may only send an area code with the report. It is not necessary to obtain a serial number, but you must record what is sent otherwise you risk hard-won points being deducted.

G4ODV

Pos	Call	QSOs	Bonus	Eqpt Code	Score
1	G3ZEM	195	76	4C19	962
2	GM3POI	189	70	4Q19	911
3	G3SJJ	179	72	4C17	897
4	G4BUO	179	71	4C17	892
5	G4BJM	173	71	4C17	871
6	G4BWP	170	67	4C16	847
7	G4IFB	159	69	4C15	822
8	G3TBK	168	69	4C17	819
=	G4PIQ	162	69	4C17	819
10	G3OZF	157	69	4C18	810
11	G3HEJ	152	64	4C16	773
12	G4TLS/P	148	63	4W15	756
13	G0IVZ	144	61	4C15	725
14	G3XTT	150	61	4C17	719
15	G4ODV	132	63	4W14	697
16	G0ORH	132	60	3C16	696
17	G3VYI	129	60	3W13	681
18	G3KNU/P	129	60	3C13	680
19	GM4DGT/P	124	61	3C14	665
=	G0JQN	125	58	3W12	665
21	G3RSD	120	59	3C13	655
22	G4OGB	111	59	2C13	625
23	G4EBK	120	52	3C13	611
24	G3YAJ	112	54	3C13	606
25	G4CZB	105	55	3W13	590
26	G3UFY	101	54	4W1-	573
=	G2HLU	106	51	3C12	573
28	GW4HBK	91	51	3C14	528
29	G3KKQ	94	50	3Q13	526
30	G3JSR	92	47	3W1-	508
31	G3VNG	82	48	3C1-	486
32	G0ADH	80	48	3C1-	480
33	G0IDE	87	42	3C1-	471
34	G3GLL	72	46	3G15	443
35	G3GMS	75	42	3G12	435
36	G3BPM	71	44	4C1-	427
37	G3AWR	74	40	3Q12	422
38	GM3UM	68	34	3W1-	371
39	G4KDL	62	38	3C12	370
40	G3FVW	58	36	2W1-	354
41	G3LIK	57	34	3W1-	341
42	G3ZDD	59	34	3W2-	338
43	G0LKX	54	33	3W1-	315
44	G4JSN	48	30	3C12	291
45	G3ILO	40	26	3C12	250
46	G3ZGC	39	25	2W12	242
47	G3UGF	33	25	1W1-	221
48	G3TTB	37	22	2W1-	205

OVERSEAS PLACINGS

Call	QSOs	Bonus	QSOs	Points
1	EI4HM (Op G3HZL)	74	39	417
2	SP2DX	58	35	349
3	F6KBF (Op G0JFX)	49	31	302
4	SQ5O (Op SP5IU/K)	51	29	300
5	DJ9WH	48	29	289
6	LA1IE	42	28	266
7	ER5AL	40	27	252
8	SP5GH	38	27	249
9	HA8BE	33	26	229
10	RZ3QYA	31	24	213
11	SP8GYD	26	21	183
12	PA3AMA	22	18	156
13	OM2XW	20	18	150
14	US7IGF	20	14	130
15	UT1ZZ	12	11	91

SWL SECTION

ONL-383	46	29	283
SP0013-JG	38	29	268

Checklogs acknowleged with thanks from GW0KZW and SP5GKN.

VHF RESULTS

70MHZ TROPHY 1994

There was an excellent entry this year, probably the best for quite a while and this reflects in the number of groups who decided to take a trip north of the border, with many GM portables in evidence. One or two entrants would like to see the extra hours restored at the end of the event and your comments would be appreciated on this subject. Please make sure you read the rules fully prior to entering, and in particular pay attention to which multiplier rule is in force. Many entrants lost points for not correctly marking claimed multipliers in the log. Ensure that in the event of receiving bad signal complaints these are also entered in your log with the correct time and suitable comments, as again failure to do this could result in severe points reductions or even disqualification. Congratulations to GD4GNH operating for the Northern Lights who is awarded the Trophy as being the highest scoring entrant.

G4XUM

ALL OTHERS SECTION

Pos	Callsign	Loc	Score	QSO	Best DX	km
1	GM4ZAP/P	85AJ	36918	68	GJ3YHU	697
2	GM3CKR/P	85PS	33340	74	GJ3YHU	728
3	GM4DSP/P	97CK	32760	50	G6SRC/P	708
4	GW4MGR/P	83JA	25756	72	GM4DSP/P	477
5	G3TCU/P	91SF	24380	69	GM4DSP/P	695
6	G6SRC/P	01LG	21318	55	GM4DSP/P	708
7	GM4CWH/P	86RV	20010	42	G4SSD	730
8	G4ZTR	01KW	19305	54	GM4DSP/P	635
9	G7ANQ/P	92FM	17587	59	GM4DSP/P	547
10	GJ3YHU	89WF	17344	42	GM3CKR/P	728
11	G3PJX/P	91TF	16644	60	GM4DSP/P	696
12	G4SSD	80FI	15960	50	GM4CWH/P	730
13	G3VGG/P	82XJ	15840	61	GM4DSP/P	560
14	G6AQP/P	91XG	15334	61	GM4DSP/P	694
15	G8DDY/P	90JO	14097	53	GM3CKR/P	583
16	G4SJH/P	91PF	8961	37	GM4DSP/P	693
17	G4WAC	92BJ	6264	32	GM4DSP/P	561

SINGLE OPERATOR FIXED SECTION

1	GD4GNH	74QD	37583	65	GJ3YHU	572
2	G4PIQ	01MU	31152	73	GM4DSP/P	647
3	G3UKV	82RR	13949	52	GM4DSP/P	525
4	G0EHV	94FW	10819	38	GJ3YHU	636
5	GI4KSO	64XK	10353	30	G6SRC/P	586
6	G3LVP	81WV	8736	39	GM4DSP/P	617
7	G3NKS	81XU	8480	40	GM4DSP/P	621
8	G4AFJ	92HO	8128	41	GM4DSP/P	538
9	G3HYH	92JO	7456	40	GM4DSP/P	539
10	G3FDW	84ME	6164	33	GJ3YHU	555
11	G3FIJ	01KV	4658	23	GM4DSP/P	639
12	G4OUT	92AT	3664	25	GM4CWH/P	455
13	G3BPM	80OS	3604	32	GD4GNH	396
14	G6MXL	80XR	3402	20	GM4ZAP/P	534
15	G8PNN	95EF	2394	19	G3VGG/P	316
16	G4BIK	02AI	2295	22	GM4DSP/P	577

VHF CONTESTS CALENDAR

29 Aug	144MHz CW Cumulatives (May 95)
2/3 Sep	144MHz Trophy / SWL (Jun 95)
3 Sep	4th 144MHz Backpackers (April 95, page 83)
13 Sep	144MHz CW Cumulatives (May 95)
24 Sep	70MHz Trophy / SWL (Jun 95)
28 Sep	144MHz CW Cumulatives (May 95)
3 Oct	1.3/2.3 Cumulative (June 95)
7/8 Oct	432-24GHz (Jun 95)
11 Oct	432MHz Cumulative (Jun 95)
13 Oct	144MHz CW Cumulative (May 95)
18 Oct	1.3/2.3GHz Cumulative (Jun 95)
26 Oct	432MHz Cumulative (Jun 95)
29 Oct	1.3/2.3GHz Fixed/SWL (June 95)
30 Oct	144MHz CW Cumulative (May 95)
2 Nov	1.3/2.3 GHz Cumulative (June 95)
4/5 Nov	144CW 6-hr (June 95)
4/5 Nov	144CW 24-hr (July 95)
10 Nov	432MHz Cumulative (June 95)
16 Nov	1.3/2.3 GHz Cumulative (June 95)
27 Nov	432MHz Cumulative (June 95)
3 Dec	144 AFS/ Fixed /SWL (July 95)
4 Dec	1.3/2.3 GHz Cumulative (June 95)
12 Dec	432MHz Cumulative (June 95)
26-29 Dec	70/144/432 Fixed/Portable (Aug 95)

HF CONTESTS CALENDAR

2 Sep	AGCW Straight Key (Aug 95 p22)
2 / 3 Sep	SSB Field Day (Jun 95)
2 / 3 Sep	LZ DX CW (Aug 95 p22)
2/3 Sep	All Asian DX (SSB) (Sep 95, p24)
4 Sep	2nd QRS Cumulative (Aug 95)
9/10 Sep	WAE DX (SSB) (Sep 95, p24)
12 Sep	2nd QRS Cumulative (Aug 95)
16/17 Sep	Scandinavian SAC (CW) (Sept 95, p24)
20 Sep	2nd QRS Cumulative (Aug 95)
23/24 Sep	Scandinavian SAC (SSB) (Sep 95, p24)
28 Sep	2nd QRS Cumulative (Aug 95)
1 Oct	21/28 SSB (Jun 95)
1 Oct	ON Contest (SSB) (Sep 95, p24)
8 Oct	2nd QRS Cumulative (Aug 95)
8 Oct	ON Contest (CW) (Sep 95, p24)
15 Oct	21/28 CW (Jun 95)
28/29 Oct	CQ WW DX SSB

ARDF

RIPON QUALIFYING EVENT (TOPBAND)

Date: 3 September.

Map: 99 (Northallerton and Ripon)

Assembly: 1300 for start at 1320.

Location: Ripon Racecourse, NGR 331701

Competitors requiring tea should notify Mike Parker, tel 01423 870375, no later than 27 August.

SEE CENTRE PULL-OUT FOR ALL 1996 CONTEST RULES!

Members' Advertisements

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. 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. Advertisements will be placed in the first available edition of *RadCom*.

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

AEA Morse machine MM3, excellent condx; £120. Warn industries Z3500 12VDC winch with remote controller for telescopic tower manufacturer overhauled; £200. Standard C500 dual band C500 h/held bxd, accessories; £150. Drake AUX7 board for TR7/R7A unused installation instructions; £25. Sherwood filter CF600/6 for R4C; £25. Carriage extra or collect. 01986 798524 (Woodbridge).

ALINCO DJ580 dual band bxd, good condx with soft case, charger NiCad, battery case; £270. 01287 660821 (Guisborough).

AP1086 issue 1 (RAF radio stores Ref Nos) also AP1186A B-C-D-E all sections & APs relating to radar, radio equipment. Would purchase post-war to current Magnetrons, Klystrons, T/R cells, Ignitrons, Thyratrons, Microwave planar tubes, TWTs & special CV types. Required R1355 10D/13032, IFF RXs R3002, R3067, R3121 control unit type 17 all unmodified, excellent price offered. Tel or fax anytime; 0171 511 4786.

BUTTERNUT mini beam bxd, new; £175. Jaybeam vertical 10,15,20m; £55. Kenwood MC85, new; £70. Microset 100W 144 amplifier pre-amp; £100. Alinco 144 amplifier with pre-amp 3W/50W; £75. Daiwa MRC7500 round controller new; £45. Kent single paddle key; £20. Everything mint condx. 01362 821125 (Dereham).

COMMODORE 64, two keyboards plus third to cannabalise two 16in VDUs, one in metal case; £30 the lot or split. Collect. Junction 4 M2. 01634 379140 (Gillingham, Kent).

COMPLETE station, Drake TR7 tcvr with PSU, MN2700 ATU, ext spkr Drake mic, full service man, excellent condx; £950. Icom R71 HF rcvr, as new condx; £525. Icom ICR7000VHF/UHF rcvr, as new condx; £475. Yaesu FRG7700 HF rcvr, good condx; £275. Alinco DR119E 50W 2m mobile with mic, bracket, bxd as new; £195. Astatic classic chrome mic; £60 ono. 3 pairs Icon headphones, new in box; £15.00 pair. Racal RA217D HF rcvr with MA323 FSK unit (audio fault); £100. Alinco DJ160 h/held US version, works okay; £100. 0435 873434. (Mayfield).

FT290 Mk1, fitted spkr mic with PTT/scan buttons. FT790 Mk1, both have NiCads chargers soft cases & owners mans; £200 & £225 respectively. Heatherlite mic with PTT/scan controls suitable for the above. Other extras available. RN Electronics 2m-6m transverter, mint, unused; £175 or swap for 70cm h/held. Will deal for duel bander h/held. Colin, G1VJH, 01260 252057 (Macclesfield) all enquiries answered.

