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8 THE RADCOM LEADER

News from HQ by Peter Kirby, G0TWW.

9 RADCOM NEWS - in colour

Worked All Britain Lifeboat Officially Named • 1.3GHz ATV Repeaters • 1996 President • HQ Open 16 Sep • RSGB Contests Supplement • IARU Region 1 Appointment • RSGB Council Vacancies • Star Teachers in STELAR • RAE and Mors Courses Currently Available • Council Brief • RSGB Regional Meeting in GM • Novice Learns About HQ • New Senior Novice Instructor • Poole Novice Contest • Special Swedish Station • Newsletters Needed • The 1995 RSGB HF Convention

10 RETURN TO THE KINGDOM OF BHUTAN - in colour

Top D-Kit Jim Smith, VK9NS, describes the work going on behind the scenes since his last operation in 1990 to bring amateur radio back to Bhutan.

17 AMATEUR RADIO ON POSTAGE STAMPS - in colour

In a month when the Royal Mail commemorates Marconi, Taizo Arakawa, GWORTA, JA3AER, owner of one of the World’s finest collections of amateur radio stamps, shows just how many there are to collect.

43 RSGB CONTESTING GUIDE 1996

A 16-page pull-out section containing all the 1996 RSGB contest rules.

TECHNICAL FEATURES

36 NOVICE NOTEBOOK

Ian Keyser, G3ROO, describes a companion to the 80m transmitter in last month’s RadCom, the 'Pineham', an easy-to-build receiver for the same band. In colour.

38 A VARIABLE IF SELECTIVITY UNIT

If you have an older style or home-brew transceiver then this add-on board may be for you. Although specifically designed for the G3ISO transceiver, this variable IF selectivity unit, by AR Thomson, GM3AHR, will work with any transceiver with a 9MHz IF.

41 A CALIBRATOR FOR ELECTRONIC KEYS

Calibrating the speed control knob of an electronic key can be rather approximate. This unit, designed by Terry Grice, G4PSL, provides a precise and simple solution. In colour.

59 EUROTEK

Erwin David, G4LOI, translates an article by Fred Schultz, DL1OAQ, on a 7MHz magnetic loop antenna, which can be disassembled for easy transport. In colour.

61 IN PRACTICE

Ian White, G3SEK, answers readers’ questions: Biasing Transistor Power Amplifiers • More Tips • RF Feedback Inside HF Rigs • Conductive Grease for Aluminium.

63 TECHNICAL TOPICS

Solar Flares - Predicting effects? • Seeking Better Batteries • Saw VCOs Above120MHz • Sealing Coaxial Cables • Low-distortion, Constant Output AF Pre-amp • Modern Receiver Design • TT Feedback.

REGULARS

22 HF NEWS
24 VHF/UHF NEWS
27 NOVICE NEWS
30 PROPAGATION
31 QSL
32 SWL NEWS
33 IOTA
37 HELPLINES
78 DATASTREAM
80 MICROWAVES
83 SATELLITES
87 CONTEST CLASSIFIED
88 MEMBERS’ ADS
90 RSGB BOOK LIST
93 CLUB NEWS
95 RALLIES AND EVENTS
95 GB CALLS
96 SILENT KEYS
98 THE LAST WORD
99 INDEX TO ADVERTISERS

PRODUCTS

69 EQUIPMENT REVIEW

The matchbox-sized CommSlab µ-Modem is reviewed by Roger J.Cooke, G3LDI. In colour.

71 SOFTWARE REVIEW

Experimentation is one of the joys of amateur radio. Ian White, G3SEK, reviews the ARRL Radio Designer software - a pointer towards a new direction.

PETER HART REVIEW

The MFJ-1798 is a new multimode HF vertical antenna which also works on 6 and 2m. Peter Hart puts it through its paces. In colour.
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The RadCom Leader

News From HQ

A S 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
Tony Whitaker, seen here as G3RKL, at the university, tel: 01202 595089.

THE LATEST CALL-SIGNS issued by SSL as of 30 August were in the G*WKR*, 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 remaining being by bus and train. While walking, he wore a Raynet reflective jacket at all times, as a safety aid. Using a Standard CS28 handheld transmitter, CSCs 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 amateurs, LADOR and LASSP, when north of Dingwall, and on simplex GM/E85EVB/M (on top on Ben Nevis) from near Golspie.

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 63.

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

Another bumper package brought certificates for Colin Redwood, G6MXX, covering 20 countries two-way on 50MHz, 10 squares on 1.3GHz, and a DX 25 countries award on 50MHz.

The achievement of Derek Thomas, 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 countries with a 4m allocation.

Congratulations to all award recipients who include:

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Another bumper package brought certificates for Colin Redwood, G6MXX, covering 20 countries two-way on 50MHz, 10 squares on 1.3GHz, and a DX 25

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 contesteer, 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 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 63.

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Congratulations to all award recipients who include:

50MHz: 10 countries G6FDJ, G7ORH, G1EFL, 20c G1HLT.20c G7GYS, G7KAO, G8CDW. 7c G1SDO, G4FVP, G4SEU. 80c G0LCS. 110c G6HKM.
25 squares G7RUY. 50s G8CDW, G7GGM. 100s G7GYS, G7GGO, G4OUC. 225s G1SDO, G4SEU. 250s G7BXS. 275s GW6VZ. 252s G6BCX.
DX Award 25 countries G0S00, G7GYS. 75c G4SEU. 144MHz. Standard Transmitting Award G00RI. 40 squares / 10 countries G3RHJ, G7ORH. 60s / 15c G3FJ. 432MHz. Standard Transmitting Award G3YHF.
70 squares / 15 countries. G4MKF, G8NEY. 1.3GHz. 50 squares G6HKM. 85s G3XDY. 24GHz. Advanced Award (150km) G6XMP.

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.
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 in 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.

Initial Proposals

In December 1993 the then Minister of Communications, Dr T Tobgyel, 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.

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

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

Left: Putting up R5 vertical outside the MOC building in Thimphu.
Right: Wangdo operates A51MOC.
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 was bringing, 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 exhilarating for me; Bhutan is that sort of place, and I felt at home.

Setting into my room at the Hotel Druk in the middle of Thimphu 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 Mahabir.

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 Minister, 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. I felt that we should 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 Kirsli [VK9NL], Jim's wife - Ed) on Norfolk Island.

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.

The A51MOC station.

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.

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

RADIO COMMUNICATION September 1995
Look What's Being Said -

PREVIEWED IN JUNE
HAM RADIO TODAY

"Performed very well indeed during CQ worldwide contest"
- Mike Dennison G3XDV
- Editor, Radio Communication

"Very good transmit & receive audio"
- Andy Durrant G7OEC
- Coastal Communications

"The audio is unbelievably good"
- Martin Lynch G4IKS

"It's brilliant"
- Chris Taylor G1FMH

"Award Winner - absolute delight to use - Amazing first venture into HF"
- Rob Mannion G3XFD
- Editor, Practical Wireless

"Superb for mobile use - Alinco have surprised the world"
- Chris Lorek G4HCL

REVIEWED AUGUST ISSUE PRACTICAL WIRELESS

The DX-70 is the world's smallest HF transceiver - providing 100 Watts all modes & 10 Watts on 6 metres. General coverage receive is included, and wideband transmit available for export. Detachable front panel for remote mounting & security. Plus superb specification and performance. £1095

The ALL-NEW DJ-G5 compact dual band handheld transceiver replaces the well known DJ-580 which was a best-seller worldwide. Packed with state-of-the-art features including CTCSS tone encode & decode. 200 memory channels. Alinco's amazing 11 channel MonitorScope & new high efficiency power MOSFET module. Includes wideband receive coverage: 108-174MHz & 420-470MHz. Also 850-950MHz included.

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"I tried one at the Friedrichshafen Exhibition - it's superb"
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01702 205843
During a recent visit to RSGB HQ, Rowley Shears, G8KW, generously presented the RSGB museum with a unique exhibit: a KW 20000 transceiver (left). This prototype, the only one ever made, was a digital frequency read-out 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, G3HC, 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, G3GIW, 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, G6HIL, 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.

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

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. Further details please contact the Buckinghamshire County Council Adult Continuing Education Office course hotline on 01494 536537.
- The West Herts College (Dacorum Campus), at Marlowes, Hemel Hempstead, will hold a combined RAE and Morse course starting on Thursday 21 September. To enrol, contact the Adult Studies Dept direct on 01442 420771 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 Amphi, Beds. Further details from Nigel Reynolds or Liz Holman on 01255 404412 or the tutor Eric Eislely, G3YJO, 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 4629184.
- 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 Chewer on 0181 4784758 or Alan Salmon on 01708 557600 for further details.
- Highbury College, in Coatham, 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, GB4CM, and further details may be obtained direct from the college on 01705 39131.
- RAE courses will be starting in September in Horsham and Burgess Hill, West Sussex. Further details contact John Fuller, GOO/O, on 01444 459857.
- 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 12WM Morse code test. The instructor is John Christophers, GO/P, and further information may be obtained from the college on 01952 642226.
- The Rugley Adult Education Centre, in Taylors Lane, Rugby, 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 RAE and Morse courses. Enrolment is on 4/5 September. For further details contact Student Services on 01332 519951 or Frank Whitehead, G4MLL, on 01332 512060.
- 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 Mobberby Road, Morley Green, Wilmslow, Cheshire. Further details contact Gordon L Adams on 01625 490047.
- An RAE course will be held on Thursday evenings beginning 14 September at Marple Ridge College, Hisbert Lane, Marple, Stockport, Cheshire. Further details telephone 0161 427 2111.

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 934981 for further information.
- Wales
  - Bridgend and District Amateur Radio Club will be running an RAE course at Club Brynmenny, Brynmenny near Bridgend. Contact Alan Humphries, GWKYT, 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.
The new quality "Boult" version of the new IC706/Omni DX70.

For those of you who feel they don't need 2m and 1.5m model 100 watts on HF + 6m and 10W on 2m ECall.

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Magnetic Loop Antennas

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ML80 - 7.3 - 30 MHz (continued)

ML70D: 3.1 - 10 MHz (continued)

ML1 Central Unit: Not Supplied

A 2 way control unit allows remapping & switches between 2 loops.

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GSRV Half Size: (40 - 10) m £35.00

GW40 Window: 160 - 10 m £55.00

GW50 Window: (80 - 10) m £65.00

F2W: End Fed Wire (x) £9.95

DLB: Long Wire Balun £39.95

Flexi Wire Wire £1.95 per meter

GSBV Plus Antennas

For the dedicated DXer or QRPer who uses 450 ohm feedline terminated in a balun for coax feed without cable radiation, GSVRV Plus Full Size: (80 - 10) m £75.00

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TC 250 Variable capacitor 1394c: 6 - 8 KHz £24.95

TC 500 Variable capacitor 1394c: 6 - 8 KHz £34.95

TC26 Roller Coaster 1.394c: 6 - 8 KHz £39.95

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TC48 Turns Counter Dial is marked 15 units for full container. 48 term maximum 1/4" drive shaft £19.95

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RL042: 2m (c/w Nickel & Chg £18.95

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FT971 RRP £279.95 £259.95

FT1060 RRP £349.95 £329.95

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RADIO COMMUNICATION September 1995

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14
Council Brief  
Notes of a meeting held on 8 July 1995.

Administrative  
It was resolved that the 1996 President would be P R Sheppard, G4EJH. 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  
'HOby 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 Communications.

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 burglars 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.

Poole Novice Contest  
IN AN ATTEMPT to encourage Novice licensees to have a first go at contests, the Poole Radio Society has announced its first National Novice Contest. The contest takes place on Sunday 17 September from 1300 to 1500 UTC in the 50 and 432kHz 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 Octoher.

- The US 1995 'Young Ham of the Year' award has gone to 15-year old Adam Weyhauspl, 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, W9ITF, Amateur Radio Newsline, Yasus USA and CQ magazine.

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

- THE LATEST CALLSIGNs issued by SSS as of 9 August were in the G0*OW, G7VM, 20*A* and 211*E* series.

Special Swedish Station  
TO CELEBRATE 100 years of radio and the 70th anniversary of the Grimton radio station (callsign SAQ), radio amateurs from Grimton near Gothenburg will be operating special event station 766SAQ 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 Alexander sons transmitters operating on 16.7kHz. Today, only one of the transmitters remains, and it is the only operational Alexander transmitter in the world.

Newsreaders Needed  
TWO METRE and 70 centimetre FM newsreaders are required urgently for G2BRS in the Cambridge /Mid-Anglia region. A reserve newsreader is needed to cover for the 800m broadcast by GSV0 in the East Yorkshire area. If you would like to volunteer, please contact Ian Kyle, G1AYZ, as soon as possible. His phone number is 01486 885034.

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 804 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, Whistleable, Kent CT5 3QF.

- CONGRATULATIONS to the Grafton Radio Society, G3AFT / GB9DWL, in north London, which this year is celebrating its 50th anniversary. For further information about the society, contact the Secretary, Rod Harrigan, G4JUZ, 7 Torrington Gdns, BoundsGreen, London N11 2AB.

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 RIC, Ms Elaine Shread, GM7T2T, 15 Hardie Court, Aberchirder, Huntly, Aberdeen-shire AB54 5TG, tel: 01466 780739.

Novice Learns About HQ  
KEEN YOUNG radio amateur Alex Genor, 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, Hertfordshire, was given an insight into different aspects of HQ's work, spending time in the RadioCom, Despatch, Amateur Radio, Accounts and the General Manager's departments. He is seen here in executive mode with General Manager Peter Kirby, G0TWW.

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 Sewyn Meredith, GW4XKL, who has been doing sterling work with disabled students at Commhill Day Centre. His address is 5 Woodfield Rd, Llandybiele, Ammanford SA18 3UR, tel: 01269 850803.
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 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.

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 Harrison 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
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<th>No</th>
<th>Issue</th>
<th>Country</th>
<th>Face Value</th>
<th>Gibbons</th>
<th>Scott</th>
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<td>1961.06.26</td>
<td>Poland</td>
<td>2.50 zlotys</td>
<td>1239</td>
<td>993a</td>
<td>Conference of Communication Ministers of Communist Countries (Emblem of PKZ)</td>
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<td></td>
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<td>1205</td>
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<td>20th Anniversary of SRU</td>
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<td>1972.08.26</td>
<td>German Dem Rep.</td>
<td>25 pfennigs</td>
<td>1333</td>
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<td>Society for Sports &amp; Technology</td>
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<td>2356</td>
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<td>Costa Rica</td>
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<td>1000</td>
<td>C634</td>
<td>16th Convention of Fed de Radio Club de Centro America.</td>
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<td>50 yen</td>
<td>1666</td>
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<td>1375</td>
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<td>1983.08.11</td>
<td>Jordan</td>
<td>25 liras</td>
<td>1377</td>
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<td>30</td>
<td>1983.08.11</td>
<td>Jordan</td>
<td>40 liras</td>
<td>1378</td>
<td>1159</td>
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<td>31</td>
<td>1983.09.11</td>
<td>Jordan</td>
<td>50 liras</td>
<td>1379</td>
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<td>32</td>
<td>1983.08.11</td>
<td>Jordan</td>
<td>100 liras</td>
<td>1379</td>
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<td>33</td>
<td>1983.08.01</td>
<td>USSR</td>
<td>6 kopecks</td>
<td>5537</td>
<td>1296</td>
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<td>34</td>
<td>1983.10.07</td>
<td>Nicaragua</td>
<td>1 cordoba</td>
<td>2534</td>
<td>1297</td>
<td></td>
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<tr>
<td>35</td>
<td>1983.10.07</td>
<td>Nicaragua</td>
<td>4 cordoba</td>
<td>2535</td>
<td>512</td>
<td></td>
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<tr>
<td>36</td>
<td>1983.12.19</td>
<td>Solomon Islands</td>
<td>18 cents</td>
<td>509</td>
<td>1323</td>
<td></td>
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<tr>
<td>37</td>
<td>1984.01.30</td>
<td>Venezuela</td>
<td>2.70 bolivars</td>
<td>2524</td>
<td>1157</td>
<td></td>
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<td>38</td>
<td>1984.04.14</td>
<td>Uruguay</td>
<td>7 pesos</td>
<td>1635</td>
<td>860</td>
<td></td>
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<td>39</td>
<td>1985.07.24</td>
<td>Peru</td>
<td>1300 sol</td>
<td>1615</td>
<td>860</td>
<td></td>
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<td>40</td>
<td>1961.12.10</td>
<td>Bulgaria</td>
<td>13 ct</td>
<td>3363</td>
<td>3207</td>
<td></td>
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<tr>
<td>41</td>
<td>1961.12.10</td>
<td>New Caledonia</td>
<td>64 franc</td>
<td>801</td>
<td>C211</td>
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<tr>
<td>42</td>
<td>1967.03.09</td>
<td>Luxembourg</td>
<td>12 franc</td>
<td>1201</td>
<td>767</td>
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<tr>
<td>43</td>
<td>1967.06.14</td>
<td>Israel</td>
<td>2.50 pounds</td>
<td>1027</td>
<td>964</td>
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<td>1967.11.23</td>
<td>Lebanon</td>
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<td>1650</td>
<td>1061</td>
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<td>Liberia</td>
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<td>1651</td>
<td>1062</td>
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<td>Liberia</td>
<td>35 cents</td>
<td>1652</td>
<td>1063</td>
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<td>47</td>
<td>1967.11.23</td>
<td>Liberia</td>
<td>35 cents</td>
<td>1653</td>
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<td>Oman</td>
<td>130 baths</td>
<td>347</td>
<td>306</td>
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<td>49</td>
<td>1991.03.01</td>
<td>Bolivia</td>
<td>2.40 Bs</td>
<td>509</td>
<td>819</td>
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<tr>
<td>50</td>
<td>1991.04.09</td>
<td>Norfolk Island</td>
<td>43 c</td>
<td>510</td>
<td>502</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>1991.04.09</td>
<td>Norfolk Island</td>
<td>1 S</td>
<td>511</td>
<td>503</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>1991.10.06</td>
<td>Indonesia</td>
<td>300 Rp</td>
<td>511</td>
<td>1477</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>1991.10.06</td>
<td>Argentina</td>
<td>4000 Austral</td>
<td>307</td>
<td>C124</td>
<td></td>
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<tr>
<td>54</td>
<td>1993.06.15</td>
<td>DPR Korea</td>
<td>50 ch</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>55</td>
<td>1993.06.15</td>
<td>Post Cards</td>
<td>40 Gr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>1970.10.09</td>
<td>Poland</td>
<td>4 kopecks</td>
<td></td>
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<tr>
<td>61</td>
<td>1970.03.25</td>
<td>USSR</td>
<td>2.50 zlotys</td>
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<td></td>
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<td>62</td>
<td>1970.04.20</td>
<td>Korea</td>
<td>100 won</td>
<td></td>
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</tr>
<tr>
<td>63</td>
<td>1985.05.22</td>
<td>Australia</td>
<td>33 cents</td>
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</table>
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 OST, 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 Henaster, 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 Bussemier, DL4UE, Eckstr 1, D-68577 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.

