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The Radio Society of Great Britain Members' Magazine

RadCom

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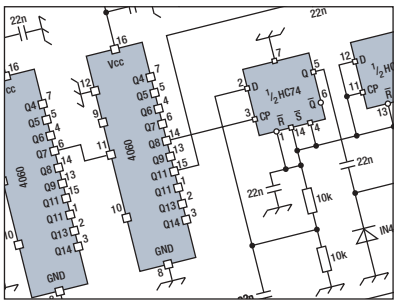
3B9C DXpedition

Don Field, G3XTT, describes 'Project Star Reach', the Five Star DXers Association DXpedition to Rodrigues p36

Space

A recent trip to Riga in Latvia, enabled National Space Centre Radio Society member Andy Thomas, G0SFJ, to activate YL on satellite p84



TT

Pat Hawker, G3VA, and the latest in the 'huff & puff' stabilisation saga p59

Whatever next

Steve White, G3ZVW, previews Yaesu's flagship, the FTDX9000, due to be launched later in the year p65

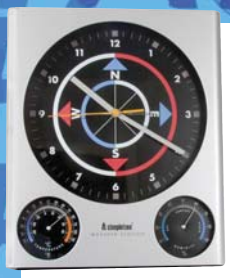
INSIDE

WIN! A bhi 'Wonder Wand' HF - UHF portable antenna and tuneable counterpoise system p20

WATERS & STANTON

PAY SU

NO DEPOSIT NOTHING TO PAY



FREE!

Get this lovely Wall Clock (worth £24.95) with temperature & humidity readout absolutely free. Purchase any transceiver or receiver more than £100 and mention this offer to get your *free* wall clock. Subject to Availability

NEW IC-7800 In Stock!

The most advanced amateur band transceiver ever produced!

New Wonder Wand!

40m - 70cm QRP Antenna

Ideal for FT-817 and radios up to 25 Watts. This pocket size system includes tuner and telescopic whip. PL-259 fitting plugs straight into the radio. The antenna is hinged for easy adjustment. Made by bhi in the UK, this is a must for FT-817 owners. **£89.95**

Order code: W-WAND

Carriage £6

Special Offer

All HF whip antennas need a counterpoise. We can offer you the mini tuneable bhi CPOISE with the Wonder Wand for a special inclusive price of **£139.95**

Order code: W-WAND Offer

BUY NOW PAY LATER AT ALL THREE STORES

You won't find a better deal!

Proof that at W&S you get the best possible deal. On selected items it is now possible to pay nothing for a whole year without incurring any interest charge. Amazing but true. And what's more, you get probably the best prices in the business. Give us a call today or visit one of our branches.

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29.8% APR REPAY £31.53 PER MONTH FOR 36 MONTHS. TOTAL AMOUNT DUE £1135.08. INTEREST IS CALULATED FROM THE DATE OF THE AGREEMENT.

ALL FINANCE SUBJECT TO STATUS WRITTEN QUOTATION ON REQUEST.

ICOM IC-756 PRO II £1899 C

Flagship of the Icom range of HF transceivers. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit.

ICOM IC-7400 SPECIAL OFFER £1299 C

HF/VHF 100W transceiver covers 1.8 - 146MHz Features large LCD with spectrum scope, auto ATU and same DSP system as IC-756PRO II. A great base station!
Comes with *FREE* SP-21 Speaker & SM-20 Desk mic

ICOM IC-703 SPECIAL OFFER £589 C

HF/ 50MHz Transceiver 0.1-10W Portable, Mobile, Base-Station. Ideal for Foundation Licence/QRP. Auto ATU, DSP memory keyer. External batt **BP-228 £71.76.** B

FREE Icom IC-703 Logbook with every IC-703 - While Stocks Last!

ICOM IC-706 IIG DSP £769 C

HF/VHF/UHF mobile DSP transceiver. Its relative small size not only makes it a great mobile rig but also for fixed station use as well. HF general coverage and VHF & UHF .

Heil Traveler single ear "706" headset + PTT **£89.95 B** →

ICOM IC-718 £449 C

HF 100W transceiver. Covers all HF bands plus wideband receive. C/w auto notch, dual VFO, SWR meter etc. Options include extnl ATU DSP & filters.

KENWOOD TS-2000 £1599 C

Top-of-the-range Kenwood transceiver. HF/VHF/UHF or up to 23cm with the optional module. Built-in auto ATU, DSP and its unique TNC.

ARCP Control Software. **£44.95 B**

KENWOOD TS-870S DSP £1399 C

HFDSP 100W base station. 1.8 - 30MHz. Excellent all round rig great for DX working with its ability to winkle out weak stations using its true IF DSP. No filters to buy.

MC-60A base mic with pre-amp. Ideal match. **£117.95 B** →

KENWOOD TS-570DGE £849 C

HF100W base station with built-in auto ATU. Very popular rig, excellent performance on SSB and CW. Two fitted antenna sockets - very handy.

SP-23 Matching base station receiver **£68.95 B** →

ICOM IC-910X with 23cm £1249 C

Icom's all mode VHF/UHF transceiver with 23cm.
Large clear LCD with lots of facilities. 100W on VHF and 75W on UHF, 10W on 23cm.

UT-106 DSP unit **£84.99 B**

Basic Model IC-910H £1129 C

YAESU FT-1000 MKV £2349 C

200W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC PSU - Acknowledged as one of the finest DX rigs on the market. Superb tailored audio and the ability to select Class A bias for dramatic signal purity.

YAESU FT-1000 FIELD £1749 C

100W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC / 13.8V DC - Building on the success of the FT-1000MkV, the Field has become a respected leader in its class.

KENWOOD TS-480SAT & TS-480HX

NEW The **TS-480SAT** is the 100W version of this new HF+6m transceiver from Kenwood. Smaller than the TS-2000/ TS-B2000 it has many similar features.
TS-480SAT £999 C

The **TS-480HX** is the 200W version of this new HF+6m transceiver. **TS-480HX £1099 C**

YAESU FT-897 £899 C

100W HF rig plus 2m and 70cms (50W/20W) 13.8V external supply / internal optional FP-30V AC power supply / self powered portable using optional Ni-MH pack at 20W output. Compatible with FC-30 auto ATU and ATAS 120/100 antennas. The "must have" radio for 2003.

YAESU FT-847 £1199 C

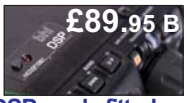
1.8 to 440MHz, this all-in-one transceiver offers unbeatable value. 100W on HF plus 6m, and 50W on 2m and 70cm. You get genuine RF clipping on SSB for up to 6dB gain and there are 4 separate antenna sockets.

YAESU FT-857 NEW £729 C

HF / 50 / 144 / 430MHz Mobile Transceiver. HF/6m 100W, 2m 50W, 70cm 20W. (13.8V DC)
Developed on the FT-897 and FT-817 transceivers. Built-in features 32 colour display, spectrum scope, AM airband aircraft reception, built-in memory keyer, detachable front panel.

YAESU FT-817ND £499 C

bhi NE-DSP1061 Module available!



160m - 70cms. Up to 5W output all modes. ***Ours includes*** **battery and charger.** **Add £90 for DSP ready fitted.**

NEW DSP Module

There is NO new FT-817 DSP! The fact is that the UK manufacturers, **bhi**, (of whom we are their largest distributor), have produced a lovely 4-stage DSP module that can be fitted inside the FT-817. The NE-DSP1061 module costs £89 plus a fitting charge of £25 for retro-fitting to existing models. This includes installing a mini switch and LED on top cover.

TOKYO HY-POWER HL-50B £269.95 C

FT-817 VERSION !

This Linear Amplifier has been specifically designed for use with the FT-817. Enjoy up to 50 Watts output

UMMER 2005!

FOR 12 MONTHS ON SELECTED ITEMS MARKED BY £

THE ONLY THING WE WON'T DISCOUNT • CUSTOMER SERVICE •

ICOM IC-E208 NEW £279 C

VHF/UHF FM Dual Band Mobile Transceiver *Freq range 144-146MHz, 430-440MHz Tx *55/50W (3 pwr steps each band) *Wideband Rx 118-173, 230-549 & 810-999MHz *512 memories *FM narrow capability *104x2 DTCS, 50 CTCSS tone squelch *16 DTMF channels *HM-133 remote control mic *Packet ready for 9600/1200bps-mini DIN or 1200bps-mic socket *Supply 13.8V

ICOM IC-2725E £269 C

The Icom IC-2725 dual band FM transceiver is proving very popular. Easy to install, the controller is separated from the main unit - great where space is limited.

ICOM IC-2100H £229 C

2m 55W FM mobile. Commercial grade, rugged construction. One piece die-cast aluminium chassis. Selectable green or amber display.

YAESU FT-8900R NEW £339 C

Want the best of all worlds then the FT-8900R is just the ticket! A rig with four of the most popular mobile bands - 10m/6m/2m & 70cm. Detachable head.

YAESU FT-2800M NEW £159 C

*144-146MHz *FM *137 - 174MHz expanded Rx *RF Pwr 65/25/10/5W *25/12.5kHz channel spacing.The NewFT-2800M from Yaesu with 65 Watts High Power, rugged construction, excellent receiver performance and direct keypad entry.

YAESU FT-8800E £289 B

Dual Band FM Mobile 50/35W
The FT-8800R series operates as two radios in one, with independant two channel operation.
Remote head mounting capability, wideband receive on VHF & UHF and over 1000 memories.

YAESU FT-7800E NEW £239 C

*2m/70cms Dual Band Mobile *High power 50W 2m /40W 70cms *Wide receive inc. civil & military airband *CTCSS & DCS with direct keypad mic. *Detachable front panel *1000 memories plus five one-touch

We Price Match!
Call 08000 73 73 88

KENWOOD TMD-700E £449 C

Certainly the best 2m/70cm dual band mobile transceiver with APRS. Does not need extra high cost boards to function. The only extra if required is a compatible GPS receiver.

KENWOOD TM-V7E £359 C

Dual-band 2m/70cm.
A lovely cool blue display, easy to read with 50/35W output. 50W/35W plus 280 memos and five storable operating profiles.

KENWOOD TM-G707E £289 C

Dual Band
If you are looking for simplicity and low cost, here's the answer. 2m &70cms with detachable front panel and "Easy operation mode." GREAT!

YAESU VX-7R £299 B

6m/2m/70cm

Available in Silver or Black

The VX-7R is the best outdoor handie ever. The case, keypad, speaker and connectors are all sealed against water damage. Wide Frequency coverage from 500kHz to 900MHz the VX-7R is ideal for monitoring a variety of broadcasts. The display is a dazzling 132x64 dot matrix providing easy-to-read frequencies and information plus pictorial graphics.

YAESU VX-150 £125 B

The VX-150 is a fully featured compact yet incredibly rugged 2m 5W Handheld. Features include direct keypad frequency entry, CTCSS, DTMF, 1750Hz tone calling, wide/narrow deviation selection. It has a die-cast case, large high output speaker, illuminated keypad and battery voltage meter.

YAESU VX-2E NEW £169 B

Dual Band handy, 1.5W (2m) and 1W (70cm). Full DTMF, CTSS and DCS. With 1300 memories and AM/FM coverage 500kHz-960MHz.

ICOM IC-E90 £269 B

The new E-90 offers triple band coverage of 6m, 2m and 70cms. Up to 5W output and rx coverage from 495kHz - 999MHz makes this a very attractive rig.

ICOM IC-T3H £129 B

The IC-T3H 2m handheld features tough quality but with slim looks. Its striking green polycarbonate case has been ergonomically designed. The rig is capable of providing a powerful 5.5W output with either Ni-Cad or Ni-MH battery packs. Supplied with charger and rechargeable battery.

KENWOOD TH-D7E £319 B

DATA COMMUNICATOR

One of the most successful handhelds over the past few years. It has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit. Plus NMEA, 200 memos, and up to 5W output.

KENWOOD TH-F7E £249 B

WITH EXTRA WIDE RX COVERAGE

- 144-146MHz Tx/Rx: FM
- 430-440MHz Tx/Rx: FM

Up to 6W out with Li-ion battery and "scanner" style coverage from 100kHz to 1300MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

KENWOOD TH-G71E 199 B

If you want an excellent 2m/70cm dual-bander then you can't go wrong with the TH-G71. Fully functional with three power levels, 200 memories, CTCSS tone encoder/decoder, illuminated keypad and backlit LED.

YAESU VX-110 £119 B

Combining the ruggedness of the VX-150 with the simplicity of 8-key operation, the VX-110 is a fully featured 2m hand held ideal for the most demanding of applications. With its die-cast case, large speaker, and illuminated keypad, it is particularly well suited for most conditions. The VX-110 is a very affordable, rugged and reliable handheld.

Price Match Competitor's goods must be: new, UK sourced via official UK distributors and be in stock. Some competitors items offered may be non-UK compatible, ex demonstration or have no CE or E approval. All our new products come through official sources.

carriage charges:
A=£2.75, B=£6, C=£10

E&OE, All prices subject to change.

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VERTICAL ANTENNAS

Hustler Mobiles

Get top performance when on the move. Purchase the **MO-3 base** (137cm) for **£24.95** or the **MO-4 base** (68cm) for **£22.95**. Then add the resonator of your choice. **RM-10, RM-12, RM-15**, all **£19.95** ea. **RM-17, RM-20 £24.95** ea. **RM-40 £26.95, RM-80 £29.95**
Carriage £6

Resonator

Base section MO-3 or MO-4

MA5V Base vertical
No radials needed

Prices down!

CUSHCRAFT BASE ANTENNAS

MA6V *NEW*	20-17-15-12-10-6m 250W PEP	**£269.95**	C
MA5V	20-17-14-12-10m 250W PEP	**£239.95**	C
R8	40-30-20-17-15-12-10-6m 1.5kW	**£469.95**	C
R6000	20-17-15-12-10-6m 1.5kW PEP	**£329.95**	C

DIAMOND CP6 £239.95 C

**Bands: 3.5 -50MHz *Power: 200W *VSWR: Better than 1.5:1*
**Socket: SO-239 *Height: 4.6m *Radials: 1.8m adjustable*

Covers five popular HF bands and the 6m band. Low angle radiation makes it ideal for DX work. Outperforms dipoles for long distance contacts and compares favourably with beams located 10m+ above ground. It doesn't need long wire radials. Adjustable rigid radials, DC return helps the antenna get rid of static noise. Antenna is adjustable for each band.

HARI High quality German traps. (Pairs)
200W 20m £44.95 40m £49.95 80m £53.95
1kW 20m £59.95 40m £64.95 80m £73.95
Carriage £2.75

HARI High quality German Baluns
SO-239200W 1:1, 4:1 or 6:1 £25.95 ea.
1kw 1:1 £34.95 4:1 or 6:1 £41.95 ea
Carriage £2.75

HORIZONTAL BEAMS & DIPOLES

CUSHCRAFT Prices down!

Premier HF beam used around the world by serious DX'ers.

X-7	20/15/10m 7 el. Yagi 2kW	**£669.95**	D

Not got the space for a full sized HF beam antenna, then the mini beam MA-5B should be considered.

MA-5B	10-12-15-17-20m 4 el. Yagi 2kW	**£369.95**	C
A4-S	10-15 & 20m 4 el. Yagi 2kW	**£569.95**	D
A3-WS	12 & 17m 3 el. Yagi 2kW	**£379.95**	D
D-3	10-15-20m dipole element 2kW	**£249.95**	C

Don't want a wire antenna but can't fit a Yagi, then consider a rotatable dipole.

D-3W	12-17-30m dipole element 2kW	**£249.95**	C
D-4	10-40m dipole element 2kW	**£349.95**	C
D-40	40m dipole element 2kW	**£319.95**	C
TEN-3	10m 3 el. Yagi 2kW	**£229.95**	C
ASL-2010	13.5-32MHz 8 el. log periodic	**£749.95**	C

RADIO WORKS

A choice of quality wire antennas available to fit almost any circumstances. Prices down!

CW-160	160-10m 76.8m long	**£129.95**	C
CWS-160	160-10m 40.5m long	**£119.95**	C
CW-80	80-10m 40.5m long	**£89.95**	C
CWS-80	80-10m 20.1m long	**£109.95**	C
CW-40	40-10m 20.1m long	**£84.95**	C
CW-20	20-10m 10.36m long	**£89.95**	C
CW-620	20-6m 9.7m (32ft) long	**£89.95**	C
G5RV PLUS	80-10m with balun 31m (102ft) long	**£59.95**	B

WATSON FC-130 FREQUENCY COUNTER £59.95 B

**1MHz-3GHz *Impedance 50 Ohms*
**LCD readout *10-digit display*
**16 segment bargraph*
**BNC Whip Antenna*
**Black anodised case *Internal Ni-Cads*
**600mAH *6 hours operation*
**AC charger *9V DC 300mA*
**68 x 80 x 31mm*240g*

WATSON HUNTER FREQ. COUNTER £49.95 B

**10MHz-3GHz *Impedance 50 Ohms*
**LCD readout *8- digit display*
**BNC Whip Antenna*
**Black anodised case *Internal Ni-Cads*
**AC charger *9V DC 300mA*
**68 x 80 x 31mm *210g*

PORTABLE ANTENNAS

MIZUHO (FOR FT-817)

ATX-WBN	Walkabout 80-6m Whip 1.5mBNC	**£44.95**	B
ATX-WPL	Walkabout 80-6m Whip1.5mSO-239	**£44.95**	B
ATX-W38	Walkabout 80-6m Whip 1.5m 3/8in	**£44.95**	B

New Low price on Walkabout whips, three to choose from with three different connectors.

AT-80	Single band 80m whip with BNC	**£19.95**	A
AT-40	Single band 40m whip with BNC	**£19.95**	A
AT-30	Single band 30m whip with BNC	**£14.95**	A
AT-20	Single band 20m whip with BNC	**£14.95**	A

Range of single band HF antennas with BNC connection. Ideal for FT-817.

AT-17	Single band 17m whip with BNC	**£14.95**	A
AT-15	Single band 15m whip with BNC	**£14.95**	A
AT-12	Single band 12m whip with BNC	**£14.95**	A
AT-10	Single band 10m whip with BNC	**£14.95**	A

Zero Space DX Antennas

From Hustler USA

Run full legal power - 80m to 10m - with no masts or guys to worry about. 50 Ohm feed.

Small garden, planning problems or similar restrictions? Then the Hustler range is the answer. These HF verticals will take 1kW of power, work at ground level, and are self-supporting. A single earth rod will get you going. Add buried radials for even better results. Many hams have got on the HF bands with just this simple system. So why not join in the fun. These are rugged, well-built antennas that American hams have been using for years. Now they are available in the UK from our three stores.

4BTV
40-20-15-10m. 6.52m high. Full band coverage.
£149.95 C

5BTV
80-40-20-15-10m. 7.64m high. Full band coverage (100kHz on 80m).
£179.95 C

6BTV
80-40-30-20-15-10m. 7.3m high. Full band coverage (100KHz on 80m).
£209.95 C

MFJ Compact Portable Tuners

MFJ-971
QRP portable tuner, 300/30/6W. Wire, coax or balanced. **£99.95 B**

MFJ-1026
Active Antenna, 1.8-30MHz with noise canceller. **£189.95 C**

MFJ Power Tuners

MFJ-989C £359.95 C
3kW 1.8 - 30MHz. Wire, balanced and coax feed. Full metering and switching

3kW fast differential tuning design. 1.8 - 30MHz. Wire balanced and coax systems. Full metering and switching.

MFJ-986 £329.95 C

MFJ Popular Tuners

MFJ-949E £159.95 B
1.8 - 30MHz. 300W wire, balanced and coax. Inc dummy load, metering and antenna selector.

Similar to the MFJ-949E, but without internal dummy load. One of the most popular ATUs in the world!

MFJ-948E £139.95 B

MFJ Match Makers

MFJ-910 £24.95 A Mobile Matcher. Connect between mobile whip and transceiver. See your VSWR come down as you switch impedance match.

MFJ-914 £64.95 B

Auto ATU extender. It let's your internal transc. ATU handle difficult coax antennas such as G5RVs etc. Greatly extends the range cpability.

Antenna Analysers

MFJ-259B £259.95 B

Full diagnostic information about your antenna. 1.8 - 170MHz. Totally portable. Great value.

MFJ-269 £349.95 B

The most comprehensive diagnostic analyser ever made. 1.8 - 170 plus 415 - 470MHz

MFJ-969 ATU £199.95 B

The latest design from MFJ, this unit features an active power meter for really accurate PEP measurements. Powered by an internal PP3 battery (not supplied) or an external 12V source. This is one of the most popular 300W models, having a very wide frequency range an excellent power and VSWR accuracy.

MFJ-260C DUMMY LOAD £37.95 B

MFJ-260C 1.5MHz - 150MHz 300W 50 Ohm SO-239
**Size 180 x 57 x63mm • Weight 450g*

Handles 300W for 30 seconds and lower powers proportionally longer.

MFJ-901B VERSA TUNER £85.95 B

This compact tuner is a low cost alternative where the main station already has a VSWR meter and just requires the 'bare bones' tuner. It will handle all types of aerials, match coax fed systems, long wires and balanced feeders and is very simple to use. It retains the basic MFJ T-network that has a wide impedance matching capability.

MFJ-461 MORSE READER £84.95 B

The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking, a serial port - if you wish to connect to a computer to display the text on a bigger screen. It can also be connected to your receivers audio if required.