FT736R excellent condx, complete with 1.2GHz unit free 50 ele 1.2.69GHz Tonna. Buyer collects or pays carriage; £1100 ono. G0DLJ, QTHR. 01623 513573 (Sutton-in-Ashfield).

HIGH voltage Electrolytic capacitors, brand new, recent manufacture. Suitable valve wireless repairs, valve, audio amplifier construction, RF linear PSU etc. Valves from 2 microfarad to 200 microfarad at 350, 450 or 500V. Very reasonable prices. SAE brings full list. Also valves (new) ECC81, ECC82 at £1.00 each, ECC83, 807; £3.00. Add £2. postage, cheques to; K Bailey, 40 Seymour Close, Birmingham B29 7JD. 0121 472 3688 (Birmingham).

ICOM 751A HF tcvr CR64 high stability filter fitted. RC10 frequency pad controller. Voice synthesizer unit fitted. Icom IC 500 automatic antenna tuner. Icom IC15 power supply; £950. or Icom IC765 has the lot; £1,500. Take your pick. I only need one. Alan, G4YYD, QTHR, 0161 797 7893 (Bury, Lancs).

ICOM ICR 9000 the best HF/VHF/UHF multi mode rcvr available. 100kHz steps. CW voice synthesizer & variable speed cooling fan. Excellent condx, little used, original packing, will deliver 50 mile radius. Regret lack of funds forces sale; £2875. Cash or guaranteed cheque only please. David, G4JMF, QTHR, 0151 355 3854 home, 0151 347 2169 office, 0378 756268 mobile (Ellesmere Port).

KAM multi mode TNC version 6; £175 BNOS LPM 432-10-100; £225. JT603 Icom/BBC interface with software & books; £50. G3LDI, QTHR. 01508 570278 (Norwich).

KENWOOD TM24IE 2m FM; £200. Icom IC28E 2m FM; £200. Kenwood AT250 HF auto tuner; £175, all in vgc with handbooks. GM4SID. 01224 790001 (Aberdeen).

KENWOOD TS-120V 100W mobile 10-20-40-80 variable down QRP bxd with circuit; £325 ono, mint condx. Drake R8E 0.150 - 30MHx all modes and filters. Computer control SW; £800 ono. 525mb high speed SCS1-2 internet. Tape streamer with 1 card and software; £250 ono. Apple 2+ computer system 2 x disks monitor & assorted SW; £75. Ideal for beginner PC-case with 132W PSU; £10. C/A 1950s Spyset HF operational. Serious offers. 0956 544 202 (NW London).

KENWOOD TS850SAT, exc condx, mic, box, etc. GM3WYL, QTHR 0141 776 6098 (Kirkintilloch).

KENWOOD TS950S HF tcvr with narrow CW filter with handbook, bxd as new. Tim Norton. G0OCX QTHR. 01704 878912 (Formby).

PYE Europa, LO band FM, single or multi channel, working or not, price negotiable. 01651 882283 (Aberdeen).

PYE P5000 hi-band FM hand held, charger, batteries; £35. Pye Olympic Hi-band FM. Mic, hand book, looks new; £35. Storno FM mobile Hi band complete, man; £20. Hitachi 19in colour monitor; £90. HP85B computer, handbooks, interfaces, programs; £50. Xerox toner, gwo; £95. Motorola MT700 hand portable Hi-band FM battery manual; £35. Colour Dot-Matrix printer; £35. Wide carriage Dot-Matrix printer; £30. 01651 882283 (Aberdeen).

SPECTRUM analyser Hameg HM-8028 with tracking generator HM-8038 & mainframe HM-8001 pristine. See cirkit catalogue for full details best offer over; £500 within seven days of publication also Leader LCR740 bridge; £130. Details Cirkit Thurlby Thandar LCR meter TC200; £60. 01566 782463 (Launceston).

TEKTRONIX type 891 40GHz spectrum analyzer CW 12GHz waveguide, vgc; £650. Wanted Motorola GP300 VHF/UHF h/helds. 01582 461952 d/time. (Harpenden).

TEN-TEC OMNI D with 252MO PSU; £300. Hygain TH3 MK3 beam antenna; £100. 50ft telescopic mast; £50. Heathkit HD1250 dip meter; £35. Bencher paddle (chrome); £50. G4DUS, QTHR. 01923 720616 (Rickmansworth).

TOWER 36ft galvanised 4 section heavy duty with climbing steps. Offers or exchange for; FC707 or similar ATU. G4ADE, QTHR. 01964 534365 (Hornsea).

TRIO TR9130 2m multimode tcvr, with BO9 system base, Sp120 spkr & MC-60 mic vgc; £295 ono. GPV-144DX 2m Colinear vgc; £25. SF250 SWR meter & frequency counter; £40 ono. Jaybeam Q4/2M quad antenna; £25. Silent key sale. G4CNY, QTHR. 01432 273323 (Hereford).

TRIO TS530S good condx with MC35-S mic, original packing & man.; £400. Yamaha PSR-50 keyboard; £50. Please phone after 7.30pm. 01865 200335 (Oxford).

TS-930S 500/270Hz filters operator & service mans; £675. AT-180 tuner fitted 30MHz LP filter; £150. GM4SID, QTHR 1995. 01224 790001 (Aberdeen).

TS930SAT tcvr, new digital board fitted by Lowe, excellent condx, buyer collects; £750 ono. 01785 225974 (Stafford).

2-METRE mobile/packet rig. Alinco DR110 45W, colour LCD display, usual scan, memories etc with M/mount, very small! £145. 01235 532653 (Abingdon).

20M SSB/CW QRP tcvr MX-14S with spkr/mic & batteries; £70. 2m VHF FM Rx NR-56; £25. G4EHT, QTHR 01543 251133 (Lichfield, Staffs).

A BARGAIN! Hyundai 286 PC, EGA enhanced colour monitor, mouse, 2 HDD, 130mb + 30mb, 2 FDD, 1.44mb, 640kb memory, 2mb extended. All installed & working. Software includes; Dos 6.2, Radio, Packet, databases, spreadsheets, word processing, games etc; £175 ono. G4HBA. 01404 43894 (Honiton, Devon).

ADONIS AM503 desk mic; £30. BNOS 20amp PSU; £40. J-Beam C5-2m colinear; £25. Dee Comm 70cm colinear; £40. Daiwa CN460H SWR/power meter cross needle 140-450MHz; £40. Daiwa SWIIOA SWR/power meter 1.8-150MHz; £125. Drae 12 amp PSU; £25. Trio TR9000 multimode 2 metre & mobile mount, bxd; £250. Atlas 180 HF tcvr 50W; £200. G4RKQ, QTHR. 01604 712865 (Northampton).

AEA PK-88 Packet TNC with full man & PC software; £75. Dave, 01604 37769 (Northampton). Daytime please.

ALINCO DR430E UHF mobile tcvr. 5/25 watts new August 1994. Price £250. + carriage. GW3VKL, QTHR. 01446 738756 (Barry).

ALTRON 'Pygmy' telescopic lattice tower. 40ft maximum, 14ft minimum. Autobrake winces, base plate mounting. Nearly new, £395. 01206 240700 (Colchester).

AMPLIFIERS FL2100Z WARC; £395. BNOS LPM; £95. Quad Spider; £20. 10m fibreglass arms; £15. TS430S + narrow filters/FM, bxd; £690. GW0GEI 01248 750615 (Anglesey).

AMSTRAD PC1512 computer. Twin disc drives, memory expansion to 640K, excellent condx, complete with keyboard, colour monitor & various software. Must be well worth £100, complete with mans, disks etc. G0BDJ, tel or fax: 01304 366164 (Dover).

AMSTRAD PCW9512 with Locoscript and Locofile 3in & 3.5in disk drives, daisywheel printer, excellent condx, buyer collects; £80. Joan, G0GZA 01242 691051 (Cheltenham).

AOR 3030 HF receiver with VHF converter fitted, PC windows software available. 012657 31461 (Bushmills).

APRICOT PC 486SX-20 50mb HDD, colour monitor, MSDOS 6.2 windows 3.1. HAM software, ideal for shack. Mint. Buyer collect; £390 ono. 0181 578 4484 (West London).

ATARI-STE CAD, bureau, desk top publisher with font creator and printer driver for any printer; £7. also maze game; £5. Hard disc drive, brand new 50mb offers. Mr V McClure, 43 Roman Way, Seaton, Devon. 01297 23421 (Seaton).

AUDIO amplifiers mosfet 'audio associates' X800 presumed 800W per channel suitable PA systems or mega HiFi; £250. Trio TS830S plus CW filter & luxury toning knob; £550. DFC230 digital VFO; £100. Kenwood TM351A 50w 2m tcvr with extended transmit & receive; £295. G4FMO. 01283 840667 (Abbots Bromley).

AVO MK4 valve characteristic meter, handbook, data book. Good clean condx; £100. KW2000B tcvr, Cw filter, frequency meter, mic, phones; £150. 01625 2602320 (Poynton).

BARGAINS station close down. IC737; £725. SP21; £25. FL2000B linear new finals; £225. MFJ931 artificial ground; £75. Adonis AM808G mic; £50. SX200 1.8-200m; £50. FL3; £75. Alinco DJ580; £200. Kamplus 7.4; £250. MFJ1272B mic switch; £25. Alinco DR599 with Duplexer; £350 all in mint condx with original boxes. 01522 751920 (Lincoln).

BIRD 43; £90, Philips PM3219 dual 50MHz storage scope; £170, Russian LF/DF Rx; £40. Eagle Rx80 SWL Rx; £60. Robin answerphone complete; £20. 4KVA Lister diesel alternator; £300. TM6221 AF balun; £5. PX4; £10. PX25; £10. (Would swap either for EA52). Drake filters SI300 & SI1800; £45 ea. Mullard EI34 new, bxd; £25 per matched pair. R123M Russian CNR ex-IRAQ. Chris 01705 596836 (Portsmouth).

COBWEB antenna multi band dipoles ideal for anyone with limited space upgraded to Yagi; £80 ono. 01425 672927 (Christchurch).

COLLINS 325-1 Tx winged emblem. Full power output on some bands, but needs some attention; £185. Matching home built PSU; £85. Realistic radio mic kit; £45. Hitachi S-UHS-C stereo camcorder outfit UM-S-83E, cost £1100. As new; £450. Home built 160M Am Tx; £60. Yaesu FL2100B linear amp; £450. Racal single channel Rx. RA1205; £20. All carriage extra. G3HWX. 01704 840328 (Ormskirk, Lancs).

COLLINS logo rcvr 651-S-1 30kHz-20MHz USB/LSB/AM (wide/NAR) CW (wide/NAR) service man, mech, filters; £420. Collins 180-L3 auto ATU end fed wire 400W pep vacuum variable, circuit & man, connectors; £110. G3LBA. 01865 821503 (Abingdon).

DATONG multi mode filter FI3, mint condx, excellent performer; £75. G3BBK, QTHR. 01435 866129 (East Sussex).

DRAKE SW8 mint condx; £450. G1POJ. 0117 9744157 (Bristol).

EDDYSTONE 670A vgc; £85. Vibroplex WW2 model, good condx; £70. KW dummy load. 100 watt; £45 KW 600 linear ok spares; £75. Split carriage at cost. GM3NCS QTHR. 01343 835635 after 6pm (Burghead).

ELECTRONIQUES coils transformers & front end modules or receivers using them eg G3PDM, G3RKK, G3HTA RG1RA1, Tony, 01905 641759 (Worcester).

ENGLISH electric 16-80pF Vacuum tuning capacitor; £30. No offers. 01844 346274 (Princes Risborough).

EP925 PSU/30 amp; £70. To collect Goodmans HiFi 80 watts; £200. To be collected 35mm Sharp vision camera & flash gun; £20. 35mm Practika sport camera; £12. 0181 806 4470 (Clapton Common), after 6pm.

FL50B FR50B HF Tx/Rx matched pair in working condx; £150 ono. G6ZER, QTHR. 01604 891258 (Northampton).

FOR sale FT530 new quick charger NC-42 FT-23 + charger Drake TR-7 best offer for the TR-7 call G0UUT, 0181 386 4503 (Borehamwood).