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


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 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.

The four Pitcairn Islands stamps being issued on 5 September.
**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. 802346).

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**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, Stonygate, 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 Marconin 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.
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 ConwayReef 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 Asherton, 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 Instructors 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

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

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

YAESU
Performance without Compromise

TURN TO PAGE 40 FOR LECTURE SYNOPSIS
T he 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 Bhumibol of Thailand’s accession to the throne and he is the Patron of RAST. The location is the Samul Orchid Hotel and the special station HS5SEA 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 Ascoline 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 G3CAY will be in attendance and will be present during the various sessions. There will also be a ‘Ladies programme’ involving a visit to Venice. I suggest that anyone interested should contact PROMOTEMarl 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 compose this 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 (FS), has been added to the DXCC Countries List. It went on to state that documentation for the recent PS1/0H2AM 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 O2H2B will take place before the Beijing DX Convention in October and will be much smaller than his ZA operation because of the delicate political 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 (30,866 QSLs). 544 applications (67.91 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. ZS425QN will mark the 50th anniversary of the 42nd Swarkop Air Base in South Africa between 16 September and 5 October. ON6TT returned to Angola early in July and will stay until 28 August as D2TT on all bands 1.8 to 28 MHz mostly on SSB and RTTY. He will emphasise the new bands and RTTY. He is a telecom consultant for the Red Cross. He will spend the day when he is at work he intends 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 ‘VUVVUV de MYCALL/B de MYCALL/B’. If you hear it please try to let Peter know via E-mail to ijrlad@angonet.gn.apc.org - noting his name clearly in the body of the message.

Until 31 December the special station HS100R will be on the air from Hungary to mark the centenary of radio. RSGB DX News Sheet says that RX10X/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 14 MHz 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 near 34.120 MHz after 2300. According to RSGB DX News Sheet, 3A2LZ has published 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 50 MHz 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 50.2 MHz. This privilege is not available to foreign visitors under the provisions of CEPT T/R 61-01. The SundaValls Radioamator station 53BGE will be on the air as 583BE until the end of 1995 to celebrate the 50th anniversary of the club. FSX5L 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 G3GVG, GE6GV, G6/6AMS, G8KH, G8ST and some others. Callsigns listed in italics are of stations using CW. -

10 MHz

0000 HK0EE, KP4AVA, PZAM, V31RD, VP5ZM, ZL4WA, 8X/ON4WW, ZL3CW

0500 FMM/PSH, P49T, V92AQ, ZIs, 9Y4KB

1200 CJ5AK, J-029JNS, 9S2SS, TH5EF, ZA1AJ, 9X/ON4WW

14 MHz

0400 FR5DX, J28JA, K7BC, ZL4AP

0600 A0HE, F09WS, K13HF, KHECD, KL7XD, LBCN, VK9NS, W5S, ZK3RJ

0700 A08N, F06NL, J71KAA, 7020X, RX10X/FJL, 501U8EE

0800 K56QW, AH9G, R1FJZ, 9VBBB

1300 JA0KRLS, VP2VM, ZA1FX, ZA1PX

1400 BY1LU, 7020X, Y0EE, XT2CH, 9MDJ

1500 A61AN, BV0GJ, HS00A, J1TGB, SU2MT, V65DG, G44AL/7

1600 BY6RT, HS0ZA, 2S1YE, TH70T, TUSDY

1700 B2Q1L, HS2NS, J72J, KL17F, 90E8, 9MBC, 91NHM

1800 S92LY, XU6H, ZD7CT, A5NTh, 7Z1S, 9MZA

1900 ET3AA, J69LJ, TUSCE, TZ3LL, VC2RT, VU200, 9L1PG

2200 HF8C8, HC8KU, JY1, P43ARC

18 MHz

1500 JA2AAM, OK1EE005

1600 AJ1T7, KL7OTH, 7020C

1700 D44BC, ET3YU, JA

1800 JA71AN, BV2KI, 879RTF, TA1AR, VPEM, XU8HA, 38CFC

1900 J23A, TLUMS, VU2BIX, XT2CH, XX9G, Y28ARW

2000 ET3BT, KL7XD, Z56BW, 7W5J

1700 CN6IC

2100 KH6EC, 9S2SS, QB5MC, 8X/ON4WW

2200 HC5AI, HK0E, J13N3SYI, 5RASD, 9Y4N3SYI

Near 34.120 MHz after 2300. According to RSGB DX News Sheet, 3A2LZ has published 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 50 MHz 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 50.2 MHz. This privilege is not available to foreign visitors under the provisions of CEPT T/R 61-01. The SundaValls Radioamator station 53BGE will be on the air as 583BE until the end of 1995 to celebrate the 50th anniversary of the club. FSX5L 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.
October as POTRI but only on SSB on 3.5 and 28.3MHz (between 28.300 and 28.500MHz). T12JP 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 = X07, VO2 = X08, VY1 = XN7, and VY2 = XN8. Also from Canada, there will be a special station CY3ARIU 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 NPe4W and the callsign will be X070. The actual stay on the island will be about one week - the other two weeks will be occupied by the return journey from Valparaiso. Another expedition - also mentioned in last month's column - this time to Juan Fernandez Is will be organised by K4UEE and K6EUE 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 size 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, H-2HMM, 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. V2UFS, on the Andaman Is, is reported to be keeping schedules with V2U4A 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 K9IR who was leader of the highly successful 3YOPI expedition to Peter I Island last year. More details later, T30DW is reported to be likely to remain on West Kiribati for about two years. The 1995 RSTH/Scharbeuf Reef operation 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 K4J4VH, 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 Scharbeuf 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 ARL's decision that Scharbeuf Reef should not be accepted as a separate DXCC country. This time the callsign will be B5TA and N7NG, OH1RY, SM7PPK, and J4HRF 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 itself will take place at the beginning of the DX season and will cover the low bands and RTTY. It will also have a beam.

RG5B 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 V150PEACE and the Australia Remembrance 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, WB2QDQ, K7TV, and K4HQL. 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 Neills Rd, Evans Mills, NY 13637, USA. Again, more information later.

**AWARDS**

**1000 Jahre Kremes Award**

The city of Kremes in Austria will celebrate its 1000th anniversary in 1995. To apply for the award it is necessary to work two stations in Kremes during 1995. The same station may be worked 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, Linbergstrasse 39, 3503 Kremes-Rehberg, Austria. Stations located in Kremes include OE3's AT5, AHU, BEA, DTA, EUN, FQA, G5E, GBA, HGB, HY, HZG, IJS, J5, J6, J7, JN, JZ, LXJ, N5, N7, N8, N9, NEA, O0W, PBU, PNU, PWN, WRU, SET, SAW, SCC, BSP, SFC, TFR, TRB, WFB, WOP, WPS, YHS, YTW, and YZ2. All these stations will use the special prefix f1000 during 1995.

AGCW/CL 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 Wiesen, DJ5SK, Feudenheimer Str. 12, D-69123 Heidelberg, Germany, before 31 October 1995.

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

ALL ASIAN DX CONTEST (SSB)

0002 September - 2400 3 September

1.8 to 28MHz (no VARC). 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. Rules of copies/summary sheeting forms may be available, but in 1994 did not arrive at the time of writing (SASE please).

WAE DX CONTEST (SSB)

1200 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 up to three parts. Minimum of time allowed on a band is 15m. Work non-European 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. The points are to be scored by means of QTCs. I can supply copies of the 1994 rules - the 1995 version had not arrived when this web was being written. The WAE list is as follows: C3, CT, CU, DL, EA, EA6, EL, ES, F, G, GD, GI, GJ, GM, GM, Silland (GU, GW, HA, HB, HB3, HV, I, IS, IT, JW (Bear Is), JW (Spitzbergen), JX, LA, LX, LY, OE, OH, OH0, OJ0, OK, OM, ON, OY, OZ, PA, SS, SM, SP, SV, SVS (Rhode), SV9 (Crete), SY, SYT, TA1, TF, TK, UIA1-3-4-5, ZA2, UB, UC, UA1N, UO, UY, YO, YU, ZA, ZB2, 1AO, 3A, 4J, 4K, 4N, 4U, (Geneva), 4U (Varna), 5A, and 5H. Logs must be mailed before 15 September (CW section) 15 October (SSB section) or 15 December (RTTY section).

In the 1994 ARLR 10 Meter Contest GA0EV scored 5,082 points, G0GTJ 392, and G0GQG 340. GA0EV 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)


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 RTT plus serial number starting from 001. ON and DA stations will give their club code - the 50M0 of 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 2800 Beersel, Belgium.

THANK YOU

TO THOSE WHO PROVIDED INFORMATION this month. Special thanks go to the following for news items: the Lymnx DX Bulletin (EA2KL), the Long Island DX Bulletin (VP2ML), the RSBG DX News Sheet (G4BUE), and DXPRESS (PA0FOA). Everything for the November column to reach me no later than 14 November.

28MHz COUNTRIES TABLE

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VHF UHF NEWS

NORMAN FETCH, G3FPK

40 Easdale Gardens, Purley, Surrey CR6 1EZ

T HIS SUMMER has produced some excellent DX solar. 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 NDF week and 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 2/5 EDITION of Dubus Magazine includes an article by Charles Suckling, G3WGO, 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 usually some new 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 Dohuls, DJ3QC, Robert Lentz, DL3WR, and Terry Bittan, G3JUV/DJ6BOB. The first UK agent was Don Hayter, G3JHM. In 1966, Mike Woodcock, G6BMQ, and his wife purchased the rights and rights, producing their first issue in 1971. They formed KM Publications expressly for this purpose and now have 3,500 subscribers worldwide. Their postal address is 5 Ware Orchard, Barby, Rugby, CV23 0BU and the E-mail one is 100441.377@compuserve.com.

The Summer 1995 issue includes articles on a VHF/UHF grid dip meter using a T1S86 J-fet transistor in both battery powered versions, a 29/432MHz transverter in modular form, a 28/50MHz transverter and a big wheel antenna for 70cm.

CONTESTS

ELLA TUGWELL, G0GFIP, sent a copy of the rules for the 19th annual BYLARA Contest. The dates/times to note in your 1996 diaries for this event are: 11 Feb 1996-2000 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 145.750-145.175, 145.600-146.000, 432.800-433.375 and 438.600-434.975MHz.

For a copy of the rules send an SASE to G0GFIP 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 the novices their first taste of Contesting". 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 wherever source."

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

MOONBOUNCE

THE TORONTO VHF Society, VE3ONT, will be active from the Algoupinig Observatory (FN5D5XW) in the two legs of the ARRL EME contest using the 46MHz dish. The proposed schedule is: 7 Oct 0000-0957, transmitting on 144.100 listening on (QSK) 144.100-144.110. They will be ready (QRV) before 0000 for testing and random QSOs. 7 Oct 2306-1013 on 50.100, QSK 50.100-50.105, and 1296.050, QSK 1296.050-1296.060. The November schedule is: 4th Oct 0805-1049 on 432.050, QSK 432.050-432.060, again ORPV10000, and 4/5 2137-0947 on 144.100, QSK 144.100-144.110. All times are UTC and frequencies are in MHz.

As always use the dish is subject to last minute changes due to weather. It is needed for radio astronomy. The times are for a dish elevation limit of 9° in FN5D5XW. They will use horizontal polarization on 50MHz, HRCMP on 144, 432 and 1296MHz but all stations are requested to accommodate LHCP. Thanks to Dennis Mungham, VE3ASO, for this in-
formation. QSLs go to him at RR #3, Mountain, Ontario, Canada K2E 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 make more up for the higher-than-usual path loss." British stations reporting activity were G3LTP, GO6EKK and GW5WWV. 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 08690-4700, USA. His E-mail address is a.katz@ieee.org.

The only UK activity report is from John Regnault, GA5SWX (JN02), who completed with J1LZG on random on 2m on 8 July during a 5m window with 529 reports each. 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 (JN79), I0K8ZNY (JN71), IT3JW/L9, IT5Q5 and IW6EKK (JM69) and IAM4DA (JN79). The second, 1816-1847, was to southern France, Spain and north Africa. Stations worked were EA3GDD and EA3KJU (JM00), EA3/DL3MGO, EA3DBJ and EB3EDT (JN01), EA3ADW, EA3BRH, EA3CARE, EA3MRI and EA3DUX (JN11), EB3FPPF and KF6KPR/JN12, EA5FIC, EA5QZ and EB5ECY (JM89), EA5ANO and EB5IIF (JM89), EA7QH (JN07), EA7QH (JN05), EA6PS, EA6SBD and EA6XQ (JN19) and EA9AI (IM75). The third opening at 1916 only lasted a few minutes and 18MPO (JN70) was contacted.

My thanks to Alec Trustler, G6FIF(SXW), Andy Wyplanty, G1AWF (LDN), Mike Jupp, G1HHW (SXW), Angela Sitton, G1XEO/G0HGA (HFD), John Quarmby, G3XDY (SFK), Ken Osborne, G4IIO (SOM), Andy Stafford, G4YMD (SOM) and Graham Watt, GM6WBY (FFE), for these reports.

There was some good tropo on the Saturday evening. On 2m G4VMJP worked LA2PH A (J038) and O291T (J048). Edward Alley, GW0PZD (GD3A) reports DL0OUP/J (J043) at S9 through out to 968km. He worked many North Germans in JO31, 32, 42-44 and lots of ONS and PAs. OZ9EDR/P (J064) was a new square. Other DX included DL7AKA (J062) and DL9GJW (J054).

**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 counties 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 from these parts were the best opening to North America they had ever experienced. G4IGO's report was from 1752 and it was still going well at 2005 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, 05, 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 EM69, FM07, 17, 18 and 29, FN10, 41 and 42.

Geoff Brown, G1JIC, 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 - N5OSX (JN01) was Sin 40dB, for example. Other DX worked included OX3LX (GP36) and KP4EIT (FK68). Eli Marty, G6HMK (ESX), made 59 QSOs with Ws and VEs in 33 squares, some which were new.