Check our website for more info - www.wspic.com

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Details of the Society's volunteer officers can be found in the RSGB Yearbook 2004

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RSGB matters

DAYTON 2004

As usual, the RSGB manned a large stand at the Dayton Hamvention, which took place from 14 to 16 May in Dayton, Ohio. For many US amateurs, the Dayton Hamvention provides a unique opportunity for them to look at - and buy! - RSGB books and other merchandise. The following RSGB members 'signed-in' at the stand:

Howard Roux, AA4RX; Adam DeSantis, AA8SU; Mike Crownover, AD5A; Dick Pascoe, G0BPS; Colin Smith, G0LIN; Mike Willis, G0MJW; Brook Verrall, G0VEB; Marios Nicolaou, G0WWW; Derek Atter, G3GRO; Ivan Davies, G3IZD; Mike Underhill, G3LHZ; Pronz Arigho, G3NVM; Peter Waters, G3OJV; Bob Whelan, G3PJT; Ian Keyser, G3ROO; Peter Chadwick, G3RZP; Harry Bellfield, G3SBV; John Longhurst, G3VLH; Stewart Bryant, G3YSX; Martin Atherton, G3ZAY; Richard Hadfield, G4ANN; Fred Handscombe, G4BWP; Tery Giles, G4CDY; Dave Robinson, G4FRE; Peter Head, G4FYY; Ernie Bailey, G4LUE; Tony Fishpool, G4WIF; Jim Hicks, G4XRU; Gavin Keigan, G6DGK; Jeff Stanton, G6XYU; John Ray, G8DZH; S J Haseldine, G8EBM; Robin Haighton, GD4INU/VE3FRH; R D Weary, K9RDW; Paul Gehman, KB3IVG; Don Zeman, KD9MF; Sindre Torp, LA6OP; Stavros Tsiakkouris, M0BBB; David Bowyer, M1AEI; Bill Sexton, N1IN; Steve Beckman, N3SB; D Faunt, N6TQS/M0BPI; Pete Michaelis, N8TR; Tom Osman, VE3RZ/G3XMX; J Byers, VE3YZA; Joe Reisert, W1JR; Charles Moizeau, W2SH; Eric Rosenbeig, W3DR; Hugh O'Donnell, W3FUD; Edmund B Ridington, W4EBR; William S James, W9LYN; Donn S Dengel, W9TOC; Paul Pagano, WA4AA; Jim Scott, WK3N.

RSGB member Harry Bellfield, G3SBV (centre), is introduced to the President, Jeff Smith, MI0AEX, by General Manager Peter Kirby G0TWW, on the RSGB stand at Dayton.

QSL BUREAU BACKLOG TACKLED

The Society has recently placed a contract with Remploy Ltd to carry out the pre-sorting of QSL cards before they are posted to sub-managers. The bureau is currently running at an average of 10 weeks for a QSL card to go through the system. A significant backlog, particularly of foreign cards, has been building up and the QSL bureau staff were struggling manfully to keep up.

The pre-sorting carried out by Remploy will enable a much quicker QSL card service to be provided to members.

VANITY CALLSIGNS

For the past three years the RSGB has been in discussion with firstly the RA and more recently Ofcom over the introduction of 'vanity callsigns'. Whilst supportive of the idea, Ofcom has informed the Society that due to IT software issues it is unlikely that vanity callsigns can be introduced before March 2006.

YOUR COUNTRY NEEDS YOU

An article on page 58 of July 2003 *RadCom* described plans for participation of GB5HQ, the RSGB Headquarters station, in the IARU Radiosport contest. In the first major multi-multi operation from the UK in this contest, GB5HQ came second and was only narrowly beaten by the German HQ station, DA0HQ. The GB5HQ team are most grateful for the support of 926 different UK stations who contributed a total of 2346 QSOs to the final tally.

DA0HQ's victory was in large part due to the contribution of more than three times that number of QSOs from over 2000 different German stations. GB5HQ will be mounting another bid to reach the top spot in 2004, and the organisers ask for as many stations as possible to work GB5HQ during the contest period on 10 / 11 July, 1200 - 1200UTC. There will be 12 separate stations active on the six contest bands 160 - 10m, phone and CW. All the stations will be linked by

CONGRATULATIONS!

Congratulations go to the following RSGB members who successfully upgraded from **Foundation to Intermediate** following the exam on 18 May:

David Cook, M3TGV; Kevin Hall, M3KDH; Kenneth Hull, M3LKH; Gary Baker, M3GBX; Kevin Haworth, 2E0XTC; Gary Cannon, M3IKW; Jon Downes, M3EEQ; Paul Greenwood, M3OFF; Leslie Naylor, M3LNR; Douglas Tordoff, M3ZWA; James Boag, MM3KKT; Eric Taylor, M3EGT; Cyril John Hale, M3ORR.

From **Foundation to Intermediate** following the exam on 26 May: John Milne, M3BYF; John Norrington, M3NOZ; Mick Matthews, M3BYC; Paul Cattermole, M3MIG; Tom Harrison, M3TFH; Stephen Glass, M3JBK; Martin Juhe, M3JUH; Ian Ross, M3IVR; Nigel Holderness, M3YZF; Noel Bradford, M3NOL; Maurice Titcombe, M3MLT; John Whalley, M3FBS; Nigel Meakin, M3NHM; David Brewerton, M3EZP; Roy Turton, M3GIW; Brian McVanemy, RS192476; Trevor Codner-Armstrong, M3ZEE; Andrew White, M3FUA.

From **Intermediate to Advanced** following the exam on 26 April: Alan Lyons, 2M0EXD; Karl Gamble, M0KIG; Allan Thornton, 2E0IOW; Rex Potter, 2E1TDQ; Wayne Thomas, M3CRY; William Maddox, M3FTX; Andrew Vine, 2E0VIN; Enid Wheeler, 2E0DPM; Nicholas Kail, 2E0MLR; Gary Collis, M0GRY; Cathryn Law, 2E1OKT; Russell Meech, M0IJZ; Ian Underwood, 2E1IJW; Paul Dyer, M3PDY; Donna Moore, 2E1XJR.

the Internet so if you call GB5HQ on one band / mode the operator should be able to let you know the operating frequencies of the other stations operating as GB5HQ. The individual stations will be located right across the country, from Guernsey to Scotland.

As before, awards will be available for working GB5HQ on at least three, six, nine and all 12 band / mode slots. More details are on the website www.gb5hq.com New QSL cards will be produced for 2004 and all incoming direct, bureau or e-mail requests will be honoured. Direct QSL requests should go to G3TXF (QTHR).

VACANCIES IN REGION 9

We have vacancies for people to strengthen the RSGB team in the following districts of the London & Thames Valley Region (Region 9): Surrey and London South of the Thames; Hertfordshire and London North of the Thames; Bedfordshire and North Bucks; Berkshire. If you live in the above counties and would like to join us in helping to grow the hobby with the RSGB please contact Paul, M0CJX, tel: 01737 279108 or e-mail: m0cjx@rsgb.org.uk

CHANGE TO REGIONAL MANAGER

Ken Frankcom, G3OCA, is the new RSGB Regional Manager for Region 13, East Midlands. He replaces Bryn Llewellyn, G4DEZ, who resigned from this role for personal reasons.

SCOTTISH REGIONS

Major changes to the two RSGB Scottish Regions have been approved. Region 1, previously known as Scotland West and the Western Isles, becomes **Scotland South and the Western Isles**, while Region 2, previously known as Scotland East and the Highlands becomes **Scotland North and the Northern Isles**. As a result, two new districts will be added to Region 1: District 15 (Lothians) and District 16 (Borders). The Deputy Regional Manager for District 15 is Dave Stockton, GM4ZNX, whose address is correct in the *RSGB Yearbook*.

A Deputy Regional Manager is to be appointed for District 16. Anyone interested should contact Gordon, GM3ULP, whose e-mail address is gm3ulp@qsl.net

Fife will become part of District 23 in Region 2. The Regional Managers for both Regions remain unchanged. The Regional Manager for Region 1 is Gordon Hunter, GM3ULP, and the Regional Manager for Region 2 is Peter Thomson, GM1XEA (both QTHR).

MAKE YOUR EXPERIENCE COUNT

If you have taken part in an amateur radio training course in the recent past - either as a student or an instructor - it is quite possible that you could help others by sharing your experiences. Steve White, G3ZVW, is currently compiling a new RSGB book which will provide additional information for the Foundation, Intermediate and Full licence examination courses. What he wants to know is what students and instructors thought were the good points of the existing training material, where it was thought there was a lack of information that was required by the syllabus, what additional material instructors found it useful to produce, etc. Please e-mail your experiences, ideas and suggestions to: steve.white@rsgb.org.uk or write to him via RSGB HQ.

ARTICLES WANTED

RadCom always has a backlog of articles awaiting publication and sometimes it takes many months before an article submitted can be published. However, at present there is a shortage of practical constructional articles. If you have built a piece of equipment and would like to offer it for publication - whether this is your 'life's work' or a project that can be knocked together in an evening - we'd be pleased to hear from you. We do pay for articles after publication. For further details please contact *RadCom* Technical Editor, George Brown, M5ACN, at radcom@rsgb.org.uk

VHF AWARDS MANAGER

Bill Salt, M0CBQ, 89 Woodhall Drive, Waltham, Grimsby DN37 0UX, has now been appointed as the new RSGB VHF Awards Manager. He takes over from Tony Jarvis, G6TTL, who is thanked for his years of service to the Society in this role. Bill's e-mail address is vhf.awards@rsgb.org.uk

QSL BUREAU NEWS

Marc Litchman, G0TOC, of 26 Oak Tree Close, Loughton, Essex IG10 2RE, is the new RSGB QSL Bureau Sub-Manager for the G7AAA - ZZZ series of callsigns. He has taken over from A Shipp, M0CEG, who is thanked for his service to the Society.

AROS TALKS

The RSGB Amateur Radio Observation Service coordinator, Barry Scarisbrick, G4ACK, is giving a talk on the work of AROS at the Plymouth Radio Club on 20 July. For further details please contact Den Perryman, G7NMA, tel: 01752 346158.

HIGH SPEED TELEGRAPHY CHAMPIONSHIPS

The fourth European High Speed Telegraphy Championships take place in Nis, Serbia and Montenegro, between 15 and 19 September. Individuals or teams wishing to represent the UK at this event (travelling at their own expense), should please contact the General Manager's Department at RSGB HQ for further details, tel: 0870 904 7373 or e-mail: gm.dept@rsgb.org.uk

VHF AWARDS NEWS

A relative newcomer is Martyn Preston, G0THY (OX), who sent a very large bundle of cards some of which dated back to the early '90s. The net result is that Martyn gains certificates and stickers in the 'Squares', 'Countries (2-way)' and 'Countries (DX)' tables which provide an excellent foundation for subsequent claims. Martyn's highest increments are 150 squares and 40 Countries (2-way).

James Kelly, GM1VKI (KY), submitted a claim with some cards that went back to 1990, resulting in a certificate and stickers for 25, 50 and 75 squares. All James's contacts were made using an FT-290, 'homebrew' transverter and 30W amplifier to a full-size delta loop in his loft. One or two very early contacts were made with only 0.5W from a transverter.

Dave Robinson, WW2R (and G4FRE), has been busy on all bands from 1.3 - 24GHz. He gains various incremental stickers as shown below but the outstanding achievement must be that coveted number one certificate for 24GHz!

Summary of Award Recipients

50MHz: 25 Squares: G0THY, GM1VKI. 50S: G0THY, GM1VKI. 75S: G0THY, GM1VKI.
100 - 150 Squares: G0THY.
10 - 40 Countries (2-way): G0THY.
25 Countries (DX): G0THY.
1.3GHz: 20 Squares: WW2R. 25S: WW2R.
2.3GHz: 10S: WW2R. 15S: WW2R.
3.4GHz: 10S: WW2R.
5.6GHz: 5S: WW2R.
10GHz: 10S: WW2R. 15S: WW2R.
24GHz: 5S: WW2R. ♦

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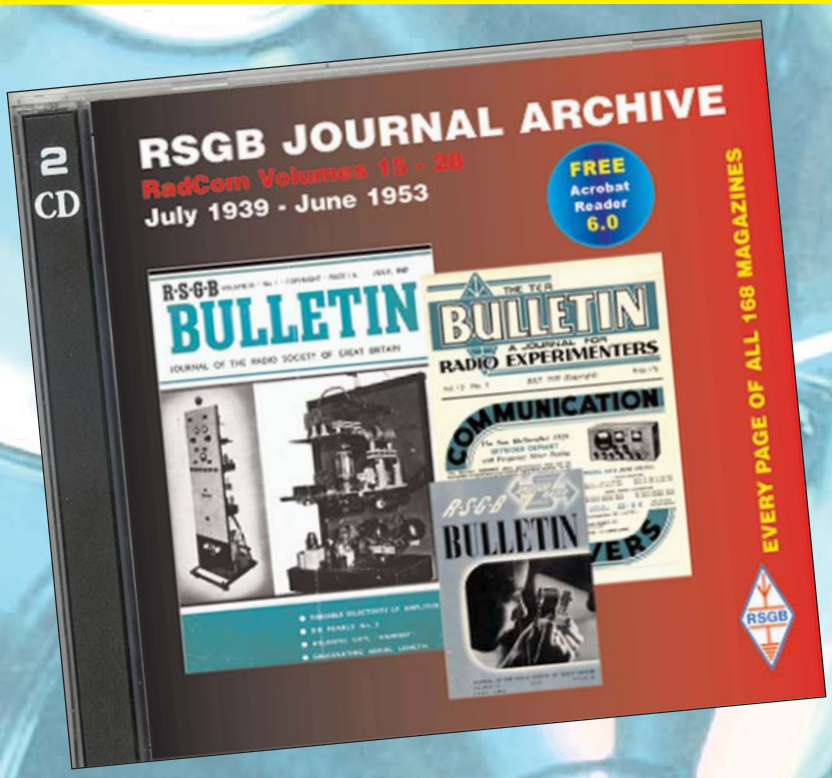

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Corporate (Senior Citizens) (Applications should provide proof of age at last renewal date)	£33.50
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HamClub (under 18)	£18.50
Affiliated Societies (UK or Overseas)	£42.50

Subscriptions include VAT where applicable.
Special arrangements exist for blind and disabled persons. Details and membership application forms are available from RSGB HQ.

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p55 – The North Wakefield Radio Club put on a DXpedition to one of the UK's rarer IOTAs, the Farne Islands

p33 – Amateur radio photographer Henryk Kotowski, SM0JHF, enthuses about the Åland islands between Sweden and Finland in the Baltic Sea

Canadian youngsters visit Bletchley during European visit

MKARS welcomes Canadian D-Day group

Monday 31 May saw the Milton Keynes Amateur Radio Society (MKARS) extend the hand of welcome to 160 Canadian schoolchildren (www.junobeach.ca) on a special visit to Bletchley Park. The group came to Europe as part of the D-Day commemorations, during which they buried a time capsule on the Normandy beaches. The visit to Bletchley Park (Station X) resulted from the twinning between MKARS and North Shore ARC, VE3NSR, which has close contacts with the Camp X site in Canada.

Mike Everett, G3LFR, and Frank Collins, M0RPM, welcomed the Canadians on behalf of MKARS and after reading a short poem Mike presented Nancy Hamer Strahl, the leader of the group, with a book for the school library. In return Lynn Hodgson presented the club with a certificate of appreciation and some books for the club's library. The group was given a guided tour of Bletchley Park, home of the Enigma machine and was then dropped off at a restaurant overlooking the Tower of London for dinner before taking the Tube back to their hotel. The group have since moved onto France.

Mike Everett, G3LFR (left), receives the certificate of appreciation from Lynn Hodgson from Canada.

Dayton raffle raises funds for youngsters

A raffle with a difference was held at the Dayton Hamvention in May to raise money for the trust fund set up for the two young children of Bill Fisher, W4AN, shortly after he became a Silent Key. Bill was a top contester and founder of contesting.com and eHam.net The star prize, an Icom IC-756PRO-II donated by Icom (America), was won by John, WA2GO. Having already won his prize, John kindly donated a further $386 to bring the total raised for the trust fund to exactly $20,000. Peter Chadwick, G3RZP, reports: "The raffle was the brainchild of Paul, K9PG, and he was helped to turn it into something by Scott, KA9FOX, with Chad, WE9V, helping on the Internet. One of the prizewinners was 2E1RDX but RSGB Past Presidents Bob Whelan, G3PJT, and Peter Chadwick, G3RZP, didn't win anything!"

Ofcom appoints Spectrum Advisory Board

On 19 May Ofcom (www.ofcom.org.uk) announced the establishment of the Ofcom Spectrum Advisory Board. The Board will provide independent advice to Ofcom on spectrum management issues in order to help Ofcom carry out its remit in securing optimal use of the radio spectrum, taking account of the different needs and interests of all users. The Board will meet five to six times a year, with the first meeting in June, and will publish its own annual report. Ofcom is the independent regulator and competition authority for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services. It took over the responsibilities and assumed the powers of five former regulators, including the Radiocommunications Agency.

The night Poland saved Cowes

On 2 May the Brickfields Amateur Radio Society on the Isle of Wight operated GB2BSC ('*Blyskawica* Saves Cowes') to commemorate an event in WWII in which the town of Cowes was saved by the Polish destroyer *ORP Blyskawica*. The ship was in Cowes for a refit in 1942 and when the town was attacked by 180 bombers it was the *Blyskawica* that provided the town's defences. The ship's visit, and the fact that she was fully operational, certainly saved the town from destruction. Today she is a museum ship in Gdynia.

Members of the Brickfields ARS operating GB2BSC from the jetty in Cowes.

'Hall of Fame' inductees

CQ Amateur Radio magazine announced this year's inductees into the *CQ* Amateur Radio Hall of Fame and the *CQ* Contest Hall of Fame at Dayton on 14 May. Among the 15 inductees into the Amateur Radio Hall of Fame is John Clarricoats, G6CL, the RSGB General Secretary between 1932 and 1963 and the editor of the *T. & R. Bulletin* and *RSGB Bulletin* between 1937 and 1963.

The *CQ* Amateur Radio Hall of Fame was established in 2001, to recognise those individuals, whether licensed radio amateurs or not, who significantly affected the course of amateur radio; and radio amateurs who, in the course of their professional lives, had a significant impact on their professions or on world affairs.

Nevada expands

Nevada (www.nevada.co.uk) has purchased a 12,000 sq ft warehouse just across the road from its current distribution centre at Farlington, Portsmouth. MD Mike Devereux, G3SED, has ambitious plans for the new warehouse. "With the acquisition of a second warehouse we have the opportunity to offer the UK's largest-ever display of amateur radio equipment under one roof. We will have HF beams fully assembled with masts, towers and wire antennas all on show inside the warehouse", said Mike, who has been busy sourcing new products for the company to stock and to manufacture under the Trident and Palstar brand names.

Nevada has recently released new catalogues for scanners and CB, and its new amateur radio catalogue will be ready shortly. There are plans for an open day in November to showcase the new facilities.

ATV from space

On Saturday 31 July Graham Shirville, G3VZV, will give a presentation to the AMSAT-UK (www.uk.amsat.org) Space Symposium on the plans to put an Amateur Television repeater on the International Space Station. It will have a conventional FM ATV input on the 1.2GHz band and a Digital ATV output on 2.4GHz. It is also proposed to install a camera on the outside of the station to give pictures of the earth.

The Space Symposium at the University of Surrey, Guildford, runs from 31 July to 1 August and is open to all amateurs and SWLs. A day pass, which must be bought in advance, costs £10. For further details contact the secretary, Jim Heck, G3WGM, tel: 01258 453959 or e-mail: g3wgm@amsat.org

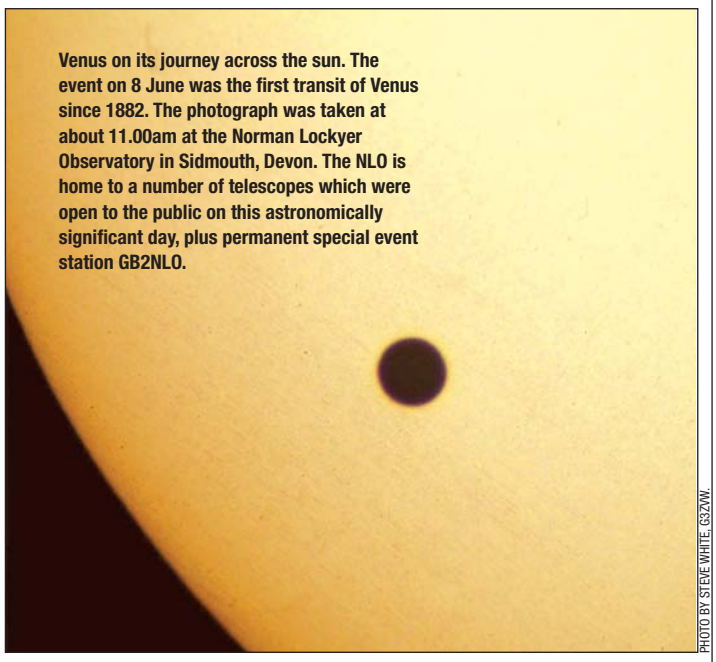
Mike Foale, KB5UAC, on board the ISS.

Morse Proficiency Programme in Scotland

Three members of the former RSGB Morse test group in the Grampian Region, Scotland - James MacKinnon, GM4EKC; Norman Mackenzie, GM3WIJ; and Norman Burns, GM4DIN - introduced Morse Proficiency Programme tests at Fraserburgh on 24 April. The occasion was the centenary of Marconi's research and work in that town. A week earlier, Dave Lawley, G4BUO, re-introduced Morse tests at the Kempton Park show.

In Fraserburgh, tests were offered at 5, 10, 15, 20 and 25WPM. There were two candidates at 5WPM (QSO format), three at 10, one at 15 and three at 20WPM. All passed and qualified for award certificates. All candidates opted to use a straight key for the sending text.

The Marconi celebrations were hosted by the Fraserburgh Heritage Centre. The Banff & Buchan and Aberdeen Amateur Radio Societies combined efforts to run three special event stations with considerable success. Crowds flocked to the centre and a keen interest was shown in the Morse tests.



Venus on its journey across the sun. The event on 8 June was the first transit of Venus since 1882. The photograph was taken at about 11.00am at the Norman Lockyer Observatory in Sidmouth, Devon. The NLO is home to a number of telescopes which were open to the public on this astronomically significant day, plus permanent special event station GB2NLO.

PHOTO BY STEVE WHITE, G3ZVW.

Transmission 2004

'Transmission' is the annual amateur radio fund-raising event for the British Wireless for the Blind Fund (registered charity number 1078287). This year, 'Transmission 2004' takes place over the weekend of 25 / 26 September. *Now* is the time to start planning your activity in order to raise funds for this very worthwhile charity! The idea is that you ask your friends, family, workmates - anyone in fact - to sponsor you for contacts made during 'Transmission 2004'.

This year is slightly different as trophies will be awarded to the individuals and groups / clubs who make the most contacts or raise the greatest amount of money for the charity. In order to qualify for one of the trophies you must be a current member of the RSGB and resident in the UK. However, overseas amateurs and non-members of the Society are also invited to join in the fun and raise funds for BWBF. Certificates will be sent to everyone (including overseas / non-members) raising or donating at least £10.