FRITZEL 18-24MHz rotary dipole new stainless fittings 1kW; £120. Capacitance meter 1PF-2000micro farad. Digital PPG battery; £35. G3LBA, 01865 821503 (Abingdon).

FT1012D 9 bands, DC PS, FM; £380 ono. Wanted FT757 & 2m rig. G3OAB 0121 747 8489 (Birmingham).

FT101E excellent condx, h/book original packing, PC cable fan mic; £250. Alinco DJ500E 2/70 handy battery charger, rubber duck intern 2/70 FM guide; £250 ono. Hi mound electronic key model DA-1 mains & battery; £50. G0CKB, QTHR. 01206 575035 (Colchester).

FT102 CW FM; £400. FT690; £200. 6m 50W PA; £120. Pye 4m 4 channel; £90. Roland JV80 synthesizer expanded; £700. G4RUQ, QTHR, (eves) 01246 236756 (Chesterfield).

FT221 Mutek front end; £250 50W linear; £50. Computer power supplies nominal 12V 10A; £15. 7.5A; £10. Buyer collects. 01227 361740 (Herne Bay).

FT690R MK1 mint condx; £200. Three matched 6146B valves new; £30. Jaybeam 4 ele 6m Yagi; £20. Howes 80m transverter; £25. FT209R + spkr, mic; £120. 4865+/33 Proc; £15. G4VQH, QTHR. 01948 880460 (Whitchurch).

FT736R Yaesu 2m multimode 25w facility for 70cm/6m rarely used; £1100 ono. Going QRT. 01322 276327 (Dartford, Kent).

FT757GX MK2 and FR757AT with power lead and hand mic; £800. 01992 769970 (London).

FT901D HF tcvr with FM SP901 spkr; £375 or FT901 etc with FC902 ATU; £500. TR2500 2m h/held; £75. Apricot PC green monitor 10meg H drive software, super scala, s written, s planner packet program; £40. Steve, QTHR. G4YTK. 01543 278902 (Cannock).

FULL size G5RV also choke balun for G5RV from Ferromagnetics both never used & bxd; £35 + postage. 01429 862681 (Hartlepool).

HEATHKIT SB102 tcvr 80-10m 2x 6146B PA 150W input with power supply spkr, mic, original mans some spares CW only working SSB, needs expert attention, suit new HF licensee or keen technician; £65. Owner needs space. G3KRT, QTHR. 01895 638287 (Ruislip, Middx).

HF linear amplifer AEA LA-30E single EIMAC 3-500Z with QSK option bxd, arrival of Alpha forces sale; £450. Jim, GM0NAI, QTHR. 01505 613176 (Bridge of Weir).

HF on a budget! (see TT, July). Heathkit SB-102, 100W, 5-band Tx/Rx. CW filter, PSU/spkr, spares, mans. G3MCO 01245 441117 (Chelmsford).

HOWES QRP kit 10/15m partly built; £150. G4DPJ, QTHR. 0117 959 0413 (Bristol).

HUSTLER 6BTV vertical 10,85,20,30,40,80M bands two months old. Putting up beam; £150 ono. GM4KLO, Mike, 0141 639 2729 buyer collects or pays freight. Super SWR. (Glasgow).

HW100 in working order new PA valves complete with SP/power supply & mans; £85 + carr. GW3VLU, QTHR, 01222 707257.

IC735 Icom tcvr carefully used with man, bxd, can be checked in shack if collected; £590. QTHR, 01227 274947 (Whitstable).

IC740 built in PS; £200 IC701 external PS; £100 both faulty so cheap. Buyer collects from ATHR. Walton-on-Thames 01932 220898 G4HEG.

ICOM 251E 2mtr m/m fitted Mutek FE board Icom 451E 70cm m/m. Fitted Mutek pre-amp board both excellent condx, boxes, mans, QRO transformers 2000 + volts 1.1 amp used for 4x4-400 weighs 52kg, 2000+ volts used for 4-500. Valves bases heater transformers, various other items. Offers please. Dave, G0DZJ 01455 282168 (Broughton Astley).

CONTINUES ON P92

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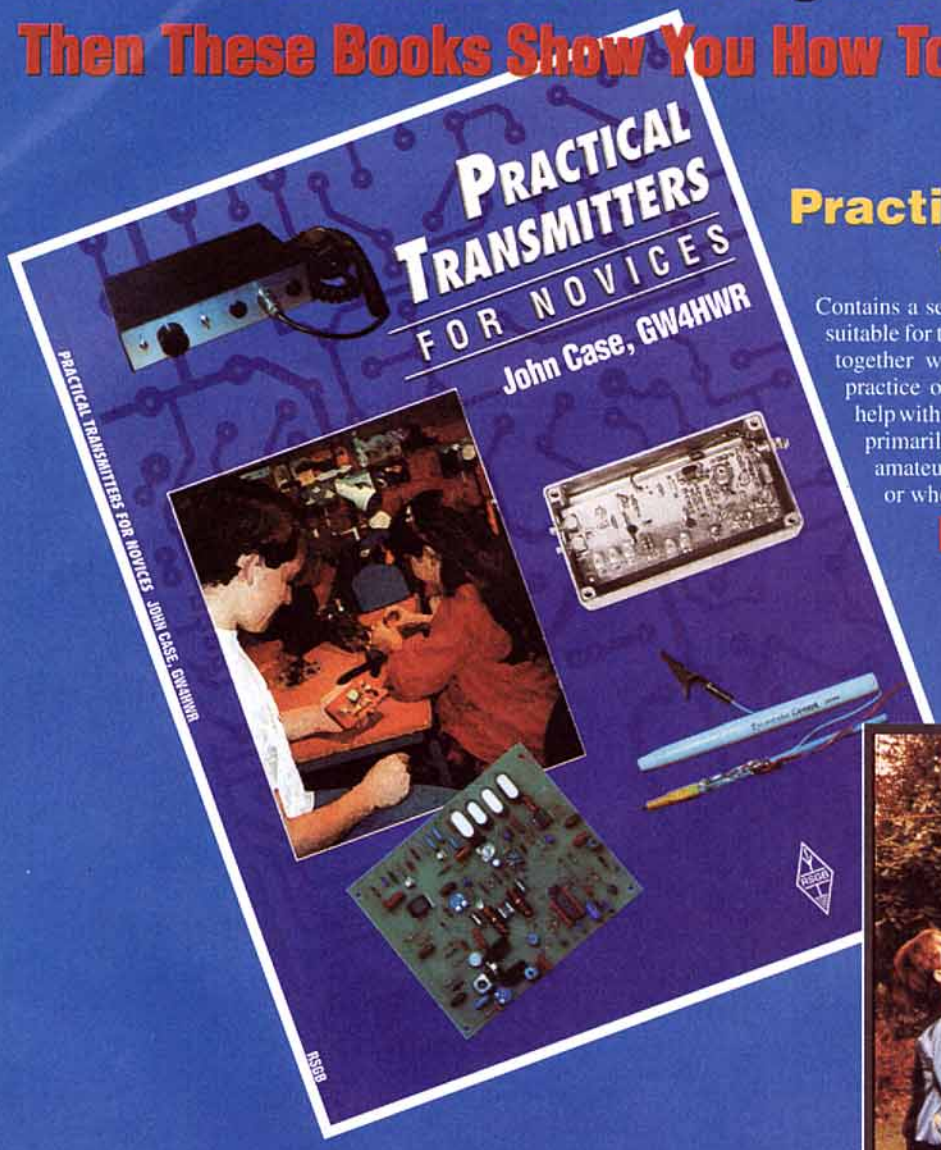

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Contains a selection of 'easy to build' transmitter designs suitable for the UK Novice bands (including microwaves), together with simple test equipment. The theory and practice of transmitting techniques is also outlined to help with understanding the circuits presented. Although primarily aimed at Novices, it will be of interest to any amateur who is building transmitters for the first time or who is considering moving up to microwaves.

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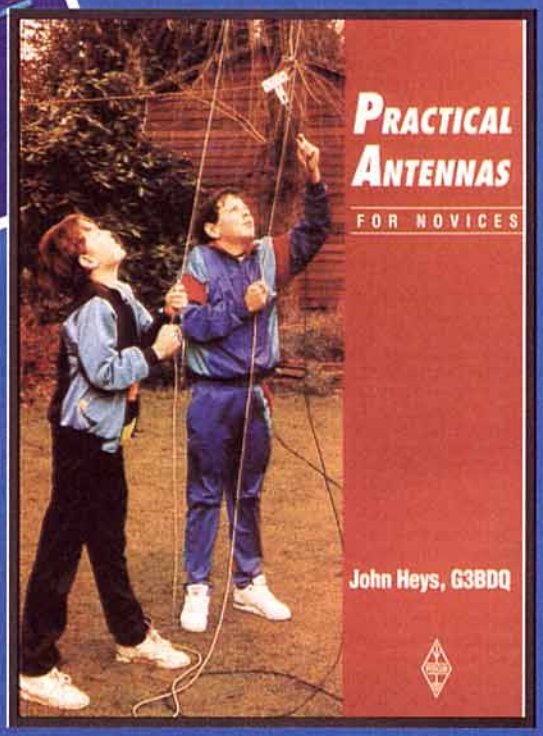

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The antenna is one of the most important parts of an amateur radio station and, in this guide John Heys, G3BDQ, explains in detail how to build simple but efficient antennas for each of the Novice Bands up to 434MHz. A complete chapter is devoted to the safety and commonsense aspects of installing and using a transmitting antenna. This book will be invaluable not only to Novices, but also to any amateur looking for easy-to-build antenna systems that really work.

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CONTINUED FROM P88

ICOM 735 HF tcvr , bxd with mic & man, exc condx; £595 ono. Mizuho 10m h/held QRP tcvr SSB/CW complete with four crystals; £125 ono. G0ECK, QTHR. 0181 393 9115 (Epsom).

ICOM 751 PS15; £600. NAG 2m 300W linear; £250. Yaesu FT790; £275. FT73OR; £130. Trio TM201A 2m FM; £160. TR2300 2m FM; £99. Alinco 730G 30W 70cm linear; £60. Tiny II TNC; £99. Tokyo Hypower 6m amp 100W; £60. Suntron 6m amp 75W; £50. All vgc. Interested? G6IYK 0181 802 4334 (London).

ICOM FL32 250Hz filter for IC735; £40. Wanted 4-400 tubes can test if condx not known. 01579 362652 (Liskeard).

ICOM IC-W2E superb condx, little used; £300. also packet modem boards with instructions. Get on packet the cheapest way ever; £30 each. Only ten left hurry hurry! Dave G4VCO 0181 723 6261 (eves). (Perivale).

ICOM IC701 HF/SSB all band tcvr + handbook & power unit; £300. KW107 supermatch ATU; £80 ono., good condx. G0IWH, 01689 870426 (Orpington).

ICOM IC745 HF tcvr with general coverage Rx FM board fitted, mic, handbook, bxd, vgc; £475. 01758 740445 (Gwynedd).

ICOM ICRI scanner 0.1-1300 MHz extra batt packs charge adaptor, bxd; £225. FT727 dual band handie bxd wall mobile drop in chgrs; £250. TM701E dual band mobile, complete bxd; £250 or £650 the lot. G3OEA. 01789 750889 (Stratford on Avon).

ICOM R9000 50kHz-2000MHz rcvr, matching SP20 spkr with filters, voice synthesizer unit, mans, bxd as new; £2995 ono. G7JAI. 01926 54556 (Kenilworth).

IDE 40mb HD; £35. Peter, G3JXR, QTHR. 01908 642398 (Bletchley).

JAYBEAM 2m 6 ele quad antenna, as new; £45. Buyer collects, G4GTR, QTHR. 01629 640475.

JRC-JST125 tcvr & spkr all filters fitted, bxd & like new; £750 ovno. Yaesu FT7B HF mobile, good condx; £269. Yaesu FT290R MKII with Yaesu linear; £329. Alinco DJ580 2mtr/70cm h/held bxd like new; £325. Yaesu FRSDX400 just serviced; £210. Icom ICR7100 new; £1225. Drake R8E rcvr; £850. Kenwood R5000 rcvr £850. AOR 3000 + 1 week old; £900 plus a few more radios. Martyn, 01480 471001 (St Neots, Cambs). Free delivery.