Paul Baker, GW6VZW (GW7T), called it "a mega WVE opening" but he did not catch until 2040, just before he left for work on a night shift. Jamie Ashford, GW7SMV (GW7), made his first transatlantic contact on 5 July with VE11YX (FN74). Next evening he worked KM11H (FN42) for country number 50 and then a couple more Ws on the 7th, all with 25W and an HBCV antenna.

**OTHER DX**

A warm welcome to Kevan Matthews, 2E1AIU (ESX), who joins the national list. Countries added in July were EH, HB0, IS0, SM, T9 and YL. Another new contributor is Ken Grover, G3KF (KNT), who used an IC-551 and 3-6e Yagi on a 40ft mast. He caught his first Es on 20 June and a second on 16 June making 38 contacts in 17 countries.

The best of Terry Chaplin's, G1UGH (SFK), Es QSOs in July were 1st EH9IE (IM75), 2nd UT6K (K041), 11th OH1U (KF10) and YL3AG (K026). 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 UT5X, LX1UX and CT7G3SDL, EH9IE, SV1AHX (KM18), 4UKCOPA (IL46), EH8ACW (IL28) and CU1CB (HM76) - not bad for 25W and a 2-ele antenna.

**144MHZ**

**NEWS**

G0HQA 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 a 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, G0HKB (CB3), is making two 10-ele DL5WU Yagis which should improve his station performance considerably. Roger Kendall, G0UPU (GLR), is a new well known VHF DXers were in attendance at the wedding of Ian Watt, GM4ZFR, to Sandra Gillespie in Edinburgh. From left: Pat Hargreaves, G3TEY; Gary Styles, GM0CIT/LA9GJ; Graham Knight, GM5FFY; John Rooney, GM9TDB; Kevin Macleod, GM1KFM; Ruth Drinkwater, SWL; Alastair Beaton, G4ZUK; Stewart Cooper, G4MAFF; and Alec Allen, G3DEE.

Several well known VHF DXers were in attendance at the wedding of Ian Watt, GM4ZFR, to Sandra Gillespie in Edinburgh. From left: Pat Hargreaves, G3TEY; Gary Styles, GM0CIT/LA9GJ; Graham Knight, GM5FFY; John Rooney, GM9TDB; Kevin Macleod, GM1KFM; Ruth Drinkwater, SWL; Alastair Beaton, G4ZUK; Stewart Cooper, G4MAFF; and Alec Allen, G3DEE.
 contributor who has been QRV with 25W for a couple of years. John Hill, G7CLY (HBS), wrote from County Antrim on 26 June. 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 Higham, GM0VBE (SC0), who was active as G0VBE/P from IO70NN in Conwell 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, GW7VEG (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 was low. On 26 June, G4MFKP (J099/SLD), GM0MLB (IP90/SLD) and GM0HTT (IO83/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 SM5MJX (J078).

By 30 June, the lift favoured the east with DLs much in evidence. G1AWF worked G0AFT (J073) but the Polish stations were not too strong in London. By NFD weekend, the DL direction was favourable. British Isles stations in GM and EI were also consistent on 1 July.

SPORADIC-E

In the late afternoon of 25 June, 1620-1725Z, there was a good opening to Italy and Greece. Stations worked included I59IPQ/9, IW8PJP and IW8PQ (JM78), 1BM0 (JM70), IK7H1N and IK7NH1 (J001/JM7W/kW3) and their return, SV3XH (KM7D).

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 HA, HA8, IK0, I4, OES, OK1Z, OM3, OM36, SS, SP9, YT5, Y7 and 9A. Best DX were probably UT3WYY/P (KN19), UT5DE (KN18) and Y05CBX (KN27).

Other squares worked included NE6V, 75, 76, 79, 85-89, 94-99, NO8, KN99 and KN09.

G4SWX worked 14YN0 and IK0YUS (JN63) in a brief opening at 1047. Between 1114 and 1214 John made eight QSOs with EA3 and EA9 stations in IM99, JN00, 01 and 11. GW0PZT reported a continuous opening from Gwynedd, 0231-1212, during which he worked 66 stations - 25 HA, each YU and 9As, 6 each Y5s, 5 Fs, 4 each OEs and YOs, 3 S5s, 2 each OM8s and DLs and a TK. Edward highlights Y02OC/P (KN15), OM3TRV (JN88), 4N7FK (KN05) and TK6EP (JN41) as the best. 1

The last event was on 15 July, 1640-1943, mainly to the central Mediterranean, Greece and Bulgaria. Stations worked by several contributors included ISOO2K (JM49), IK7M0N (JN90), IW9DRY (JM67) and reported also as IW9BRY, IT53IPQ/P, IT9SGO/Q, IT9GO and IW9EKK (JM68), L21UK (KN12), L21WR, L22ZV (KN23), L22AB (KN33) L22ZT, Y03DAC, Y03DMU and Y03JW (KN34).

Maltese QSOs were with H11ET, H95CL, H95L and H95SN. Best DX were probably IW9ERY/H9 (JM65), SV2AOE (KN10) and SV7ALL (KM20).

METEOR SCATTER

Bill Thomas, G4AEP (BRK), is another first-time contributor. He is trying some MS and is now completed with GL2BIL (K014). G0FIG lists July completions with SM3DL7WBN (J881), LY2BIL, SM/DL3GJW (J086), 16WJ (JN72), I4YN0 (JN54), 9A3XH (JN75) and LA5DLDTA (JP21) between the 8th and 18th.

Thanks also to the following readers from whose input these reports were compiled: G1HWW, GI4GHG, G6HJKM, GJ4ICD and GW7SMV.

430MHz UP

2E1AIU OPERATES on 70cm. On 28 June, during the good tropo period, Ken worked PE1PXG and DL8SUD but did not mention any stations or contacts. A QSO with him is always appreciated.

On 70cm, the only new square for G0FIG was F5GKX (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. G0HKG 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 G7RDR (LCN) in low power between 10 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 CO 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, G15WH (MCH), notes 23cm QSOs with G3DVF (OFE), G4VPM (SOM) and G0FYM (YSW) but did not state the states.

G3XDY lists 70cm QSOs over 500km on 1 July with D0NFN (J044) and OZ9ED/R. Next day John contacted DL8SUD and OA25BAL/P (JO55) and OZ6DL (JO65) and DF0BA (JO42). On 23cm on 29 June he worked DB2BZ (JO42), OZ6DL and DK2NH (JO53). On 1 July DL0CUP (JO43), DF0NFN, DL0MI (JO42), OZ2ED/P and OZ25BAL/P and next day D0RG (JO62), DL4QUP and DK9SOY (JO52), DG1RDP (JO62), DL2NUDP (JO63), DL0SH (JO54) and DL7AKLP and DF0TEC/P (JO79).

Nothing was heard of the Sp's and SMs worked by G0HVF/P on 23cm on the Sunday morning of NFD weekend.

On 26 June G6HJKM worked G1MTDU (IO87) and GM0SUS/P (IO91) on 70cm shortly after their UHF QSO to give her JO73 on this band.

FINALE

ITWOULD MAKE editing so much easier if readers would please list activity separately 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 email, please make sure you include your full details. For example, on 18 July there was an Internet message from an A Rowley, but no callign was stated. There were two in the RSGB Cell 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 01817639457. My Compuserve ID is 70630,603 and the Internet address is 70630.603@compuserve.com. The BT Gold mailbox number is 67:CCQ063.*
YOU READ about 13-year-old Alex King, 2E0AJ, 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 his own. George welcomed his offer and, after offering help and advice, they decided times and frequencies when Alex would be calling "QO QRS DE 2E0AJ".

He will call on Sundays at 0600 GMT (9.00 am BST) and on Thursdays at 1800 GMT (7.00 pm BST). On both occasions the frequency will be 3.575 +/- ORM 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, G4LXX, 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 when he left off at a later date.

So, how did they cope? The physical act of soothing 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 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 OTHR, 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, G3HMO 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 71[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 'I' 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 OTI would merely give the caller what he wanted - a reacting audience! Ignored, he would never know if he had even been heard.
SMC, ARE & REG WARD
37 years and still Number 1

THIS MONTHS SPECIALS
KENWOOD TS850S only £1495.95

KENWOOD TS850SAT only £1589.95 ★ LIMITED STOCKS OF BOTH ITEMS ★

HF TRANSCEIVERS

KENWOOD
TS-950SDX list £3995 our price £3195
TS-850 list £1995 our price £1495
TS-850SAT list £1995 our price £1625
TS-450S list £1499 our price £1249
TS-450SAT list £1649 our price £1435
TS-56S list £1059 our price £895

VHF/UFH HANDI's & PORTABLES

YAESU
FT-1000 list £3099 our price £2895
FT-990 list £2399 our price £1795
FT-990DC list £2099 our price £1645
FT-900 list £1995 our price £1245
FT-840 list £959 our price £725

ICOM
IC-775DSP list £3700 our price £3599
IC-736 list £1969 our price £1665
IC-738 list £1649 our price £1435
IC-729 list £1325 our price £1175
IC-706 list £1195 our price £999
IC-707 list £889 our price £775

VHF TRANSCEIVERS

ICOM
IC-280H list £1785 our price £1549
IC-275H list £1495 our price £1345
IC-215H list £1499 our price £1249
IC-2000H list £269 our price £239
IC-2340H list £389 our price £329

KENWOOD
TS-790E list £1989 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 £394
TM-702E list £579 our price £499

VARIABLE TRANSCEIVERS

YAESU
FT-736R list £1999 our price £1549
FT-8500 list £749 our price £659
FT-5200 list £729 our price £695
FT-5100 list £679 our price £615
FT-2500M list £399 our price £295
FT-2200 list £419 our price £329

ICOM
IC-Z1E list £699 our price £529
IC-2GXE list £565 our price £425
IC-2GKET list £599 our price £455
IC-W21E list £559 our price £425
IC-W21ET list £599 our price £455

KENWOOD
TH-79E list £479 our price £419
TH-22E list £254 our price £219
TH-42E list £289 our price £249
TH-20E list £319 our price £269
TH-40E list £369 our price £319

STANDARD TRANSCEIVERS

C558 sale offer price £239
C468 sale offer price £199
C188 sale offer price £169

On some Items supplies are limited at our offer prices

VHF Antennas

CUSHCRAFT
R5 10/12/15/170m vertical £279.00
RF 10m thru 40m vertical £186.00
AV-3 14-21MHz vertical 4.3m long £289.00
AV-5 3.6-14MHz vertical 7.4m long £293.00
APB 8 Band Vertical £199.00
APB18A 8 Band Vertical £199.00
40-2C 2-40m Yagi £515.00
A3S 14-21/20MHz Yagi £319.00
A2WS 12/17/30m Yagi £275.00
ATCG 3m Extension 40W £115.00
155C 4-6m Yagi £259.00
154DC 4-6m Yagi £249.00
D4 Dipole 10/15/20/40m £479.00
D3W Dipole 12/17/30m £179.00
A4S 3-6m Yagi £425.00

Radio Communication September 1995
**NEW PRODUCTS**

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

OUR PRICE **£659** Save £90.00

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

**ALINCO DX-70**

HF & 6m remote mountable mobile transceiver. 100w output HF 10w on 6m. Rx coverage 150kHz-30MHz on 6m, 50-545MHz all mode including FM.

**ANTENNA ROTATORS**

**NEU**

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HE-702S 2M/70cm Whip BNC £14.50
HS430 5m Whip Whip SMC £10.00
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HE-727SS 2M/70cm Mobile Whip £17.00
EK504B 2M/70cm Mobile Whip £22.50
SMC125S 12M Mobile Whip £9.50
SMC155S 15M Mobile Whip £16.50
SMC173S 17M Mobile Whip £13.75
HFS 12/173 Bal Base Whip £9.00
29H29B 10M 2EL ZL Beam £90.00
HE-GPM6 2x1/4 Base Collar £36.00
GP33 3x1/4 Base Collar £59.00
SC14 2M SWISS QUAD £65.00
WXM 21/27CM Base Collar £39.00
WXK 27CM/27CM Base Collar £59.00
WVM 100CM Base Collar £76.00
WMS 27CM/27CM Base Collar £199.00

**NEW ACCESSORIES**

FT411 2m handy 1 only £189.00
FT611 70cm handy 1 only £209.00
FT185 70cm handy 2 only £229.00
FT850 2m handy 5 only £249.00
TH78E Dual band handy £379.00
TM441E 70cm mobile £349.00
TH29E 2m handy 1 only £199.00
IC735 HF transceiver 1 only £369.00
IC73B 2m mobile 1 only £279.00
IC229H 2m mobile 50w £319.00
IC235E 2m handy wideband RX £349.00
IC323DH Dual band mobile £499.00
IC449E 70cm mobile £359.00
IC725E HF transceiver 2m £1025.00
IC737 HF transceiver £1269.00
ICF SW1000 Sony receiver £149.00
AR2000 ARM AFM scanner £259.00
SARC500E ADR all mod scanner £269.00

**ACCEESSORY BARGAINS**

144TV 2m module FT770 £39.00 B
430TV 70cm module for FT781 £169.00 B
144TV 2m module for FT765 £199.00 B
DCT75 DC lead for FT776 £10.00 A
6C Charger FT296 £20.00 A
D1100020 Transistor antenna FT290R £13.00 A
T135 Robt duck FT290 £10.00 A
NC15 Desk charger FT200, 203, 272 etc. £59.00 B
FM06 Head FT200, 203, 272 etc. £36.00 B
CSS10 vinyl case FT209 + F83B £22.00 A
CSS27 vinyl case FT277 + F83 £22.00 A
CSS21 vinyl case FT211 £22.00 A
CSS3 vinyl case FT232 + F83B £22.00 A
CSS22 vinyl case FT232 + F83 £22.00 A
CSS4 vinyl case FT247 + F80 £17.50 A
CSS5 vinyl case FT247 + F80 £17.50 A
CSS6 vinyl case FT247 + F80 £17.50 A
N92 New FT260/360 etc £20.00 A
CMH13 Vinyl case F280/280 £24.50 A
N92 Desk charger FT206/708 £35.50 B
AM7777 AM unit FT77 £127.77 A
MM15 Mobile bracket for FT270 £155.55 A
MM16 Mobile mount FT77 £178.88 B
MM21 Mobile bracket FT230/269 etc. £12.22 A
MM33 Mobile bracket for FT7111 £205.55 A
MM46 Mobile bracket for FT470 £12.55 A
FMU7001 FM unit FT100/1 £19.00 A
DCT301 DC inverter FT501z £10.00 A
MM1 Mobile mount FT501/1 series £10.22 B
XFS-78AM AM filter FT10/1 £1.41 A
XFS-78MC FM Filter FT701z £129.50 A
XFS-76MC 500W CW filter FT102 £157.12 B
XFS-75MC 500W CW filter FT102 £157.12 A
SC5026 270W CW filter FT102 £179.50 B
HBF977 FT72 battery holder £7.75 A
FC240 Remote RTU suitable for conversion £99.00 A
NORD18A 96 channel memory unit for NR515 £159.50 A
FRAT700 External antenna £189.00 B
CQ-7000 10 watt antenna switch £199.00 B
FRFV/FMV Mobile wideband FM £5.30 A
DC500ID1012 DC kit complete with DC lead £4.99 A
MM33B Mobile mount for FT7111 £205.55 B
FMB42 Metal case FT741X £79.00 B
D08216C RX mod kit FT72 £3.00 A
D30325A NB kit £2.59 A
SET ONE External board kit for FT40 £24.00 A
D08367 Counter unit FT301 (improved type) £15.95 A
DG 20W power supply FT40 £24.99 A
BFA3 Battery adapter for P1, NC1, NC3 etc. £5.00 A
YF3A OM1F96 ft 286 FT72 £35.50 A
FS5 Low pass filter 500kHz FRG770 £10.00 A

**TVC £13.50**

**Handsfree/Mobiles by post E5**

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**EUROPE**
- Moscow
- Madrid
- Gibraltor
- Ireland

**ASIA**
- Osaka
- Hong Kong
- Bangkok
- New Delhi
- Teheran
- Colombo
- Bahrain
- Cyprus
- Aden
- Suva
- Wellington/L
- Sydney/L
- Perth
- Honolulu

**AFRICA**
- Seychelles
- Mauritius
- Nairobi
- Harare
- Cape Town
- Lagos
- Ascension Is
- Dakar
- La Palmas

**S. AMERICA**
- Stk. Scheland
- Falkland Is
- Rio de Janeiro
- Buenos Aires
- Lima
- Bogota

**N. AMERICA**
- Barbados
- Jamaica
- Bermuda
- New York
- Mexico
- Montreal
- Denver
- Los Angeles
- Vancouver
- Fairbanks

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).
THE QSL Bureau Sub-Manager for the G4A and G4H series, Dave Roebuck, GOLLM, has recently moved. His new address is c/o 92 Owlet Road, Windmill, 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, G6GSB, the Sub Manager for the G3S series, whose callsign was given incorrectly in At Your Service on page 96 of the July RadCom. Knowing your name, you 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 punsters should be getting responses in due course.