To take part you will need to obtain a sponsorship form from the BWBF, Gabriel House, 34 New Road, Chatham, Kent ME4 4QR; tel: 01634 832501; fax: 01634 817485; e-mail: info@blind.org.uk; or download one from the BWBF website at www.blind.org.uk Full details are on the RSGB website at www.rsgb.org/bwbf and on the BWBF website.

NEWS BRIEFS

- The makers of the television series Spitfire Ace are now making a series for Channel 4 on the airmen of WWII bomber crew. They would like to hear from any grandchildren of bomber crew airmen, particularly wireless operators, who would like to know more about what their grandparents did. The young volunteers will filmed while being put through some of the elements of training that airmen undertook in WWII. If you are interested please contact Jess on 020 7013 4476 or e-mail: Jessica.versluys@rdfmedia.com
- Icom (UK) has a limited number of logbooks to give to customers who have purchased IC-703 transceivers. If you would like one, contact Icom Marketing with the serial number of your IC-703 (on the back of the radio by the antenna socket) together with your name, address and telephone number. The logbooks are available on first come, first served basis. This promotion is only open to residents of the UK and Ireland who have purchased Icom UK imported IC-703 transceivers.
- The organisers of the Leicester Amateur Radio Show point out that contrary to rumours that are circulating, the Leicester Show will go ahead this year. There has, however, been a change of date: this year's show will be held on Friday and Saturday 1 / 2 October (as shown in RadCom). This change is because the Donington Exhibition Manager did not want parking problems on the weekend of the SuperBikes event, when the Leicester Show had previously been scheduled.
- Numerous radio clubs and colleges hold amateur radio licensing courses throughout the year. Advanced (Full) licence courses have 'traditionally' started in September, but Foundation and Intermediate courses can start at any time. Details of all courses of which we are aware are now published on the RSGB website as www.rsgb.org/foundation, www.rsgb.org/intermediate and www.rsgb.org/full respectively.
- A video of the 3B9C DXpedition (see pages 36 - 40) is now available. It runs for 45 minutes, and with it, as an added bonus, is the so far unreleased D68C video. It is available for £14.95 by going to www.fsdxa.com/3b9c/video.html
- Sonia Gandhi, the leader of India's Congress Party, which won a surprise victory in May's General Election, is a licensed radio amateur with the callsign VU2SON. Mrs Gandhi is the widow of assassinated former Prime Minister of India Rajiv Gandhi, VU2RG, who was himself an active radio amateur.
- The latest countries that we know to have dropped the Morse code requirement for access to the HF bands are France, Finland and New Zealand.

Club and Regional News

1 Scotland West & Western Isles

No club details received.

2 Scotland East & the Highlands

ABERDEEN ARS
Note: all meetings now Thursdays 1930 to 2130.
1, Junk sale.
22, QRP communications, George Burt, GM3OXX.
29, Morse and on air. Ellis, GM4JLZ, 01224 580594.

COCKENZIE & PORT SETON ARC
3, End of Clun 20-Year Anniversary Competition.
3, 4, VHF Field Day.
10, 11, Museum of flight 'Annual Air Show' GB2MOF. Bob, GM4UYZ, 01875 811 723

3 North West

CHESTER & DARS
6, Surplus sale.
20, Talk by G Landen-Turner.
27, Pie and pint. Chris, MW3TWI, 01244 683629.

SOUTH MANCHESTER R & CC
2, Morse code evening, Ron, G3SVW.
9, HF on air.
16, 'Transistor Circuitry', Chris, G4HON.
23, Technical Topics evening.
30, Talk by Col, VK2CFC. Ed, 0161 969 1964.

STOCKPORT RS
6, Ferrite cores, Steve, G3OAG.
20, 'Out and about with my '817', Rob, 2E0IAM, & Ian, G1ITZ. David, M1ANT, 0161 456 7832.

THORNTON CLEVELEYS ARS
5, On air.
12, Auction.
19, Simple HF antennas, Ian, G3ZRZ.
26, Talk TBA. Jack, G4BFH, jack.duddington@btinternet.com

WARRINGTON ARC
13, BBQ.
20, The early telegraph, part2, Tom, G0MYN.
27, Friedrichshafen HamFest, Jim, G3NFB, & Gordon, G4SCI. John, G0RPG, 01925 762722.

WIRRAL & DISTRICT ARC
7, D&W, Harp (Ness).
14, Bring and tell.
21, D&W, Fox and Hounds (Barnston).
28, G8PMF DF hunt. Tom, G4BKF, 07050 291850.

4 North East

GOOLE R & ES
7, Unload night at Lionel Winder Selby.
14, Debrief BBQ at Barmby Tidal Barrage.
21, Social evening and feedback at *The Black Swan* Asselby.
28, On air at mobile site. Richard, G0GLZ, 01405 769894.

HALIFAX & DARS
20, QRP, Rev George Dobbs, G3RJV. Tom, M0TKA, 01484 715079.

KEIGHLEY ARS
22, Members short talks.
29, 'Foxhunt'. Kath, G0OSA, 01535 656155.

SHEFFIELD ARC
2 - 4, IRLP convention in Sheffield.
5, VHF contesting, Andrew, G0HSA.
12, VHF radio.
19, 'Foxhunt' and meal.
26, HF radio. Nick, G4FAL, 0114 255 2893.

YORK ARS
4, York Radio Rally at York Racecourse. Keith, G3WVO.

5 West Midlands

COVENTRY ARS
2, On air, licensing class, CW practice.
9, BBQ, on air, licensing class, CW practice.
16, 2m DF hunt.
23, 30, On air, licensing class, CW practice. John, G8SEQ, 024 7627 3190, johng8seq@ntlworld.com

GLOUCESTER AR & ES
5, 'Lundy Calling'.
12, 19, 26, On air HF / workshop. Tony, 01452 618930 office hours.

HILLCREST ARS
1, Police radio in South Africa, Peter, G1FET.
29, Roy Clarke, G8AYD, Regional Manager. Stuart, M0SJV, 01384 232457, m0sjvstuart@supanet.com

KIDDERMINSTER & DARS
6, RSGB EMC Committee, Roy Clarke, G8AYD, RSGB Regional Manager. Tony, G1OZB, 01299 400172.

MID-WARWICKSHIRE ARS
13, Field Day planning.
27, Medium range DF tests (a.m. meeting). Bernard, M1AUK, 01926 420913.

SALOP ARS
1, Final NFD preparations.
8, Used equipment sale, no junk.
22, Talk by John Green, G3KPP.
29, Summer social. John, G0GTN, 01743 249943.

ST LEONARD'S ARS
8, 'Foxhunt'.
15, Portable evening at Marquis Drive: transmit with kite antenna.
22, Shack night.
29, Constructing a 40m trap. Derek, G0EYX, 01785 604904.

STRATFORD UPON AVON DRS
12, Surplus equipment sale. G8HJS.
26, Construction competition. Terry, G3MXH, 01789 294387.

TELFORD & DARS
3, VHF Field Day, Long Mynd, Church Stretton.
7, Open evening, on air.
14, Club project: 2m portable antenna, M1RKH.
21, Outing on to the Wrekin: take your gear up and use it!.
28, 'Antennas in the Field' competition at HQ. Mike, G3JKX, 01952 299677.

6 North Wales

CONWY VALLEY ARC
7, 'Update on one-valve receiver', John, GW3JGA. Wynne, GW6PMC, 01745 855068.

DRAGON ARC
5, RSGB video. Les Hayward, MW0AQZ, 01407 760986.

MERION ARS
1, Video and talk on work of RSGB, Liz Cabban, GW0ETU, Regional Manager. Martyn Jones GW4XZJ.

7 South Wales

No club details received.

8 Northern Ireland

No club details received.

9 London & Thames Valley

COULSDON ATS
12, Inter-club quiz with Andy, G8JAC. Steve, G7SYO, 01737 354271.

CRAY VALLEY RS
1, VHF NFD planning, Simon, M3CVN.
3, 4, VHF NFD.
15, CVRS Scillies DXpedition planning;
15, Visit by W6 amateurs.
21 - 26, Isles of Scilly DXpedition. Bob, BRS32525, 020 8265 7735 after 8pm & weekends.

CRYSTAL PALACE R & EC
2, Variometers and associated test equipment. Bob, G3OOU, 01737 552170 or Victor, G1PKS, 020 8653 2946.

DORKING & DRS
3, 4, VHF NFD.
27, Activity evening. John, G3AEZ, 01306 631236.

RADIO SOCIETY OF HARROW
30, Summer social. Jim, G0AOT, 01895 476933 or 020 7278 6421.

READING & DARC
8, Video & preparation for McMichael Rally. Pete, G8FRC, 01189 695 697, www.radarc.org

SHEFFORD & DARS
1, VHF NFD planning.
3, 4, VHF NFD.
8, Mobile 'foxhunt'.
15, BBQ. David, G8UOD, 01234 742757.

SILVERTHORN RC
9, Talk on Roding Valley.
16, On air.
23, Preparation for club camp.
30, Last meeting until 3 Sep. Les, G0CIB, 07980 275081.

SOUTHGATE ARC
8, 'SAQ, the Alexanderson alternator VLF transmitter in Grimeton, Sweden. Mike, M0ASA, 020 8366 0698.

SUTTON & CHEAM RS
15, Junk sale. John, G0BWV, 020 8644 9945, info@scrs.org.uk

WIMBLEDON & DARS
30 July - 8 August: summer camp. Jim, M0CON, 020 8874 7456.

10 South & South East

ANDOVER RAC
6, Microwave operation, Brian, G4NNS.
20, 'Work what you make', Jim, G4NWJ. Terry, G8ALR, 01980 629346.

BASINGSTOKE ARC
3, 4, VHF Field Day.
25, ARDF 'foxhunt', G4WIZ, & BBQ. Frank, M0AEU, barc@2lo.info

HARWELL ARS
3, BBQ, John, M3LNU.
13, DF hunt, Ron, G0BNC. Angus, G0UGO, hars.g3pia@tiscali.co.uk

HASTINGS E & RC
21, Club auction at William Parker School. Peter, G0FUU, 01424 432418, Peter.Firmin@virgin.net

HORNDEAN & DARC
27, Talk TBA. Stuart, G0FYX, 023 9247 2846.

HORSHAM ARC
1, Travel Log, Adrian, G4LRP. David, G4JHI, 01403 252221.

ITCHEN VALLEY RC
9, Raynet.
23, RSGB video nostalgia. Sheila, G0VNI, 023 8081 3827, sheila.williams@ivarc.org.uk

SOUTHDOWN ARS
5, BBQ at Beachy Head site. John, G3DQY, 01424 424319.
SWINDON & DARC
1, VHF NFD preparation.
8, Swindon Rally preparation.
15, DF hunt, social evening.
22, RSGB IOTA contest preparation. Mike, M5CBS, 01793 826465.
TROWBRIDGE & DARC
7, 144MHz DF event. Ian, G0GRI, 01225 864698 evenings / weekends.
WORTHING & DARC
7, BBQ.
14, Early electric telegraph.
21, Plans for fire brigade open day.
24, Fire brigade special event.
28, Setting up your station. Roy, G4GPX, 01903 753893.

11 South West & Channel Islands

APPLEDORE & DARC
19, BBQ. Brian, M0BRB, brian.jewell@ic24.net
BOURNEMOUTH RS
2, 'My shack', Chris, M5AGG.
16, Summer supper. Chris, M5AGG, 01202 893126, www.brswebsite.freeserve.co.uk
CORNISH RAC
1, Rally preparation.
10, Annual rally at Penair.
12, Computer section. John, G4LJY, 01872 863849.
SOUTH BRISTOL ARC
7, Working the Lundy Island DXpedition.
14, Debriefing of VHF NFD team.
21, Digital cameras.
28, On air. Len, G4RZY, 01275 834282.
WEST SOMERSET ARC
6, BBQ at Woodside. Jean, G0SZO, 01984 633060.
WESTON-SUPER-MARE ARS
3, 4, VHF NFD. D Welch, G0ATD.

12 East & East Anglia

BRAINTREE & DARS
5, BBQ.
19, Astronomy talk. John, M5AJB, 01787 460947.
CAMBRIDGE & DARC
2, Field Day preparation.
9, Efficient aerial feeding and measurement, Ian, G4AKD.
16, 'Foxhunt' receiver checking.
23, 'Foxhunt'. Ron, G3KBR, 01223 501712.
CHELMSFORD ARS
6, Talk on WWII experiences as radio operator and rear gunner in 'Stringbags' flown from aircraft carriers, Les Sayer.
25, Sanford Mill Radio Museum. George, G3UTC, 01277 622707, george3utc@btopenworld.com
FELIXSTOWE & DARS
4, GB2FX at Felixstowe Museum, Landguard Fort.
10, 11, Foundation licence course, Orwell Park School.
26, Indian cookery, Orwell Park School.
27, Intermediate licence exam, Orwell Park School. Paul, G4YQC, paul.whiting@bt.com
HARWICH ARIG
14, On air, BBQ. Tony, G4EYE, 01255 886065.
NORFOLK ARC
4, Rally at Barford.
7, Reflections on Barford Rally, briefing for trophy DF contest.
14, Members' trophy DF contest.
28, Magnetic loops, Mike, M3MCS, John, G4AYV (TBC). Reg, G0VDO, 01603 429269.

13 East Midlands

EAGLE RADIO GROUP
13, Talk by local coastguards on advances in marine radio and how digital radio can take the 'search' out of S&R. Terry, G0SWS, 07979 733640.
LEICESTER RS & CC
5, Quarterly open meeting.
12, Junk sale & station operation.
19, SSTV, Mike, G4SJX.
26, Video and station operation and construction.
31, Visit to Bletchley Park. Tom, G1IUT, 0116 286 3949, tomchristmas@ukonline.co.uk
RAF WADDINGTON ARC
8, Practical evening. Martin Farmer, M3MDF, martin@farmer4.freeserve.co.uk

Items for club news should be sent to the *RadCom* Office at HQ to arrive by the 26th of the month, ie approximately a month before publication (eg 26 January for the March Issue). News items should be sent in writing (fax, letter or e-mail: gb2rs@rsgb.org.uk) by the club secretary or the person responsible for publicity. Post cards for this purpose are available from RSGB HQ. A database of all meetings is shared between *RadCom* and GB2RS, so information only needs to be sent once.

INTERMEDIATE SUCCESS IN MIDLANDS...

The successful members of the Charlie Delta ARC with their instructors.

The Charlie Delta ARC's (www.cqdx.co.uk) first Intermediate course was a success with all 10 candidates passing. They wish to thank Dave, M0DCM, and his assistant Dave, G0MJY, for all their hard work. The Charlie Delta ARC will be running a Foundation course on 22 June and are hoping to run another Intermediate course for those who wish to take the next step. The club is also thinking of running the Advanced course in the near future for those who have passed the Intermediate exam. Further information from M0DCM, tel: 01902 635244; e-mail m0dcm@blueyonder.co.uk

... AND DUNDEE

Left to right: Tom Harrison, GM3NHQ; Jim Boag, MM3KKT; Stuart Higgins, MM3GTR; and Bob Ganson, MM0BTD, of the Dundee ARC.

The Dundee Amateur Radio Club (www.dundee-amateur-radio.co.uk) is pleased to announce that its members Stuart Higgins and Jim Boag successfully passed their Intermediate radio licence exam on 18 May. Thanks go to Tom Harrison, GM3NHQ, for his tuition and to Bob Ganson, MM0BTD, for invigilating the exam.

YEOVIL ARC's 20th QRP CONVENTION

The 20th annual Yeovil QRP Convention was held on 18 April in the Digby Hall, Sherborne, Dorset, preceded a couple of weeks before by the associated 'Fun Run' QRP contest. The speakers were Rob Micklewright, G3MYM, on transmission lines and how they work; Rob Mannion, G3XFD on *PW* present and future; and Adrian Dening, G4JBH, with a practical demonstration of modulation characteristics.

During the convention the Yeovil Club was presented with the G2NJ Trophy. This is awarded annually by the G-QRP Club to the member considered to have made the best contribution to international QRP during the year. The plaque was presented by Bob Hudson, G4JFN, of the G-QRP Club and received by George Davis, G3ICO, on behalf of the Yeovil Amateur Radio Club.

The Construction Challenge, to build the most accurate frequency measuring device using only passive components, was won by Peter ▶

Bob Hudson, G4JFN, of the G-QRP Club presents George Davis, G3ICO, of the Yeovil Amateur Radio Club with the G2NJ Trophy.

Welch, G3OFX.

Some 36 QRP stations in seven countries took part in the 'Fun Run'. The winners were: 40m section: GW4ALG; 80m section: G4PRL; both bands: GW4ALG. The station consistently using the lowest power was F6GGO, who used 2 watts throughout the event.

BRACKNELL AMATEUR RADIO CLUB

At the recently-held AGM of the Bracknell Amateur Radio Club (www.g4bra.org.uk) the following committee was elected for the 2004/2005 year: Chairman: John Ellerton, G3NCN; Secretary: Simon Poysden, G1BND; Treasurer: Dave Sergeant, G3YMC; Minutes Secretary: Elaine Poysden, M1KDA; Co-opted Members: Steve Baugh, G4AUC; Newsletter Editor, Richard May, G8IBP.

The club meets at 8.00pm on the second Wednesday of every month at the Coopers Hill Youth and Community Centre, Crowthorne Road North, Bracknell, Berkshire; visitors are always welcome. For further information tel: 01344 425666.

READING DOUBLES MEETINGS

The Reading & District Amateur Radio Club (www.radarc.org) will be reverting to *two* meetings per month, on the second and fourth Thursday of each month (excluding December), commencing in September. Further details from Pete, G8FRC, tel: 01189 695697.

HOOVER (MERTHYR) ARS

Following its recent AGM, the new secretary of the Hoover (Merthyr) Amateur Radio Society is Howell Thomas, MW0ATG.

BRAINTREE CLUB GOES FROM STRENGTH TO STRENGTH

The Braintree Amateur Radio Society (www.badars.org.uk) held its AGM on 17 May. An unusually good turnout - for an AGM - was seen and there was no shortage of members willing to take on new posts on the committee: a refreshing change! Presentations were also made to recognise work carried out by members during the year. The Founders' Trophy was awarded to Keith Rawlings, G4MIU, for his work in helping the club and promoting amateur radio in general and club newsletter editor Dean, G4WQI, awarded the Harold King Memorial Award to Dave Penny, G3PEN, for his varied and interesting contributions over the year.

PHOTO BY GEOFF, G0BYH.

Braintree club chairman Dave, G0DEC, presents Keith, G4MIU, with the Founders' Trophy.

There was also a large turnout for the Braintree ARS's annual construction contest. Members and visitors saw a varied range of entries from antennas to beautiful wood turned bowls. Each member gave a short talk describing their entry and then everyone was given the chance to vote and award marks out of 10 for their favourite entry. With only 35 marks separating first and last places it was a very close contest. In third place with 125 points was Steve, G8YVR, with a crystal calibrator. In second place came Melvin, G0EMK, with 131 points for a 4m vertical antenna. The winner, though, with his first-ever entry, was nine-year old Ben Rawlings, M3EUO, with his 40m receiver, scoring 136 points. Ben was presented with the Constructor's Trophy.

The club is going from strength to strength and new members are welcome.

BUSY YEAR AT LINCOLN SW CLUB

The Lincoln Short Wave Club (LSWC, www.lswc.co.uk) has had a busy start to the year, being active as GB0EM from Ellis' Mill for the Mills on the Air weekend. One of its younger members Jade, M3JDE, aged 15, operated the VHF station while club chairman, Peter Kendall, M0EJL, and Jim Stevenson, G0EJQ, among others worked the 7 and 3.5MHz bands. The club was inactive on the Saturday of the Mills weekend as it was hosting another Foundation course, which brought the total number of new M3s from the LSWC to 20. Instructor Bob Shaw, G3VRD, and many other members have helped to bring new blood to our hobby.

This year, as last, LSWC will be operating during the 'Museums on the Air' event as GB0MLL from the Museum of Lincolnshire Life, Burton Rd, Lincoln. For the D-Day commemoration, the club is operating as GB2CWP from RAF East Kirkby, near Spalding. This aviation museum has the distinction of being the most haunted airfield in the country (as seen on TV's *Most Haunted*) and club members will be camping overnight, though Baz Matthews, M3DMV, the LSWC's Activities Manager says, "I doubt we'll get much sleep as things go bump in the night. The callsign is in recognition of the current owners' son, Christopher Whitton Panton, who sadly died in a Halifax MkIII." The LSWC and RAF East Kirkby are working together to build a permanent amateur station at the airfield, which will also house a small radio museum. The on-site shack will be open to visitors, and the station will be operational frequently. The shack is scheduled for completion by the end of June.

Finally, the LSWC 'Hamfest' will take place this year at the Showground, Newark, Nottinghamshire, on 19 September (see www.hamfest2004.secret-bunker.org.uk).

OLDHAM ARC'S NEW WEBSITE

The Oldham Amateur Radio Club now has a new website address: www.oarc.org.uk The club meets every Tuesday at 7.40pm at the Air Training Corps, Park Lane, Royton, Oldham. The club also runs Foundation and Intermediate courses. For further information contact the secretary, Mike, M1CVL, tel: 01706 367454 or e-mail: M1CVL@thersgb.net

SEEN AT THE VMARS RALLY

Thanks to Mike Buckley of the Vintage and Military Amateur Radio Society (VMARS) for sending in these two photographs of military manpacks and 1950s equipment (a KW Vanguard transmitter and Eddystone receiver) seen at the VMARS Southern Event in Worthing on 3 April. The event is a rally organised by members of VMARS and open to all.

GREEN'S MILL ON THE AIR

On 8 May the South Notts Amateur Radio Society (www.snarc.org.uk), the South Normanton & District Amateur Radio Club and the Amateur Radio Club of Nottingham put on a special event station at Green's Mill (www.greensmill.org.uk) in Sneinton, Nottingham, for the 'Mills on the Air' weekend. The windmill and science centre is now the home of the South Notts ARC. The mill was named after George Green, the 19th century mathematician who devised Green's Theorem, still the basis of many electrical theorems used today. A half-size G5RV antenna was attached to the sails of the windmill as an inverted-V. Over 300 members of the public visited the mill and science centre during the weekend.