JRC135 tcvr with NBD520 PWR supply. 5-150W output all modes. The Collins of japanese radio, bxd; £850. MET 6 ele 144MHz crossed Yagi. New unopened; £20. All plus carriage. Clarke 01483 275461 (Surrey).

KENWOOD 850 SAT up/down mic, leads, mans, original packing all as new; £1000. 0161 766 5265 (Manchester).

KENWOOD RZ-1 scanner; £100. Kenwood MC90 mic never used; £130. Superstar 360FM 10m multimode 28-29.7 mod by Spectrum electronics; £90. BV131 10m linear with fan; £50. Pioneer car radio/cassette removable, little used, man; £50. Mark, GI3YDH, QTHR 01232 795783 (Belfast).

KENWOOD TH78E 2m/70cm h/held, case, spkr/mic, cigar lead, charger handbook, immaculate condx, little used, bxd as new; £325. Trio TS510 HF bands tcvr; £150. SEM Tranzmatch ATU 1.8-30MHz; £75. G0SYK, QTHR. 01225 767411 (Trowbridge).

KENWOOD TH79E dual band handie as new; £300 ovno. Yaesu FTC-740A high power 4m 12ch mobile, bxd as new; £55. Philips M294 (4M), M296 (70cm) mobiles; £35 ea. Buttemut HF2V 40/80m vertical, as new; £80. Zetagi B300P 200W HF amplifier; £65. Telephone after 6pm, w/days; GM0BRJ 01236 824781 (Kilsyth).

KENWOOD TL922 linear very little used. Boxed with manual & spare pair of valves; £800. 01792 883371 (Swansea).

KENWOOD Tm 255E 2 metre multi mode base/mobile tcvr in mint condx, bxd with mic, man, DC lead; £575. Diamond CP-6 multiband vertical antenna, in good condx, bxd complete with instructions; £70. Phone Martin, G0HRZ, 0181 597 0234.

KENWOOD TM702E 25W mobile dual band tcvr, excellent condx, bxd; £325 ovno. Icom 24 ET dual band hand held, bxd; £230 ovno. 0191 3847306 (Durham).

KENWOOD TM742E tribander mobile fitted 2m-70cm modules. Detachable front panel, CTCSS fitted mobile front panel kit 50W on 2m 35W on 70cm perfect condx, sell; £550 ono. Steve, G0SGR. 01262 670540 6pm-7pm, eves or w/ends only. (Bridlington).

KENWOOD Trio TS520 HF tcvr with Cw filter & spare set unused valves, used but nice condx; £299. Also Microwave modules 432/285 432 to 28 MHz transverter, completely unused believed perfect; £89. Also Howes 10/12m transceiver MTXID & DXRIO with HPAIO PA and 5 meter. All in Howes case. Idealnovice SSB/CW rig. Hardly used; £120. use with 432/285l63VYV. 01772 600234 (Nr Preston).

KENWOOD TS440SAT, filters fitted, excellent condx; £750, bxd with man. 01902 863423 (Wolverhampton).

KENWOOD TS450SAT mint, never used on Tx; £1000. NRD515 rcvr good condx, no mods, no man; £350. MFJ207 antenna analyser; £50. Drake TR7 service man; £15. Capco 4 way remote antenna switch, never used; £50. 01606 883355 (Cheshire).

KENWOOD TS520SE bxd, mic, man, mint condx. G4GIQ, QTHR; £280. 01606 44622 (Northwich).

KENWOOD TS850S with ATU; £1,000 ovno. Kenwood TS790E inc duplexer;£1,000, no offers. Both bxd & mint condx. Dick, G0TBU. 01304 831 969 (Dover).

KENWOOD TS850SAT CW Adonis AM303G desk mic, excellent condx, bxd + mans; £1130. G0RTH, Alan after 6pm or w/ends. 01268 413598 (Basildon).

KENWOOD TS850SAT with DRU2, immaculate condx, bxd & mans; £1300 ono. 01827 281406 (Tamworth).

KW107 or KW109 wanted or any none working KW equipment to help restore my collection. Ring after 5pm. Barry, G1NPN. 0151 334 7134. (Bebington).

KWM2/A 516F2 plus spares tubes IF's axtals VFO full manuals etc; £375. Datong FI2; £40. Vibroplex blue racer; £45. HP97 calculator; £50. Zenith supersport 3865X 120/3 meg carry case unused NiCad pack; £425. Packard Bell PB2450+ modem new, bxd; £15. GW3JUV. 01656 653875 (Bridgend).

M/M432/100 70cm linear. T52200GX + M/M144/30LS 2m linear. 3 scanners Yupiteru 5000, PRO 43 H/H PR02006DESK, Jermyn H/D mains inverter 24VDE/300W. Low 2m 12ch 12/24OV monitor Rx. Opus IBMXT computer & software. Ranger 10FM/M tcvr. Diawa CN620A HF/VHF power/SWR. Phillips 8in TV monitor. ICS fax machine. DRAE 24A PSU. Tech tradipper. Trio BC5 2400G charger Yaesu YM48A MMIBB mics. Mutek 70cm/12DB pre-amp, EX broadcast sound mixing desk, Maxcom 4E for conv. 10FM, Motorola MX340 H/H UHF PMR/charger aerials masts RTC ring all best offer secures. 01384255816 (Dudley WH).

MAST three section 30ft tubular steel screwed couplings, suit small beams or support for long wire antenna; £45. G8EFY. 0121 427 1052 (Birmingham).

NATIONAL HF rcvr type HRO-M nation Co inc Malden USA. Full set plug in coils. Spare valves. Original power supply. No mods. Schematic DIA. Circuit details. Buyer collect, gwo. Offers. 01386 446207 (Evesham).

PCR2; £30. Dawes ULF Osc; £10, cassette-recorder; £8. 24v ex-army co-axial relay; £7. Compaq PC, no hard-drive; £20. 01242 232107 (Cheltenham). W/ends only please.

R1000-150kHz-30MHz as new, plus VC10 converter 110-174MHz & man; £325 ono. 01247 460251 (Bangor, Co Down).

RACAL RA17L/RA137 in case; £140. RA78 TP system comprising RA17L/RA70/PV178B and Siemens T1000 TPU; £250. RA117/98 Rx and SSB unit; £200. MA350B; £130. MA152 SWR unit; £60. RA87D HF Rx; £100. MA79H with MA284 in a case with some spare valves in gwo; £280. RA17 MK1 first version of RA17 produced in 1957, brand new front panel, in a case; £150. Collins R390A HF Rx; £200. Plugs, leads & mans for most. Rob, 01526 322491 (Metheringham).

RN electronics 6m transverter RN6m/02 2m IF together with 7DB switched attenuator, bxd in large di-cast box, full instructions; £145. 1992 international callbook, 1991 US callbook, both free but £5 each for postage. Low-Band DXing ON4UN 1st EDN; £7 Dartcom WXSAT scanning receiver, LCD frequency readout, latest Dartcom mods, S meter, cxd with built in PSU and spkr. Full documentation; £150. G0KTN. QTHR. 01225 703726.

RUSSIAN spy tcvr type P-353. Built 1976, built in key, number key, high speed tape keyer, light, headphones, spare lamps and fuses, English instruction and ATU complete with battery belt pack, hand charger, wire antena, universal mains and battery adapters. Collectors item, best offer secures. Mike, 216 Lincoln Road, Peterborough PE1 2NE.

SAMSON ETM5C electronic keyer in mint condx, 3 months old. List price; £90, sell for; £60. Post paid anywhere in UK. 0117 9642101 (Bristol).

SHACK clearance, Murphy HF communications rcvr; £100. Various low voltage power supplies; £10. Locher line test set; £10. 8in floppy drives free. Bag assorted digital ICS; £10. 4X150 PA unit; £10. SDK85; £5. Bench PSu; £10. Callers only. 01625 861003 (Chelford).

SIGMA SAS-2 160-10m shortened dipole (only 70ft long). Balanced 450ohm ladder - line feeder (needs aTU). vgc, cost £90 accept £50. Sandpiper centre - loaded 80m dipole; vee and vertical centres. Very compact, works well, as new; £20. G0EOL, QTHR. 01606 554857 (Winsford, Cheshire).

SSB electronics transverter model LT23S 2M IF 23cm output low, vgc, bxd with all relevant paperwork; £275 ono. Kenwood TH79E 2M/70cm h/held only a few weeks old comes with 2 dry cell battery boxes. 1 9.6V NiCad protecting outer case, spkr, mic CTCSS, board fitted, worth near to £600 will accept £425. G1HRD. 0181 788 3151 (Wandsworth).

STRUMECH 40ft lattice tower good condx, plus 21in wall mount stand off; £300 ono. 0181 842 1688 (Hayes, Middx).

STRUMECH Versatower 40ft, base plate, two powerful winches, robust rotator with beam position indicator, power supply; £200 ono. Situated Argyll 01880 820 842 (Tarbert).

TENPO 2004A 432MHz QRO linear 800W plus out SSB LT70S transverter, both mint, less than year old; £1200, will split; £900, £350. Conrad, G0RUZ 01226 754 799 (Barnsley).

TEXTRONICS 545B scope, telequipment D52-2CH scope, advance 'Q-meter' type-T2, chart pen recorder, Pye pocket phone 10 space charger 3 pocekt phones, Sharp DX620 CD, Marconi value volt meter TF 1300, computer PSUs 5, 23 & 50V, videos 1-VHS, 3-Beta, ECG recorder, NiCads, meters, PCBs & much more. Offers. Paul, QTHR, 01642 813924 (Middlesborough).

TILTOVER tower BXI 3 section tupe 60G including ground post power winch CDR ham-M rotator; £275. Buyer collects located Ryton Tyneside apply to G5RI, QTHR.

TIMESTEP PDUS software & man; £50. Timestep HRPT software, dongle and man; £50. G0KTN, QTHR. 01225 703726 (Melksham, Wilts).

TL-922 linear amplifier. gwo with man, buyer to collect; £950 or near offer. Roger, GW0UDH, 01873 811323 (Crick Howell).

TRIO 130V ideal QRP station with matching PSU; £348. Coultant PSU; £39. Buyer must collect. G0UAU, QTHR. 0121 358 3639 (Birmingham).

TRIO 9000 2M multimode GC not used mobile. CW mounting brackets, mans, box; £260. G4LKF, QTHR. Prefer buyer inspects, collects. 01536 260598 (Corby).

TRIO ATU AT230; £60. Tonna 9ele/2m; £10. Old valved radio; £10. AVO valve tester; £10. AVO model 7; £15. Rotator; £15. Codar RF preselector; £3. G4ZDF, QTHR. 0115 9333313.

TRIO R2000 rcvr gwo with Howes ATU; £240. ICS Fax 1 + Navtex; £80. 01785 223249 (Stafford).

TRIO TS-520 HF tcvr built in 240V PSU or 12 volts/DC with mic, man, SSB filter; £350. Alinco-DR599 dual bander extended and AM Rx also remote fixing kit; £435. Standard hand portable spkr/mic; £10. Mobile spkr; £10. Alinco-ALR-72 70cm 24W; £185. Grundig Rx FM/AM/AMW/SSB service man; £150 01328 710641 (North Norfolk).

TRIO TS520S HF tcvr SSB/CW 100W plus Kenwood ATU AT230 both excellent condx. G0IEL, QTHR; £375. 01388 762801 (Crook).

TS140S fitted CW filter PS430 mices MC435 and MC80 gwo; £680. AT250 auto ATV gwo; £250, together; £850. R1000 receiver gwo; £180. FRG8800 fitted FRV8800 VHF converter & wide band Fm option with FRT7700 antenna tuner gwo; £425. multi 700EX 2m FM transceiver gwo; £60. All ono, buyers collect or deliver, reasonable distance. G4MNB, QTHR, 01793 826325 (Swindon).

TS670 10W multi mode includes 6m 10m 15m & 40m, excellent condx, buyer inspects & collects; £400. David; 01977 558706 (Castleford). Please phone after 6pm.

TS830S tcvr CW filter all HF bands mic handbook with matching AT230 ex condx; £525. Katsumi Ek150 electronic keyer; £40. BC221 wavemeter built in MOD PSU charts handbook very accurate; £30. G4JFU, QTHR. 01726 812571 (St Austell).