The Norwegian bureau has moved address to Norsk Radio Relais 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 CallBook 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.

AWARDS

GIBORNE, 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, Gibborne 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 Gibborne 2000 Award, P O Box 1017, Gibborne 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 continents 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 G3TTL who is QTHR.

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 a 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, GJOVJP, 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 fast 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**

**JUST IN CASE** you should remind

ing, 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 CW

DX Contest. The rules, see the table (right), are quite simple, with

the onus on logging what you can hear, and there are few restric-
tions. Last year I received more than 80 entries from 17 DXCC

countries and this time I am hop-
ing 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 en-
tries. 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 al-
ways adds a great deal of inter-
est. One such DXpedition will be

by the crew who operated at

C56DX last year. This year they

will be QRV from C54 - 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, SO, EA9, D44, CT3, EA8, W,

VE, SB4 and 4X4? On 20 metres or 40 metres perhaps?

In fact, according to various re-

ports, 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 equip-
ment 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 Car-

ibbean. I am advised that as well as

KP4 and CO, stations in PY were

also audible in the UK. During

June, the band was appar-
ently open to the USA on five

consecutive evenings though I

only caught two of them. The first

was a short opening to VE1 and

while the second, of around 4 hours,

was a much bigger event with Ws

and VE8 audible in London from

2042 to 2242. Stations in W1-4,

W6-0 and VE1-3 were heard.

David Whisker, BR5V4Z9, caught

the CO at the beginning of one

Stateside opening and the

KP4 at the start of another. These

choice loggins brought his 5m heard score to 104. He was wait-

ing for eight confirmations in

order to get the third RSGB 50MHz

SWL 100 Countries Award.

David Whisker, BR5V4Z9, remarked that 5m 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, Davidmen-

tioned RSGB VHF Field Day. He

said that the skip was very nar-

row for much of the contest as he

could hear many DIs in Northern

Germany working other Germans

in nearby squares. Meanwhile, 2

July provided EA91B and EA91MH,

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

loggins this time were EWS9/

UX2 MM from Cheromby (QSL

da LI3SDQ and CG7D) (Special

gateway 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

several ICAO beacon transmissions. There were several volunteer

and Ray passed on a progress

report. A team of five listeners

was established: Ern Sherry

BR520370, (now sadly de-

ceased); Jim Fairgrave,

BSR5324; Bill Hough, GO1HF;

Ron Newsome, BSR56138; and

Don Law, BSR87742.

Listening commenced in Janu-

ary 1994 and was running smoothly by February. Unfortu-

nately, the Australian Beacon had
to close down leaving only LNA2

in Norway. By the end of January

this year, LNA2 started to give

trouble and Ron's antennas were

blown away in the gales! Despite

these problems, the scheme ap-
ppealed to those who were retired,

and the Reporting Club were par-

ticularly grateful for the listen-

ers' efforts. Listening provided

some interesting occurrences, in

particular an unusually high inci-
dence of coronal holes, and some

fine reporting of LNA2 by

BSR5324, during night-time con-

ditions in May 1995 on 5470, 7870, 10407, 14405 and 2045 kHz.

For anyone interested in 10

and 6 metre propagation, the Six

and Ten Reporting Club has

monthly the magazine, Ray will

send details on receipt of return

postal. He is OTHR.

**QSL HELP PLEA**

A NUMBER OF sources have asked me to provide QSL infor-

mation. Can anyone help with

good addresses for the follow-

ing? 6Y5X (October 89 and Octo-

ber 91), FRDX (October 90),

5U7M (October 91), XU2UN (No-

vember 92), SU1AH (November

92), TT5BP (October 93), TG0AA

(October 93), 5T5MS (October

94), VP5X (March 95), VP6CFM

(September 95), TO5GI (March

95), 2D8ZXR (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 CW 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, 7.05 and 1.8MHz).

3. Points will be as follows:

   a) Countries in the SWL’s own continent score 1 point each.

   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) Call sign of station heard.

   d) Confirmation of the station being worked is not required.

   e) RS of station heard at SWLs QTH. No station may be logged whose RS is less than 4 x 4.

   f) A country multiplier/ishoot sheet must be provided.

   g) Computer generated logs will be welcomed.

   h) Logs should be sent to Bob Treacher, BR52325, 93 Elbaker Road, Egham, London SE9 1QJ, England.

   i) Logs must be postmarked no later than 27 November 1995.

   j) Certificates will be awarded.

   k) 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 mem-

bership 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.
S

E V E R A L  R E A D E R S 
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 which island?' and '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.

**STATION LOAN**

The IOTA Committee has made good use of a portable station, comprising the Yaesu FT-800AT 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.

**CONVENTIONS**

THE HF CONVENTION, to be held at Windsor over the weekend of 6/10 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.

**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.
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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 G3RVJ '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 filter 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.

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 3,652kHz 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 C1, C1, C3 and C4. 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 transmitters. Apply power to the receiver and a slight hiss should be heard in the headphones. Now connect an antenna, 57ft 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 G1, if not 10:1 to get adequate tuning rates.

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

Fig 2: The general view showing the construction of the 'Pineham' receiver.
HINT OF THE MONTH

BEEESWAX 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 pol-
luting the tip. If later adjustments are neces-
sary, hold the iron near the core for a few
seconds and it will easily turn to allow adjust-
ment. It is also extremely useful for holding a
component in oscillator circuits where me-
chanical stability is imperative. Just a few
drops 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**

<table>
<thead>
<tr>
<th>Resistor (all resistors 1/4 watt)</th>
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<tbody>
<tr>
<td>R1</td>
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<td>R2, R3</td>
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<td>R5</td>
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<td>T2</td>
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<th>Additional Item</th>
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<tr>
<td>X1</td>
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</table>

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

* 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 150122 VHF field strength indicator. Peter can be contacted QTHR or by telephone 01235 688695.

* Teny Cooper, G4CBY, would like to hear from anyone who has experience of using the HX240 2M metres to H4 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 Casparr, G3XON, QTHR, or telephone 01483 36953.

* Laurie Breitnagh 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.

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**RADIO COMMUNICATION** September 1995

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**HELPLINES**

**FOR MEMBERS**

- Fred Sammon, G44PCY, would like help to identify the equivalents for the following transistors: UK Government numbers CV9297, CV9557, CV9396, CV10253, CV10254. He would also like to know more about the following eight-pin integrated circuit devices: D3748 SGM7704, and D3748A SGM7740. If you can help, please contact Fred on 01365 324939.

- 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 Flord Cadgan, Twyn, 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 Hallicrafter S210 receiver. If you can help please contact Dennis, QTHR, 01799 530763.

- Having purchased a Heathkit GDI/U Dip Meter without coils G3GMW would like to hear from anyone who has this instrument; for details of the coils (diameter and number of turns etc). Please phone 01477 537706 or write QTHR.

- Information is required on the Stornor TX860 spec.7462. If you can help please contact R W Hopley, G0DQH, QTHR.

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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 G3TWO 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.

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 vanes 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.

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 VR1 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 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.

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**COMPONENT LIST**

<table>
<thead>
<tr>
<th>Resistors</th>
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<tr>
<td>R1, R3, R12, R2</td>
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<td>R23, R27</td>
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<td>RV2</td>
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</thead>
<tbody>
<tr>
<td>C7, C9</td>
<td>1nF</td>
</tr>
<tr>
<td>C6</td>
<td>10nF ceramic diode</td>
</tr>
<tr>
<td>C10</td>
<td>0.1μF polyester</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inductors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RFC</td>
<td>3 turns on FX1115 bead</td>
</tr>
<tr>
<td>C8, C10</td>
<td>2μF</td>
</tr>
<tr>
<td>C12</td>
<td>1nF</td>
</tr>
<tr>
<td>C1, C2, C4, C7, C13</td>
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</tr>
<tr>
<td>C14, C16, C19, C20</td>
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</tr>
<tr>
<td>C22, C23</td>
<td>1μF</td>
</tr>
<tr>
<td>C3, C8, C11</td>
<td>100μF</td>
</tr>
<tr>
<td>C5, C6, C15</td>
<td>33pF</td>
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<tr>
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<td>78μF</td>
</tr>
<tr>
<td>C17</td>
<td>39pF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semiconductors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TR1, TR2</td>
<td>MFE20</td>
</tr>
<tr>
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</tr>
<tr>
<td>TR4</td>
<td>BF494</td>
</tr>
<tr>
<td>TR5, TR6</td>
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</tr>
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<td>BB105</td>
</tr>
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<table>
<thead>
<tr>
<th>Additional Items</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>10MO2DS</td>
</tr>
<tr>
<td>CH1</td>
<td>5.6μH</td>
</tr>
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</tr>
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Components are available from JAG Electronics Components, 1180 Aldridge Road, Great Barr, Birmingham B44 8PB.
The DXCC Program by Chuck Hutchinson, K8CH

ARRL Membership Services Manager, Chuck Hutchinson, will show a series of 35mm slides that will take you 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.

Amateur Radio on Internet by Mike Richards, G4WNC

Although most people have heard of Internet, few understand its workings and potential. Mike Richards gives you 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. 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 his low budget 160m antennas. His talk is a mixture of science and engineering, with worked examples included. Included will be modelling, loading, feed methods, using balloons, making your own hydrogen with experimental results from the amazing FWEs and statics, plus the Mikrospc special varieties, Beverage and magloop receiving antennas. In addition G4DBN's DXpeditions to over 100 countries and over 160 metres in 8 weeks using small but practical antennas that really work.

Cluster Forum by John Clayton, G4PDQ

Packet Cluster users are somewhat isolated from the rest of the world and are best served by the users themselves. The Forum will take place on Wednesday 12th November. Contacts will be encouraged to attend and be ready to speak on any and all aspects of Cluster.

Computers in the Shack by Ron Field, G3XTT

Don Field, a leading expert in Information Technology, will talk about hardware and software selection, software applications and 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 DXpeditioner horner 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 the all-sky sunspot network and explain what they are about 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 (AS) back on the world amateur radio map. The AS1MOX operation in 1994 was an important step forward. By 10/09/94, 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 DQs 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, making 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 Communication 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 I and II, and CWsor. 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 organise 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 longhous landed 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 30000 QSOs in 7 days.

Low Band Antennas - My Way by Ron Stone, G63YDX

Ron Stone gained his 5 band DXCC (no 587) from a suburban site in Essex in 1977. The move to Woles 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 G63YDX 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 fixtures 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, G3SSJ (Chairman RSGB HF Contests Committee)

A guided trip into exciting HF contesting 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 contest operating, restricted sections, and point-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
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 specified period 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 1µA.

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 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. O10, 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:

\[ 1023 \times \text{dot duration time (seconds)} \]

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 \times 0.12s = 122.76 seconds. Speed is in inverse proportion to time so for some arbitrary keyer speed:

```
1023 x dot duration time (seconds)
```

Fig 1: Keycal, circuit diagram.
SPEED CALIBRATOR

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

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.

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.

CONSTRUCTION.

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 padle and commence timing.
4) Release the paddle when the audio pin 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 percent 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 is useful for QRS working with novice operators and for tuition purposes. A 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, FHS9P
1/4in jack socket, Maplin, BW78K
Battery, 9V PP3
Case Electromail 5502-635
Battery clip

Components are available from JAB Electronics Components, 1180 Aldridge Road, Great Barr, Birmingham B44 9PE.
Electromail, PO Box 33, Corby, Northants, NN7 9EL. Tel: 0536 204555
Maplin Electronics, PO Box 3, Rayleigh, Essex. Tel: 01702 556751.

RADAR COMMUNICATION September 1995
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!

RSGB CONTESTING GUIDE 1996 INDEX

<table>
<thead>
<tr>
<th>CONTEST</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF CONTESTS</td>
<td></td>
</tr>
<tr>
<td>RSGB HF Contests Calendar 1996</td>
<td>iii</td>
</tr>
<tr>
<td>Affiliated Societies</td>
<td>iii</td>
</tr>
<tr>
<td>LF Cumulative Contests</td>
<td>iii</td>
</tr>
<tr>
<td>1.8MHz CW Contests</td>
<td>iii</td>
</tr>
<tr>
<td>7MHz DX Contest</td>
<td>iii</td>
</tr>
<tr>
<td>Commonwealth Contest</td>
<td>iii</td>
</tr>
<tr>
<td>Slow Speed Cumulatives</td>
<td>iv</td>
</tr>
<tr>
<td>RoPoCo</td>
<td>iv</td>
</tr>
<tr>
<td>Low Power Fixed Contest</td>
<td>iv</td>
</tr>
<tr>
<td>National Field Day</td>
<td>iv</td>
</tr>
<tr>
<td>Low Power Field Day</td>
<td>v</td>
</tr>
<tr>
<td>Islands on the Air Contest</td>
<td>v</td>
</tr>
<tr>
<td>IARU Region 1 SSB Field Day</td>
<td>v</td>
</tr>
<tr>
<td>21 / 28MHz Contests</td>
<td>v</td>
</tr>
<tr>
<td>Club Calls Contest</td>
<td>v</td>
</tr>
<tr>
<td>VHF CONTESTS</td>
<td></td>
</tr>
<tr>
<td>General Rules for RSGB HF Contests 1996</td>
<td>xi</td>
</tr>
<tr>
<td>The VHF Contests’ Championship</td>
<td>xii</td>
</tr>
<tr>
<td>Code of Practice for VHF / UHF / SHF Contests</td>
<td>xii</td>
</tr>
<tr>
<td>VHF / UHF Listeners’ Contests</td>
<td>xiii</td>
</tr>
<tr>
<td>The Backpackers Series of Contests</td>
<td>xiii</td>
</tr>
<tr>
<td>VHF Field Day 1996 Rules</td>
<td>xiii</td>
</tr>
<tr>
<td>Summary and Calendar of RSGB</td>
<td>xiv</td>
</tr>
<tr>
<td>VHF / UHF / SHF Contests</td>
<td>xiv</td>
</tr>
</tbody>
</table>

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, G3XFX and Ian Pritchard, G3WVG, at the G0AAP/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; Racing the TH7 beam at G3VHB/P.
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 or Club. Enjoy the local rivalry, it's great fun whether you don't have a high or complex antenna either, a simple dipole or doublet works well.

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 affiliated club. The Club 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 FANARS, 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 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 entry form. (e) Contacts: In the CW section, 3570 to 3590kHz is reserved for slower-speed contacts, it is intended that operators entering this section will be experienced with CW and contest techniques and should be able to make contacts here in a more relaxed environment. Experienced contesters using the section are required to keep their speed down.

3. Scoring: Scoring will be based on the highest aggregate number of points in each band. No station or operator may represent more than one affiliated club or branch.

4. 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.

5. Certificates of Merit to the three leading teams, in each of the CW and SSB sections. 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.

6. Awards: CW: The Edwina Trophy to the leading team. The Mascon 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 of the eligible station will receive a certificate of merit, the trophy passing on to the next highest scoring entrant who is eligible. SSB: The Trophy Retaining 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 CONTACTS

This series of short contests, each of just two hours duration, will test your skills and develop antenna systems for the three lowest frequency bands. As the events count towards the HF Contests Championship, they provide excellent insight into the efficiency of various antenna systems that were given by G3HIC in his article in the July 1995 edition of Radio Communication.

RSGB HF CONTESTS CALENDAR 1996

<table>
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<th>Time UTC</th>
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<td>22/23 Jan</td>
<td>1.8MHz DX</td>
<td>CW</td>
<td>SSB</td>
</tr>
<tr>
<td>17 Jan</td>
<td>24/25 Feb</td>
<td>1.8MHz DX</td>
<td>CW</td>
<td>SSB</td>
</tr>
<tr>
<td>20 Jan</td>
<td>27/28 Feb</td>
<td>1.8MHz DX</td>
<td>CW</td>
<td>SSB</td>
</tr>
<tr>
<td>23 Jan</td>
<td>29/30 Mar</td>
<td>1.8MHz DX</td>
<td>CW</td>
<td>SSB</td>
</tr>
<tr>
<td>26 Jan</td>
<td>2/3 Mar</td>
<td>1.8MHz DX</td>
<td>CW</td>
<td>SSB</td>
</tr>
<tr>
<td>29 Jan</td>
<td>6/7 Apr</td>
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<td>CW</td>
<td>SSB</td>
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<td>1 Apr</td>
<td>8/9 Apr</td>
<td>1.8MHz DX</td>
<td>CW</td>
<td>SSB</td>
</tr>
</tbody>
</table>

RSGB GUILEST COUNTRY CODE 1996

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) Overseas. Open section contains all operators worldwide. 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 1000W 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: 1 for each UK County worked. The final score is the total of contact points times the number of Multipliers worked.