Some young members of South Normanton and District ARC on the air from Green's Mill

Supporters of the Radio Communications Foundation

We asked members when renewing their membership to include a donation to help to continue to support the work of the Radio Communications Foundation. The following is the list of those members who have kindly sent in a donation by the deadline date for this issue. Contributions continue to be wanted: if you would like to help, please send your donation to RCF, c/o RSGB HQ.

RCF 'Big Hitters'

Stockton & District ARG,	G4XXG
Dr R Harkess OBE,	GM3THI

A F Hunt	M1FIN	P Hey,	G4JHS
M J Livingston,	A92EV	K F Barnard,	G4MMA
W Gellerich,	DJ3TZ	J P Hart,	G4POF
V Climente Valero,	EA5OO	C A Toomer,	G4RKE
R W Shaw,	EI2EL	C C Webber,	G4SCD
Dr W Piotrowski,	G0BOE	T T Harber,	G4SZS
J A Frost,	G0DCR	K H Kirby,	G4VKK
W H Cross,	G0ELZ	M H Day,	G4ZKI
Vale of Evesham RAC,	G0ERA	P G Harris, J H Broughton,	G4ZOB G4ZSV
J A Pears,	G0FSP	S J Cocks,	G4ZUL
E R Flower,	G0GCN	D G C Hicks,	G6IFA
Y Katoh,	G0GRV	D E Parr,	G6OSO
D W Mason,	G0HPJ	R M Saunders,	G6VAX
R Battersby,	G0IMB	T Jarvis,	G6XTZ
W G C Bowles,	G0KCZ	A H Mutimer,	G6YYU
V Denecker,	G0LMX	K F H Newland,	G7AIE
L G F Bradshaw,	G0MRL	R C Ward,	G7BJD
L J Volante,	G0MTN	O J Chivers,	G7JXZ
J W Fox,	G0OWB	N D Fisher,	G8ATO
A G Pinnock,	G0PIN	G Lindsay,	G8BZL
J A Marsden,	G0RRR	J Clee,	G8EYQ
K Greatorex,	G0THF	J Harman,	G8GIU
R E Fisher,	G0UEB	T I P Trew,	G8JXV
S H Barthorpe,	G0UVM	A P Branton,	G8VUS
R B Verrall,	G0VEB	A J Wills Browne,	GD4XWB
C L Thomas,	G0VTE	M H McFadden,	GI3VCI
J Hodges,	G0WRN	J H Sander,	GI4BUJ
DJ Penrose,	G1CWZ	D F Gray,	GJ3XOJ
D J Austen,	G1EHF	R Kelly,	GM0GRD
Dartmoor Radio Club,	G1RCD	L R Alexander,	GM0LVK
R Mallender,	G1UPL	H J L Smith,	GM1CQC
L J Mackenzie,	G1XUO	D J Mackay,	GM3SYO
B L Underhay,	G1YES	D W Clouting,	GM3YGS
G G Jessup,	G3AMG	A W Ross,	GM4PMT
P R Burridge,	G3CQR	R B Gall,	GM4UFD
B J Shaw,	G3CRJ	J M Thomson,	GM8GUX
B J Gealer,	G3DEF	A Swiffin,	GM8OEG
W J Omer,	G3DOJ	B A Morgan,	GW0GQC
D D Rolph,	G3DXD	Mrs J James,	GW0KPD
B O Leach,	G3DXY	J R D Morgan,	GW4AYJ
R G Morris,	G3FDG	J Bird,	GW4BDV
P J Simpson,	G3GGK	J R Williams,	GW4TSG
M J Street,	G3JKX	J H F Markham,	GW6INF
J S E Pearce,	G3MEC	Dr B H Allen,	M0BZE
D Edmunds,	G3MJW	G Sturanovic,	M0EAA
A R Smith,	G3MPB	K G Chadwick,	M0TMO
R M F Inman,	G3MYG	O G Prosser,	M0WIN
G C Driver,	G3NDE	G M Ellis,	M1BLQ
J G Burnett,	G3OLW	B A Sutton,	M1EFF
D J Sumner,	G3PVH	A H J Blurton,	M1KAB
P L Rudwick,	G3RDR	R W Coggle,	M3ARI
D J W Price,	G3RLF	Mrs E M Wheeler,	M3DPM
D W Trowell,	G3RML	G Patrick,	M3EKB
W A Gordon,	G3SEG	A D Waddington,	M5AMN
D S Woods,	G3TGC	K Sharples,	M5KEN
Dr S A G Chandler,	G3UDD	R A M Burns-Allan,	MM1BYY
Mid Warwickshire ARS,	G3UDN	B M Gigg,	MW0CCJ
D I Gould,	G3UEG	S Redmond,	MW0ZZK
M J Peake,	G3UIJ	T Coates,	RS177805
C G Parsons,	G3WTU	K McCarthy,	RS185961
R W Moore,	G3YUX	C Atukorale,	RS193152
D A Bailey,	G3ZNR	M Addicott,	RS19615
A E Nightingale,	G3ZPU	E G Biggerstaff,	RS21990
M R L Smith,	G4BTE	A D Bailey,	RS26888
A Korda,	G4FDC	J M Harmer,	RS40312
Dr J Clarke,	G4FFD	J Waddington,	RS92362
D J Sewell,	G4FVK	Raynet (N Ireland),	RS95281
R A W Sheppard,	G4GFQ	G L Palryd,	SM5AOG
P H Pearson,	G4GXI	P J Naish,	VK2BPN
G A Brownell,	G4HRA	G R Lengling,	W9DHI
G Tonge,	G4IDG	S Westrich,	WB8OWM
L W Cain,	G4IKO		

The RSGB is also grateful to those many generous members who have sent donations anonymously, or who have asked us not to publish their names.

Radio Communications Foundation to provide bursaries to sixth form students

The RCF has joined up with the Arkwright Trust to encourage sixth form students with an interest in radio communications

The Radio Communications Foundation (RCF), has joined forces with the Arkwright Trust to provide bursaries to Sixth Form students who elect to take maths and a science-based subject at GCE 'A' level.

Recipients must have an interest in radio communications and must apply through their schools' Design and Technology departments. Applicants have to sit a formal examination, which is set by the Arkwright Trust, and attend an interview. The bursary, which is £800 per year, is split into two halves: £400 going to the school and £400 to the student. The money is to be used for educational purposes.

The RCF will provide one bursary in 2004 and, from 2005, three bursaries annually.

GB4FUN FEATURES IN *THE TEACHER*

The April / May 2004 edition of *The Teacher*, the magazine of the National Union of Teachers, carried an article by Ann Logan on GB4FUN and in particular the visit of the RSGB mobile amateur radio demonstration vehicle to the King's School in Canterbury, which was reported in *RadCom* (April 2004, page 15). In the first three days after publication of the article, Carlos Eavis, the GB4FUN manager at RSGB HQ, received four enquiries from teachers about booking GB4FUN for their schools, which just emphasises how important publicity - simply getting the message out - is when promoting amateur radio. ♦

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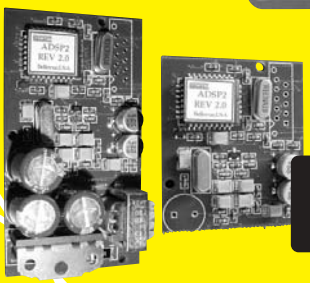

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Reviewed by Chris Lorek, G4HCL

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Digital voice transmission: the AOR ARD9800

Back in 1999, Andy Talbot, G4JNT, and Charles Brain, G4GUO, were experimenting with digital voice transmission over a 70km path on 40m SSB. An article [1] was published in *RadCom*, a paper presented at the 18th ARRL/TAPR Digital Communications Conference, and another article in the May / June 2000 edition of the US-based experimenters' journal *QEX*, yet their digital voice modem remained an experimental, and definitely entirely home-made, piece of hardware. The hardware-based modem gave excellent FM-quality voice over an SSB mode and bandwidth, using a digital vocoder and DQPSK modulation with 36 tone carriers spaced at 62.5Hz, with an overall bandwidth of 312.5Hz to 2500Hz. This allows the system to be used in a standard SSB bandwidth, as well on other modes such as AM and FM (a comprehensive technical description is on G4GUO's website - see 'Web search').

The Japanese company of AOR has now 'grabbed the bull by the horns' and turned Charles's and Andy's ideas into a commercially-available piece of hardware, the ARD9800 digital communications modem.

SELF-CONTAINED

The ARD9800 is a stand-alone unit, which simply connects to the microphone input and speaker output connections of a transceiver and a suitable 12V DC supply. It measures 100 x 32 x 158mm, weighs around 600g, and comes supplied with plug-in speaker-microphone, DC supply lead, PC interface cable, speaker cable, an eight-pin plug matching the 'radio' connector at the rear of the unit, and a user instruction manual. Apart from the radio termination, for which you'll have to make up a lead to suit your transceiver, the rest is almost a simple 'plug in and go' operation. If you're not skilled with a soldering iron, ready-made leads to suit a variety of radios are available, as AOR have chosen the standard 'Adonis' microphone connection pin arrangement for their 'radio' interface connector.

So, after I'd made up a lead to match my HF transceiver, I was ready to put it on the air. This was a simple exercise of first adjusting the receive audio volume level on my transceiver so that the 'Over' LED on the modem's front panel just extinguished, and secondly adjusting the mic gain on my transceiver to suit the modem's transmit output level. There's a pre-set level adjustment on the modem for this, accessible using a small screwdriver via a hole in the lower case lid, but I found I didn't need to adjust it. The receive audio is usually routed to a small speaker on the top case lid of the modem, the speaker-mic can also be used for this. A 3.5mm external speaker jack socket is also fitted on the rear panel. I used this with my external desktop speaker on receive as the modem's small internal speaker was, fairly naturally, a little 'tinny' sounding.

OPERATION

With the modem's front-panel analogue / digital switch set to the analogue ('~') position, conventional SSB operation is available. To use digital voice, you simply set the switch to the digital ('10101') position and incoming digital audio is automatically decoded (non-digital audio is simply routed straight through).

On receive, the speaker volume is adjusted by using a small rotary volume control on the modem's front panel - it's important to keep your main receiver volume unaltered once it's been set to the right level for the modem.

On transmit, the first second of each transmission is taken up by a synchronisation header, during which the 'BUS' LED on the modem's front panel flashes. After this, it lights steady red to show you're in digital speech transmit mode. This is important, in that you need to wait at least a second after pressing the PTT before you start speaking otherwise the first part of your transmission will be lost. Unlike normal SSB, where the average power is usually much less than the PEP, in digital mode the transceiver is being run in virtually 'constant carrier' mode, ie 100% duty cycle just like RTTY or PSK31. Remember this if you're using a linear amplifier!

DATA

You can also send and receive data with the modem at an impressive over-air 3600 bits/sec rate, using a terminal program such as Windows HyperTerminal. Both ASCII data or binary data (eg for file transmission) can be used, and both types can be mixed as communication data. However, you need to be careful with certain data 'strings', as the hexadecimal [FE] command is used to signify the start and end of each data stream – you'll need to use a conversion if [FE] appears in the middle of your data stream. At the receive end, the data is automatically decoded by the modem, and displayed by the other station's terminal program.

DIGITAL IMAGE COMMUNICATION

Within the modem is a plug-in slot for an optional memory module. If

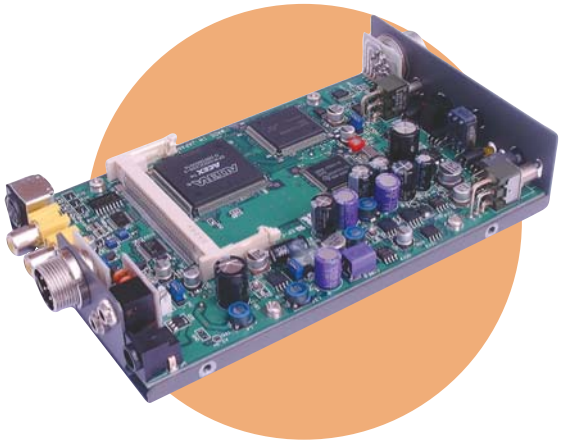
It seems like the whole world of wireless communications has either gone, or is going, fully digital. That is, apart from radio amateurs using speech on SSB or FM. But that may not be for too long, as Chris Lorek reports...

Fast Data Modem

this is fitted, you can also send and receive TV-resolution digital video frames. Just connect a video input, eg a standard PAL TV camera, to the relevant socket on the rear panel, and press the 'TX' push button on the front of the modem. This will 'grab' a frame of video and send it over the air, using JPEG compression. A typical frame will take around a couple of minutes to be transmitted. US versions come with NTSC video, so note that trans-Atlantic video contacts may not be compatible unless you've the appropriate image-conversion system at your station (eg most domestic video recorders can replay PAL and NTSC video). A video output phono socket connects to your video monitor for playback and monitoring.

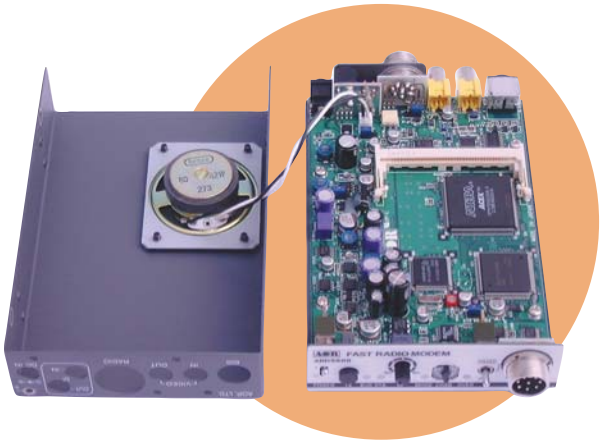
SELECTIVE CALLING

If you wish, using the PC interface you can program a 'digital squelch' into the modem. Here, you can assign your own five-digit identification number, and specify the ID numbers for your destination stations. The ARD9800 I tested was also equipped with an IDENT and NET-MASK facility. This allows the digital squelch to remain muted until you are called by a member of your own group or groups, with 16 selectable addresses and scenarios. I simply kept this at the default of '00000' for all, although communicating with others who have pre-programmed other IDs was quite satisfactory as long as they'd not programmed the NETMASK/ID decode as activated.



The ARD9800 uses a published 'open' protocol of data communications, so this is fine by most regulatory bodies including the UK's Ofcom and the US's FCC for over-the-air amateur use. An obvious question is of course whether it could be used commercially and, yes, there's a professional version, the ARD9900, which adds selectively switched data encryption for over-air communications security.

ON-AIR RESULTS



In normal use on receive, whether digital mode is selected or not, as soon as the unit detects a valid digital audio code it automatically switches to receive digital mode. With the help of RSGB Spectrum Forum Chairman and HF Manager Colin Thomas, G3PSM, using a similarly-equipped station, we conducted a number of tests on various bands, times and antenna systems to replicate various operating paths and associated signal strengths.

Our initial findings on weak but copyable SSB paths were, to be honest, a little disappointing. Sometimes the unit would try to decode, other times it wouldn't, other times we just got very garbled audio. But as soon as we chose a path giving '59 copy' the results were astonishing! Absolutely 'telephone quality' speech was the result - you really could not believe this was HF SSB! A digital Automatic Frequency Control (AFC) of ±125Hz is built in, so you don't have to be spot on frequency, likewise if one station changes frequency slightly in mid-contact you'll still remain 'locked in'.

All in all, if there was a good path available for reasonable quality SSB, above around 15dB signal-to-noise ratio (ie R5 copy) from my on-air test results I found the units would synchronise and work very well. Below this, a trained ear would still be able to read the SSB along with various pops, crackles and other interference to at least some degree, whereas the ARD9800 wouldn't be able to cope. Admittedly, unlike weak-signal text-based data modes such as PSK31 and PacTOR, G4JNT and G4GUO certainly didn't claim this to be a weak-signal mode, saying it requires "about a 25dB SNR to function", which I'd go along with.

The ARD9800 is currently available in the UK and USA, and besides these countries you'll also find users to my knowledge in Cyprus (5B4AFQ), Denmark (OZ1DX, OZ1UL, OZ1UM, OZ1YA, OZ2FF, OZ4PY, OZ6TX and OZ7JP), and the Philippines (DU1EOV).

I wasn't able to test the modem over a wide variety of selective-fading and multi-path selective fading propagation scenarios, mainly due to the lack of many others using the system at the moment. However, over the mixed ground wave and NVIS sky-wave paths I tried the unit on, it did perform admirably as long as a reasonable signal-to-noise ratio was there. The modem has an inherent 4mS 'guard interval' together with Forward Error Correction (FEC) to help against this, which did seem to work well. It also appeared to be able to get through constant-carrier and switched-carrier (eg CW) interference, probably due to the 36 different tone frequencies used together with the FEC.

Although each transmission gives a digital preamble, if the data synchronisation fails, either at this point or in mid-transmission due to QRM, I found that (as the instruction manual suggests) manually switching over to 'analogue' mode and then

pressing and holding the front-panel 'TX' button would often give a gradual but successful decode of the incoming digital audio.

"CQ DIGITAL"

As digital voice on HF is currently in its infancy, unless you've prearranged a sked you'll probably find it a 'hit-and-miss' affair to get contacts! There's a suggested calling frequency of 18162.5kHz for this, although an initial call in normal USB of "CQ Digital" would probably not go amiss. Unlike some other countries such as the US, where callsign identification is OK in the mode being transmitted, here in the UK you'll need to identify your callsign at least every 15 minutes in a traditional analogue mode. This means, during 'ragchews' and the like, switching back to normal SSB and giving an analogue SSB (or CW) speech identification every so often. I'd have preferred an optional 'auto-CW' ID to have been included, as present in many packet and multi-mode terminal units, but this is just a minor point.

I did confuse a few amateurs on my local 2m and 70cm repeaters when I had contacts through these using the modem! The upshot of this, though, was that they became interested in the system, and are awaiting the day when either hardware prices come down or PC-based

soundcard software becomes available for the mode. Although I didn't test the modem in VHF/UHF FM mobile operation, AOR says this could result in periodic losses of data synchronisation due to mobile 'fast-flutter' signal fades.

THE FUTURE

Around 20 years ago I purchased a multi-mode radio data modem, for around the same price in today's terms as the ARD9800, and I haven't looked back nor ever regretted the decision. Likewise a few years later with a DSP filter unit which I built myself, as no commercial versions were available at the time. Since then other options, such as PC sound-card based software, have eventually become available for some of these modes, and as time marches on, so does technology and processor speeds. It could be a while before PC processors become fast enough to handle this digital speech mode via a sound card, but as history has proven, hardware-based solutions lead.

We already have commercial 'off-the-shelf' HF transceivers available with built-in RTTY and PSK31 data capabilities - just plug in a keyboard and off you go. Is it just a short matter of time until amateur radio equipment manufacturers add a further 'digital modulation' push-button to the front panel of their transceivers?

I feel AOR are to be commended in leading the field by launching a ready to use add-on set-top box which instantly transforms any amateur radio transceiver into a digital multimedia (speech, data, and video) transceiver.

Our thanks go to AOR (UK) for the loan of the pair of ARD9800 modems for review. The ARD9800 is available from all authorised AOR (UK) dealers at a current retail price of £499. ♦

REFERENCES

[1] 'Digital Voice Communication', by Andy Talbot, G4JNT, RadCom October / November 1999.

WEB SEARCH

Charles Brain, G4GUO (G4GUO / G4JNT digital voice modem 1999)	www.chbrain.dircon.co.uk/dvhf.html
AOR (UK)	www.aoruk.com

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The prizes in our competition are a bhi Wonder Wand portable antenna and the matching tuneable counterpoise system. Since the review was published, bhi has informed us that it has reduced the price of the Wonder Wand. It now costs £89.95.

The tuned counterpoise system is £59.95 and there is a 'W Wand Offer' of the two items together for £139.90.

The full rules are listed below. (Hint: re-reading Chris Lorek's review in the June 2004 RadCom will help you with the answers!)

COMPETITION RULES

Look at the three multiple choice questions below. Write your answers on a postcard or the back of a sealed envelope (no letters accepted) and send to: 'Wonder Wand' Competition, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Entries must be received at RSGB HQ by first post on Monday 2 August. You must be a current member of the RSGB on the closing date of the competition (2/8/04) in order to enter. The winner will be announced in the September RadCom.

Q1. The bhi 'Wonder Wand' operates on which bands?
(a) 7 - 50MHz bands (b) 7 - 144MHz bands (c) 7 - 430MHz bands.

Q2. To what length should the telescopic whip be adjusted for operation on 7 to 28MHz?
(a) 33cm (b) 1.0m (c) 113.5cm.

Q3. Where is the 'Wonder Wand' made?
(a) Japan (b) Great Britain (c) USA.

THE SMALL PRINT

Only one entry per member (multiple entries will be disqualified). No other correspondence can be entered into. All entries will become the property of the RSGB. Please state on your entry if you do not wish to receive further promotional material or offers from the RSGB. The competition is open to current RSGB members only. Employees of the RSGB and of bhi are not eligible to enter.