TS830S Tx/Rx with CW filter works well comp with mic little used man; £450. Mike 01252 518009 day, 615831 eves (Hants).

TS850SAT very good condx; £1150. Mutek TVVF144A 2m transverter; £150. MM 70cm transverter; £95. Versatower 40ft no ground post; £250. 386SX-33 mother board with 2mb ram; £90. Cirrus 1mb VGA card; £30. 01223 570679 (Cambridge).

TS940S ; £1250. SP940; £65. TS700G; £295. KW1000; £475. SB200; £350. SB220 2KW; £850. HW101 W/SP; £125. SB620 scanalyzer; £95. RA17N; £150. B40; £75. FT101EX; £175. FT101E; £350. FT902DM; £450. FT101ZD/AM/FM; £425. FV101Z; £95. FTV107R; £30. FL2100Z; £525. R4C; £274. FT200; £175. FT102; £395. FC102; £175. Icom AT500 auto; £350. AT250 AUTO; £250. Trio 9R-59DS; £75. FR50B; £75. FRG8800 W/VHF; £525. FC700; £95. DX-100U; £50. Six 11ft lattice tower sections make 66ft or two 33ft; £200. Silent keys shack clearance. Onos.01398 361215.

TWO three 20ft section towers complete with tiltover ground posts new winches and ropes, good condx; £400 each. QTHRs 01568 797418, 01981 251227 (Herefordshire).

UNWANTED gift. Yaesu SP6 spkr, bxd as new; £100. 01482 657853 (Hull).

VACUUM variable capacitors 1000pF and 2000pF 2kv 40 turns; £35 each. Ian 01784 450047 (Staines).

VERSATOWER 40ft wall mounted head unit winches base mount. Buyer collects; £250. G4CMU. 01737 354497 (Banstead).

YAESU FT7 tcvr 80/40/20/15/10 pristine condx. 20W input all semi conductor with suitable 13.8VDC 5 amp mains supply handbook, box, leads; £230. G3EAY; 01799 530763 (Saffron Walden).

YAESU FT727R 2m/70cm dual band handie bxd with man charger & YHZ headset; £195. Kenwood TR751E 2m multi mode with man and bracket for mobile/base mounting as new, never used mobile; £495. Would consider PX for mint FT736R. Mizuho h/held QRP 20m tcvr AN14 antenna included spare crystals, instructions; £195. All owned from new. 01494 440865 (High Wycombe).

YAESU FT757GX FC757AT FP757HD super radio must sell with mic; £600. Arthur, 01255 870034 (Essex).

YAESU FTDX401, spkr, man, base & hand mics; £125. Heathkit SB102, PSU; £100. Kenwood MC60 mic; £40. Vector 500 HF linear 4x811A; £350. Larkspur C42, PSU and harness; £75. Offers invited on following items:- R1132A, TB57 Tx, Rx, man. A13 radio complete with man & accessories. PTR175 aircraft Tx/Rx. A41 radio. SCR522 on original rack with control box. G0JNT, QTHR. 01472 752794 (Grimsby).

YAESU tcvr FT757 with FP757 HD power supply & FC757AT auto ATU; £675, consider exchange Kenwood R5000 or similar. G6NUZ. 01205 365209 (Boston).

WANTED

ANTIQUE wireless equipment, crystal sets, horn spkrs, early valves, pre-war television, spy sets, early military gear; cash and collect:- G4ERU, 5 Luther Road, Winton, Bournemouth BH9 1LH. Tel/Fax; 01202 510400.

EDDYSTONE S 680 & 830/7 receivers Eddystone Di cast spkr 0/50 Hammarlund. SPC 400SX Rx phone anytime. Alan, 01538 702187 (Oakamoor Staffs).

FT101ZD accessories. SP901 external spkr. YO901 monitor scope with Panadapt. 50MHz & 70cm transverter modules for FTV901. Any other 101ZD or 901 accessories dead or alive. Dead or ropey 101ZD /901 for spares. WHY? Call during office hours. Geoff, G8RCZ 01392 460050 (Exeter).

MANUALS circuits for telequipment oscilloscope S22 and UNAOHM colour bar generator EP874. mains, transformer for telequipment oscilloscope D66. G3RXG, QTHR. 01934 843562.

RECENTLY available on surplus market did any one buy & no longer wants pair of SSB filters 100kHz USB LSB, also pair 1.4MHz filters USB, LSB 2.35BW. G3AMF, QTHR. 0353 720583 (Soham, Cambs).

ATTENUATORS 30dB/100W 10dB/10W. Power head for HP 431C or complete HP 431C. Extender board for Tektronix 7603 scope and plug in units. 01504 352 804 (Londonderry).

BC 375 and/or GP-7 transmitter together with tuning units TU6B TU8B etc. Condition un-important. Anything interesting considered. 01603 860452, evenings (Norwich).

BUTTERNUT HF6V-X antenna required. Good price paid for one in excellent condx, complete with instruction sheet. Call Tony, G0MDZ, 01636 830005, (Nottingham).

CIRCA 1957 portable transistor radio type PAM 710. Marconi crystal set type A. Marconi one valve crystal set type RB10. SG Brown Crystovox horn loud spkr. GEC transistor device type GET1 and GET2. Lee, 01243 863687 (Bognor Regis).

CIRCUIT/man Ferrograph Logic 7 stereo model 7622H tape recorder, WHY? copies. RS95377. Mr Douglas, 16 St. James Street, Gloucester GL1 4JS.

CR100 or B28 rcvr please state price including carriage forward. G3LYU, QTHR. Have QRP gear for /ex if agreeable. 0116 2876459 (Glenfield, Leics).

INSTRUCTION book for Marconi TF868 bridge & astatic 1104C microphone. G3XKF. 01296 614128.

JRC535D with 'Lowe' treatment if possible. G. Tallis, 57 Sundial Lane, Great Barr, Birmingham. 0121 357 9582.

LOAN of FT102 instruction manual for copying or to purchase all expenses gratefully refunded. Valves BL636SJ7 metal. G3MBW, 01943 874794 (Leeds).

MANUAL, original or good photocopy for Wayne Kerr bridge type B601. Your costs reimbursed by G3DYY, QTHR. 01487 841558 (Nr Huntingdon).

MAST windup around 40ft. Needs to be in good condx, and strong. Scotland only. Bill GM0VIT, 01250 886324 (Blairgowrie).

MONOBAND 20m tcvr would exchange Alinco 2m 100E. 01572 812472 (Oakham).

MORSE key type IOF 7741 EX T1154 R1155 known as bath tub key. Steve, G4MPK, QTHR. 01372 812136 (Surrey).

OCTAL based 1MHz crystal, part no DC-9 for BC-221, also 6SJ7Y with the yellow base. Quote price delivered to EFC Owen. 28 Chartfield Road, Reigate, Surrey. RH2 7JZ.

RACAL recever type 1779 or 1772 1771 in gwo and condx. Mans also wanted, can collect over reasonable distance. GW3JUV. 01656 653875 (Bridgend).

RADIO amateurs conversation guide (OHIBR) language aid and Russian cassette supplement to purchase or loan. 01249 730278 (Wiltshire).

RF Thermo couple meters Cantena Dummy load. G3POX, QTHR. 01480811549 (Huntingdon).

SOLID state HF tcvr wanted. Compact (IC735) preferred but VST-100 or IC-745 also of interest, around £400. 01963 240319 (Castle Cary).

SPEAKER unit trio SP930 also correct packing carton and proper packing pieces for TS930S tcvr. G3JMO. 01642 486155 (Redcar).

TELEQUIPMENT S54A single beam Oscilloscope, copy of circuit or sight of h/book please. G3DJK 0181 679 2717 (London).

USERS hand book or photostat of Hewlett Packard Laptop computer 45711B disk drive 9114B Thinkjet printer 2225C+. All letters answered. Mr R Arnold, 12 Wiltshire Avenue, Crowthorne, Berks RG45 6NG.

VALVES wanted urgently; PX-4; PX-25 DA-30, DA-60, DA-100 DA-250, STC-4300; STC-4274, P-27 AC-044; LS-5/6, AVO-163 valve tester; Garrard 301 turntable EMT R-80/R-32 & 927-930 turntables; Siemens & Klangfilm cinema spkrs & amps; PX-4/PX-25 amplifiers. Tannoy & Lowther spkrs; HMV-160 radiogram, KT66-77-88 EL-34, 9am-7pm 01435 882702 (Heathfield).

WORKING/non-working/faulty 1980s generation solid-state HF tcvrs, good physical condx, also Trio 7200G 2m-FM. Roger, GW3YEP, QTHR. 01559 362632 (Llandysul).

EXCHANGE

KENWOOD TR751E 2m multimode ex condx, part-ex for T57IIE or other 2m multi mode base rig or sell; £450 ono. Phone John, G0NAJ. 0161 304 9327, QTHR (Dukinfield).

TS830S in vgc, + MFJ versa tuner & a Welz 50r dummy load. Exchange for a 2 metre all mode base station only. No cash involved, please ring Ted; 01229 770379 (Cumbria).

ICOM IC735 mint condx, little used, bxd, exchange for R71E in similar condx, other good quality rcvrs

considered. Jim 0191 416 8211 (Washington).

KENWOOD TS440S, Kenwood AT230, MC60 mic, TET 2 ele tribander, exchange classic British bike. Cash adjustment WHY?, eves, w/ends; 01986 798403 (Halesworth).

MULTI satellite system Echostar 6500 1.2m offset dish complete with mans, can be seen working swap for Ham Radio looking for VT200T plus 2m or 70cm base rig or WHY? 01286 831245 eves (Gwynedd).

CLUB NEWS

DEADLINE - Items for inclusion in the November 1995 issue must be sent to HQ marked "Club News - DIARY", to be received by 23 September 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 - 3, 144MHz Backpackers; 7, Needs of the club; 14, HF/CW; 21, Projects; 28, VHF/SSB; October 5, Mock Morse test; 12, AGM. Details 0117 9654886.

RSGB CITY OF BRISTOL Group - 27, 'On Location'. Details 0117 9672124.

SOUTH BRISTOL ARC - 6, 2m Challenge - Work All Bristol; 13, Review of Bristol Rally; 20, Learn to play bridge; 27, Bring and buy. Details 01275 834282.

THORNBURY & DARC - 4 October, Building a 50MHz receiver; 11, CW Competition night. Details 01454 612689.

BEDFORDSHIRE

SHEFFORD & DARS - 14, Welcome back; 21, Bygones of measurement; 28, Mobile DF hunt; 12 October CQ World-wide planning. Details 01462 700618.

BERKSHIRE

BRACKNELL ARC - October 11, Designing with 'S' parameters. Details 01344 420577.

NEWBURY & DARS - 27, Talk 'Satellites' by G3RWL. Details 01635 863310.

READING & DARC - October 12, Final junk sale of 95. Details 01734 698274 (eves).

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 20, Mini construction contest. Details 01296 437720.

CHESHAM & DARS - 6, General meeting; 13 CW practice; 27, On the air evening. Details 0494 676391.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 1, Preparation for 2m trophy contest; 15, L Wires by G3WQF; 22, Quiz with other clubs; October 13, Junk sale. Details 01954 200072.

CHESHIRE

MID CHESHIRE ARS - 7, On the air evening; 14, Video night; 21, On the air evening; October 2, Committee meeting; 5, On the air evening; 12, Calibration night - Bring a rig. Details 01606 592207.

CLEVELAND

EAST CLEVELAND ARC - 15, Open evening; 22, Demonstration of soldering techniques; 29, Book review night; October 6, Talk on radio amateur jargon and abbreviation. Details 01642 475671.

CLWYD

CONWY VALLEY ARC - 6, Talk 'Microwave Techniques' by Miles, GW4RCE; October 4, Talk 'An Evening with a Camcorder' by Trefor, GW0PZS and Norman, GW0MKP. Details 01745 855068.

WARRINGTON RC - 5, Talk 'Generating Multi-media CDs' by Mike, G6AWD; 12, Talk 'VHF Log-periodic Antennas' by Mike, G3FDW; 19, Talk 'VFOs, Signal Generators and Oscillators' by Jack, G3JIR; 26, 'Microwaves' by Mike, G3PFR. Details 01925 762722.