5. Awards: Single-operator: The Thomas (G3GBB) Memorial Trophy to the leading UK station. Multi-operator: The RSGB Lichfield Trophy to the leading team on the 100 Open and Restricted section stations, and to the leading entrants in each oversasa 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.

<table>
<thead>
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<th>Date</th>
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<th>Bands</th>
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<td>14 Nov</td>
<td>21/22 Dec</td>
<td>5/15MHz</td>
<td>SSB</td>
<td>CW</td>
</tr>
<tr>
<td>18 Nov</td>
<td>23/24 Dec</td>
<td>5/15MHz</td>
<td>SSB</td>
<td>CW</td>
</tr>
</tbody>
</table>

1. Eligible entrants: UK entrants must be members of RSGB Overseas - Licensd Radio Amateurs within the British Commonwealth or British Mandated Territories. Single operator entries will not receive contact or multiplier credit whatever during the contest, including the use of spotting nets, packet clusters or other assistance in finding new contacts. Multi-operator entries shall only be accepted from stations operating a multi-band entry. Multi-band entries will not be eligible for single-band awards.

2. Contacts: Entrants are limited to the lower 30kHz of each band, except when contacting Overseas stations operating above 21030 and 28030kHz.

3. Scoring: Contacts may be made with any station using a British Commonwealth prefix except those within the entrant's own call area. For this contest, the entire UK counties OBE (excluding EI) are considered Overseas. The station transmitting may only award one point for each contact with an Overseas station. For the purpose of this contest, the entire UK counties OBE are considered Overseas.

4. Certificates of Merit to the three leading teams, in each of the CW and SSB sections. 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.

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 stations 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. The Junior Rose Bowl to the runner-up. (b) A certificate to the highest placed UK stations. Certificates of Merit to the three leading teams, overall and to the leading station in each Call Area. (c) Single-band: Certificates of Merit to the three leading Overseas and UK entrants on each band.
I V

V Q N  S

V O 2  L a b r a d o r

V K 9 X      C h r i s t m a s  I s

V K 9 C  . . . . .  . . . . .  C o c o s  ( K e e l i n g )  I s l a n d s

V K O    N o r t h e r n  T e r r i t o r y

V K 2  . . . . . . .    N e w  S o u t h  W a l e s

V K O   M a c q u a r i e  I s

V K O    H e a r d  I s

V K O    . .  A n t a r c t i c a

V E 6    A l b e r t a

V E 2  Q u e b e c

V E

V 5   N a m i b i a

V 8  B r u n e i

V 4  S t  K i t t s  a n d  N e v i s

V 3    B e l i z e

J 7   D o m i n i c a

J . 1 6   S t  L u c i a

J . 1 3    G r e n a d a

G .  G B .  G D .  G L  G J ,  G M ,  G U ,  GW   U n i t e d  K i n g d o m

C Y O   S a b l e  I s l a n d

C 5  G a m b i a

P 2    P a p u a  N e w  G u i n e a

H 4     S o l o m o n  I s

A 2    B o t s w a n a

9 Y     T r i n i d a d  a n d  T o b a g o

9 M 6  I 9 A 4 8  E  M a l a y s i a

9 M 2  W  M a l a y s i a

9 H   M a l t a

6 Y     J a m a i c a

5 r 1   N i g e r i a

5 1 - 1    T a n z a n i a

5 8     C y p r u s

3 0 A    S w a z i l a n d

2 0 4  C y p r u s

1 0  S e p t  F r s t  N a n i e

1 9 F r i a  O c t

W e d  1 7  A p r

M o n l a p  ( T e e s  9

A p r

A p r

3 5 2 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 1 0 .  3 5 r , 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

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3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.

3 5 0  •  3 5 7 0  C W

R F  o u t p u t.
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-006) and GI/EI count as EI-115.

The first islands on the Air Contests were organised by famous Swedish SWL, Geoff Watts between 1966 and 1972. The IOTA Contest was first held in its modern format in 1973. Since then the contest has been run on a very high level of organisation. It is a contest for which the maximum height must not exceed 20m. Power is limited to 100W output. (b) Resticted. One transmitter and one receiver (or one transceiver) plus a second receiver at the antenna only which must be a single element having not more than two elevated supports and not exceeding 11m above ground at the highest point. Power of equipment and aerial limitations as the restricted section. Power is further restricted to 5W output.

Notes: (a) Each entry to be provided with a second receiver, eg FT-1000, counts as two receivers. (b) Stand-by equipment is allowed on site, but may not be connected to a power source when the main equipment is in use. (c) 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 due inadquate or incorrect information, the entry may be disqualified. Should 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 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 increased power may result in the entry being disqualified, and in the event of such an infringement being proven, all operators listed as being associated with the group will be disqualified by the IARU HF Contests Committee from entering any RSGB HF contest for five years.

2. Frequency: Contest preferred parameters, as recommended by the IARU, should be used, e.g. 3510 - 3560 and 14010 - 14070kHz.
3. Scoring: For contacts with:
   - Fixed stations in Europe (Including UK) ..... 2 points
   - Portable and Mobile stations in Europe (including UK) ..... 3 points
   - Portable and Mobile stations outside Europe ..... 6 points

4. Contacts and Power limits: Contacts on 18th March and 28th March 2007 should be scored as above. Power limits for this contest are as specified below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time UTC</th>
<th>Band</th>
<th>Mode</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun 14 Jul</td>
<td>0900 - 1200 &amp; 1300 - 1600</td>
<td>3510 - 3560 &amp; CW</td>
<td>RST*</td>
<td>Serial No + County Code</td>
</tr>
</tbody>
</table>

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: (a) Antennas must not exceed 1m above ground and may have no more than two elevated supports. A single element horizontal or vertical dipole may be used if an installed 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 scored between "W" and "W + 5" and in accordance with the declination point, eg 1W, 1W. Participants using more than 10W should send "QRZ".
5. Scoring: 5 points for each contact with an ORP Portable or Mobile station, 10 points for an ORP Fixed station.

5. Awards: The Houston-Fergus and Southgate Trophies to the winners of sections and (a) and (b) respectively. Certificates of Merit to the first three in each section.

The Plymouth Radio Club on NFD. Left to right: GilvZ, G4HTD and GJGNZ.

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.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time UTC</th>
<th>Band</th>
<th>Mode</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun 6 Oct</td>
<td>0700 - 1900</td>
<td>2150 - 2160</td>
<td>SSB RS</td>
<td>Serial No + County Code</td>
</tr>
<tr>
<td>Sun 20 Oct</td>
<td>0700 - 1900</td>
<td>2100 - 2110</td>
<td>CW</td>
<td>SRT*, Serial No + County Code</td>
</tr>
</tbody>
</table>

1. Sections: (a) UK Open: (b) UK Restricted (c) UK QRP (d) Overseas Open (e) Overseas Restricted (f) Overseas QRP contest

1. Sections: (a) UK Open: (b) UK Restricted

Awards: Certificates of Merit to the first three in each section.

The Plymouth Radio Club on NFD. Left to right: GilvZ, G4HTD and GJGNZ.

1. Eligible Entrants: All licensed amateurs and SWLs in the UK. Multi-operator entries accepted in the Transmission Contest.
2. Frequencies / Mode: CW operation to centre about 1554kHz to encourage OSOs with Novices. Entrants should select the DX Index window and station code to be used. General QRM is not a problem unless QRM is caused by unnecessary QRM to non-contextual bands of the contest.
3. Exchange: RST* + serial number + name of Club + Club Station + Club Frequency, or "QO" as appropriate. The name of the club may be required to be included for CW contacts, otherwise it must be given in full. A Club Frequency must be given in full. If no call is given, the club's call sign will be used.

1. Eligible Entrants: All licensed amateurs and SWLs in the UK. Multi-operator entries accepted in the Transmission Contest.
2. Frequencies / Mode: CW operation to centre about 1554kHz to encourage OSOs with Novices. Entrants should select the DX Index window and station code to be used. General QRM is not a problem unless QRM is caused by unnecessary QRM to non-contextual bands of the contest.
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The Plymouth Radio Club on NFD. Left to right: GilvZ, G4HTD and GJGNZ.
Zero points claimed.

disallowed.

b. One contact only stations worked.

and any other exchange sent by that station must be recorded. The full contact 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 callign.

More than one contact with the same operator using different calligns may not be claimed. Contacts with stations who have no other contact points claimed may be disallowed. b. Duplicate contacts must be logged, with zero points claimed.

cross-band calls do not score.

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

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

Proof of contact may be required.

g. For contest purposes, IAI and IM calligns are treated as /M calligns in their own country. Other stations are regarded as being in the callign area/country indicated by their callign as sent.

Multiplexers, where applicable, are scored per band, and consist of (a) for UK stations: Countries as per the DXCC countries list, except that JA, VE, W9, VK, ZL and 25 call areas count as separate countries. (b) for non-UK stations: one for each UK country (c) IOTA and SSB FD contests, see specific rules.

Scoring. Where multiplexers are applicable the Final Score is the total QSO points for all bands added together, multiplied by the number of multiplexers from all bands added together. Where multiplexers 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) calligns nor I/M or IAM.

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 contests going during the contest.

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


a. Errors in sending / receiving calligns 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.

16. Entries must be sent to RSGB - G3UUFY, 77 Banham 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. Checkings are welcome where an entrant does not wish to make a formal entry. Acknowledgement will be sent if a stamped, addressed postcard 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 Callign and address; Name of Club or Group (if applicable); Exchange (County Code) sent; Entrant’s Name, Address and Callign; Equipment and Antennas (and height) used for each band; Output Power; Calligns of all operators and a Signed Declaration, plus either:

Logs on Computer Disk:

a. All logs must be on an MS-DOS formatted disk, 3.5in (720kb or 1.44mb) or 5.25in (360mb or 1.2mb). The disk label must indicate the contest name and the name of the log sender in the form of (callign) LOG eg G3XX/LOG or G9XX-PL-LOG, (for portable stations).

Acceptable formats are CT Bin, NA .ODF, Super Duplex LOG, GOWGY LOG, and RSGB standard format for disk logs.

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

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

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

(c) The same callign 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.

eg Pages should contain 40 QSOs, with columns as follows: Time, Callign worked, RST(T) / serial sent, RST(T) / serial received. Other Data (specify to the contest). Now bonus / multiplier, QSO points. Any RST(T) column left blank will be taken as 59/9.

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

A Duplicate Sheet for each band. This comprises a list of all calligns 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.

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

---

### 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 callign 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 contact 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 callign.

More than one contact with the same operator using different calligns may not be claimed. Contacts with stations who have no other contact points claimed may be disallowed. b. Duplicate contacts must be logged, with zero points claimed.

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.

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

Proof of contact may be required.

g. For contest purposes, IAI and IM calligns are treated as /M calligns in their own country. Other stations are regarded as being in the callign area/country indicated by their callign as sent.

Multiplexers, where applicable, are scored per band, and consist of (a) for UK stations: Countries as per the DXCC countries list, except that JA, VE, W9, VK, VKL and 25 call areas count as separate countries. (b) for non-UK stations: one for each UK country (c) IOTA and SSB FD contests, see specific rules.

Scoring. Where multiplexers are applicable the Final Score is the total QSO points for all bands added together, multiplied by the number of multiplexers from all bands added together. Where multiplexers 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.

b. Duplicates Sheet for each band. This comprises a list of all calligns 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.

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

---

### NOTES

The equipment coding system. RSGB standard for contest log data on computer disk and UK County Codes which follow are all used in both HF and VHFI / 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 scrutiny 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 1986, 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 discernible indication of a station's power and antenna system and will be used in Contest reports.

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RADIO COMMUNICATION September 1995
Why do people keep using Martin Lynch

• Quality of Service • Consistently Low Prices
• Specialises only in Amateur Radio and associated products
• The sales team are all licensed radio amateurs
• The only company able to offer a five year warranty on all products
THE IC-706

Just to prove a point, here's a little photo of the VERY FIRST IC-706 in the U.K. - at MARTIN LYNCH, along side the hot contenders, TS-50 and the new DX-70 from Alinco.

In case you've been on Mars for the last three months and haven't heard about the new IC-706, ICOM thought it was about time they showed the other manufacturers what "innovation" is all about!

Here are some reasons as to why your shack isn't a shack without the new IC-706.

- It takes no more room than a small 2m multimode
- It produces 100 watts on HF
- It produces 100 watts on 6m
- It has all modes as standard (including wide band FM RX)
- It has GenCov, RX, 30kHz-200MHz
- It has 101 memories
- (including AlphaTag)
- It employs a Spectrum Scope
- It has a quick release front panel.
- It has a Spectrum Scope
- It has 101 memories
- It employs a Spectrum Scope
- It has a quick release front panel.

The question is, does it transmit on FOUR METRES as well?
The answer is probably YES, but wait and see!

To order your IC-706 call the sales desk today - your trade-ins are very welcome! DIAL 0181 566 1120, NOW!

THE IC-775DSP

If you haven't actually used a new IC-775DSP and you are interested in owning the very best in HF engineering, then pop in to the LYNCH shop for a test drive.

It's very big, but not the size and weight as the conventional, has 240 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.

Trade-ins are very welcome and a free finance option is available. (subject to status).

THE ALINCO DRM-96

Are you ready for the activity on SIX METRE FM yet? I have a limited number of 10 watt ALINCO transceivers at special giveaway prices - but hurry, they are going fast.

THE ALINCO DX-70

We had ten from the importers and sold the lot within a week. Why? Because in one hit, Alinco have designed and produced a first class MINI HF transceiver with 6 metres that must have the other manufacturers quivering in their boots! The audio is very crisp and clear, its a dodger to use thanks to the super user friendliness and as always with Alinco its priced to sell. £195.00

£10 deposit and 12 payments of only £82.80, FREE FINANCE!

Digital Filters

NEW

MyDEL POWER BOX

13.8 volt DC at 20-25 AMPS

ONLY £79.95 - beasting any other price for power supplies by a mile!

Digital FILTERS

KNOW THE NOISE WITH A DIGITAL SIGNAL PROCESSOR

TIMEWAVE DSP69 £220.00
TIMEWAVE DSP59 £175.00
APX TV £255.00

Fasad up with non protected power supplies that can go high volt and blow your rig to bits? So are we! Most of the super cheap 2925s uses power supply that can have no OVERVOLTS protection, let alone short circuit protection. Ideal for your FT990, FT950 or any other 100 watt SSB transceiver, the new MyDEL "POWER BOX" is the most cost effective way of supplying enough power for your shack. It employs twin rectifiers on a separate heat sink and is housed in an attractive metal screened cabinet for maximum RF screening.

ONLY £79.95 - beasting any other price for power supplies by a mile!
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 Courot "swivels" a transmission on 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 are on.

The SCOUT will also allow you to capture up to 400 frequencies and 256 hits per frequency. The SCOUT's Memory Tune captures frequencies, 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 AR8000 Scanner + Scout + Interface = £837.95 Deposit £73.95 and payments of only £66.60, ZERO APR

Package 2 New AR-2700 Scanner + Scout + Interface = £725.95 Deposit £69.95 and payments of only £54.55, ZERO APR

Package 3 Your existing AR8000 + New Scout + LF = £424.95 Deposit £44.95 and payments of only £31.60, ZERO APR

Package 4 A new Scout complete with Nacida Charger & Antenna £399.95 Deposit £39.95 and 12 payments of only £30.00, ZERO APR

If you don't want to take advantage of my free finance and would rather pay cash, credit card or trade-in, then call 0181 - 922 3535 today for expert advice. I promise you the best overall deal in the UK. Get ringing, or you'll lose the bargains.

Note: Notes, prices & monthly payments are based on 17.5% VAT & no extra price increases!€.
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 Brian
Please pass on my sincere thanks to all members of your staff for the kind, informative and pleasant manner in which 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 Martin
I am enclosing the copy of the Operators Manual for the FRG-5600 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 next 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 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 for your extremely nice letter referring to 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 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 C1tink. 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 backlght 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.
UK COUNTY CODES FOR HF & VHF CONTESTS

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<th>County Name</th>
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Notes:
- The 's' in GM6NX/K and GM6NX/K1 is used instead of the 's' in GM6NX/K2.