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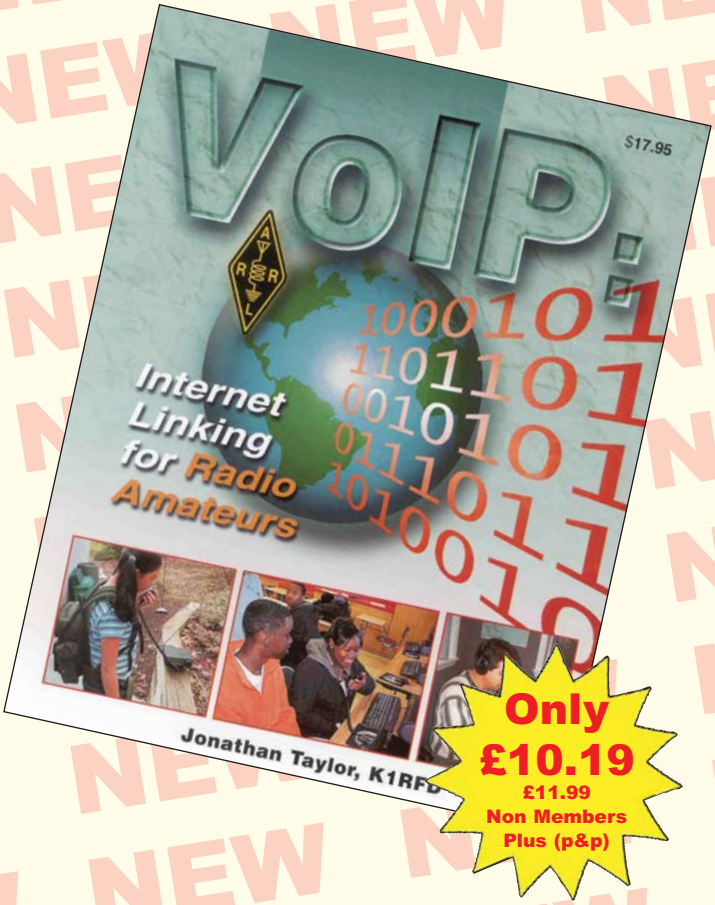

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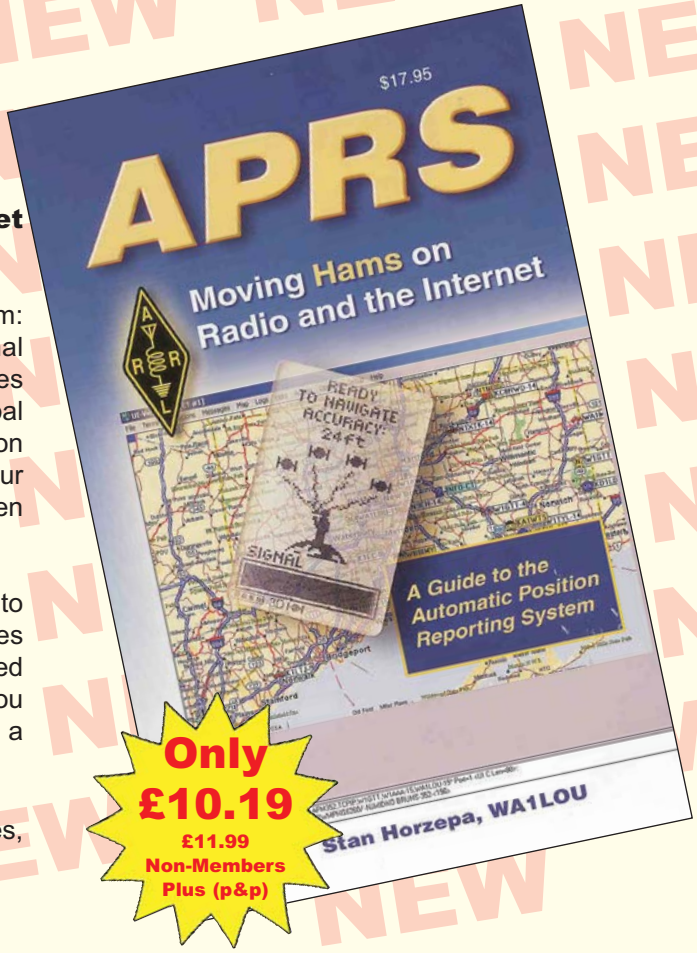
2004 Edition, The American Radio Relay League, Paperback, 144 pages, size 228x182mm
ISBN : 0-87259-926-4



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2004 Edition, The American Radio Relay League, Inc. 160 pages, size 212x137mm. ISBN: 0-87259-916-7

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Digital voice transmission

ARD9800 Reviewed by Chris Lorek in July'04 RadCom...

"I feel AOR are to be commended in leading the field by launching a ready to use add-on set-top box which instantly transforms any amateur radio transceiver into a digital multimedia (speech, data, and video) transceiver."

The ARD9800 is a modem unit that connects to the microphone input of virtually any transceiver. The user simply wires a connector for his particular transceiver, connects the speaker output of his transceiver to the modem and then connects the modem to a 12V DC power source... no modification is required.

The ARD9800 provides NEAR FM QUALITY audio using SSB. Even better, the digital signals require no more bandwidth than analogue signals, this is achieved through **OFDM** (Orthogonal Frequency Division Multiplexing).

Normal analogue operation is possible (because the transceiver has not been modified). To use digital voice, simply select the DIGITAL MODE on the ARD9800, incoming signals are automatically decoded, no selection necessary. So, if an analogue signal is encountered, the transceiver operates conventionally, however if a digital signal is encountered, the ARD9800 automatically selects the digital mode so that high quality interference free audio is produced.

The ARD9800 can be used in any mode, SSB, AM and FM, however FM mobile operation could be prone to 'picket fencing' (fast flutter) on VHF/UHF which could result in the loss of data. With the **optional memory board**, images can be easily transferred, similar to SSTV. Currently SSTV images are in NTSC, a PAL version is near completion. ***£499.00 inc VAT, UK carriage free***

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Steve Hartley takes a look at the April 2004 Foundation, Intermediate and Advanced licence exams. How did you get on?

Newcomers' news

April was a busy month for exams with all three levels being sat in the same month for the first time. Let's see how readers faired...

The results of the first Advanced examination were delayed due to the absence of a pre-determined pass mark. There are fewer candidates at this level, so students and tutors should be aware that 'instant' results are unlikely until sufficient numbers have sat the exam to allow a standard pass mark to be set.

One candidate who contacted me thought he had done enough to pass but was quite nervous until he received his pass slip. He thought the paper was 'fair' but contained more calculations then he had expected. Congratulations to those who passed and I hope those who didn't will try again soon.

INTERMEDIATE SUCCESSES

The practice papers offered through the column appear to have been useful to those who had them, as several readers have let me know that they passed the April exam after using them for revision.

Dewi Roberts, GW0ABL, is the Lead Instructor at the Dragon Amateur Radio Club on Anglesey. Dewi was one of the tutors who had copies of the Intermediate practice papers. By return, he sent in his own practice paper, which he is happy to offer to others through the column. E-mail requests to me, or send a stamped addressed envelope for postal requests, please.

The Dragon club's Intermediate and Foundation courses are supported through the club's Education Fund, built up from members' donations. Club meetings are held at Abeneser Hall, Llanfairpwll on the first and third Monday evenings of each month. Les Hayward, MW0SEC, is the Secretary and can be contacted on 01248 470606 or les@corfe-castle.demon.co.uk

YOUNGEST FOUNDATION

Kevin O'Reilly, GW0KIG, keeps the Welsh theme going with a report that eight year-old Daniel Jones is the youngest person to complete successfully the Foundation course at Highfields ARC in Cardiff. Courses at the Highfields club are run under the leadership of Rob Lannon, GW6ZHM.

A very happy Daniel Jones with Highfields ARC Chairman Tom Roberts, GW0WHT, and, to Daniel's right, course tutor Rob Lannon, GW6ZHM (see 'Youngest Foundation').

It is worth noting that Foundation students are now expected to know the phonetic alphabet and that antenna orientation determines the polarisation of the radio wave. *Foundation Licence Now!* has been amended to reflect these changes.

THE INTERMEDIATE VFO

I have had several enquiries about the variable frequency oscillator (VFO) in the *Intermediate Licence* book. Some questions relate to the availability of components and others to what to do with it once built.

It was never the intention that the VFO should be built by students as a stand-alone project. The idea was to give tutors a fall back in case students decide to build something that does not include a VFO. That said, it is an interesting project if you have never built a VFO before and it makes a good demonstration tool for drift, stray hand capacitance, the effect of mechanical shock on a 'poorly constructed' oscillator, etc. Another instructor confessed that this was the first RF project that he had ever built. So much for the 'good old' RAE!

The components are all readily available (see 'Websearch' below). Various Field Effect Transistors (FET) have been used (MPF102, J310, 2N3819, etc) with excellent results. However, there is a word of warning if using something different to that shown in the book - check the pin outs. One instructor claimed a record 40-minute construction time but excluded the time it took to work out that the lack of oscillation was due to 'crossed wires'!

Cheap variable capacitors are getting more rare but they are still stocked by many sources or you can recycle parts culled from old AM / FM portable radios. A standard air-spaced variable will also work well but these tend to be more expensive.

What can you use the VFO for? I have run a small direct conversion receiver from mine and I added a buffer amplifier to help it drive a low power Morse transmitter. My VFO, with buffer, has also done service in the 'Colt' superheterodyne receiver from the RSGB's *Radio & Electronics Cookbook*. These would all be good projects for Intermediate students and I hope to write them up for publication soon.

WHY DOES NO-ONE ANSWER?

Ian Hogan, G0FYN, wrote to say that he had been approached by some newcomers who thought they were being ignored. Their CQ calls on 144MHz SSB were going unanswered whilst other stations were getting contacts. As it turned out the newcomers had been using vertical antennas when almost all VHF SSB stations use horizontal polarisation. The difference can make a strong signal unreadable. This means that the CQ calls are probably not being ignored - they may just not be heard.

Ian also makes the point that you should allow stations time to turn their beams. If the other station is using a rotator it may take a little while for them to point the antenna in your direction so please be patient and make good long CQ calls, as you are taught on the Foundation course.

Another newcomer once complained to me that she had made very few contacts in a 144MHz contest. When I asked what equipment she had been using it became clear why her score had been so limited - she had been calling on FM when most of the other contest stations were on SSB. Put the modes and polarisation together and your QSO (contact) count should increase! ♦

WEB SEARCH

Some component suppliers:

JAB	www.jabdog.com
Sycom	www.sycomcomp.co.uk
J Birkett	www.zyra.org.uk/birkett.htm
G-QRP Club sales	www.g4wif.fsnet.co.uk

By Peter Dodd, G3LDO

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G3LDO (ex-VQ4HX, VQ1HX, VQ3HX, 9L1HX, PA9APV, ZK1XE and CN2PD) brings us the benefit of his experience in operating on 'one-man' DXpeditions from holiday venues.

One-man holiday

In the depths of winter you (or your partner) may have booked a holiday to that seductively sunny location selected from a brochure from one of the local travel agents. If, like me, you get bored with beaches or irked by excursions after a couple of days, you could plan some amateur radio into the vacation. In this regard I am thinking more about a mini-DXpedition using HF and I am assuming that this is a 'normal' holiday with amateur radio being just a part of it. It follows that you would need a set-up that will give the maximum number of QSOs for the limited time you might have for radio operation.

Although this article is a general description of the considerations regarding taking your amateur radio equipment with you on holiday it also describes, as an example, a recent holiday to Marrakech in Morocco. Even if you don't plan to take equipment, always take a copy of your amateur radio licence: while on a world trip a few years ago I had the opportunity to operate from the QTH of a local amateur in Rarotonga, Cook Islands, and obtained the call ZK1XE on the basis of a good photocopy of my G licence.

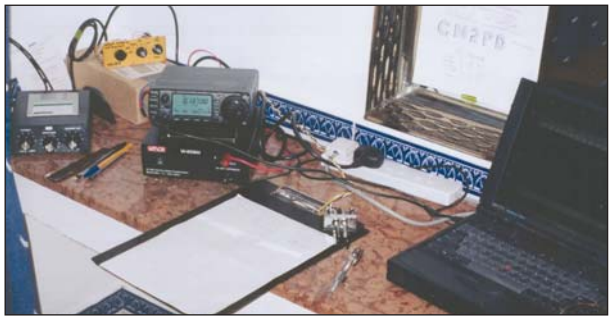
EQUIPMENT CONSIDERATIONS

The equipment and the antenna should be reasonably efficient yet relatively lightweight. If you consider that the maximum weight allowance for a package holiday flight is around 20kg, the weight of the radio equipment is an important consideration. It should be able to operate on as many of the HF bands as possible to take advantage of the varying propagation conditions that may be encountered in a short stay.

The Antenna and ATU

Starting at the antenna, the multiband doublet would seem the most flexible and practical solution. The length is not critical (a major advantage when planning an antenna for a location that you have never seen), and a 20m centre-fed length has worked well for me.

The antenna needs to be supported above the hotel or apartment roof, preferably at the centre, where the radiation is the greatest. The lightest and most portable of masts available is a telescopic fibreglass pole, originally made for fishermen and called a roach pole. This is only 1.2m long when telescoped and can be carried in hand luggage as a walking stick on the vacation flight. [A suitable source is the SOTA Pole from SOTA Beams - see www.sotabeams.co.uk/SOTAPole.htm and the article on page 52 - *Ed.*]



The CN2PD set-up at the Hotel Tikida Garden, Marrakech. The IC-706 sits on top of the Watson W-25SM SMPSU, with the MFJ-901B ATU to the left. Note the lightweight CW paddle key fixed to the clipboard.

Mohamed Fouad Menhal, the Reception Manager of the Hotel Takida Gardens, who proved so helpful in providing a suitable room and providing assistance with erecting the antenna, with author Peter Dodd, G3LDO.

The antenna can be installed by attaching the centre to the top of the support pole, which can be fed with 300 Ω ladder-line taped to the pole. This makes for an efficient antenna that is both lightweight and inconspicuous, as can (nearly) be seen in the photo. Ladder-line is good for running through gaps in doors or windows. The support pole can then be fixed to almost any convenient upright building structure using tape, tie wraps or string.

An essential item when using such an antenna is a suitable ATU with provision for feeding a balanced antenna. I tried to make a small ATU that would handle 100W but found obtaining the right sized components rather expensive and difficult to source. I found a suitable moderately priced unit, the MFJ-901B, which is not much larger than an FT-817 transceiver and weighs only 600gm.

The Transceiver and PSU

There are a lot of small transceivers around these days that are suitable for this sort of operation. I use an old IC-706 MkI, which has all the HF bands, plus 6 and 2m. It has a built-in CW filter and also integral SWR / power meter, which means that you don't have to take an additional instrument for tuning up the ATU. This transceiver has an output power of 100W and weighs 2.5kg - not the lightest transceiver available these days but very compact and rugged.

In the past the heaviest item needed for 100W operation was the power supply, with the transformer contributing most of the weight. This problem has been overcome with the introduction of the switch mode power supply unit (SMPSU). These PSUs have had a bad press due to the interference they can cause, particularly when installed in some television sets. However, I have to report that when using the Watson W-25SM SMPSU not a trace of interference could be detected, which indicates that the unit has very good built-in screening and filtering. It weighs only 1.6kg compared with a traditional transformer type, which can weigh as much as 10kg.

Miscellaneous

If you are into CW, you will probably want to take your favourite paddle key. There are a couple of reasons why you shouldn't. A paddle key is usually mounted on a heavy metal base, often weighing more than 1kg, to stop it skating around the desk when you are operating. This adds unnecessarily to the overall weight. Use a lightweight paddle and fix it to a clipboard as shown in the photo. There is a further consideration. The security X-ray systems at airports are very sophisticated and can see the internal structure of radio equipment even though in a metal box. However, they have problems

DXpeditions

with thick slabs of material, such as the base of a paddle, and you may be required to identify the item.

You may also wish to take a laptop computer so that you can log your contacts. However, my HP Omnibook 5700 weighs 3.5kg although some of the more modern ones may be lighter. I normally use an exercise book ruled with columns that I feel necessary; a low-tech solution that adds little to the overall equipment weight.

Unless you are really *au fait* with your modern rig it is wise to take some instructions of how to work through the menus and settings of your transceiver. Although I had spent some time familiarising myself with the lesser-used functions of IC-706, I found the photocopied instructions that I included did get used. The total weight of items other than the equipment described above is about 1.6kg (total weight just over 6kg).

SETTING UP

If you are lucky you will be allocated a room on the top floor of the hotel with easy access to the roof for installing an antenna. If you have been allocated a room that is unsuitable, don't be afraid to ask if you can change to a more suitable room; I have never had this request refused although I may have been lucky in as much as there were spare rooms available. Note that it is easier to make the change before unpacking suitcases!

If you are staying in an hotel, establishing good personal relationships with the hotel management at an early stage is important. The chances are they won't know what amateur radio is, so some education might be necessary and to this end a copy of the licence and some amateur radio literature is useful. The main reason is the business of erecting an antenna on the roof of the hotel. During my vacation / DXpedition to Marrakech, the Reception Manager even provided a couple of maintenance men to help me put up the antenna. Do not venture on to a hotel roof without permission.

Setting up an amateur radio station in an apartment is often a different matter because there may be no-one around to discuss the matter of obtaining permission.

For an AC mains connection I originally considered removing the British 13A plug from the PSU and fitting a suitable continental two-pin plug (or one appropriate to the country being visited). I decided against this approach and now prefer the use of a four-way 13A extension board. Some hotel rooms have only one mains socket and the distribution connector allows the use of British electrical items such as chargers and a hairdryer, without removing the 13A plugs. Furthermore, each item is separately fused. The extension connection to the hotel mains socket can be made via a 13A plug and an adapter - this arrangement allows the whole installation to be fused. A 10A fuse is suitable on a 220 - 240V AC supply. A 13A fuse will be required for a 115V AC supply.

Monsieur Kamal Moubarak from the Moroccan licensing authority calls to return the money that was incorrectly sent with the licence application. He also joined in with the birthday celebration of my wife, Erica.

The doublet on the roof of the Hotel Tikida Garden, Marrakech.

OPERATION

I am not that fond of pile-up and contest type operating, preferring short chats; what you might call 'rubber stamp QSOs'. However, if conditions are good to other parts of the world that regard you as DX, a pile-up will ensue. Use headphones to keep the noise in the hotel room down. I found the Heil headset with the boom microphone useful for this sort of operation. When things really got going the QSO rate could be two a minute. With my proficiency (or lack of it) on CW, the best I could do was one per minute. However, there are some real advantages for this mode for vacation operating: with headphones it allows QSOs to be made while your partner watches television. You can also sneak in an extra half-hour operation on the way back from the toilet in the middle of the night (the G3 complaint) without disturbing anyone.

THE CN2PD OPERATION

You may notice that the equipment shown in the photo opposite includes a laptop, against the advice above. The reason for this is that it formed, together with an LF preselector and amplifier (yellow box top left), part of some 136kHz listening experiments. The results of these experiments were described in the 'LF' column in *RadCom*, December 2003.

When it was first decided to go to Morocco, I found information regarding obtaining a CN licence difficult to obtain. The information I did receive indicated that I should write to the Agence Nationale de Réglementation des Télécommunications (ANRT) in Rabat, including a copy of my G licence and passport. I was led to understand that the fee was 300 Dirhams, about £20. In the event the correct procedure was to wait for a reply to the letter, which would include a bill for the licence fee, which is to be paid into a local bank on arrival (in this case only 70 Dirhams). Full details on obtaining a CN licence can now obtained from the RSGB Amateur Radio Department. ♦

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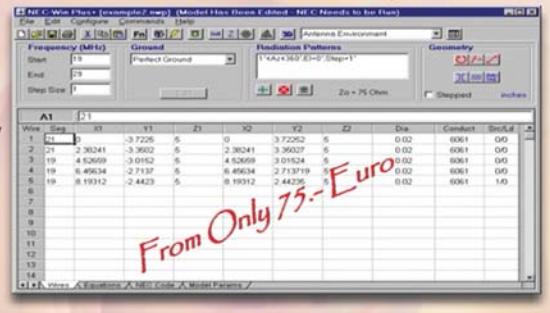

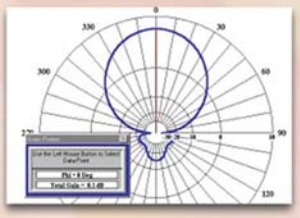

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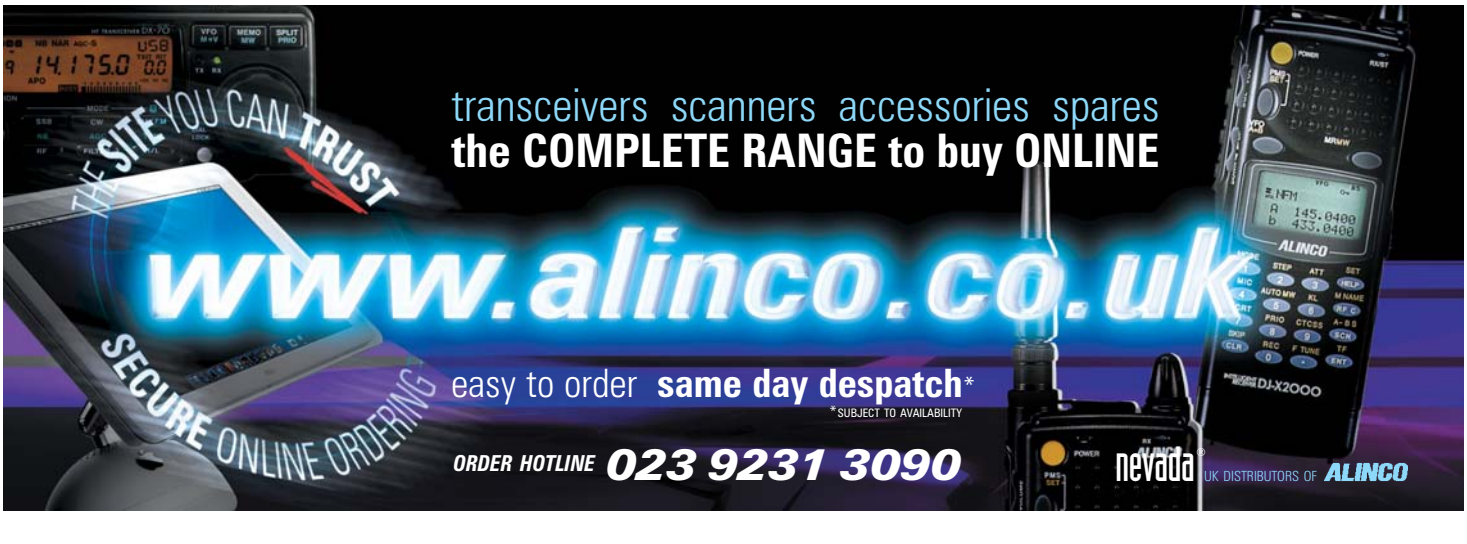

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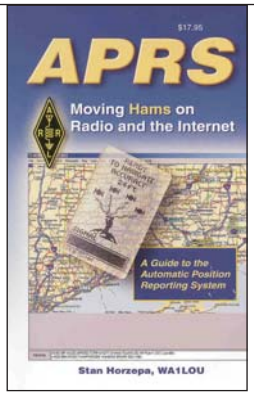

APRS – MOVING HAMS ON RADIO AND THE INTERNET
by Stan Horzepa, WA1LOU
Published by ARRL, 2004
Reviewed by RSGB Staff

Stan Horzepa, WA1LOU, will be well-known to many for his regular 'Digital Dimension' column in the ARRL magazine, *QST*. Many people will also recognise the letters 'APRS', and perhaps, even approximately, what they stand for but, beyond that, familiarity tends to be somewhat tenuous. I say 'approximately', because most people will say that APRS is an 'Automatic Packet Reporting System', whereas it is actually an 'Automatic Positioning Reporting System', as defined by its creator, Bob Bruninga, WB4APR, in the Foreword to the book.