CORNWALL

CORNISH RAC - 7, Talk 'You and Your Fire Safety'. Details 01209 820118.

ST AUSTELL ARC - 14, Visit to Radio Cornwall; 18, Talk 'My Experiences with SWEB' by Keith, G3XFL; October 2, Interference seminary by Bert, G3VWK. Details 01726 72951.

SALTASH & DARC - 4, HF Field Day planning; 18, Treasure hunt. Details 01752 844321.

DERBYSHIRE

BUXTON RA - 12, Rig alignment with Ron, G4MRQ; 26, Equipment night; October 10, Talk 'QRP' by Dave, G0RKT. Details 01298 25506.

DERBY & DARC - 6, Junk sale. Details 01773 852475.

DEVON

AXE VALE RC - October 6, AGM. Details 01297 653404.

DORSET

FLIGHT REFUELLING ARS - 3, Naval video presentation by RNARS member George, G0NUM; 10, Talk 'The Pioneers Before Marconi' by Ian, G2BDV; 17, Talk 'An Overview of Flight Refuelling's Products and Operations' by Mike, G4YTA; 24, Talk '70cms ATV and Related Kits/Equipment' by G8IKP and Tony Naylor of Spectrum Communications. Details 01425

CONGRATULATIONS

To the following who our records show as having reached fifty years continuous RSGB membership this month:

Mr K G Thompson, G3AMF
Mr C H Walker, G3AZT
Mr F R Piper, G3BGO
Mr R E Sparry, G3BJC
Mr W M Dunell, G3BYW
Mr W W King, G3ECU
Mr J E Hodgkins, G3EJF
Mr H B Shields, G3GB
Mr A T Hunt-Duke, G4IOT
Mr B M Morrisey, G4YK

EAST SUSSEX

HASTINGS E & RC - 20, Lecture on GPS by Trimble Navigation. Details 01424 830454.

SOUTHDOWN ARS - 4, Talk 'The Biggest Aspidistra in the World' by Les, G3FET; 2 October, Annual auction. Details 01825 763022.

ESSEX

CHELMSFORD ARS - 5, Talk 'Centenary Marconi Lecture' by Stanley Wood; October 3, AGM. Details 01245 256654.

LOUGHTON & DARS - 1, Aylmers Farm Part Deux - Setting up; 15, RSGB video night; 29, Talk 'Navigation' by Tony, G0LWM; October 13, Talk by G0LWF. Details 0181 500 2811.

FIFE

GLENROTHES & DARC - 17, AGM. Details 01592 265789.

GLOUCESTERSHIRE

CHELTENHAM ARA - 1, Fun with ELNEC by G3SZS. Details 01242 242336.

GLOUCESTER ARS - 2/3, SSB Field Day; 20, AGM. Details 01452 421510.

GRAMPIAN

ABERDEEN ARS - 1, SSB Field Day preparations; 8, Junk sale; 15, GM3ALZ Building Competition; 22, Building Competition Winner's Talk; 29, BAP quiz; October 6, Junk sale; 13, Demonstration - MFJ- 259 Antenna Analyser. Details 01224 628005 (office hours) or 01569 731407 (evenings).

GREATER LONDON

ACTON, BRENTFORD & CHISWICK RC - 19, Discussion on HF Hum Interference. Details 0181 992 3778.

BROMLEY & DARS - 19, Equipment test evening with Ian, G4VTD. Details 0181 777 0420.

COULSDON ATS - 11, Talk on EMC by Derek, G6MFM; October 9, Talk 'Videotelephony - From Techniques to Systems' by Timothy, G8JXV. Details 0181 684 0610.

CRAY VALLEY RS - 7, Talk 'Police Radio' by G3ZPS; 21, Talk and Video 'Introduction to Amateur Satellites' by Ian, G7PHD; October 5, Surplus equipment sale. Details 0171 739 5057 (office hours only).

CRYSTAL PALACE & DRC - 16, Talk 'Learn Morse in One Hour' by Steve, G3ZVW. Details 0181 699 5732.

EDGWARE & DRS - 14, On the air evening; 28, Talk 'Practical Wireless: A Personal History' by Rob, G3XFD. Details 0181 204 1868.

RADIO SOCIETY OF HARROW - 15, Quiz evening; 22, Golden anniversary planning; October 6, Talk on PMR Conversion. Details 01895 632377 (evenings).

SILVERTHORN RC - 15, Club meal; 22, On the air evening; 29, On the air evening; October 6, On the air evening; 13, Junk sale. Details 0181 505 1871.

SOUTHGATE ARC - 14, Talk 'Computer Simulated CW Contest' by Ron, G3KTZ; 28, On the air evening; October 12, Surplus equipment sale. Details 0181 360 2453.

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EVENTS DIARY

SOUTH LONDON COLLEGE ARS - Meets on the last Wednesday of every month. Details from G0TUZ who is QTHR.

SUTTON & CHEAM RS - 21, Talk 'Digital Audio Broadcasting' by Mark Saunders. Details 0181 644 9945.

WIMBLEDON & DARS - 8, On the air evening; 29, Microwaves for Beginners; October 13, Demo of Plug Soldering. Details 0737 351313.

GREATER MANCHESTER

BURY RS - 12, Radio amateur relief expedition; October 10, Construction competition Details 0161 762 9308.

ECCLES & DARS - 5, 'Computer Based Learning' by G4UOT; October 3, Talk 'JOTA 1994' by G7ELA. Details 0161 773 7899.

OLDHAM ARC - 14, Talk 'The Magic of X-rays' by G Oliver, G0BJR. Details 0161 627 1639.

WIGAN-DOUGLAS VALLEY ARS - The club is currently meeting at the temporary location of The Hesketh Arms, Shevington, Wigan. Details 01924 211397.

GWYNEDD

DRAGON ARC - 4, Talk 'The Function of an Evacuation Hospital in the Gulf War' by Ieuan, GW4FQU; 18, More camcorder techniques by Trefor Edwards, GW0PZS and Norman Grice, GW0MKP; October 2, AGM. Details 01248 600963.

HAMPSHIRE

BASINGSTOKE ARC - 24, 2m direction finding competition; October 2, AGM. Details 01256 25517.

HORNDEAN & DARC - 26, Talk on HM Coastguard by Toby Stone. Details 01705 472846.

THREE COUNTIES ARC - 13, Junk sale. Details 01428 606298.

WINCHESTER ARC - 15, Talk 'Wildcard' by Mike, G6AIQ. Details 01962 860807.

HEREFORD AND WORCESTER

BROMSGROVE ARS - 26, Night on the air; October 10, Talk on DX logging. Details 01527 542266.

DROITWICH ARC - 5, PMR conversions; 3 October, Talk 'Experiences On My Chile Expedition' by John Layton. Details 01905 778794.

MID WARWICKSHIRE ARS - 12, Open day. Details 01926 424465.

HERTFORDSHIRE

VERULAM ARC - 26, Talk 'Global Positioning System' by Kim, G3YGA. Details 01923 262180.

WELWYN - HATFIELD ARC - 4, Talk on cross field antennas by Maurice, GM3HAT; 18, An evening with David Lauder, G0SNO; October 2, Junk sale. Details 01920 462241 (eves) or 0181 982 7298 (day).

HUMBERSIDE

GRIMSBY ARS - 14, Visit to Cleethorpes Observatory; 28, RSGB night; October 12, AGM. Details 01472 825899.

HORNSEA ARC - 6, Committee meeting; 13, Test equipment of old; 20, DF discussion; 27, G3GBH Cup; October 11, Talk 'East Yorkshire Railways' by G0DEB. Details 01964 562258.

KENT

EAST KENT RS - 1, Talk 'A Guide to Military Communications during WWII' by Brian, G8DIU. Details 01277 743070.

LANCASHIRE

PRESTON ARS - 14, Quiz night; October 12, Auction evening. Details 01772 686708.

LEICESTERSHIRE

LEICESTER RS - 11, On the air evening; 18, Progress meeting; 25, Talk 'QRP' by George, G3RJV; October 2, On the air evening. Details 0116 2917250.

LINCOLNSHIRE

LINCOLN SHORTWAVE CLUB - Talk 'Lincolnshire Superstitions' by Maureen Sutton. Details 01522 549531.

MERSEYSIDE

LIVERPOOL & DARS - 5, Quiz; 12, On the air evening; 19, Pre-AGM; 26, Surplus sale; October 3, AGM. Details 0151 722 1178.

WIRRAL ARS - 6, Construction contest; 20, Surplus equipment sale; October 4, AGM. Details 0151 644 6094.

NORFOLK

NORFOLK ARC - 6, Talk 'PW and My Former Years' by Rob, G3XFD, editor of Practical Wireless; 13, On the air evening; 20, Talk 'Building an 813 Linear' by Chris, G4ILR; 27, On the air evening; October 4, Talk 'Phase Locked Loops' by Mike, G4EOL. Details 01603 789792.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - 7, On the air evening; 14, Preparation for BHI special event station; 21, Fox hunt; 28, Construction evening; October 5, On the air evening; 12, Talk 'Locating QRA and WAB Squares' by Paul, G0SPA. Details 0115 950 1733.

GPT ARC - Club now meets on Thursday evenings and Sunday mornings. Details 0115 922 6321.

MANSFIELD ARS - 14, Ashfield Show preparation. Details 01623 792243 or 01623 423697.

WORKSOP ARS - 26, Talk on Practical Wireless by editor Rob, G3XFD. Details 01909 487741.

SHROPSHIRE

SALOP ARS - 14, Packet radio with Salop Packet Users Group; 28, Quiz night with PARC; October 12, AGM. Details G7SBD QTHR or @ GB7PMB.

TELFORD & DARS - 3, On the air evening; Details 01952 261923.

SOMERSET

TAUNTON & DARS - 1, Preparation for NFDSSB; 15, Talk 'The DX End of DX Operating' by Tom, G0PSE. Details 01823 680778.

WEST SOMERSET ARC - 5, Bring and buy auction. Details 01984 631470.

WINCANTON ARC - 4, Talk 'Ionspheric Reflection' by Rob, G3MYM. Details 01935 44243760.

YEOVIL ARC - 7, Talk 'Indoor Aerials' by G3KSK; 14, Talk 'Gadgets and Gizmos' by G7SDD; 21, Talk 'Radio Recollections 1935 to 1995' by G3BPM; 28, On the air evening; October 5, 'The National VHF Postcode Charity Challenge' by G3ZXX; 12, Club visit to RNAS Yeovilton Meteorology Section. Details 01258 473845.

SOUTH YORKSHIRE

BARNSLEY & DARC - 4, Two metre fox hunt; 11, 1995 quiz night; 16, Talk by RSGB general manager Peter Kirby, G0TWW. Details 0836 748958.

DRONFIELD & DARC - 4, Treasure hunt; 11, Quiz night; 18, Construction night; 30, Annual prize-giving; October 2, On the air evening. Details 01246 290250.

SHEFFIELD ARC - 11, Interclub quiz with Dronfield & DARC; 18, Talk by Dave, G0JJR on working with Ding Dong; 26, Ten pin bowling competition; October 2, Presentation of this year's awards; 3, Raynet meeting; 9, AGM. Details 0114 244 6282.

STAFFORDSHIRE

CANOCK CHASE ARS - October 5, AGM. Details 01543 262495.

SUFFOLK

FELIXSTOWE & DARS - 4, Talk 'Antennas' by Neil, G0ORG; 18, Visit to Anglia Television Centre; October 2, Packet clinic with Andy, G3ZYP and Adrian, G7TYV. Details 01394 273507.

IPSWICH RC - 1 October, 21/28MHz contest; 4, Talk 'Propagation' by Jim, G3YLA. Details 01473 212891.

SUDBURY & DRA - 5, AGM. Details 01787 313212 (before 10pm).

SURREY

ECHELFORD EARS - 14, Talk 'German WWII Radios - Part 3' by Richard, G4PRI; 28, Bring and buy sale. Details 01344 843472.

TAYSIDE

DUNDEE ARC - 12, Enrolment evening; 19, Construction evening; 26, AGM; 10 October, Construction evening. Details 01382 739179.

WARWICKSHIRE

MID-WARWICKSHIRE ARS - 12, Open evening; 26, Talk 'Satellites and Radio' by G4DF. Details 01926 424465.