VHF CONTESTS

GENERAL RULES FOR RSGB VHF / UHF / SHF CONTESTS 1996

1. Entries.
   a. All entries must be addressed to P O Box 29, Thongenc, Cardif CF3 5YA.
   b. Entries must be postmarked not later than 16 days after the end of the contest, or, for multiband 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 multiband contests, single band entries are always acceptable.
   g. Details about the contests may be addressed to the VHFCC Chairman, David Johnson. G4DHF, 65 West Street, Bourne, Lincs PE10 9PA, tel 01778 425367 12.10 - 12.40pm / 5.00 - 7.00pm.

2. Format
   a. All entries must be accompanied by a VHF / UHF contest cover sheet (form 827) 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 obtained 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 page, and be correctly collated (not Z fold). Each sheet should be headed with the entrant's callign, ARU locator, contest title and sheet number. Logs should be tabulated as follows:
      i. Date / time (UTC)
      ii. Callign or station worked
      iii. My report on his / her signal and serial number
      iv. His / her report on my signal and serial number
      v. ARU Location received
   c. In contests with a multiplier scoring system, please also submit a list of multipliers worked, showing at least the callign, and either serial number sent or time at QSO, for each contact claimed as a new multiplier.
   d. Alternatively, entries are encouraged on floppy disk.
   e. 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 427A) must be submitted.
   f. All entries must be on an MS-DOS formatted disk, 3.5in (720ko or 1.44MB) or 5.25in (360ko or 1.2MB).
   g. The 's' in GM6NX/K and GM6NX/K1 is used instead of the 's' in GM6NX/K2. LOG. Each log sheet must be submitted with a distinguishing number eg G8XXX1.LOG, G9XXX2.LOG. Only LOG sheets should be put on the disk.
   h. Compliments 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 Allied 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 verification document. The spirit of the contest will be paramount.
   c. In multi-band events, all stations must be located within a circle of 1km radius. Entrants must not change their location or callign during the contest.
d. Stations located outside the UK (G, GW, GM, GI, GD, GU, GJ) may enter a contest, and will be tabulated with 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.), in addition to GSOAP DUSP may be used - e G4DUSP is not, but G4DUSP is OK.

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

g. The lower of the contest power limit or the standard licence limit shall be the limit not exceeded during the contest. Contacts made under a high-power permit will not count for points. Severe action may be taken against infringement 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 VHFC or its representatives, and give site access information if requested to do so. The inspector must be permitted to remain only 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 official exchange consists of at least both call-sigs, RS(T) signal reports followed by a serial number, and the IARU locator. Participating contests may require additional location 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 prove that 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 made with stations appearing as operators on any of the cover sheets forming an entry will not count for points or multipliers.

f. Only one scoring contest may be made with a given station on each band, regardless of suffix (IP, ML, etc) during an individual contest 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 mobile numbers (eg M) are eligible.

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 selling up contacts or talkback. No confirmation of QSO exists must take place on the talkback frequency. All exchanges for the contest band in use must be made on that band. The talkback chatter 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 between stations separated by the distance shown in the table will score as indicated:

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<th>Score</th>
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<tr>
<td>0 - 50</td>
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<td>&gt;50 - 100</td>
<td>0.5</td>
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<tr>
<td>&gt;100 - 150</td>
<td>0.25</td>
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<tr>
<td>&gt;150 - 200</td>
<td>0.125</td>
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<tr>
<td>&gt;200 - 250</td>
<td>0.0625</td>
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<tr>
<td>&gt;250 - 300</td>
<td>0.03125</td>
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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 table will be obtained by taking the sum of the normalised scores on each band. The normalised scores will be calculated by:

\[ \text{Normalised score} = \text{Score achieved} \times 1000, \text{divided by} \text{band / session leader score} \]

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 over 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 a contest will be obtained by including an A4 AAE with the entry marked with call-sigs, contest and (if applicable) group name.

7. Multipliers

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

t. If the same multiplier is applicable for a particular contest, it may 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 2a).

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

e. In co-operation with the FFCC, we have agreed that for 1996, the county to be exchanged in the contest will be based upon the county 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 net 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 Ordinance Survey route planning map or equivalent) no closer than 1,825,000 or as a distance greater than 25km from such a point, and a cardinal direction from that point, eg 10km north.

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 call-sig during the contest. In the case of national societies, there will be a separate meeting place, and each team member must operate within 50km of that designated meeting place. Multiple call-sigs in combination with different locator zones are encouraged for national and international contests. The best 3 or 5 scores (determined in individual contest rules) of each team will be used to form an entry, and each member will be credited with the total score, but please submit all contacts that the adjudicator can form teams appropriately after checking of the logs is complete. Please mark your QSO 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 Backpachers contest. Stations entering the Backpachers contest only may be worked from the same 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 sessions without knowing everyone else’s scores, so please submit your logs and scores from all sessions in which you were active to 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, but please submit contacts to only one contest. Submissions to both contests will be divided between two cover sheets - one for the shorter contest and one for the 24-hour event. Entries may be automatically sub-mitted into the 24-hour event unless you specifically request otherwise.

S7. This contest runs concurrently with all or part of an RSGB multi-contest campaign. 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 as at 1 pt / km. Please submit two cover slips - one for the RSGB, normally with radial net scoring (except where noted otherwise in the individual contest rules), and the other for the IARU, preferably at 1 pt / km for submission to the IARU. Entries may be submitted to the IARU event only if 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. Country and County Multipliers. The multiplier for a band is the sum of the number of different DXCC counties, countries, and large QTH locator squares (eg JO01, IO91 etc) worked on that band.

M2. County 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 / 7cm (The overall two band normalised score).

ii. 432MHz Trophy

iii. 50MHz Trophy

iv. 144MHz Low Power

v. 432MHz Low Power

vi. 144MHz Trophy

vii. 70MHz Trophy

viii. 135MHz Trophy

ix. 2.9GHz Trophy

2. There is a Single Operator Fixed Station section (SF), and a Single Transmitter section (ST).

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. Each station must use the same contest multiplier fixed section of a contest may elect to submit their score towards All Others score if they wish.

4. The John Plagge Memorial Trophy is awarded to the winner of section SF, and the Racial Radio Cup to the winner of section ST.

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. 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 a separate 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 responsibility of the operator to ensure that equipment is kept to a good level. In operation from a good site, levels of spurious radiation which may be acceptable from a home site may well be found to be excessive at remote locations (25 miles Evelyn, 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 good. Each 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 undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all amateur band spurious emissions, including noise modulations, 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 intrans stations appear radiating unwanted signals or with 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 changes relative to the wanted signal, then non-linear effects are occurring in the receiver. Some synthesised equipment has excessive local oscillator phasing errors which will manifest itself as an apparent spatter on strong signals, even if there is no overload 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 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 overdriving will be more severe if speech processing is used, so pay particular attention to drive levels when operating to ensure compliance with 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:
   a. Date / time (UTC)
   b. Callsign of station heard
   c. My report on his / her signals
   d. Station number sent by heard station
   e. Callsign of station being worked
   f. IARU Locator given by station heard
   g. QTH given by station heard (if appropriate)
   h. Points claimed.

On 144MHz, the callsign in column (v) may occur once in every ten contacts logged, QSO and test calls do not count for points and should not be logged. It is both sides of the QSO can be heard, both can be claimed for points.

3. The highest aggregate score awarded to a listener 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. "Society-acceptable" four hour periods. Timing of the contest should allow participants time to (walk) reach the operating sites and return home with a good margin of daylight. Times will be staggered to co-ordinate with existing contests. For dates and times, see 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 output 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 moveable towers, cranes or other any other 'significant structure' (in excess of 2m outside diameter) is to be used as support. The highest feed-point of the antenna driven element will be limited to 30ft (9m) above ground level.

4. All equipment must be battery powered. If a mains operated converter is envisaged, they must 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.

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 runners-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 sessions at 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.

Recommenodation

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 contests are 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 'dual' thereby causing some confusion and delay. Should this happen, the second contact should be corrected and stated at a later time. This anomaly has arisen as a result of attempting to make more activity by co-ordinating two quite different contests simultaneously. Backpacker's participants, in particular, are requested to bear this in mind 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 Cal Book or from G4DPH to: VHF Contestia Committee, c/o D Johnson, 65 West Street, Bournemouth, Linca PE19 8PA, to arrive no later than 10 June 1996. Each group may only register one site although changes can be made provided G4DPH is informed at 01775 425367 at 12.00 - 12.45pm or 5.20 - 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 0000UTC. 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 (operations 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 equipment 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 locational must be given.

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):

a. The height of any antenna must not exceed 10 metres above ground level.

b. Only one antenna per band may be used (ie not stacked, beamed or collinear arrays or switching between two or more antennas). A site fee (ie Yagi or quad antenna) is permitted, Dish or backfire antennas must not exceed 2m diameter.

Low Power section (L):

a. The power output of any band must not exceed 25W PEQ.

b. The height of any antenna must not exceed 10 metres above ground level.

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 disqualified. In the event of a last minute site change it is the responsibility of the group to make suitable arrangements for the inspector to visit 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, PO Box 29, Bridgend CF35 5YA.

c. Please enclose a 4p cover sheet for each band, including separate ones for the 70MHz SSB and CW sections.

9. Awards

The Surrey, Marlborough, 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

<table>
<thead>
<tr>
<th>Date</th>
<th>Time UTC</th>
<th>Contest Name</th>
<th>Sections</th>
<th>Notes / Special Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Jan</td>
<td>1000 - 1500</td>
<td>144MHz CW</td>
<td>SF, O</td>
<td>CW only to be used during this contest. County / Country Multipliers (M1)</td>
</tr>
<tr>
<td>21 / 28 Jan</td>
<td>1000 - 1200</td>
<td>70MHz Cumulatives</td>
<td>SF, O</td>
<td>Full QTH information to be sent (S2)</td>
</tr>
<tr>
<td>11 / 25 Feb</td>
<td>0900 - 1300</td>
<td>432MHz Fixed / AFS</td>
<td>SF, MF</td>
<td>APS rules apply (S3), 3 stations per team</td>
</tr>
<tr>
<td>24 Mar</td>
<td>0900 - 1300</td>
<td>70MHz Fixed</td>
<td>SF, MF</td>
<td>Full QTH information to be sent (S2)</td>
</tr>
<tr>
<td>2 / 10 / 19 Apr</td>
<td>1900 - 2100</td>
<td>144MHz SSB Fixed Station Cumulatives</td>
<td>SF, MF</td>
<td>SSEB 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.</td>
</tr>
<tr>
<td>7 Apr</td>
<td>1700 - 2100</td>
<td>1.3GHz / 2.3GHz Fixed</td>
<td>SF, MF</td>
<td>These run as separate contests - there will be no overall tabulation.</td>
</tr>
<tr>
<td>4 / 5 May</td>
<td>1400 - 1400</td>
<td>432MHz CW</td>
<td>S, M</td>
<td>This contest runs concurrently with the first 8 hours of the 432MHz - 240GHz event (S8). Score at 1pt/km (S1).</td>
</tr>
<tr>
<td>1 Jun</td>
<td>1400 - 2200</td>
<td>50MHz Trophy</td>
<td>S, M</td>
<td>This contest runs concurrently with the first 8 hours of the 50MHz contest (S8). County and Country Multiplier (M1).</td>
</tr>
<tr>
<td>1 Jun</td>
<td>1200 - 1700</td>
<td>First 50MHz Backpackers</td>
<td>S, M</td>
<td>County, Country and QTH Locator Multiplier (M4). See separate Backpackers rules.</td>
</tr>
<tr>
<td>9 Jun</td>
<td>0900 - 1200</td>
<td>70MHz CW</td>
<td>SF, O</td>
<td>CW only to be used during this contest. County and Country multiplier (M1), Full QTH information to be sent (S2).</td>
</tr>
<tr>
<td>16 Jun</td>
<td>0900 - 1300</td>
<td>Second 144MHz Backpackers</td>
<td>S, M</td>
<td>County and QTH Locator Multiplier (M4). See separate Backpackers rules.</td>
</tr>
<tr>
<td>23 Jun</td>
<td>1800 - 2200</td>
<td>432MHz FM</td>
<td>SF, O</td>
<td>PM only to be used in this contest. Country and country multiplier (M1)</td>
</tr>
<tr>
<td>6 / 7 Jul</td>
<td>1400 - 1400</td>
<td>VHF NFD</td>
<td>S, M</td>
<td>See separate rules. A Backpackers contest runs during part of this event (S4)</td>
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<tr>
<td>7 Jul</td>
<td>1100 - 1500</td>
<td>2nd 144MHz Backpackers</td>
<td>S, M</td>
<td>County and QTH Locator Multiplier (M4). See separate Backpackers rules.</td>
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<tr>
<td>14 Jul</td>
<td>1100 - 1500</td>
<td>2nd 50MHz Backpackers</td>
<td>S, M</td>
<td>County, Country and QTH Locator Multiplier (M4). See separate Backpackers rules.</td>
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<tr>
<td>20 Jul</td>
<td>1400 - 2200</td>
<td>144MHz Low Power</td>
<td>S, M</td>
<td>25W maximum output from the transmitter, County, country and QTH locator multiplier (M4).</td>
</tr>
<tr>
<td>21 Jul</td>
<td>0800 - 1400</td>
<td>432MHz Low Power</td>
<td>S, M</td>
<td>25W maximum output from the transmitter, County, country and QTH locator multiplier (M4).</td>
</tr>
<tr>
<td>18 Aug</td>
<td>1700 - 2100</td>
<td>432MHz Fixed</td>
<td>SF, MF</td>
<td>County, country and QTH locator multiplier (M4).</td>
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<tr>
<td>3 / 18 Sep</td>
<td>2900 - 2300</td>
<td>144MHz CW Cumulatives</td>
<td>S, M</td>
<td>CW only to be used in the contest. Cumulative contest rules apply (S5).</td>
</tr>
<tr>
<td>7 / 8 Sep</td>
<td>1400 - 1400</td>
<td>144MHz Trophy</td>
<td>S, M, SS</td>
<td>Co-ordinated with IARU contest (S7). A Backpackers contest runs during part of this event (S4).</td>
</tr>
<tr>
<td>8 Sep</td>
<td>1100 - 1500</td>
<td>4th 144MHz Backpackers</td>
<td>S, M</td>
<td>Country and QTH Locator Multiplier (M4). See separate Backpackers rules.</td>
</tr>
<tr>
<td>29 Sep</td>
<td>0000 - 1500</td>
<td>70MHz Trophy</td>
<td>SF, O</td>
<td>County and country multipliers (M1)</td>
</tr>
<tr>
<td>5 / 6 Oct</td>
<td>1400 - 1400</td>
<td>432MHz - 240MHz IARU</td>
<td>S, M</td>
<td>Co-ordinated with IARU contest (S7). Score at 1pt/km (S1).</td>
</tr>
<tr>
<td>5 Oct</td>
<td>1400 - 2200</td>
<td>1.3 / 2.3GHz Trophies</td>
<td>S, M</td>
<td>These contests run concurrently with the first 8 hours of the IARU contest (S6, S7). Score at 1pt/km (S1).</td>
</tr>
<tr>
<td>1 / 16 / 31 Jan</td>
<td>2000 - 2300 LOCAL</td>
<td>1.3 / 2.3GHz Cumulatives</td>
<td>SF, O</td>
<td>The 1.3GHz and 2.3GHz events are separate contests - there will be no overall 2 band tabulation. Cumulative contest rules apply (S5).</td>
</tr>
<tr>
<td>15 Nov</td>
<td>0000 - 1700</td>
<td>144MHz Fixed / AFS</td>
<td>SF, MF</td>
<td>APS rules apply (S3), 3 stations per team.</td>
</tr>
<tr>
<td>1 Dec</td>
<td>0000 - 1700</td>
<td>70 / 144 / 432MHz Christmas Cumulatives</td>
<td>SF, O</td>
<td>Cumulative contest rules apply (S5). Country, country and QTH locator multiplier (S3) applies, and the same multipliers may be claimed for credit on each band on each day.</td>
</tr>
</tbody>
</table>
... Some Famous Contest Stations

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 G3KLR/P.

Rob Ferguson, GM3YTS, operating GM6NX/P, which went on to win the Scottish Trophy in National Field Day 1992. See page 11 for a picture of the unique 'shack'
of GM6NX/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 Epsomford Amateur Radio Society station, G3UES/P, immediately prior to the start.