Perhaps because of this familiar unfamiliarity with the system, Stan Horzepa has taken an unusual step with the formatting of his book. Instead of the usual dry procession of chapters on what it is, how it works and how it can be used, each chapter heading is a question: What is APRS?; What is the 'System' in APRS?; How Do I Interconnect the TNC and the Radio in an APRS Station?; How Do I Send and Receive Text Messages With APRS? These are just some of the headings (not consecutive). I suppose you could consider the book to be a very comprehensive FAQ on APRS. It even covers the *practical* uses of APRS.

Bob Bruninga points out that APRS usage has not saturated but, like the cellphone before it, the 'cells' need to be made smaller, with the powerful hilltop digipeater being the last thing a good APRS network needs. You don't agree? Read the book!

All the facts you need are here, with lots more besides. The small format of the book immediately makes it less daunting than it otherwise might have been. It is a follow-up to Stan's previous 1999 book *APRS: Tracks, Maps and Mobiles*, and also covers the evolution of the system since then. If you want to learn about APRS, this is the place to start.

APRS – Moving Hams on Radio and the Internet
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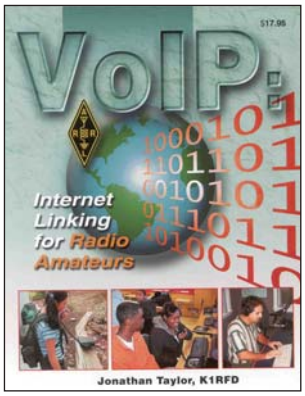

VOIP: INTERNET LINKING FOR RADIO AMATEURS
by Jonathan Taylor, K1RFD
Published by ARRL, 2004
Reviewed by RSGB Staff

For those of us who have held an amateur radio licence for longer than the Internet has been in existence, VoIP (Voice over Internet Protocol) might seem a little mysterious. Why would anyone *want* to use the Internet - since that is most certainly *not* amateur radio - to link two amateur stations together?

Well, very many amateurs might well want to. What if you live in a block of flats and you are unable to put up any external antenna whatsoever? If you live in a detached house you may still have antenna restrictions, the effect of which is that you find it difficult or impossible to make anything other than local or semi-local contacts. Even those amateurs lucky enough to be able to put up a large HF beam sometimes find themselves frustrated by the lack of *reliable* 'ragchew' contacts with stations on the other side of the world. Even when propagation conditions are good enough, HF band 'pile-ups' mean some amateurs are reluctant to spend a long time chatting with just one station. Interference can also make it difficult to hold a long conversation. But while it is of course *possible* to make such long-distance contacts, even using low power, for *most* of the time the ionosphere just will not cooperate! VoIP provides a solution for all these scenarios: using Internet linking it is possible to have 59+ FM-quality conversations with other amateurs while using very simple equipment such as 2m or 70cm handhelds.

VoIP: Internet Linking for Radio Amateurs is written by Jonathan Taylor, K1RFD, who is well qualified to de-mystify this subject, for it was he who, as recently as mid-2002, wrote the *EchoLink* software package. It is amazing to note that in less than two years *EchoLink* has been registered by 110,000 amateurs in 147 countries. Yes, this is an area of amateur radio which is moving extremely rapidly and we would be Luddites to ignore it. Internet linking is here, and is here to stay.

This book is ideal for the amateur who is vaguely aware of the existence of VoIP but who knows little or nothing about it. It starts off with a brief history of how Internet linking came about, followed by a chapter, 'Using a VoIP Link', which includes a gentle introduction to terms that may be unfamiliar to 'traditional' amateurs. Later chapters go into the practicalities of setting up nodes (note than an NoV is required if you wish to set up an RF node here in the UK) and more detailed explanations of what *EchoLink* and *IRLP* can do.

If your amateur radio interest is DXing or contesting, or if you're interest is in designing and/or building equipment to use on the air, Internet linking is probably not going to interest you that much. But on the other hand if you're into computers or if you simply enjoy conversing with like-minded individuals - either on the other side of the town or across the other side of the world - Internet linking could be just what you have been waiting for! And if your interest in making such contacts has been flagging, this could be just the thing to re-invigorate your amateur radio operating.

VoIP: Internet Linking for Radio Amateurs is a unique book - probably the *only* book on this most recent development of amateur radio published anywhere. If Internet linking is a subject that you want to learn more about, this book is absolutely essential reading.

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NES1061 Inc Fitting	£115.95
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Watson Supplies

W30-AM

0-15VDC
30/35A Peak
£119.95

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NEW

13.8VDC
25A Switchmode
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W-25AM 25A Supply	£89.95
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Will tune AR-8200, AR8000 & IC-R10
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Call for further details

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* Imp - 50 Ohms
* LCD readout
* 10-Digit display

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CN103N VHF/UHF	£65.95
CN801H HF/VHF	£109.95
CN801V VHF/UHF	£119.95

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CS-201 2-Way	£24.95
CX401 4-Way	£49.95
CS401N 4-Way NType	£Call

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AV-200
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CT12DX DX Paddle	£111.95
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Watson Antennas

Watson W2000
Bands 6m/2m/70cm
Gain 2.15/6.2/8.4dB
Power 200W (50W 6m)
Type 1/2, 2x5/8, 4x5/8
Length 2.5m
£69.95

W-30 2/70	£39.95
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W-300 2/70	£64.95
W-2000 6/2/70	£69.95
WBV-70 4m 1/2 Wave	£39.95

Bencher Antennas

Butternut HF-6V
Bands: 80/40/30/20/15/10
Height (Adj): 26 ft (7.9 m)
Weight: 12 lbs (5.4 kg)
Impedance: Nom 50 ohms
VSWR: 1.5:1 or less
£299.95

Butternut HF-2V 40/80	£229.95
Butternut HF-6V 80-10	£299.95
Butternut HF-9V 80-6	£349.95
Butternut HF-5B 20-10	£319.95
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A-17-12 17&12 ad for HF6V	£49.95
A-6 6m ad for HF6V-X	£14.95
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Hustler 5-BTV
5 Bands - 80-10m
Height 7.64m - Weight 7.7kg
SWR 1.15:1 - Power 1kW
£209.95

Hustler 4-BTV 4 Band Vert	£169.95
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West Mountain Radio

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RIGblaster M4	£109.95
RIGblaster RJ	£109.95
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Nomic 4P	£59.95
Nomic RJ	£59.95

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Tonna - 20655
23cms (1296 Mhz) 55 element 21.5 dbi gain "N" 4.64m long.

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Tonna 20811 2m 11el	£79.95
Tonna 20817 2m 17el	£99.95
Tonna 20909 70cm 9el	£45.95
Tonna 20919 70cm 19el	£59.95
Tonna 20921 70cm 21el	£74.95
Tonna 20635 23cm 35el	£64.95
Tonna 20655 23cm 55el	£89.95
Tonna 20745 13cm 25el	£69.95

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HF15FX 15m Mobile	£39.95
HF20FX 20m Mobile	£39.95
HF40FX 40m Mobile	£39.95
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X200 Base 2/70	£84.95
X300 Base 2/70	£99.95
X510 Base 2/70	£124.95
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A4S - 20/15/10	£569.95
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ASL-2010 13-32MHz	£749.95
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D3 - 20/15/10 Dip	£249.95
D3W - 30/17/12	£249.95
D4 - 40m Rotary	£349.95

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M-150GSA 1/4 2m Mobile	£11.95
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NR-770H 2&70 Mobile	£23.95
SG-7900 2&70 Mobile	£31.95
CR-627 6&2&70 Mobile	£33.95
X-200 2&70 Base	£58.95
X-300 2&70 Base	£63.95
X-510 2&70 Base	£98.95
V-2000 6&2&70 Base	£68.95

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CWS-160 160-10m	£114.95
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CWS-80 80-10m	£109.95
CW-40 40-10m	£84.95
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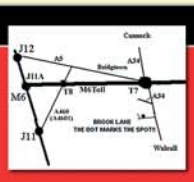

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1KW Auto ATU - 1.8-54MHz - 1-8 secs
Tune - Approx SWR Rating of 10:1

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LDG Z-100 *Best Seller!*

100w Auto ATU - 1.8-54MHz - 0.5 - 6 secs

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100w Waterproof Auto ATU - 1.8-54MHz
1-5 seconds Tune

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1:1 or 4:1 Balun - Covers 1.8 - 30Mhz
Power rating 200w

£29.95

LDG AT-897

100w Auto ATU for FT-897 - 1.8-54MHz

£199.95

Accessories:

K-OTT Kenwood Interface	£49.95
Y-OTT Yaesu Interface	£54.95
Icom-IC1 Icom Interface	£29.95
Alinco-IC1 Alinco Interface	£29.95
AC-1 Cable	£19.95

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W4RT Electronics

One-Plug-Power

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now.

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NEW! 1800 mAh Large Capacity FT-817 Internal Battery Soluion Still use Internal 817 Charger

OPP-897 £99.95

One Plug Power for the FT-897 4500 mAh; Fully Compatible with the FT-897 and Yaesu Charger.

NEW!

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now. One-Plug Power comprises a 1800 mAh NiMH battery pack, both over-termperature and over-current protection, connection to the FT-817 Molex connector, and a modified Yaesu battery cover door featuring a power jack that allows connection of a battery charger such as the Maha MH-C777 or MH-C888.

One-Big Punch

One BIG Punch (OBP) is a custom add-on accessory for the Yaesu MH-31 microphone commonly used with many Yaesu amateur radios

OBP £49.95

Speech Compressor for the Yaesu MH-31 mic and FT817 FT857, FT897. Improve the TALK POWER.

Hand Mike £57.95

W4RT Electronics Microphone with One BIG Punch Speech Compressor included.

The One BIG Punch is an AF-based speech compressor specifically configured to provide remarkable increase in talk power while maintaining good audio quality. The OBP is NOT a clipper, but a compessor providing great voice compression, high-level limiting, and noise gating. The unit can be mounted inside the MH-31, requires no additional electrical power, and can be turned on or off by using the MH-31's TONE switch.

One-Board-Filter

The One-Board Filter (OBF) affords you the opportunity to have both the Collins CW and SSB mechanical filters available in your FT-817 together!

OBF £229.95

Replace two filters in the space of one. OBF includes the two optional filters and fitting.

Collins Mechanical Filters
for the Yaesu FT-817, 857 & 897.

500 Hz CW - £94.95 ***2.3kHz SSB - £94.95***

This is the option that many, many FT-817 owners have requested. The OBF utilizes Collins Mechanical Filters that are the same as used in the optional Yaesu filters for the FT-817. The bandwidth of the 7-pole CW filter is 500 Hz and the 10-pole SSB filter is 2.3 kHz. The One-Board Filter is NOT available for installation by FT-817 owners. This is not a "do-it-yourself" option. The One-Board Filter must be installed by RADIOWORLD, or a competent engineer . If in doubt please call for details.

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OTT-817 £54.95

It requires no external power and works with both manual and automatic tuners.

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W4RT FT817 One Fast Charger	£Call
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W4RT FT-817 Stand

£19.95

Simply snaps into position. Adjust for desired height. Complete with non slip feet and allen wrench.

Professional-Grade FT-817 Stand

West Mountain Radio

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RIGblaster Plus	£139.95
RIGblaster M8	£109.95
RIGblaster M4	£109.95
RIGblaster RJ	£109.95
Nomic 8P	£59.95
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The Miracle Whip

RX - 0.6 to 460 Mhz
TX - 40,30,20,17,15,12, 10, 6, 2m & 70cm

Power Limits 25W PEP 10W Cont.

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Siro MAG 145 PL	£22.95
Solarcon Magz-17	£39.95

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Tokyo HL-50B HF / 50MHz Power Amplifier

£269.95

Frequency: 3.5 - 28MHz + 50MHz
Mode: SSB/CW, FM/AM
RF Drive: 5W (FT817)
RF Output: 50W PEP (25W AM)
Power: 13.8V 10A max

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SPECIAL OFFERS

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Suits most Icom Radios

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Max. output current: 20A (full duty)
Operating temp. range: -10°C to +60°C
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Alinco DR-M10 10 Metre Transceiver £99.00
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The CEPT licence

Going to use your radio abroad this year? If you are going to a CEPT country then read this first. The regulations are changing following the decisions at WRC2003.

The CEPT recommendation T/R 61-01 permits the holders of a Full (Advanced) UK licence to operate abroad in certain countries without having to obtain a licence from the Administration of the country you intend to visit. This very convenient arrangement is intended for short visits only, typically one to three months. Many of us make use of these arrangements every year.

But T/R 61-01 has now been revised following WRC 2003. The changes include removal of any Morse code requirement together with ambiguities concerning portable and mobile operation as well as simplification of the wording. But not all of the CEPT countries have yet adopted the new T/R 61-01.

In practice you have to:

- Check that your national licence class does qualify for a CEPT Licence and that your national licence document confirms this. *Only UK Full (Advanced) licence holders have a CEPT Licence.* The UK Validation Document for Full licence holders states this in three languages.
- Check what national licence class in the country to be visited is equivalent to the CEPT Licence.
- Check what are the operating privileges and regulations covering the use of that national licence class in the country to be visited.
- Use the appropriate prefix which has to be appended to your own national callsign (and suffix if required).

The key point is that the operating privileges for you, when operating under the CEPT Licence, are defined by the ***country being visited, not the privileges in the United Kingdom.***

HOW DO YOU FIND THIS INFORMATION OUT?

Details of radio amateur licensing worldwide are summarised on OH2MCN's excellent website (see 'Websearch' below) and further information can usually be obtained from the website of the national society.

The full text of T/R 61-01 is available on the European Radiocommunications Office (ERO) website - see 'Websearch'. Follow the link via T/R 61-01 in the table. T/R 61-01 Appendix II contains the information on national licence equivalence. There is also a summary table listing those countries which have implemented the latest T/R 61-01 on the ERO website.

So far so good, but for the next few years we will be in a transition situation as countries change their national legislation to reflect the WRC2003 changes. Not all of the countries who implemented the previous versions of T/R 61-01 have yet implemented the revised and current version. In such cases it is reasonable to assume that the requirement for Morse code for operation below 30MHz and any other restrictions still stand. (The old version of T/R 61-01 can still be found by going to www.ero.dk opening the drop-down menu 'ECC Activities' and then the sub-menu 'RA Working Group' and then the document 'Radio Amateurs'. In that document is a link to the old version of T/R 61-01.)

Any country can add extra conditions to T/R 61-01. These conditions will be shown as footnotes in T/R 61-01 Appendix II. For example, Estonia requires their prefix (ES) to include numerical regional information, like 'ES1'. Please also note that special conditions sometimes apply to overseas territories such as those of France. Local permission will very often be required in such cases.

Some countries, even members of CEPT, have never formally implemented any version of T/R 61-01.

The situation will change throughout this year as countries change their internal legislation following WRC2003. The definitive website is that of ERO, referenced above.

HOW DOES THIS WORK IN PRACTICE?

Let us suppose you have a Full (Advanced) UK licence. Have a look at your Validation Document. You will see reference to the fact that your UK licence is equivalent to the CEPT Licence. You will also see reference to CEPT in *BR68* (Full or A/B).

Now have a look at the T/R 61-01 entry on the website above and scroll to Appendix II. In the table of countries look for the country you intend to visit, let's say Germany. There you will see that the CEPT Licence is equivalent to the German Class 1 and 2. You can find the details of these classes on the DARC website. Those conditions are the ones you must operate under when you visit Germany.

However, let's suppose you want to visit France. When you look at the French entry you see there is no equivalent licence class listed. This means that France has *not* implemented the latest version of T/R61-01. France did, however, implement the previous version of T/R 61-01 but has not yet amended its national regulations. Reference should therefore be made to the earlier version of T/R 61-01 and we assume that Morse competency would still be required for HF operation there.

So if you gained a Full UK licence when Class A and B were merged in the UK last year and you previously held a Class B you would *not* be able to operate HF in France but you would in Germany. This is because you do not have a pass in the Morse test.

This is where the ERO implementation document becomes very useful. This summarises the implementation status and is updated as countries change their regulations to adopt the new versions.

SUMMARY

We are in a state of change with T/R 61-01. You do need to check the situation before you operate. Even this article could be out of date by the time it gets into print. And don't forget to take a copy of your Validation Document with you. You may be asked to show it. In fact a spare photocopy or two helps all round.

I have not spoken here about arrangements between CEPT and non-CEPT countries. These arrangements are also subject to change and I will let you know when things are clearer.

T/R 61-01 bears no relation to the import and export of your amateur radio equipment, which is subject only to relevant customs regulations. Such aspects are best discussed with someone who has been before.

Finally, one of the best websites for world-wide DX operation is 'DX Holiday' (see 'Web search').

DISCLAIMER

Whilst every effort was made to ensure that the information given herein is accurate, no responsibility is accepted by the RSGB, IARU, or the author for any errors, omissions or misleading statements in that information by negligence or otherwise, and no responsibility is accepted in regard to any subsequent action based on this article.

[Bob Whelan has donated the author's fee for this article to the Radio Communications Foundation - Ed] ♦

WEB SEARCH

OH2MCN's overseas licensing site	www.qsl.net/oh2mcn/license.htm
European Radiocommunications Office (ERO)	www.ero.dk
T/R 61-01 full text	www.ero.dk/documentation/docs/doccategory.asp?catid=2&catname=ECC/ERC/ECTRA%20Recommendations
or	http://tinyurl.com/2bcdf
Latest T/R 61-01 countries summary table	www.ero.dk/documentation/docs/implement.asp?docid=1802
or	http://tinyurl.com/2reh7
DX Holiday	www.dxholiday.com

By Henryk Kotowski, SM0JHF

Sibeliusgången 28 XI, SE-164 77 Kista, Sweden.

E-mail: sm0jhf@chello.se

Visit Åland - OH0

Main: Putting up aerials at the lighthouse keeper's cottage at Nyhamn.

Top right: Sture, OH0JFP, climbs one of his VHF antenna towers.

Part of the OH0JFP antenna (and wind!) farm.

The tower belonging to Einar, OH0NJ, in Åland farmland countryside.

Young Polish operator Donata Gierczycka, SP5HNK, visiting the OH0JFP station.

Amateur radio photographer and world traveller Henryk Kotowski, SM0JHF, enthuses about these beautiful islands in the Baltic. With low-cost flights to Stockholm and a cheap car ferry to the islands, a mini-DXpedition to OH0 using the CEPT licence has never been easier.

The Åland [pronounced "Aweland" - *Ed*] islands between Sweden and Finland are very attractive for many reasons. The weather is almost always excellent in the summer with sunlight almost 24 hours a day in late June / early July. It is never crowded there. One can easily reach the islands by car and ferry. Amateur radio is quite popular, but local operators are not very active, so being a visitor on the air "portable OH0" is still attractive.

I have visited the Åland Islands many times and from Stockholm it is very easy to get there. About 100km north of Stockholm there are two ferry lines that will take a car and the driver in little more than two hours to Åland. The cost is low, about £11 return. There are other ferries from Stockholm city, but then one has to spend more than six hours aboard and the cost is higher. On the other hand, the view of the archipelago is magnificent in the summer.

Most tourists rent a cottage, usually close to the waterfront. Angling is popular, although the best time is said to be September.

The local amateur radio club, Ålands Radioamatörer, has some 40 to 50 members but the activity is low now. There is a VHF contest shack with a number of antennas for 6m and up. The callsign used here is OH0A.

There are also some HF contest stations but they belong to operators from mainland Finland who go there only for contests. Jukka, OH6LI, has a station on Geta hill where he signs OH0V. A small island called Brändö, in the eastern part of the Åland archipelago, has for decades been the home of the OH0B contest station. There are two rotary towers with stacked Yagi arrays for HF. Another joint station, OH0Z, located in the northern part of the main island, also has two high rotary towers with HF stacked arrays. Next to OH0Z is a local VHF-orientated club station with the callsign OH0AZ.