WEST SUSSEX

CHICHESTER & DARC - 19, Talk by Mike, G8JVE on a 2 metre synthesized transceiver project. Details 01243 573541.

HORSHAM ARC - 7, Talk by Roger Weston on his DXpedition in Tristan Dacuhna. Details 0181 686 5701 (office hours) and 01403 27552 (evenings).

WORTHING & DARC - 20, Talk 'Stateside' by G3LQI; 27, Early Sinclair Products by Enrico Tendeschi; October 11, DIY PCs. Details 01903 753893.

WEST YORKSHIRE

DENBY DALE & DARS - 6, Talk 'Alarm Update' by Malcolm, G0ISX; 13, Fox hunt; 20, Talk 'Sailing, Part 2' by Ken Whortley; October 4, Talk 'The Day the Gas Cooker Talks Back' by Robert Miles. Note: Denby Dale & DARS has appointed Malcolm Mckenzie, G8RWN as its new secretary. Details 01484 861782.

HALIFAX & DARS - 19, AGM. Details 01422 202306.

KEIGHLEY ARS - 14, Ideas for '96; 28, Quiz v Northern Heights. Details 01274 496222.

LEEDS & DRS - The club has announced new officers. The new chairman is Phil Robinson, G6HGT; new treasurer is Tony Mawson, G0JVI and new secretary is Malcolm F Robertson, 2E1CRL. Details 0113 2450794.

WAKEFIELD & DRS - 5, On the air evening; 12, Screening of the video 'Blakey Ridge'; 19, Talk 'Modifying PMRs' by G4IZH; 26, On the air evening. Details 0113 282 5519.

WILTSHIRE

SALISBURY R & ES - Please note that the club has changed its name to the SALISBURY AMATEUR RADIO CLUB. Details 01722 329398.

SWINDON & DARC - The club has relocated to the Community Centre, Savernake Street. Details 01793 822705.

TROWBRIDGE & DARC - 6, Whys and Wherefores of the Cubical Quad Antenna. Details 01225 864698.

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'.

2 SEPTEMBER

ANNUAL WIGHT WIRELESS Rally - National Wireless Museum, Arreton Manor, Newport, IOW. Open between 11am and 5pm. Free admission to the Wireless Museum and the extensive gardens plus free parking. Also, no charge for trade stands or the bring and buy sale. Collection for the Radio Invalid and Blind Club. Talk-in on S22. Details Douglas, G3KPO 01983 567665.

3 SEPTEMBER

BRISTOL RADIO RALLY - Doors open from 10am until 4pm. Admission £1 and free to accompanied children under 12. Features include more than 100 tables with table hire at £15 each, a large bring and buy sale, refreshments, ample under cover parking and talk-in on S22 Details Muriel, G4YZR 01275 834282 (24 hour answerphone.)

18th TELFORD Rally - Telford Exhibition and Racquet Centre, Telford. Easy access from M54 - well sign posted. Free parking, trade stands, flea market, bring and buy, special interest groups and RSGB in attendance. Conference room available if required. Details 01952 588878 or 01743 249943. Traders only contact Jim on 01952 684173.

VANGE ARS Rally - Laindon Community Centre, Laindon, Basildon, Essex. Centre is only a short walk from Laindon Station (Fenchurch Street to Shoeberyness line). Signposted from the A13 and A127. Open 10.30am. Entrance £1. Morse tests on demand plus refreshments, free raffle, talk-in on S22. Details Stuart, G1VWB 01375 859632.

8 - 10 SEPTEMBER

AMATEUR RADIO CARAVAN & CAMPING CLUB Rally - Details G4LWA, QTHR, tel 01494 531755.

9 SEPTEMBER

BALLYMENA ARC Annual Rally - Ballee High School. Details GI4HCN, QTHR, tel 01266 659769.

9 / 10 SEPTEMBER

RSGB 1995 International HF Convention - A full Convention Prospectus will be available shortly, which will include an advance booking form. Send an SAE to: Marcia Brimson, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE, UK.

10 SEPTEMBER

BARTG Rally - Sandown Exhibition Centre, Sandown Park Racecourse, Esher, Surrey. Ten minutes from junc 10 of the M25. Plenty of free parking. Most aspects of radio catered for with a special emphasis on Data Communications. Details Peter Nichol, 38 Mitten Ave, Rubery, Rednal, Birmingham B45 0JB, tel 0121 680 5963.

THE 14th LINCOLN HAMFEST - Lincolnshire Showground. Entry is £1.50. Morse tests available plus all the usual attractions. Details Sue, G8VGF 01522 525760.

SOUTHEND & DRS 75th Anniversary Radio & Computer Rally - ***New Venue*** Cliffs Pavilion, Southend-on-Sea. Admission £1.50, concessions £1. Doors open at 10am. Parking plus refreshments from Maritime Bar. Morse tests available on demand but two photographs must be provided. RSGB in attendance and a display of historic radios from the Essex police. Talk-in on S22. Details Ron, G0UAW on 01702 353676 or fax Martin, G0OQR on 01702 602271.

12 SEPTEMBER

MID-WARWICKSHIRE ARS Open Evening - 61 Elmscote Road, Warwick. Opens 6pm to 9pm. Includes amateur stations on air plus displays of computers in amateur radio, satellite feature, shortwave listening, Raynet and radio equipment construction. Details from Don on 01926 424465.

17 SEPTEMBER

CENTRAL LANCASTER Radio Rally - Central Lancaster High School, Crag Road, Lancaster, five minutes from junc 34 of the M6. Doors open at 10.30am. Entrance fee is £1.00. Details Susan 01524 64239 or 01384 896199.

CRANFIELD CAR Boot sale - Bletchley Park. Entry £1. Stalls £6 pre-paid or £10 on the day. Details from D White, G3ZPA on 01908 501310.

PETERBOROUGH RADIO & ELECTRONICS SOCIETY East of England Rally - Peterborough Showground. Easy access from A1, A605, A47. Doors open at 10.30am, 10am for disabled visitors with talk-in on S22 via G3DQW. Admission £1. Details Vince, G8NGZ on 01733 331211.

23 SEPTEMBER

RADIO AMATEUR TABLE TOP SALE - St Mary's Hall, Reddish, Stockport. Starts 10am with talk-on on S22. Details John, G4ILA on 0161 477 6702.

24 SEPTEMBER

HARLOW AR AND COMPUTER SHOW - Harlow Sports Centre. Easy access off junc 7 of the M11, A414. Doors open at 10.30am. The large ground floor main hall will feature a selection of traders both old and new with products ranging from complete radio/computer systems through to software, electronic components and second hand equipment. All car parking is free and there is talk-in on S22 and 70cm SU22 by G7REF. Full facilities for the disabled plus parking next to the entrance. Details Mike, G7BNF on 01279 868079.

NORTH WAKEFIELD Radio Club Rally - Outwood Grange School, Potovens Lane, Outwood, Wakefield. Doors open at 11am, 10.30am for the disabled. With traders of radio, peripherals and computers. Morse tests on demand with two photos needed. Details John, G4RCG on 01924 362144 or John, G0EVT 01924 825443.

THE THREE COUNTIES Radio Rally, Malvern Worcs - Details & bookings Eddie, G4PQZ on 01905 773181.

29 SEPTEMBER-1 OCTOBER

WACRAL 1995 CONFERENCE - Highbury Hotel, Weston-Super-Mare. On air activities with G3NJB. Cost will be £70 including meals and accommodation. Details G4EZU, 124 Damley Road, Gravesend, DA11 0SN.

AMATEUR RADIO CARAVAN & CAMPING CLUB Rally - Thurlaston, Leics. (AGM). Details G4LWA QTHR, tel 01494 531755.

1 OCTOBER

BLACKWOOD & DISTRICT ARS Rally - Community College, Oakdale, near Blackwood, Gwent. Doors open at 10.30am. Details Norman, GW0MAW on 01495 227550.

THE GREAT LUMLEY Amateur Radio Rally - Held at the community centre in Great Lumley, near Chester-Le-Street, Co Durham. Doors open at 11.00am, 10.30am for the disabled. Entrance fee £1 which includes programme. Free admission for children accompanied by an adult. Details G1JQT on 0207 237927.

8 OCTOBER

COMPUTERCATIONS 95 Computer & Radio Rally - Hillhead Campsite, Dartmouth Road, Brixham, Devon. Details 01803 522216.

KIDDERMINSTER & DARS Rally - Details G8JTL on 01384 894019.

13-15 OCTOBER

AR CARAVAN & CAMPING CLUB Rally - Elkington, Nr Welford, Northants. Details G4LWA QTHR, tel 01494 531755.

SILENT KEYS

WE REGRET to record the passing of the following radio amateurs:

G0FZW	Mr J S Tomlinson	
G0UXV	Mr H Aspinall	3.6.95
G1VRB	Mr V R Braden	April 95
G2CKI	Mr E A Nock	
G3BIW	Mr J B Bedford	12.6.95
G3BKF	Dr J M Ivison	11.6.95
G3FXA	Mr G W Spray	1.4.95
G3HFG	Mr D Strudwick	June 95
G3HID	Mr F W Fox	1.10.94
G3JLY	Mr S J Sparks	24.5.95
G3OHE	Mr W Frost	25.5.95
G3VWR	Mr G Foy	11.5.95
G4CGS	Mr D Sugden	17.11.94
G4COY	Mr S G Crouch	29.5.95
G4FQQ	Del Roberts	17.5.95
G4IPU	Mr E C Lambert	12.6.95
G4OKL	Mr A M Smith	
G4VDA	Mr K Burn	5.6.95
G4ZZX	Mr J B Watson	28.5.95
G7IDV	Mrs G Searle	5.5.95
G8PXY	Mr D Almond	11.6.95
G8UMR	Mr H Banfield	7.6.95
GI3ZJR	Mr A J Ruff	January 1995
GM3BEA	Mr J D Cameron	6.6.95
GM4PMC	Mr R Fraser	13.6.95
GM4ZGD	Mr G C Dick	6.6.95
RS88122	Mr A Wagstaff	6.6.95

20/21 OCTOBER

LEICESTER AR Exhibition - Easy access from Junc 21 of the M1 with the usual emphasis on amateur radio. Morse tests will be available on demand but two photographs plus proof of identity will be required. Ample car parking facilities. Talk-in on S22 and SU22. Doors open at 10am, 9.30am for the disabled. Details Frank, G4PDZ on 0116 287 1086.

29 OCTOBER

HORNSEA ARC Rally - Details Duncan, G3TLI on 01964 532588.

GB CALLS

The list below shows special event stations licensed for operation during this month. The information was taken from the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

SEPTEMBER

1	GB0CDN	Coastal Defence Needles
	GB0SRA	Southend Radio Anniversary
	GB2BHI	British Horological Institute
	GB2FTF	Frodsham Town Festival
	GB2HCD	Hoddesdon Carnival Day
	GB2RAF	RAFA Battle of Britain Airshow
	GB4NAS	Newbury Agricultural Show
	GB5CR	Cycle Ride
	GB5SH	St Hilda
2	GB100NT	National Trust Centenary Year
	GB2WMF	Winscombe Michaelmas Fair
3	GB4NAS	Newbury Agricultural Show
	GB4TRG	Telford Rally Group
4	GB1RMS	Ryelands Middle School
5	GB1ASS	NO1 Air Signals School
7	GB4NAS	Newbury Agricultural Show
8	GB0RAF	Royal Air Force
	GB100NT	National Trust Centenary Year
	GB13FRI	Friday the Thirteenth
	GB2HCR	Harpsden Church Radio
	GB2RCN	Radio Club (DE) Normandie
	GB2SEC	St Elisabeth's Church
9	GB90EHS	English Heritage Scarborough
	GB2AJS	Anglo Jordanian Society
	GB4ATG	Amateur Teledata Group
	GB5BA	British Association
10	GB4NAS	Newbury Agricultural Show
11	GB0RCS	Rogate Church School
13	GB2TAM	Tangmere Air Museum
14	GB0CDT	Coastal Defence 'T'
15	GB4NAS	Newbury Agricultural Show
16	GB0NTC	National Trust Charlecote
	GB100MR	100 Years Mountain Railway
	GB2VK	Marconi - GB to VK contact
20	GB0SHS	Sacred Heart School
	GB80STD	St Dunstan's 80th Anniversary
21	GB2RRM	Rolls-Royce Motors Open Day
22	GB4WFB	Wireless for the Blind
23	GB1CF	Cheriton Fitzpaine
28	GB2RCC	'Radio & Caravan Club'

The LAST WORD

COMPUTER RALLIES: PROS AND CONS

I must congratulate Mr Thirlwell G8AHS / G0VFW (*The Last Word*, Aug 95) on his comments regarding the number of computer stalls at recent radio rallies. For some time now I have noticed the gradual dilution of the amateur radio element at these rallies. I am the first to admit that there is a link between our hobby and that of information technology, but I think that such a strong link as seen at these events will be to the detriment of amateur radio as a hobby in the future. If this trends continues will *RadCom* become 'The Journal of the Radio, IT and Satellite Entertainment Society of Great Britain'?