One from the archives: here, a youthful-looking Chris Burbanks, G3SJJ, operates as G3EKIP, circa 1970. Note the almost exclusively British-made KW equipment!

G3OAY operating as GW8GT/P in 1992.
"The best Transceivers in the World!"

YAESU
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Principal Sponsor of the IOTA Programme
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 40cm² 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 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
WANTED - GOOD USED EQUIPMENT

Top prices paid for clean rigs

SECOND USER BARGAINS

HF TRANSCEIVERS/AMPLIFIERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>FT000A</td>
<td>Transceiver</td>
<td>£450.00</td>
</tr>
<tr>
<td>LA 130</td>
<td>High Gain HF</td>
<td>£275.00</td>
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<tr>
<td>FT107</td>
<td>Transceiver</td>
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<td>FT102</td>
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<td>TS250M</td>
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<td>TS500</td>
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MOBILE WHIP ANTENNAS

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<tbody>
<tr>
<td>B8104</td>
<td>2m/700m mini</td>
<td>£27.50</td>
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<tr>
<td>H8757</td>
<td>2m/700m mini</td>
<td>£17.00</td>
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<tr>
<td>TSH136</td>
<td>2m/700m mini</td>
<td>£18.00</td>
</tr>
<tr>
<td>SW7</td>
<td>2m/700m mini</td>
<td>£17.50</td>
</tr>
<tr>
<td>SW8</td>
<td>2m/700m mini</td>
<td>£17.50</td>
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<td>SW9</td>
<td>2m/700m mini</td>
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<td>SW10</td>
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<tr>
<td>SM12</td>
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<td>SM13</td>
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</tr>
<tr>
<td>SM15</td>
<td>2m/700m mini</td>
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BASE ANTENNAS

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<tr>
<td>WH1/2</td>
<td>2m/700m dipole</td>
<td>£89.00</td>
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<td>WH2/2</td>
<td>2m/700m dipole</td>
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<td>WHX/2</td>
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<td>GPMN</td>
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<td>GPGS</td>
<td>2m/700/23cm dipole</td>
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<td>C5350</td>
<td>6m/10cm collinear</td>
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STANDARD HANDHELD

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<td>C558</td>
<td>2m/70cm Dual Band Handie</td>
<td>£289.00</td>
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<tr>
<td>C188</td>
<td>2m Handie Keypad controlled</td>
<td>£169.00</td>
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<tr>
<td>C690</td>
<td>406/40 Roundabout</td>
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MOBILCULAR EQUIPMENT

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<tr>
<td>C188</td>
<td>2m Handie Keypad controlled</td>
<td>£169.00</td>
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</tbody>
</table>

FURTHER SAVINGS

- Only £165
- Only £195
- Only £244

FURTHER SAVINGS

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- Only £195
- Only £244

SUMMER ROTATOR SPECIAL SEPTEMBER ONLY

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RADIO COMMUNICATION September 1995
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 'tuned 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 milliams, which the bias 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 1:** Transistor PA with 'Class C' or zero base bias via RFC1, never use this for SSB!

**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.

**Fig 3:** A useful modification for existing transistor PAs up to the 25W level (designed by G4DOG for Mutek transverters).
IN PRACTICE

![Diagram of circuit](Image)

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 R1 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 civilized 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 wired-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 aerosol is an exact fit on 40mm white plastic 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


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 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 Email (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.

62

RADIOD COMMUNICATION September 1995
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 sometimes even damaging electrical power transformers and space satellites.

Because of the frequent 'disturbances' to HF propagation, it seems wise 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 Ted 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 powerful 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.

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 visually. 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 electrons 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 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,
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 astronaut crews; cocksuckers 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 above 14 to 28MHz, bringing in strong European and Inter-G/GB/GW signals on these bands even in sunspot minimum years, but also tending to blank 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 ‘roving 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 (NiCd) 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 10W on the battery, with the result that a typical NiCd 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. Riezman, 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, pp667-693). 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 batteries 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 attract the offer 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 NiCd 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’ NiCd cell can now have a capacity of 800-850mAh, compared to 500mAh only a few years ago and some have passed the 1000mAh mark. NiCd cells are capable of being charged and discharged in 10 minutes or less (a rate of 10C rather than the usual 1/10th C) and remain attractive for power tools. A prime objection to nickel cells is the bad environmental reputation of cadmium with the result that some manufacturers have initiated the collection and recycling of expended nickel batteries.

To eliminate cadmium, the nickel-metal hydride cell was first marketed around 1991 and now accounts for more than 10% of the nickel 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 nickel cells; rate capability (2C) and performance at low temperatures are poorer. Proper charging is even more critical than for standard nickel cells with ‘smart chargers’ 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-MoSS) was put into production and later withdrawn for 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

<table>
<thead>
<tr>
<th>Cell type</th>
<th>Nominal Voltage</th>
<th>Energy density (Wh/kg)</th>
<th>Power density (W/kg)</th>
<th>Self-discharge (C)</th>
<th>Cycle life</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead-acid</td>
<td>2.0</td>
<td>70</td>
<td>&lt;450</td>
<td>4-8</td>
<td>250-500</td>
<td>Lowest cost</td>
</tr>
<tr>
<td>Nickel-cadmium</td>
<td>1.2</td>
<td>60-100</td>
<td>220-300</td>
<td>30</td>
<td>200-300</td>
<td>May exhibit memory effect</td>
</tr>
<tr>
<td>Nickel-metal hydride</td>
<td>1.2</td>
<td>220</td>
<td>475</td>
<td>30</td>
<td>200-300</td>
<td>Possible sight memory effect</td>
</tr>
<tr>
<td>Lithium-ion</td>
<td>3.6</td>
<td>250</td>
<td>400-500</td>
<td>5-10</td>
<td>500-1000</td>
<td>Intrinsically safe; no metallic lithium</td>
</tr>
<tr>
<td>Lithium-polymer</td>
<td>3.0</td>
<td>150-350</td>
<td>&lt;350</td>
<td>&lt;1</td>
<td>200-1000</td>
<td>Not yet on market contains metallic lithium</td>
</tr>
<tr>
<td>Zinc-air</td>
<td>1.2</td>
<td>204</td>
<td>190</td>
<td>&lt;5</td>
<td>&lt;200</td>
<td>Requires air manager to limit self discharge</td>
</tr>
</tbody>
</table>

Table 3: Comparison of some rechargeable batteries.
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 nickel or Ni-MH cells. Since 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 lithium 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 T7 (p70). Performance has still to be assessed. Practice since NiMH 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 nickel although self-discharge is also lower. Initial capacity is better than nickel 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).

SEALING COAXIAL CABLES

DAVID APPLETON, ZL2DA, was surprised to read recently in both T7 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, RTTY silicon sealers are 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 antenna has 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 centrepiece (see, for example, February's T7, 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, retained reliable and relatively low-cost dipole units that have a S0210 connector moulded into them... I have used these in both a tropical environment and in high-UHF light zones, without problems.

"Self-amalgamating, butyl-rubber insulating tape has, for more than 20 years, eliminated and rendered unnecessary 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 seal 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 gap happens to be blowing, and that is just what badly 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, NSWZ, 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 Offices 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 "talkpower" 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 frontend performance is (now) almost subsidiary to the

[Diagram of receiver design]
consideration on the higher frequency bands. 

Radio Communication September 1995

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 MODs 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 the 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 Reich 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 in a 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 2.5 per 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 in 1981-2 by RA 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 betters 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, preselector 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 tunable three-pole minimum-loss filter of the type suggested by William Salberg in 1970 for use as a roiling filter in double conversion receivers; Fig 8.

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, G3LL, 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 last '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 value of the transmit signal there will be few problems of oxidation since the relay 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 9dBm/0 to 0.9dB as shown. Note this greatly increases the power loss in ATU networks! The efficiency formula should be:

\[ \eta = \frac{Q_{\text{LOAD}} - Q_{\text{LOAD}}}{Q_{\text{LOAD}}} \]

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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**Radio Communication**

September 1995
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, JVFX, as well as packet programs such as BayCom and TFFPX (TNC Emulator).

Currently, CommSlab have the authority to supply the latest versions of HamComm and JVFX 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 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 3kΩ, 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 JVFX 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 JVFX, you need, as a minimum, an SVGA card with more than 512k of on board memory. The optimum would be a 1Mb VEGA True Colour card. This would enable the user to utilise the 800 x 600 x 256

*The Old Nursery, The Drift, Swardeston, Norwich NR14 6LG.
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 files 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
PRONTP=SPSG
SET COMSPEC=C:\DOS\COMMAND.COM
SET TEMP=C:\TMP
SET TEMP=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! I took a while to find out the necessary control keys. It would have been easier had I had a reference book. I am still working on it, and I don’t foresee 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 PTKCOMM, an enhanced Baycom compatible modem, JVFAX simple interfaces another computer interface cards. One of these is a serial card that allows multi COM and IRQ options, ideal for packet node operators using BPO, since this software cannot be used with shared IRQs.

The CommSlab µ-Modem is available from CommSlab Ltd, PO Box 19, Erith, Kent DA8 1LH, tel: 01322 330830.
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 on 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 the 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 skillfully and avoid its particular pitfalls.

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).

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 those 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 II 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 LAPAC 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/pc/compat/lapac). 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.

NODAL ANALYSIS

Imagine constructing a circuit using wiring pins in a perforated board. Everywhere
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 addition 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 50ohm. 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 the whole 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

**Fig 3:** Circuit file for Fig 2. Lines beginning with a * are explanatory comments, not used by the program.
ADVANCED OPTIONS

YOU HAVE MANY OPTIONS when plotting the performance of your modeled 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 graph, 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 when 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 1MHz to 10MHz' 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.

One kind of reproducibility problem is where the prototype design only 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
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73 from Dave G4KQH, Technical Manager.
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 losy 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 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

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D I A G R A M  C O U R T E S Y  O F  M F J

Fig 1: The MFJ-1798 Vertical Antenna.
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 $0239 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. 16/50, 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.

Hanging 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.
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 spoked with short telescopic whip antennas. One should be sufficient to cover the whole of 7MHz and possibly two bands down to 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 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 15-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.

ACKNOWLEDGEMENT

I WOULD LIKE to thank Waters & Stanton Electronics for the loan of the antenna.
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 Multytom 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 a SASE.

The annual BARTG rally will take place on Sunday, 10 September at Sandown Exhibition Centre, Sandown Park Racecourse, Escher, 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
RK9CW is THE CLUB station of the Ural Technical University in Ekaterinburg. Former callsigns for the club were UAK9CE, UK9CAE, UZ9CW and now RK9CW. Packet activities started in 1991. To start the activities, RK9CW received a gift of a ZX Spectrum from friends in Newcastle-on-Tyne, Russ Cook, G3OTH, and the late Eamon Malone, G4MRT. Derek Daniels, G4XPH, John Price, G4OL, 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 1k of the PK88 maildrop. Two years later, following a gift of an AT286 from Sergei, 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.

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
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 good stuff, 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 weirdos, 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 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, NSJ/D, sheds new light on the much discussed topic of passwords. He addresses the problem of impostors on a BBS system assuming somebody's e-mail access 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 cryptographically 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 software via a node has not been solved yet. Is there any way 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 Mariat, G0OPC, that he has been the distributor for Windows TNC driver, written by Roger, G4IDE, for some time. It is free ware 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 OPCLG 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 FBI 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 a local then the code 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 'file' fields. It also 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 'i' 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 'unregistered copy' messages are appended to your output and no 'UK agents' will chase you if you have not paid for it.

RADIO COMMUNICATION September 1995
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, G3LTP, GTHR 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 RedCom, (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.

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.

Ducts 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!

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’.

What is singularly frustrating is that you may be in the wrong place to exploit a duct because it 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. Shallower 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! It 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 tenths of an 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 last much longer, 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 your name further. And we also need more contacts (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, G5XM. 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.Kinder@wall013, wins.id.cu.co.uk, BBS G8TPMB 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 output power and how far you have heard others. This information is essential 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 5.25 inch 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 Doglerom, 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 in so far as Arie's location is some 50km inland and he had never worked beyond 40km on 24GHz before this contact. The Schiffol 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 RSBG VHF NFD and an IARU Region 1 all band VHF/UHF/microwave contest, thus creating unusually good conditions for both these events.

Meanwhile, Steve Davies, G4KNZ/P and Lehanne 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 Meyn, G3HBB, 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 Gunn (in WG23), a 15dB cross-coupler and WG22 detector mount. Dual horn antennas of about 23dB 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 transcription 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.

Table 1: Operating Ladder positions for July 1995.

<table>
<thead>
<tr>
<th>Band</th>
<th>G8KNZ/P</th>
<th>G8KMH/P</th>
<th>G4DDK</th>
<th>G3E6</th>
<th>G4KNZ/P</th>
<th>G8KMH/P</th>
<th>G3E6</th>
<th>G4DDK</th>
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<th>G4KNZ/P</th>
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Table 1: Operating Ladder positions for July 1995.
"ARE YOU SCRATCHING YOUR HEAD ABOUT PACKET RADIO?"

Computers have certainly changed the face of Amateur Radio over the past few years. Yet less than 10% of Amateurs are active in modes like PACKET, AMTOR, PACTOR etc. If you are one of the “90%” who have yet to join us - we speculate in this area, it is not your primary area of business. We don't sell HF antennas, we don't sell 70cm, we DO however offer the WIDEST selection of Digital Radio products in the UK. Many TNC’s and modems supplied by Siskin INCLUDE ready made transceiver cables, software and intensive after sales support at NO EXTRA CHARGE!

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SOUTHAMPTON 82

"ARE YOU SCRATCHING YOUR HEAD ABOUT PACKET RADIO?"
Satellites

ARTHUR GEE, G2UK
21 Romany Road, Halstead, Suffolk NR12 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 Guiana, as the first test launch of the Ariane-4 rocket. During the past seven years it has served the amateur satellite community well and has introduced these enthusiasts to satellites in highly elliptical orbits. It reached an 'apogee' - the highest point in its orbit - of 3600km. 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 western 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, G4JU, 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, GM4HJ, who a few years ago gave me to 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.

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, SSV. 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 v1-ORM) 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 80m. 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 with out 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 on to 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 Chemn Radio Society. He 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."

RADIO COMMUNICATION September 1995
TELFORD RALLY
3RD, SEPTEMBER

The 12th 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 22% 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 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 GAEX 01952 580078 or John G0TOT 01743 245943
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DOORS OPEN AT 10.30 earlier if inclement. - SEE YOU THERE.

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Sunday 10th September, Cliffs Pavilion, Southend-on-Sea

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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 50 MHz, but become increasingly important at higher frequencies. Also, you need to ensure that the layout of

Fig 6: VHF / microwave equivalent circuit of a simple resistor. The parasitic inductance and capacitance can significantly effect performance.

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.

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 handwritten 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 2NS109’ - look up the data for yourself, or computer-ask 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.


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CONCEPTS

ARRL radio design is a powerful tool that can greatly enhance the performance of your amateur radio station. It is designed to help you design circuits and models for operation at various frequencies, including VHF and UHF. The software provides a cut-down version of a more expensive integrated package, with input via a handwritten circuit description file.

The limitations of the software include:

1. It cannot read device data from an external file, requiring manual entry.
2. It may not handle non-linear behavior as accurately as more advanced packages.
3. It cannot handle devices such as mixers and diode detectors that rely on non-linearity.

Despite these limitations, ARRL Radio Designer offers a powerful and reasonably priced alternative for amateur radio designers. It is particularly useful for those interested in designing and developing new circuits in the 21st century. However, for professionals or those with more advanced needs, more specialized software may be required.
2ND 1.8MHz CONTEST 1994

Over the last few Topband contests, it has been unusual for entrants to describe propagation as anything but good, and that is exactly what most commented this time. With the pan-European event running concurrently, there was plenty of European action as well, and a lot of USA stations were heard around 1.8 MHz. USA amateurs made up a large part of the entries, but it was surprising that the first five places were only separated by six contacts.

Dave Crow, G3BMN, has been beavering away at this event for many years and I am sure he is a contender for the highest scoring entrant. Regarding the pan-European contest, the HAMM/HAMM Committee have consisted whether to put in or not in the end decided it would be against the interests of the UK competing fraternity. The event is scheduled for some 12 hours, 1800 Saturday to 0600 Sunday. Not only would these dates those with more modest antenna systems, but it is felt that the better-equipped stations would not spend the time on the band just past a week before the CQ WW CW contest. Checklogs generally received from G3UOW, G2AVP, G3VWY, G4GUN, GW3SO, GW3YS, VM1X and VE8LE.