However, the most active local operator is Sture, OH0JFP. He has built a very impressive antenna farm some 8km south of Mariehamn, the main town. He was instrumental in building and running the OH0A / OH0AA club station during the '90s but in 2000 he decided to build a station of his own. Now there are antennas for all bands from 160m to 23cm at his contest QTH. More information at www.qsl.net/oh0jfp Sture is active each Tuesday in the Nordic VHF Activity Contests. He is very hospitable and enjoys meeting visitors, so please make arrangements with him before coming to Åland. ♦

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BNC to PL259 adapter (Female to male).....**£2.00**
BNC to N-Type adapter (Female to male).....**£2.50**
BNC to N-Type adapter (Male to female).....**£2.50**
SMA to BNC adapter (Male to female).....**£3.95**
SMA to SO239 adapter (Male to SO239).....**£3.95**
SO239 to 3/8 adapter (For antennas).....**£3.95**
3/8 Whip stud (For 2.5mm whips).....**£2.95**
Please add just £2.00 P&P for connector only orders

10/11 METRE ANTENNAS

G.A.P.12 1/2 wave alumimum (length 18' approx).....**£24.95**
G.A.P.58 5/8 wave aluminium (length 21' approx).....**£29.95**
S27-3 3-element yagi. Freq: 27-28MHz. Length: 2.5mtrs. Gain: 8.5dB.....**£59.95**
S27-4 4-element yagi. Freq: 27-28MHz. Length: 3.8mtrs. Gain: 10.5dB.....**£69.95**

BALUNS

MB-1 1:1 Balun 400 watts power.....**£24.95**
MB-4 4:1 Balun 400 watts power.....**£24.95**
MB-6 6:1 Balun 400 watts power.....**£24.95**
MB-1X 1:1 Balun 1000 watts power.....**£29.95**
MB-4X 4:1 Balun 1000 watts power.....**£29.95**
MB-6X 6:1 Balun 1000 watts power.....**£29.95**
MB-Y2 Yagi Balun 1.5 to 50MHz 1kW.....**£24.95**

TRI/DUPLEXER & ANTENNA SWITCHES

MD-24 HF or VHF/UHF internal duplexer (1.3-225MHz) (350-540MHz) SO239/PL259 fittings.....**£22.95**
MD-24N same spec as MD-24 but "N-type" fittings.**£24.95**
MX2000 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz).....**£59.95**
CS201 Two-way di-cast antenna switch. Freq: 0-1000MHz max 2,500 watts SO239 fittings.....**£18.95**
CS201-N Same spec as CS201 but with N-type fittings.....**£28.95**
CS401 Same spec as CS201 but4-way.....**£49.95**

ANTENNA ROTATORS

AR-31050 Very light duty TV/UHF.....**£24.95**
AR-300XL Light duty UHF\VHF.....**£49.95**
YS-130 Medium duty VHF.....**£79.95**
RC5-1 Heavy duty HF.....**£349.95**
RG5-3 Heavy Duty HF inc pre set control box.....**£449.95**
AR26 Alignment Bearing for the AR300XL.....**£18.95**
RC26 Alignment Bearing for RC5-1/3.....**£49.95**

MOBILE MOUNTS

Turbo mag mount 7" 4mtrs coax/PL259 3/8 or SO239.....**£14.95**
Tri-mag mount 3 x 5" 4mtrs coax/PL259 3/8 or SO239.....**£39.95**
Hatch Back Mount (stainless steel) 4 mts coax/PL259 3/8 or SO239 fully adjustable with turn knob.....**£29.95**
Gutter Mount (same as above).....**£29.95**
Rail Mount (aluminium) 4mtrs coax/PL259 sutiable for up to linch roof bars or poles 3/8 fitting.....**£12.95**
SO259 fitting.....**£14.95**
Gutter Mount (cast aluminium) 4mtrs coax/PL259 3/8 fitting...**£9.95**
SO259 fitting.....**£12.95**
Hatch Back Mount 3/8 4mtrs coax/PL259.....**£12.95**
Roof stud Mount 4mts coax/PL259 3/8 or SO239 fitting.....**£12.95**

ANTENNA WIRE & RIBBON

Enamelled copper wire 16 gauge (50mtrs).....**£11.95**
Hard Drawn copper wire 16 gauge (50mtrs)..**£12.95**
Equipment wire Multi Stranded (50mtrs).....**£9.95**
Flexweave high quality (50mtrs).....**£27.95**
PVC Coated Flexweave high quality (50mtrs).....**£37.95**
300Ω Ladder Ribbon heavy duty USA imported (20mtrs).....**£15.00**
450Ω Ladder Ribbon heavy duty USA imported (20mtrs).....**£15.00**
(Other lengths available, please phone for details)

HF BALCONY ANTENNA

BAHF-4 FREQ:10-15-20-40 Mtrs LENGTH: 1.70m HEIGHT: 1.20m POWER: 300 Watts.....**£159.95**

MISCELLANEOUS ITEMS

CDX Lightening arrestor 500 watts.....**£19.95**
MDX Lightening arrestor 1000 watts.....**£24.95**
AKD TV1 filter.....**£9.95**
Amalgamating tape (10mtrs).....**£7.50**
Desoldering pump.....**£2.99**
Alignment 5pc kit.....**£1.99**

TELESCOPIC MASTS (aluminium & fibreglass options)

TMA-1 Aluminium mast ★ 4 sections 170cm each ★ 45mm to 30mm ★ Approx 20ft erect 6ft collapsed.....**£99.95**
TMA-2 Aluminium mast ★ 8 sections 170cm each ★ 65mm to 30mm ★ Approx 40ft erect 6ft collapsed.....**£189.95**
TMF-1 Fibreglass mast ★ 4 sections 160cm each ★ 50mm to 30mm ★ Approx 20ft erect 6ft collapsed.....**£99.95**
TMF-2 Fibreglass mast ★ 5 sections 240cm each ★ 60mm to 30mm ★Approx 40ft erect 9ft collapsed.....**£189.95**

HF YAGI

HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts.....**£399.95**

ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM FREQ:10-15-20 Mtrs GAIN:8 dBd BOOM:4.42m LONGEST ELE:8.46m POWER:2000 Watts.....**£329.95**

ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m POWER:2000 Watts.....**£599.95**
40 Mtr RADIAL KIT FOR ABOVE.....**£99.00**

HF VERTICALS

VR3000 3 BAND VERTICAL FREQ: 10-15-20 Mtrs GAIN: 3.5dBi HEIGHT: 3.80m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials).....**£99.95**
OPTIONAL 10-15-20mtr radial kit.....**£39.95**

VR5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 4.00m RADIAL LENGTH: 2.30m (included). POWER: 500 Watts.....**£189.95**

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN: 3.5dBi HEIGHT: 6.50m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials).....**£119.95**
OPTIONAL 10-15-20mtr radial kit.....**£39.95**
OPTIONAL 40mtr radial kit.....**£14.95**

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials).....**£169.95**
OPTIONAL 10-15-20mtr radial kit.....**£39.95**
OPTIONAL 40mtr radial kit.....**£14.95**
OPTIONAL 80mtr radial kit.....**£16.95**

EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 5.00m RADIAL LENGTH: 1.70m(included) POWER: 800 Watts.....**£299.95**

EVX8000 8 BAND VERTICAL FREQ:10-12-15-17-20-30-40 Mtrs (80m optional) GAIN: 3.5dBi HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included) POWER: 2000 Watts.....**£319.95**
80 MTR RADIAL KIT FOR ABOVE.....**£89.00**
(All verticals require grounding if optional radials are not purchased to obtain a good VSWR)

TRAPPED WIRE DI-POLE ANTENNAS

(Hi Grade Heavy Duty Commercial Antennas)

UTD160 FREQ:160 Mtrs LENGTH:28m POWER:1000 Watts.....**£49.95**
MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts..**£44.95**
MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts.....**£49.95**
MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts.....**£89.95**
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts.....**£44.95**
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts.....**£79.95**
(MTD-5 is a crossed di-pole with 4 legs)

PATCH LEADS

STANDARD LEADS
1mtr RG58 PL259 to PL259 lead.....**£3.95**
10mtr RG58 PL259 to PL259 lead.....**£7.95**
30mtr RG58 PL259 to PL259 lead.....**£14.95**
MILITARY SPECIFICATION LEADS
1mtr RG58 Mil spec PL259 to PL259 lead.....**£4.95**
10mtr RG58 Mil spec PL259 to PL259 lead.....**£10.95**
30mtr RG58 Mil spec PL259 to PL259 lead.....**£24.95**
1mtr RG213 Mil spec PL259 to PL259 lead.....**£4.95**
10mtr RG213 Mil spec PL259 to PL259 lead.....**£14.95**
30mtr RG213 Mil spec PL259 to PL259 lead.....**£29.95**
(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

SPX-100 'PLUG N GO'

Normally £49.95. This month **£39.95**!! Plus £6.00 P&P
6mtrs through to 80mtrs.
Change band by using a simple fly lead and socket at the base coil and fine tune with the adjustable telescopic whip.
Standard 3/8 thread 1.65mtrs fully extended.

ALL PICTURES ARE FOR REFERENCE ONLY

By Don Field, G3XTT

105 Shiplake Bottom, Peppard Common,
Henley on Thames RG9 5HJ.

E-mail: hf.radcom@rsgb.org.uk

The 3B9C full team (see photo)
Standing L to R: Paul, EI5DI; John, G3WKL; Ivan, G3IZD; Jens, DL7AKC; Falk, DK7YY; Chris, G3NHL; Robert, F5VHN; Hilary, G4JKS; John, N7CQQ; Mike, G4IUF; Jim, KF7E; Nigel, G4KIU; Danny, M0GMT; Eric, K3NA; David, G0MRF; Maury, W3EF; Dave, G4FRE; Meg, M0FRE; Justin, G4TSH; Derek, G3RAU; Robert, 3B9FR, and Tim, G4VXE.
Sitting L to R: Jun, JH4RHF; Mike, G3SED; Bob, GU4YOX; John, G3WGV; Neville, G3NUG; Don, G3BJ; Don, G3XTT; Tony, G0OPB and Kazu, JA1RJU.

The 3B9C Rodrigues

Don Field, G3XTT, describes 'Project Star Reach', the Five Star DXers Association DXpedition to Rodrigues, which took place in March / April

DXpeditions take on many flavours, from small holiday operations to major feats of endurance, setting up and operating from wind-ravaged islands in the Southern Ocean. Each has its place in the enjoyment of our hobby. The UK-based Five Star DXers Association, established after the successful 9M0C Spratly Islands DXpedition of 1998 (*RadCom* April 1998), decided to focus its expertise and efforts towards a very specific type of expedition. We recognised a need for large-scale operations from moderately-rare (top 100 'most wanted') DXCC entities. These are the sort of places that get activated from time to time, and may even have one or two resident amateurs, but are tough to work on more than a few bands or modes. Usually this is because expedition groups are limited in what they take, often as a result of airline baggage restrictions, and have to compromise on antennas and / or equipment. We felt that, by shipping equipment ahead of time, by sea, we could plan to cater for all those needed band / mode combinations as well as offering an easy one for newcomers to work on the principal bands and modes. Of course, the cost of shipping a 20ft container with several tonnes of equipment is not trivial, and this then dictates to a large extent the overall size of the expedition in terms of participants (needed for assembling all that kit on site, and then operating it!) and, almost inevitably, means that sponsorship will be required to help defray the high costs involved.

This approach worked well for us again in 2001, with our second expedition, to the Comoros as D68C (*RadCom* May 2001), where we made a record 168,000 QSOs. So, not wanting to spoil a formula that obviously was working well, we set out to do something similar yet again in 2004, this time heading for Rodrigues Island in the Indian Ocean. Politically, Rodrigues is part of Mauritius, but unfamiliar to most holidaymakers to Mauritius, as it lies about 600km and one and a half flying hours to the north-east. However, for DXCC award purposes and for IOTA, it counts separately from Mauritius. Some of the background has been covered in our 'How to' article (*RadCom*, March 2004). We wanted to build on D68C, this time including some further bands and modes, including satellite, moonbounce and SSTV (slow scan television). We were also well aware that HF propagation has taken a downturn in the three years since D68C, due to the decline in solar activity, so we decided to spend longer on the air, three full weeks and four weekends, to try to give everyone a chance to work us on as many bands and modes as possible. With so many new operators on HF since 2001, especially since the recent opening up of the HF bands to previous VHF-only licensees in many countries, we hoped that many of them would take the opportunity to chase us.

THE LOCATION

Rodrigues is volcanic, rising to almost 400m at its highest point. Vegetation is sparse over much of the island as there is only the thinnest layer of soil over the volcanic rock, but herds of cattle and sheep eke out an existence and provide meat for export to Mauritius. The land area is almost exactly the same as the island of Jersey. The population of Rodrigues is around 35,000, of whom 5000 live in Port Mathurin, the island's capital and major port. The main sources of income are agriculture, fishing and handicrafts. Unemployment runs around the 25% level and the Mauritian government is keen to develop tourism to help increase employment and to generate the funds necessary to maintain and improve the island's infrastructure.

Island DXpedition

Unloading equipment from the trucks.

Building the 6m stack of Yagis.

It is clear that Mauritius subsidises Rodrigues quite heavily. The roads are good, facilities such as schooling and health are excellent, and the whole island exudes an air of prosperity. Not everyone on Rodrigues welcomes the idea of more tourism, but economic necessity suggests there is no alternative. Right now there are four hotels on the island, and the majority of visitors come from Reunion or from France. This has involved travelling via Mauritius, but the runway on Rodrigues has recently been extended, and direct flights are being opened up to a wider range of destinations. The two main hotels have their own watersports facilities, including dive centres. The foundation stones have already been laid for a few new hotels, but care is being taken to avoid over-development. The local inhabitants speak competent French and English, their local language being a French-derived Creole, but schooling being in English.

We had selected the Cotton Bay Hotel at Point Cotton (Pointe Coton) as our base of operations, for the principal reason that it is on the north coast of the island, with an uninterrupted sea take-off to Japan, Europe and most of North America. This was an excellent choice in all respects. Throughout our visit, the hotel staff were happy to cater to our every need, and many of them came to visit our stations and follow our progress. A blackboard in the bar area was kept up-to-date with the QSO totals so that guests and staff alike could follow our progress!

Licensing is reasonably straightforward, though there have been occasional hiccups in recent years due to reorganisation and other priorities in the licensing administration on Mauritius. There is some fascinating history on our web page about previous amateur radio activity from Rodrigues, going right back to 1957 and including the 1967 Don Miller operation.

The foregoing gives you some of the facts and figures about Rodrigues, but doesn't really do justice to the experience of being there. This really is a wonderful place to visit, with a genuine welcome from everyone, without the jaded cynicism which seems to pervade many more developed tourist destinations. And despite its small size, there is plenty to see and do. Not so much in the way of nightclubs and discos, but if you enjoy exploring a truly unspoilt island, with its own unique flora and fauna, or snorkelling or diving on one of the most extensive reefs in the Indian Ocean, then Rodrigues is truly a tropical paradise. Many folk likened it to being the way Mauritius was 20 years ago, before the advent of mass tourism.

GETTING STARTED

30 of us flew into Rodrigues on 16 March, most of us having taken the overnight flight from London to Mauritius, followed almost immediately by the onward hop in a small turboprop aircraft. We were 23 operators, plus an assortment of wives, partners and children (some of us would fly out after two and a half weeks, with a further group flying in). Robert, 3B9FR, was waiting for us at the airport, along with Maury, W3EF, who had flown in earlier. It was almost dark by the time we arrived at the hotel, but first order of the day was for a small team to survey the proposed antenna field and start to consider where everything should be sited. We were also delighted to see that, in anticipation of our visit, the hotel had put in an additional power line to the two chalets we would be using as our shacks.

The following morning the team split into two halves, with half going to town to empty the shipping container and supervise the loading of our equipment on to trucks (there were no facilities to ship the container directly to the hotel) while the remainder stayed at the hotel and started preparing the shacks and marking antenna locations. The container team encountered our first problem at this stage, in that the local customs staff were unfamiliar

Dave, G4FRE / WW2R, and David, G0MRF, assemble the 70cm EME array.

The full-size 2-element Trident Yagi for 30m.

with the *carnet de passage* documentation routinely used for shipping freight around the world. Fortunately they were quickly able to locate the necessary procedures, and unpacking began in earnest in the hot morning sun. By early afternoon most of the equipment had arrived at the hotel, and we could start collecting together what was needed for each individual antenna, mast, cable run, etc. For simplicity, everyone had been allocated to a team. One team set up the stations (some 16 in all), one set up the computer network (one per station, plus server machine, and additional PCs in the team room, making 20 PCs in all), and three antenna teams set to work outside.

QRV

Station build went reasonably smoothly, although we had to relocate some of the antennas even before operations started, in some cases because it became clear that we would suffer from interaction and in the case of the 160m vertical because we were warned that that the seafront location we had chosen would probably result in it being washed away! We were actually very fortunate with the weather, which was dry and not too hot. In fact, the only day of really heavy and continuous rain was late in the expedition, just as we were starting to take everything down.

We had told the waiting world that we hoped to become active on the bands at midnight local time on the Friday, and this is exactly what we were able to achieve. Every HF band was open, and we started simultaneously on all of them. It wasn't long before the *PacketCluster* system was alive with spots, and the pile-ups at our end were quite incredible.

If you have never been on the sharp end of a DXpedition, it is hard to imagine how things must be. A successful DXpedition is like a good film or play, it entertains its audience, drawing them in, getting them involved, but hiding all the legwork that goes on behind the scenes to make the whole thing possible. Hopefully we were able to present a seamless face to the world, but there was certainly plenty to do behind the scenes! At the daily meetings, for example, we usually managed to draw up a list of several antenna projects, which often involved taking down one of the antennas to fix a feed point problem or maybe a loose clamp (as in all seaside locations, we were subject to continuous winds, sometimes quite strong). We also had to re-stake many of the guy ropes, as the force of the wind plus the effect of rain in softening the ground meant that the pegs we had originally used started to work free. We got some longer stakes made up locally, from angle-iron. They certainly did the trick, but proved well-nigh impossible to remove when the expedition wrapped up.

Indoors, the technical team was faced with continual problems of interaction between stations, requiring them to make up stub filters, reroute coaxial feeders, and whatever else might help to effect a cure. This was a moving feast; it seemed that whenever such a problem was solved, a change of operating frequency or antenna heading could easily bring a whole new set of headaches. We also had to abandon our plans to operate simultaneously on SSB and CW on 80 and 20m, inter-station interference being too much of a problem, though we did manage this on 10 and 15m, albeit with reduced transmit power.

On the computer side, although the *Star Software* suite of programs had been beta tested before heading out to Rodrigues, it is only when software is used in a live situation that some of the incipient bugs come to light and G3WGV, its developer, was kept busy, at least in the early days, in tracking them down and recompiling the code. It must be said, though, that the system was robust enough to allow logging operations to continue throughout, and continued to give us management statistics on a regular basis. Rather more of a problem, was that our network became infected at one stage with a virus, apparently finding its way in via our Internet connection. This took two team members the best part of a day to isolate and fix, and could easily have had major implications for our operation. Truly a modern-day scourge. There were occasional non-radio problems to be solved, too, such as keeping cows and horses out of the antenna field. In this we were only partially successful, but at least we always managed to shoo them away before serious damage was done!

THE BANDS

As we had anticipated, 10 and 12m propagation was well down on what we had experienced three years earlier from the Comoros. However, the north-south path to Europe was very reliable and many UK stations report that we were often workable on 10m while being the only station audible on the band. We certainly managed plenty of contacts on 10m FM, too, as well as on the more conventional modes. Perhaps even more surprising was the success we had on 6m. Unfortunately this never extended to northern Europe, we had a daily path to Japan, Central Asia and

Robert, 3B9FR, operates at 3B9C.

John, G3WGV, author of the Star Software suite of programs, in the server room.

Southern Europe, much to our delight as we simply hadn't expected this. Of course, the fact that we had been able to set up a stack of two 6-element Yagis right on the water's edge obviously did us no harm.

Operating from close to the equator, the pattern is for high absorption in the middle of the day, with only the highest bands open, but the lower bands start to open around local dusk and stay open right through the night, dropping out quickly around dawn (of course, there is really no such thing as twilight at those latitudes; when the sun rises or sets it does so within minutes). As we'd expected, 15 and 17m proved to be the real stalwarts, with good world-wide propagation, while 30m again showed its mettle, to the extent that by the end of our expedition we really had 'worked it dry' with continuing good propagation but few callers.

To our delight, the noise level on the low bands was lower than we had expected, as we have had some bad experiences in the past with noise from tropical storms. And all our antennas seemed to work well. On 80m we had set up two pairs of phased quarter-wave verticals, one optimised for the top (SSB) end of the band and one for the bottom (CW) end. This proved to be a good idea, as swapping them around showed a big difference in sent and received signal strengths. We were pleased with our final totals on 160, 80 and 40, although we know that not everyone who wanted a QSO made it into the log. There is no magic formula, of course, on these bands. A decent antenna, reasonable power levels and a degree of perseverance are necessary, and we are aware that matters weren't helped by a degree of deliberate interference on our transmit frequencies. It's a mystery as to why some of our fellow amateurs feel it necessary to indulge in such behaviour. The good news is that many UK stations made it into our log on all nine HF bands. Typical is one G0 station with a pocket handkerchief garden, who kept changing his antennas as he got us in the log progressively on one band after another. It's these sort of stories that make the effort worthwhile. Perhaps the best is the Midwestern amateur in the US, a keen 160m operator who, when he realised we were actually seeing 160m openings to his area, rigged up a two-element wire Yagi between the walls of a local canyon and worked up with his station set up in his pickup truck. If you think about the size of a 160m beam, and the height required for it to work, the effort he put in to achieve that one contact takes on monumental proportions! At the other end of the scale, at least one UK amateur worked us using an FT-817 on battery power and a 'Miracle Whip' antenna.

For the specialists, we did manage one 6m moonbounce contact, and several on 70cm. To our disappointment, AO-40 remained out of commission, but we did manage some satellite contacts via FO-29. On HF, we made Rodrigues available on SSTV for the first time, though exchanging pictures is a time-consuming process and doesn't readily lend itself to the DXpedition situation. On the other hand, the more popular datamodes (RTTY and PSK31) proved immensely popular, reflecting the ease of activating these modes nowadays using PC sound card and software, and we were easily able to achieve new records for QSO totals on those modes.

We were very pleased with over 8000 UK contacts in the log, many of them with G1, G7, M3 and similar calls. Hopefully, many of those will continue to be active on the HF bands during the years to come. All in all, as well as the huge QSO total (a band-by-band breakdown is shown in **Table 1**), we worked well over 200 DXCC entities (see **Table 2**), which convinced us that pretty much everyone, anywhere in the world, had had a chance to make it into the 3B9C log.

In the space of an article like this it isn't possible to do more than give a flavour of how things went, but many amateurs took advantage of our web pages to follow the story day by day, another reflection of the times and a great example of how the Internet enhances our amateur radio experience rather than replacing it. At its peak, we were seeing over 50,000 page hits a day. The web pages are still up and you can read the unfolding story if you didn't do so at the time.

NON-RADIO ACTIVITIES

These DXpedition write-ups almost invariably manage to give the impression that life is one long round of eating, sleeping and running pile-ups. It's certainly true that some of the hotel staff and visitors found it hard to comprehend why we would come all that way to do something we could equally well do at home! But we did manage to enjoy ourselves in other ways, too. The ladies, of course, managed many excursions, but were frequently joined by other members of the team, whether to ramble to the next bay, to take a boat to one of the local snorkelling sites, or to catch the local bus into town for some shopping.