I think the Editor's remark regarding separate areas is a very good idea: organisers should take note.

Chris Askew, G0LXA

. . . Terry Thirlwell, G8AHS/G0VFW asks "where is the amateur radio interest" at radio rallies? Whilst to a great extent I agree with what Terry says, I do have to put my hand up in defence of event organisers. As the organiser of the BATC Rally in 94 and 95, I know from the inside many of the difficulties faced. It is true to say that there are some rallies, including major ones, where the organisers' only interest seems to be to fill all the available space, regardless of the type or even integrity of the traders booked. However, for many events, the necessity - at the very least - to break even means that all types of traders are accepted, which often means a great emphasis on computer-related traders.

I believe there are too many rallies these days and this only compounds the problem. But even so, there are still not enough radio-related traders who attend rallies to fill even a medium-sized hall/marquee, without any other type of trader present.

I hope that perhaps this explains a little the reasons behind the apparent swing towards computers at rallies. Please don't blame the event organisers totally, it is not always their fault. Without such essentially non amateur radio related traders the events would probably not take place at all - but perhaps that would be a good thing?

Mike Wooding, G6IQM

MORSE TEST REQUIREMENT

I expect that you are inundated by responses to the letter from G7SPN (*The Last Word*, Aug 95) about the technical requirement for the Morse test. I must write to fully support his views; amateur radio and the Morse test is equivalent to having someone walk in front of your car with a red flag! Surely by the millenium we can get rid of the Morse test?

David Mann, G8ADM

. . .I would like to put forward my point of view on the subject of the Morse test for the A licence. I was reading an article about New Zealand abolishing the Morse test [this is only a proposal - *Ed*]. As a country that is supposedly at least 10 years behind us in their ways, it seems at least they are in the 21st century regarding this outdated form of communication. When you sit the RAE you are proving to the licensing authorities that you are confident and capable of running an amateur radio station. Surely this is the main object of the exam? I can't see what banging a piece of brass up and down sending out dots and dashes has anything to do with the efficient way you run the station.

I have been told many times that "I only took the Morse test to get my licence and I have never used the key since", and some have told me they would not be able to read it now anyway. So why do we still persist in this archaic means of communication? Give us 65-year olds in retirement a chance to communicate with others in this World without having to take an archaic Morse test.

Brian A C Moran.

. . .Without wanting to be disrespectful, every time I read a letter or hear a comment from someone advocating the abolition of the Morse test, it is almost always without fail from a Class B licensee. I was more than happy to remain a Class B station for more than 17 years and never once did I grudge the Class As their all-band privilege. It was Dave Ingram's, K4TWJ, article in *RadCom* (April 1993) that stimulated my interest in CW and prompted me to write a computer program which I used to teach myself the code. I was recently given a copy of *The Complete DXer*, which is given over to CW DXing, and I have to say that if you want to increase your country total then CW is by far the best way to go, as I have found out by putting into practice the techniques described in the book.

In response to G7SPN's letter, I have to agree that passing the Morse test should be insisted upon in order to regulate the radio spectrum. The purpose of the test is two-fold. Partly to regulate the spectrum and secondly to ensure that on bands where there is as much CW traffic as there is phone, the operators are reasonably CW proficient. Therefore it should remain mandatory as a requirement for obtaining the full UK 'ticket'. In this respect, the Novice Class A licence is an ideal stepping stone.

Ian Ropper, GM0UHC

'HAMS' SLAMMED

I was very pleased to note in the August edition of *RadCom* that you intend to reward those of us who have been life-long supporters of the RSGB. It is a very welcome gesture on your part and will be very much appreciated.

I must express my dismay, however, that you have decided to introduce the vile word 'ham' into our membership structure (the Junior HamClub). For years now the Society has sought to rid us of the 'Tony Hancock image' and deplored reports in the media about activities of so-called 'radio hams'. What has changed? Is it not objectionable enough to have retailers producing 'ham catalogues' and running 'ham stores'? I find this new title of 'HamClub' most out of touch with the proud feelings of the 'real' radio amateurs, and I hope that you will think again before alienating a large proportion of the membership.

Ron Bravery, G3SKI

[Mr Bravery and other members of long standing may be interested to read the following quote: "Hams in the North are all very delighted at the prospect of having a Bulletin from which they can learn all the latest news of the doings of the Hams throughout the other part of the British Isles, and they trust that it will be an effective means of drawing all the British Hams into a closer fellowship and make for better co-operation all round." The source? The T. & R. Bulletin, *volume 1, issue 1, dated July 1925, so the use of that word has been around for a very long time, and not just in America, as many people believe* - Ed*]*

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.

SHEEP ATTACKS FOX

The acting profession will readily testify that one should never act with animals. We in the Melton Mowbray Amateur Radio Society would like to paraphrase that to read 'never *contest* with animals'. Like other clubs, we have had our fair share of 'disasters', but hardly expected to face one during that most gentlemanly of contests, the RSGB HF CW QRP Field Day, 1995. All that's required is a transceiver, maybe an ATU, key, battery, aerial and log. Saving Murphy, what could go wrong?

We established G4FOX/P in a van in a large field on a glorious Sunday morning after managing to surface early enough to only miss the first 20 minutes of the contest. All was proceeding at its usual pace, 'trade' being rather hard to come by, when there was a bellow from outside the van and the transceiver, ATU, log sheets and three cups of freshly-brewed tea leapt off the table and were deposited on the laps of the operating crew. It transpired that a large sheep, inspecting our aerial, had somehow managed to get the co-axial cable wrapped round a hind leg, and took off at high speed.

One supposes that this shows the folly of making all inter-connections so firmly. However, we managed to remain fully operational with the gear distributed among the laps of the crew and G3XYC, who was operating, displayed considerable *savoir-faire* by not missing a 'dot'. We have resolved that on future occasions we shall slip in a quick-release device somewhere in the chain. The alternative is to ensure that all animals are firmly earthed!

D A Coe, G4PZQ

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G0LOV/G4LUE UK CALLBOOK for PC. Data August 1995. Database includes amateurs, repeaters, mailboxes, nodes, European repeaters WAB £12.50. £1.50ppi Hamfax, TX/RX FAX, SLOWSCAN, RTTY, MORSE, KIT £21.00 BUILT £25. £1.50ppi. Bailey, 8 Hild Avenue, Cudworth, Barnsley, S/Yorks.

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NEXT COPY DATE

The display advertisement copy date for our November 1995 issue will be
13th September 1995

ICOM

IC-T22/42E

Mono Band VHF FM or UHF

The IC-T22E and IC-T42E are mono band handhelds packed with features from alphanumeric display to the new microphone simple remote control function. These handhelds utilize the latest Icom technology, and they look great too!

- **Big Performance Small Size** - with slim dimensions 57 x 110 x 27mm including battery pack, these handhelds fit comfortably in the palm of your hand, in your shirt pocket or small bag.
- **Alphanumeric Memory Channels** - these are expandable from 40 to 80 (not including scan edges and call channel) call channels can be tagged with a 6-character alphanumeric name such as a call sign, repeater name etc. Nothing is more frustrating than losing your channel information when your battery goes dead. EE-PROM memory backup ensures that this won't happen.
- **Alphanumeric Message Pager** - 5 transmit and 5 receive message memories are available independently from regular memory channels allowing you to use the transceiver as a simple message pager using up to 6 characters per message. This function is compatible with the paging functions for other Icom handhelds and mobiles.

- **Simple Remote-Control Function Using Mic.** - You can change the default functions of the optional HM-75's switches; squelch monitor, call channel plus memory channels 1 & 2. Ideal for operating while driving or hiking etc.
- **There's More...**
- MOS-FET power module.
- Accepts 4.5 to 16V external DC power supply.
- Log memory and repeater memory for auto storage of the last transmitted frequencies.
- Optional 50 frequency CTCSS tone squelch unit.
- 5 DTMF memories.
- Numerous scans available.
- LCD backlighting for easy night ops.

ICOM manufacture a full range of Ham base-stations, mobiles and handheld transceivers and receivers suitable for everyone from novices to top operators, no matter what your requirements, ICOM will have the radio for you.

For details of your local authorised Icom dealer contact:

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD.

General Operator: 01227 743000. Sales & Service: 01227 741741. Fax: 01227 741742.

Count on us!

NEW DUAL BAND

Dual Band Mobile FT-8500

Never before has Yaesu technology changed an industry so dramatically.

"With the Smart Controller Mic, all the radio functions are in your hand."

"And, look, the digital voltage display monitors my car battery voltage!"

"Spectra-Analyzer lets me check out channel activity in UHF, VHF and keep track of my favourite repeaters, too."

"Yaesu did it again!"

Rear-panel data jack for packet with 6-pin connections for Data Input, PTT, 9600 bps and 1200 bps Receive Data, Squelch Status, Ground.

Rotary Dial Selector Knob
Select memories and other settings according to the current mode functions.

ACTUAL SIZE
140x40x160mm (5.6"x1.6"x6.4")

Specifications

- **Frequency Coverage:**
  2m RX: 110-174 MHz
  TX: 144-146 MHz
  70 cm RX: 420-500 MHz
  TX: 430-440 MHz
- Spectra-Analyzer™ w/adjustable signal width, spacing & span markers
- 6-Character Alpha-Numeric Display
- 110 Memories (in 5 memory banks)
- Omni-Glow™ Display
- Digital voltage display
- Selectable 1200/9600 baud
- 3-Level Auto-Mute w/Mute Timer
- V+V, U+U, V+U Dual Receive
- 3 Power Output Levels
  2 m 50/10/5 Watt
  70 cm 35/10/5 Watt
- Built-in Auto Power Off (APO) and Time-out Timer (TOT)
- MIL-STD 810/C Rating
- 9 Memory DTMF Autodialer
- Handy Cloning Feature
- 3 Scanning Modes w/ Clear Scan
- Adjustable LCD Contrast/ Brightness Control
- **Accessories:**
  Consult your local Yaesu dealer.

Omni-Glow™ LCD Dual-Band Display

VHF&VHF, UHF&UHF, VHF&UHF
Select three dual band configurations. Menu loop contains 13 headings and 53 transceiver settings. Shown with custom 6-character alpha-numeric code.

Spectra-Analyzer™ displays station activity above and below the current operating channel. In Memory Recall, display signal strength of programmed channels.

Built-in digital voltage display monitors automobile battery voltage. Menu-Selectable Packet Baud Rate. Choose 1200 or 9600 bps.

The FT-8500 and Smart Controller™ Microphone demonstrates Yaesu's world leadership position in 2-way radio communication again! With just four simple flicks of the Smart Controller™ Microphone "joystick"-type lever, you command over 50 separate functions from the palm of your hand! The FT-8500 defines "high-tech" in mobile radio engineering.

The Smart Controller™ Microphone isn't the only engineering advancement. Watch the unique Spectra-Analyzer™ exhibit station activity above and below your current operating channel, and the digital voltage readout monitor your car battery voltage big and bold in the Omni-Glow™ display. In V+V, U+U or V+U view frequencies and custom alpha-numeric messages at the same time. Other features include handy cloning, selectable 1200/9600 baud, and a rear-panel data jack for packet! All of this and more in the deluxe, compact FT-8500.

The extraordinary FT-8500 Dual Band Mobile is at your Yaesu dealer now. Find out how this dramatic change will affect mobile technology for you from this day forward.

YAESU

Performance without compromise.™

YAESU UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Rd., Hounslow, Middlesex, TW4 6DR

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.