UK SECTION

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SWL SECTION

1.7MHz TOPBAND 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 lot of the border, with many GB stations in evidence. Over the two years that this band has been active, the extra bands restored at the end of the event and your comments would be appreciated on this subject. Please make sure that the extra bands are on and try to include us in your signals and pass us your隊on to which multiplier rule it is in. Many entrants test points for not controlling the bands for the top band. This year I believe in receiving bad signals complaints are also in order in your log with the correct time and suitable comments, as I expect to those could result in severe props or reductions in or disqualification this Topband. Checklogs generally received from R. D. J. Hargreaves is who was awarded the Trophy as being the highest scoring entrant.

ALL OTHERS

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SINGLE OPERATOR FIXED SECTION

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VHF RESULTS

CONTEST CLASSIFIED

CLUB CALLS CONTEST 1994

Once again there was plenty of activity, with more Club stations available to work. All the committees received indicated that participants enjoyed the three-hour contest, with several groups indicating that this was their first club competitive effort, or that they have never heard anyone on VHF contesting before.

Perhaps one of the most intriguing aspects of contesting as in any competitive area is, to continue on with a VHF competition in order to return leading places, G3UOW, The Emis Communications Ltd group, having already changed to the new VLF band, to take the top spot. This a combination of some dealers by many entrants have added computer technology to their already sophisticated contesting system. Logging software was used on a second computer containing a database of club information. That allows some dedication when you realize that apart from the main 1000 main all the rest of the equipment has to be taken up to this repeater still situated on high fool for the outbursts of Derby, G3QVY, the Rawley and District ARS, set out to find a new site for their operation, having specified that it should contain at least two 70MHz transceivers. A local contest ground provided the last saviours with two call areas on the required height and around 70MHz apart. What clinched the deal was the positioned position mid between the two trips. The only minus point being the lack of housing! Several other local antenna systems were listed in the logs, including a large supported vertical and several horizontal full-wave loops. For good VHF UHF operating on 150m, a half-wave at a reasonable height, say 50m, makes an effective antenna. For each edition 100ft in height, an increase in efficiency will be noted. A fact worth noting is that for any antenna, the maximum radiation takes place at quarter wavelength from the far end and it is this point that needs to be the highest.

VHF CONTESTS CALENDAR

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SWL SECTION

1.7MHz TOPBAND 1994

Further on this occasion which produced some of the best Topband UK openings for any station this year, it was unfortunate that con-
Members’ Advertisements


ALINC J250 dual band fed, good condition with soil charge in case. £50. John Doherty, 735 Walterton Road, Selby, YO8 8NQ.

KLM 101 VHF see TYPE 17 & 18. £400. Drake 1010 VHF, excellent condition; £350. A. S. Drake, 8156A Walwyn Lane, Westhill LA1 2SH.

FOR SALE

KFN1000S Tune mode VCXO, £175. B. Logan, 103 Ainsworth Road, Wokingham, Berkshire, RG11 8QW.

RAPID issue 11 (RAF radios store files kit) also ARP 3821 4ICU (827) supplied with all components, £35. F. J. H. Williams, 47 Gipsy Lane, High Wycombe, Bucks.

ATOMIC issue 10 (Radio store files) also rapid issue 10 (Radio store files kit) also ARP 3821 4ICU (827) supplied with all components, £35. F. J. H. Williams, 47 Gipsy Lane, High Wycombe, Bucks.

Aluco J250 dual band fed, good condition with soil charge in case. £50. John Doherty, 735 Walterton Road, Selby, YO8 8NQ.

COMPO LADE 24, six keyboards plus tid Tek badge or 2m FDL make to order, not negotiable. £1652 (Bexhill).

COMPLETE station, Drake TR7 iv with PSU, MK2/1000, £350, new, excellent condition, £350, Icom RT21 HF, new as condition, £253. Yaesu FR7000 HF, good condition £25. £100. Drake TR11E 50W 3m board, complete, £25. £100. Complete TR10 10m, £25. £100. Complete TR20 2m, £25. £100. Complete TR21 2m/40m, £25. £100.

SPECTRUM analyser Hamag Hamam 506B with tracking generator 44063A and mainframe 44061C. See catalogue for full list: these tests after offer £200 within fifteen days of publication also. £200. Drake TR11D HF, complete, £250. £100. Drake TR10 10m, £250. £100. Drake TR20 2m, £250. £100. Drake TR21 2m/40m, £250. £100. Drake TR22 2m/6m, £250. £100.

TECHRONX type 8040A spectrum analyser 200MHz, £90. £45. Winstone Morpeth.

TENNANT capacitor 18uF, £10. £5. For oo/oo.

S.NET 4W power supply for 70cm FM, will deal for dual band HF, £100. £50. D. G. Y. (Sheffield), 209A Woodhouse Lane, Sheffield, S10 3BN.

PFT35R excellent cond, complete, with 1.2GHz unr 50 site £3. £1.5GHz Tenna, £200. Buyers or cash £150,000. O. G. (Newcastle). 6125 453483 (Sunderland-In-Ayton).

HIGH voltage Electrode capacitor brand new, variable range 2:1, complete with 5A fuse case and spare 5A fus, £25. £12.4GHz mic, £25. £11.8GHz mic, £25. £10.8GHz mic, £25. £9GHz mic, £25. £3GHz mic. £25. £2GHz mic £25. £1GHz mic £25. £0.5GHz mic £25.

ICOM IC751A HF++ TX cur 12,000 high stability filter. Ideal for standard and wide band operations. £400. £200. Icom IF-100£ automatic tuner, £100. £50. Icom IC751A £400. £200. Icom IC751 £200. £100.

KCM 1000 80W (2 bands) plus accessories, £250. £125. £50 for mic, £25. £40 for power supply, £25.

METHE TMC chassis £125, new, digital board fitted by Local excellent cond, £75. Bown, £150, £75. (Baudfield.)

TYHO 150TR 150m multimode tv, £200. £100. £30. £20. £10. £5.

TYHO 3005S 5000Hz filters, £120. £60. £30. £15. £5.

KFN2000, £150. £75. £35. £20. £10. £5.

KFN2000 brand new, £150. £75. £35. £20. £10. £5.

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KFN2000 brand new, £150. £75. £35. £20. £10. £5.

KFN2000 brand new, £150. £75. £35. £20. £10. £5.
Practical Transmitters for Novices

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.

Members Price: £8.10

Practical Antennas for Novices

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 434 MHz. A complete chapter is devoted to the safety and common-sense 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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(See over page for ordering details)
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ND5intro (DOVERMAIN) £11.80 £10.03
Am Packet Radio Link Layer Protocol (ARRL) £6.50 £5.53
RTTY Awards (BARTC) £4.20 £3.62
Slow Scan TV Explained (BARTC) £6.40 £5.44
Gateway to Packet Radio (ARRL) £9.58 £8.04

VHF/UHF
All About VHF Amateur Radio (RPI) £9.50 £8.06
Radio Aurora (RSGB) £8.99 £7.64
VHF Contesting Handbook - NEW (RSGB) £4.00 £3.55
VHF/UHF DX Book (DIR) £18.00 £15.30
UHF/Microwave Experimenters manual (ARRL) £15.14 £12.87

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Badges: Callsign standard* (RSGB) £3.00
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* includes engraved

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New Style, Dark Red £6.50

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AVAILABILITY. Goods are available over the counter at RSGB Headquarters 9.15am to 5.15pm, Monday to Friday. However, you are strongly advised to confirm availability of goods by telephone before visiting Headquarters.

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Or use our fax: 01707 645105

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We have liaised with the GEC-Marconi company to jointly produce these fantastic Christmas Cards as a special offer to RSGB members. The card features a painting by the well known artist, Denis Knight, of the Needles Hotel, Alum Bay, where Marconi conducted his earliest radio transmissions. The hotel busts down early this century, so the painting has been commissioned from the few photographs and lithographs which remain of the original building. These cards measure 235mm (9.25") by 155mm (6.5") and are produced on high quality card at a cost to you of just 16p each - you will not get such excellent value at this price from anyone else!

Cards sorted into packs:
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MEMBERS: £11.95

LIMITED EDITION MARCONI TANKARD
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This is a limited edition of just 250, so order your's now to make sure you get one before they all run out.

The tankards have a portrait of Marconi on one side, and the RSGB logo and 1905 on the reverse, with gold banding on the rim, base and handle. Each tankard is numbered and comes with a special certificate - these will undoubtedly become a collector's item.

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RADIO COMMUNICATION September 1995 91
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KEW06 150 MHz linear. TS2000G + MA1440 3.5 lin. meters. 3 operating Yupiter-KU00, £430 each.

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CONGRATULATIONS
To the following who our records show as having reached fifty years continuous RSGB membership this month:

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Mr R P Gribble, G3GQ
Mr R E Spurry, G3JBC
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SOUTHDOW M - 4, Talk 'The Biggest Asp Apple in the World'. 3 October, Annual Auction. Details 01227 601 372

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GLOUCESTERSHIRE
CHELTENHAM - 3, Talk 'A View'. Details 01242 478 019

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ABERDEEN AR - 15, Talk 'Local History'. Details 01224 730 178

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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 pass it now anyway. We are still passing 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 who have been taking 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 A all their blessing.

That was Dave Ingram's, K4TWJ, article in RadCom (April 1993) which stimulated me to write a computer program which I used to test 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 testing into the techniques described in the book.

In response to GTSW's letter, I have to agree that passing the Morse test should be installed upon in order to regulate the radio spectrum. The purpose of the test is two-fold. To partake to regulate the spectrum and secondly the Morse test - that the Morse test and the use of CW traffic as there is phone, the operators are reason.

The Morse test is a requirement of the RSBG. In this respect, the Novice Class A licence is an ideal stepping stone.

Ian Roger, GM0JUC

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 the phrase and say: 'Ham in the North are Americans, as many people believe -' Hams in the North are not necessarily those of the RSBG. We reserve the right to edit letters for publication. All letters are acknowledged and may be passed to the relevant department or committee.

Ron Bravery, G3SKY

My 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 British Hams into a closer fellowship and make for better cooperation all round." The source is 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 RSBG. We reserve the right to edit letters for publication. All letters are acknowledged and may be passed to the relevant department or committee.

I must congratulate Mr Thirlewell GBAH / G0FWH (The Last Word, Aug 95) on his comments regarding the practice of competition at recent radio gatherings.

For some time now I have noticed the gradual diminution of the amateur radio element at these rallies. I am by no means at fault 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 pastime in the future. If this trend continues will RadCom become 'The Journal of the Radio, IT and Satellite Environment Society of Great Britain'?

I think the Editor's remark regarding separate areas is a very good idea: organisations should take note.

Chris Askew, GILXX

Tony Thirlewell, GBAH/G0FWH asks 'where is the amateur radio interest' at radio rallies. Whist to a great extant 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 inside the many of the difficulties faced. It is true to say that there are some rallies, including major ones, where the organiser's only interest seems to be to fill at the available space, regardless of the type or even the type of the rallies booked. However, for many events, the necessity of a rally at the very last - to break even means that all types of traders are needed, which means that a great emphasis is placed on computer-related traders.

I believe there are too many rallies these days and this is the problem. But even though the tables are still not enough radio-related traders who attend rallies to fill even a medium-sized fieldmarque, without, I believe, making the rally unattractive.

I hope that perhaps this explains a little the reasons behind the apparent swing towards computers at rallies. Perhaps this is the event organiser, not 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, G6GOM

MORSE TEST REQUIREMENT

I expect you are inundated by responses to the letter from GTSW in 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 essential to having someone walk in front of your car with a red flag! Surely by the millennium we can get rid of the Morse test?

David Menn, GA4DM

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 - 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 technical requirement]. As a country that is not part of 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.

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| ARE Communications......60 | Milton Keynes & Dist A.R.S. ..84 |
| BARTG RALLY....................86 | Mutek Limited.............96 |
| J. Birkett.....................84 | Nevada Communications........14, 15 |
| Castle Electronics.........98 | Public Domain Software.....86 |
| Cirkit Distribution Ltd.......5 | PW Publishing Ltd..........94 |
| Coastal Communications...4 | Communications Centre....74 |
| Dee Comm Amat. Radio...85 | Dee Comm Amat. Radio...85 |
| East of England Rally.....84 | East of England Rally.....84 |
| F.B.S. Ltd.....................82 | F.B.S. Ltd..................82 |
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| Lowe Electronics.........6,7 |
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| Mutek Limited.............96 |
| Nevada Communications........14, 15 |
| Public Domain Software.....86 |
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| Communications Centre....74 |
| Dee Comm Amat. Radio...85 |
| East of England Rally.....84 |
| F.B.S. Ltd..................82 |
| G3RCQ Electronics..........82 |
| Grosvenor Software (G4BNNK)....94 |
| G.W.M. Radio Ltd.........94 |
| Halcyon Electronics.......94 |
| Hands Electronics..........86 |
| Harlow Rally...............86 |
| Hateley Antenna Technology..82 |
| C.M. Howes Communications...74 |
| ICOM (UK) Ltd...............IBC |
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| J. & P. Electronics Ltd.....68 |
| Kanga Products...............82 |
| R.A. Kent (Engineers)........5 |
| Kenwood......................IFC |
| Lake Electronics.........82 |
| Lowe Electronics.........6,7 |
| Martin Lynch G4HKS........49, 50, 51, 52, & 97 |
| Milton Keynes & Dist A.R.S. ..84 |
| Mutek Limited.............96 |
| Nevada Communications........14, 15 |
| Public Domain Software.....86 |
| PW Publishing Ltd..........94 |
| Communications Centre....74 |
| Dee Comm Amat. Radio...85 |
| East of England Rally.....84 |
| F.B.S. Ltd..................82 |
| G3RCQ Electronics..........82 |
| Grosvenor Software (G4BNNK)....94 |
| G.W.M. Radio Ltd.........94 |
| Halcyon Electronics.......94 |
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| Harlow Rally...............86 |
| Hateley Antenna Technology..82 |
| C.M. Howes Communications...74 |
| ICOM (UK) Ltd...............IBC |
| Isopleths....................96 |
| J. & P. Electronics Ltd.....68 |
| Kanga Products...............82 |
| R.A. Kent (Engineers)........5 |
| Kenwood......................IFC |
| Lake Electronics.........82 |
| Lowe Electronics.........6,7 |
| Martin Lynch G4HKS........49, 50, 51, 52, & 97 |
| Milton Keynes & Dist A.R.S. ..84 |
| Mutek Limited.............96 |
| Nevada Communications........14, 15 |
| Public Domain Software.....86 |
| PW Publishing Ltd..........94 |
| Communications Centre....74 |
| Dee Comm Amat. Radio...85 |
| East of England Rally.....84 |
| F.B.S. Ltd..................82 |
| G3RCQ Electronics..........82 |
| Grosvenor Software (G4BNNK)....94 |
| G.W.M. Radio Ltd.........94 |
| Halcyon Electronics.......94 |
| Hands Electronics..........86 |
| Harlow Rally...............86 |
| Hateley Antenna Technology..82 |
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Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD.

**Count on us!**
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-Analyses lets me check out channel activity in UHF, VHF and keep track of my favourite repeaters, too."

"Yaesu did it again!"

The FT-8500 and Smart Controller™ Microphone demonstrates Yaesu's world leadership position in two-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-Analyses 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 VHF, UHF or VHF view frequencies and custom alpha-numerical 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.™**

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**Specifications**

- Frequency Coverage:
  - 2m: RX 110-174 MHz
  - TX: 144-146 MHz
  - 70 cm: RX: 420-450 MHz
  - TX: 430-440 MHz
- Spectra-Analyses™ wide adjustable signal width, spacing & span markers
- 6-Character Alpha-Numeric Display
- 110 Markertones (in 5 memory banks)
- Omni-Glow™ Display
- Digital voltage display
- Selectable 1200/9600 baud
- 3-Level Auto-Mute w/Mute Timer
- VHF, UHF, VHF-UHF Dual Receive
- 3 Power Output Levels
  - 2 m: 50/10/5 Watt
  - 70 cm: 35/15/5 Watt
- Built-In Auto Power Off (APD) and Time-out Timer (TOT)
- MIL-STD 810/C Rating
- 9 Memory DTMF Autodialer
- Handy Cleaning Feature
- 3 Scanning Modes & Clear Scan
- Adjustable LCD Contrast/Brightness Control
- Accessories: Consult your local Yaesu dealer.