Unfortunately one of the knock-on

Table 1	
Total QSO count overall	153,113
'Unique' calls in log	37,040
CW total	77,610
SSB total	66,826
RTTY total	**5,280**
PSK31 total	**2,172**
Others (FM, SSTV, EME, Sat)	1,225
1.8MHz	2,288
3.5MHz	**7,509**
7MHz	**18,366**
10.1MHz	**11,375**
14MHz	21,594
18MHz	**20,154**
21MHz	29,920
24.9MHz	16,858
28MHz	23,535
50MHz	1,448
70cm EME & Satellite	66
Africa	1,001
Antarctica	3
Asia	27,609
Europe	92,099
North America	29,809
Oceania	1,866
South America	670
United Kingdom	8,582

Table 1: Some statistics: number of QSOs made per mode, band and continent (figures in bold are new all-time records).

effects of a cyclone near Australia was that we had some large breakers outside the reef for the first ten days or so of our trip, which meant that scuba diving was restricted. Most of those who wanted to do some diving did manage to do so in the end, but a group of French tourists who had come specifically for the diving were frustrated for several days, in having nothing to do but sit at the bar and exchange diving stories.

For those who had been largely confined to barracks, we did organise a minibus tour in the third week, taking in the major sights of the island, leaving a few hardy individuals to keep the radios manned. On other days, the entertainment was largely what was available on site. There was music and dancing most evenings, and GU4YOX our 'entertainment king' took his role seriously enough to MC, sing and even spend some time on the drums! After the second team had flown in, but before the first leavers flew out, the hotel laid on an excellent buffet supper, and we closed down the station for a few hours so that we could all enjoy this together. There was champagne to celebrate our achievement (well over the 100,000 QSOs by then), great local food and, of course, musical accompaniment. Those who stayed until the end of the trip enjoyed a similar, farewell banquet the evening before they left. Indeed, throughout the whole expedition the Cotton Bay Hotel staff treated us royally.

This is perhaps also the place to mention the high level of local interest in our expedition. Local press and TV came to cover our activities, and we were also visited by several major local dignitaries including the island Chief Commissioner, its Chief Executive, and others in high office. They were all delighted to hear that tens of thousands of people around the world now knew of Rodrigues and many would be receiving a commemorative QSL card with more information about the island.

THANKS

The 3B9C team extend their thanks to all who supported them and made this expedition possible. This includes our major sponsors, of course, headed up by Yaesu but including many others, some of whom are listed in the table. Thanks are also due to all the local clubs and individuals, too numerous to mention here, but listed in full on our web page and recognised on the 3B9C QSL card. Naturally, all the participants paid for their travel and accommodation, as well as making a contribution to shared expenses. Our thanks, of course, to the management and staff of the Cotton Bay hotel, to Robert, 3B9FR, to Jacky, 3B8CF, to the various officials who were involved in arranging permits, custom carnets, etc and, of course, to our families who allowed us to take part in this unique experience. The team also wishes to thank Neville, G3NUG; Don, G3BJ, and John, G3WGV, our co-leaders, who collectively put in a huge amount of effort to make Project Star Reach a reality. ♦

Table 2									
1.8	**3.5**	**7**	**10**	**14**	**18**	**21**	**24.9**	**28**	**50MHz**
88	113	146	128	177	153	166	148	150	27

(Overall number: 214)

Table 2: Number of DXCC entities worked per band

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North California DX Foundation
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Northern Arizona DX Association
OH DX Foundation
Open University ARC
Radio Officers Association
Radio Society of Great Britain
Reading & District Amateur Radio Club
Ripon Amateur Radio Society
Royal Naval ARS
Saxtorp DX Association
Scottish-Russian Amateur Radio Society
Southeastern DX Club
Shefford & District ARS
Shizuoka DX Radio Association
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Virginia DX Century Club
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WEB SEARCH

3B9C website	www.fsdxa.com/3b9c
About Rodrigues	www.eng.uct.ac.za/~chnste010/rodrigues.html

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10M3L	3 element Std	7.41dBi	3.0mtr	6.5Kg	£129.95
10M4LDX	4 el Long Yagi	9.42dBi	5.40mtr	11Kg	£199.95
15 Metre Yagis				
15M3L	3 element Std	8.21dBi	4.40mtr	tba	£215.00
15M4L-DX	4 el.Long Yagi	10.6dBi	8.20mtr	17.5Kg	£255.00
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7Q7MM UK DXpedition

The Cushcraft A3S triband beam, installed above the 30ft water tower.

The two 40m quarter-wave phased verticals on the beach, facing north.

Left to right: Rich, M5RIC, operating RTTY; Steve, G4JVG, on SSB, while Dick, GU4CHY, and Steve, G4EDG, discuss the finer points of handling the CW pile-up.

The modified 2-ele 10m beam on a 7m bamboo, and a massive 13m bamboo with a 9m fishing rod lashed to it supports the 160 / 80m vertical.

The 7Q7MM DXpedition to Malawi took place from 18 April to 1 May. The main sponsor was Kenwood (UK), and the team was Mark, G4AXX; Dick, GU4CHY; Steve, G4EDG; Steve, G4JVG, and Rich, M5RIC.

The Kenya Airways flights, from London to Malawi, went via Nairobi and Lusaka before we arrived at Lilongwe, Malawi, over 20 hours after we set off. We were met at Lilongwe Airport by Anderson, our driver, who held up an unmistakable sign, "CQ, CQ, CQ DX", to passengers at international arrivals to attract our attention.

The DXpedition operated from Red Zebra Lodge, near Salima, on the shore of Lake Malawi. The lodge is owned by Stuart and Esther Grant, who run a tropical fish exporting business and also offer diving and underwater photography expeditions on the lake.

We applied by post for our licences in January and they were kindly collected for us from the authorities in Blantyre by Cato, LA9PF/7Q7PF. When we arrived at the lodge Cato was there to meet us, and presented us with our licences (what a great service!)

THE FIRST EVENING

We set up two simple L-verticals, each with a single elevated radial, for 10 and 18MHz on the first evening. Steve, G4EDG, started off on 10MHz CW, and was soon running a big pile-up. We stopped after an hour to break for supper, but when we came back we heard someone was continuing the CW pile-up - using our callsign! Our advice to all who worked us was to check the online log to confirm valid QSOs.

We set up the Kenwood TS-480HX and amplifier and I called CQ on 17m. There was no answer to the first call, nor the second, then it started, an almighty pile-up, a solid mass of signals from 5 to 10kHz up. It sounded like the whole of Europe was waiting for us! I slowly started pulling calls out and the log started to fill up. Dramatic lightning was coming across the lake, flashing every few seconds and booming, getting closer and closer. Then "7Q7M . . ." and the lights went out, the first of many power cuts. "Phew" I said, "that was better than any contest!" We were exhilarated and exhausted, so using torches, we stumbled off to our rooms, set up the mosquito nets and crashed.

PUTTING UP THE ANTENNAS

During the night there was a fierce storm and at daybreak the power was still off. The shack was soon provided with a mains feed from the lodge's standby generator. The antennas survived, but there was nothing to work: there were no signals on 10MHz and just some local non-amateur traffic on 18MHz. We unpacked the other antennas and assembled the Cushcraft A3S tribander on the lawn. We had lots of help to get the beam up. Cato, up on top of a 30ft concrete water tower, carefully hauled up the beam and fitted it to a steel pole.

The 40m phased vertical array was set up on the beach. Two 6ft angle-iron stakes were made for the verticals and bamboo was cut for us to support the elevated radials.

With the tribander up, operation on 20, 15 and 10m started in earnest. Dick, GU4CHY, handled a lot of the massive CW pile-ups on these bands. In the evening operation started on 40m SSB, again with a monster pile-up.

On the second day we put up a 20m-high bamboo and fishing pole vertical for the LF antenna. The 160m antenna was a quarter-wave inverted-L that went 20m up then 20m horizontally down the beach. The same wire was used on 80m; the free end was brought back down and connected to the feedpoint, making it quick and easy to change from 80 to 160m (although not after dark). The radial mat was 20 x 18m mains flex wires laid on the ground. For reception, a 160m-long Beverage was run out along a pier above the lake which conveniently ran due north. The far end was terminated in the water. The Beverage proved essential for 160 and 80m reception, no signals could be heard on the vertical due to the tropical high noise levels. We had many requests to operate 160m. Steve, G4EDG, was on 160m and 80m most nights, operating what must have been the most difficult shift. Low-band operation alternated between 160m one night, 80m the next.

Although much smaller in scale, another UK DXpedition took place soon after 3B9C. Mark Marsden describes how a small team can put on an operation that has a major impact on the bands for two weeks.

to Malawi

A Spanish group visited Red Zebra Lodge in 2002 and operated as 7Q7DX (see 'Web search'), leaving behind some equipment. We were very grateful to find coax, a 13.8V 40A power supply and a 2-element HB9CV for 27MHz which was now corroded and falling apart. The two Steves, G4EDG and G4JVG, and Rich, M5RIC, recycled it, modifying the elements and feed arrangement to make a 2-element 10m Yagi (antenna analysers are *so* useful). This was erected on a 7m bamboo pole which then allowed us to operate on 10m when the tribander was being used on 20 or 15m.

ON THE BANDS

Working the 20m grey-line early most mornings was a delight. I'd wake at dawn about 0400UTC and start calling CQ on 20m. The first stations worked were usually 'locals' in Madagascar 5R8, Mauritius 3B8, South Africa ZS and Kenya 5Z4. The first DX would usually be some VKs. They'd spot me on the *DXCluster*, and then the JAs would call. Then European stations peaked followed by USA. On four occasions there were calls from antipodal stations in the Pacific that broke through the European pile-up: two stations in Hawaii KH6, one on Tonga A35, and one on Wallis & Futuna FW. After breakfast at 0700UTC we'd return to the radios and 20m would be completely dead. Ah, the magic of the grey-line!

We had a natural lull in operation around midday each day due to tropical D-layer absorption. This became the time to do the log upload processing. This involved combining the logs from three laptops all running *CT* and one sometimes running *WriteLog*. The logs were processed into a single text file that could be efficiently uploaded to the website. We were invited to use an Internet-connected PC in the lodge office after business hours to upload the log and send e-mails to our friends and families. It was fascinating to see the website hit-counter going up at almost exactly the same rate as we uploaded QSOs (**Fig 1**); people certainly appeared to be checking the online log.

Rich, M5RIC, entered the SP-DX RTTY contest on 24 / 25 April while Steve, G4JVG, got an FM pile-up going on 10m. In the months leading up to this DXpedition some of us had been active in contests, such as the ARRL DX Phone contest, and had no 10m contacts at all. Some of us therefore did not expect too much for 10m, but how wrong we were! 10m was open from Malawi every day. We even had a comment from a station in Belgium who said "What kind of magic are you using? I've been listening to your signal all day on 10m". On that day we worked 10m continuously for eight hours on CW and four hours on SSB before the band closed.

FIG 1 © RADCOM 190

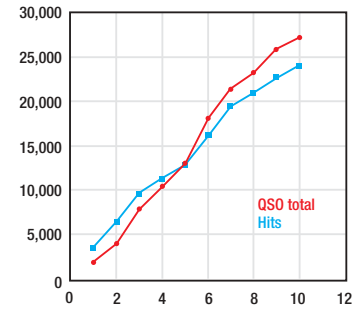

Fig 1
QSO totals and number of website 'hits' plotted against days of operation.

ON SAFARI

We took a day off from the radios on 27 April and went to the Liwonde National Park at the southern end of the lake. We went on a river boat with an observation platform and traveled about 25km north upstream on the Shire River. Along the way we saw hippos, elephants, lots of birds including a majestic pair of fish eagles, impala, water buck and large (2m long) monitor lizards. We stopped off at the Mvuu Rest Camp before returning. On the way back we visited the Catholic Mua Mission Station, renowned as a centre for its art and skilled carving.

A PRECIPITOUS CLOSURE

On the final day, 1 May, while the low-band antennas were being taken down, the tribander and HF verticals were being used in the last hours of operation. We had just passed 27,000 QSOs and were saying that we could congratulate some of the European countries who were joining the EU that day, when there was another power cut. Well, that shut us down in an untimely and humbling way. To compensate, we had lunch, took down the other antennas, and had time for a sunset cruise to an uninhabited island in the lake. A lovely way to end the DXpedition.

Malawi is one of the poorest countries on earth, yet we found everyone we met, even officials, to be welcoming, friendly and genuinely happy for us to visit their country. We were all touched by the hospitality we had received and talked about when we'll go back.

SPONSORSHIP & QSLS

We're very grateful for the sponsorship we've received. Individual contributors have been generous and are credited on our website. The TS-480HX provided by Kenwood (UK) proved to be an excellent DXpedition radio, with superb receive performance. It was mainly used at around 65W output to drive the Acom 1000 linear amplifier but, during mains power cuts, when we were running off a generator and could not use the amplifier, we were very grateful for the TS-480HX's 200-watts output.

Thanks too go to the South Dorset Radio Society, CDXC (Chiltern DX Club), the GMDX Group, the European DX Foundation and the Danish DX Group for their generous support.

E-mails and direct QSLs are now pouring in and Tony, LZ1JZ, is printing our colour QSLs. It's now over to QSL manager Roger, G3LQP, to handle the mountain of cards. Thanks to all! ♦

A NEW DX-HOLIDAY DESTINATION

We have left the Cushcraft A3S and a large amount of coax and polypropylene guy rope at the lodge for use by other groups at a nominal fee. Stuart Grant is keen to make the site available to future DXpeditions, contests and holiday operations. The A3S is neatly and safely stored in a ski bag with instructions, and lengths of RG213 and RG58 coax are carefully stored away in sealed drums for future groups to use. For further details about operating from Red Zebra Lodge please contact me or Steve, G4JVG, at g4jvg@ntlworld.com Details will also appear on the 7Q7MM website.

WEB SEARCH

7Q7MM	www.malawi.digital-crocus.com
Spanish 7Q7DX 2002 DXpedition	http://www.30dx184.com
Red Zebra Lodge	http://www.lakemalawi.com

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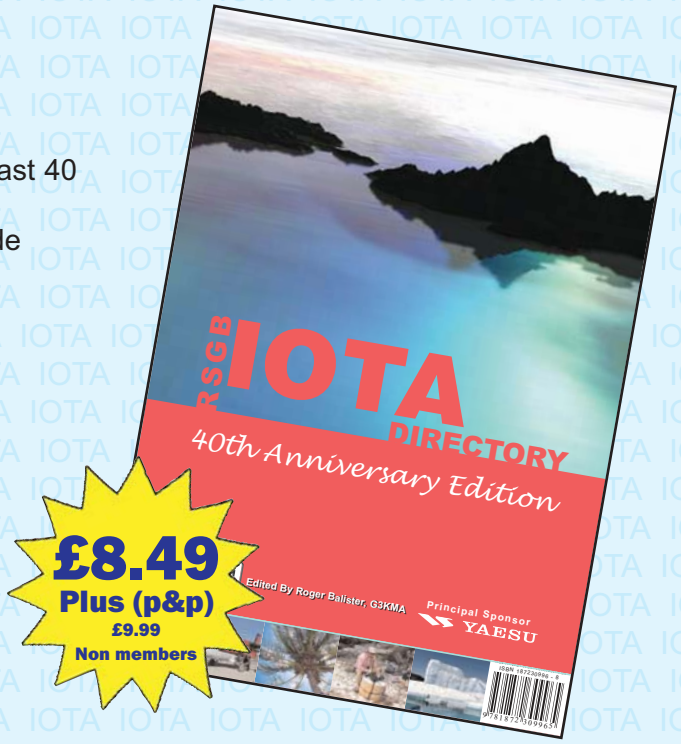

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By Tom Wylie, GM4FDM

3 Kings Crescent, Elderslie PA5 9AD.

Another of 2004's major DXpeditions was to the little-known island of Banaba in the South Pacific. Tom Wylie was the sole UK representative on this multi-national DXpedition to one of the most remote inhabited places on earth.

Banaba 2004 – the story of T33C (or, I should have searched for 'banana')

I first heard of the Banaba 2004 expedition around a year ago whilst on expedition with PA2ER, PA3EWP and AK0A to the Faeroe Islands. Rob and Ron were looking at various locations for a major expedition for 2004 and Banaba was one of the front runners. At that time I expressed an interest to go if it worked out. By June 2003 the trip was very obviously 'on'. It was also soon apparent that Frank, DL4KG, and Hrane, YT1AD, were also making plans to go to Banaba and a decision was quickly made that we should combine our efforts into a single DXpedition.

RESPONSIBILITIES & EQUIPMENT

As the numbers grew, people were allocated specific tasks. Frank, DL4KQ, became the logistics manager responsible for ensuring that all needed items were shipped to Banaba. This in itself was a mammoth task and Frank was helped in it by local amateurs DF7KF, DG7KQ and DL8KBJ.

Flo, F5CWU, became treasurer and QSL manager and had responsibility for contacting possible sponsors. Always a difficult task, especially as it was rumoured that there were several other major expeditions due around the same time.

Ronald, PA3EWP, was delegated responsibility for the logging software and the laptops, whilst Rob, PA2R, retained overall responsibility for the expedition.

After much discussion it was decided to go to Banaba with the Elecraft K2 kit transceiver. The main reasons for this decision were its size and weight, the quality of the receiver, its good press and, lastly, availability: almost everybody had one and had commented favourably on it. At the same time the Acom 1000 amplifier was chosen and the Stepp-IR 2-element Yagi as the main antenna system. This was because a single antenna could perform as a monobander on six different bands: 6, 10, 12, 15, 17 and 20m. These items were to remain our main operational equipment for the expedition.

Banaba House, the old governor's mansion, was the expedition base and CW camp.

Author Tom Wylie, GM4FDM, operating SSB.

SEARCHING FOR BANABA

It was terribly difficult to ascertain existing conditions on Banaba. An Internet search will come back with the question "Did you intend to search for banana?"!

There are no direct communications with the island, a fact which later proved difficult to overcome in getting our logs back to the Internet and our log search programme. We made contact with the island council, the members of which actually live on Rabi Island in the Fiji chain. They readily gave permission for us to land on and operate from the island. No current photographs were available apart from some old black and white ones taken before the British left the island in 1979 and some snatches of video from a BBC documentary from the early '90s. It was therefore very difficult to plan where to stay, and operating positions. Maps of the island were also non-existent. So we had to plan for the worst case scenario in almost every aspect, which as it turned out, resulted in us taking too much food, water, tents, and other items.

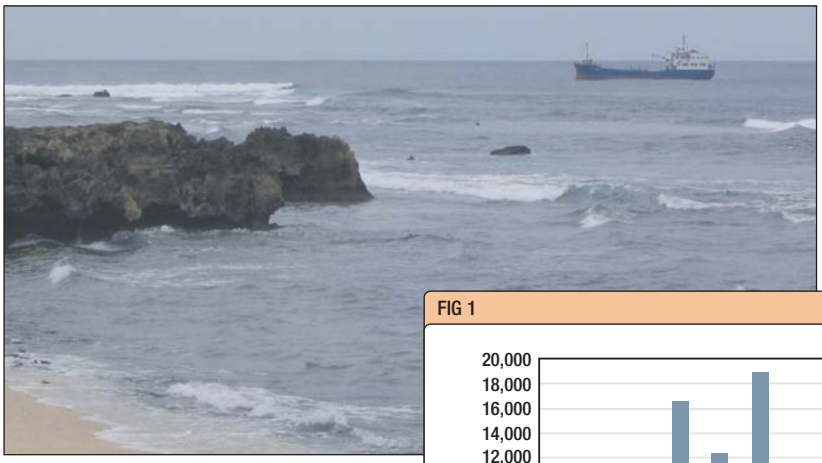
Licensing for Banaba is carried out by the Ministry of Telecommunication in Tarawa, Kiribati, and arrangements were made for the callsign to be allocated upon our arrival. T33C was born.

An equipment list was prepared, and a container was hired and prepared at Frank's QTH in Germany. All goods for the expedition including generators were purchased locally and carefully packed into the container, which left Rotterdam in early December 2003 bound for Tarawa. Dealing with customs in Tarawa turned out to be a nightmare. Everything revolves around the dollar and everything has its price. Import and export of our container turned out to be an expensive process.

GETTING THERE

We left our various homes around 24 March and met up in Raffles Gateway Hotel, Fiji. A couple of days later we flew into Tarawa. The runway extends from beach to beach on either side of the Island, a very scary landing experience. I came down to earth with a bump when I set eyes on *Te Taobe*, our ship transport to Banaba. I am convinced that this vessel had been resurrected from the scrap heap. I also learned that it had been the subject of an article in *QST* earlier in the year after its engines broke down and it drifted in the Pacific for 18 hours before being towed back into harbour.

We had to sleep in the open under a tarpaulin stretched across the cargo hatch cover for two nights and one day. Half-way through the second night, the ship ran into a squall, the tarpaulin ripped, and several of us nearly ended up over the side into the pitch-black sea. Winds gusted to 60MPH and the rain lashed down, soaking everybody and



The T33C 'cruise ship' *Te Taobe* moored offshore during unloading.

everything for an hour. This was one of the most frightening experiences of my life. The whipping ropes and flying canvas almost turned our expedition into a disaster before we even got off the ground. However, as quickly as it started, it ended, but were too scared to shut an eye for the rest of the night.

Morning and *Banaba*! It looked just like the photo on our web page: low and round. We moored about half a mile offshore, and started to unload all our container from below decks into two small rigid metal boats for transport to land. It took a whole day for all materials to be taken ashore.

ON THE AIR

A scouting party of YT1AD, DL4KQ and PA2R had gone ahead to make contact with the islanders and to decide where the various operating camps would be located. Second day on the island and all goods were shipped from the beach head to the three sites chosen for the digital, CW and SSB camps and erection of the antennas began. It was hot, between 35 and 40 degrees in the open, and very tiring work. By the end of day two we had broken mast sections in three masts and little to show for our efforts. After a good night's sleep, though, by the end of the third day all camps were more or less ready and the operation began.

Conditions on our first day of operation were good, with excellent openings to both USA and Japan on 10 and 12m. Next day, however, conditions had begun to deteriorate, particularly on those bands. The best openings to Europe were during our darkness period, with 20m opening about 6.00pm (6.00am European time). A little later, 30m and 17m would also open into Europe and by 11.00pm Banaba time, we had good signals strengths from most of the Southern European countries. It was later in the morning that signals improved into northern Europe and the UK.

Shift operating patterns were established and we soon set into a routine of eating, sleeping and operating. There were good openings to USA and Japan on 160m and 80m but is was a real struggle to make Europe on the low bands. 80 and 40m antennas were single delta loops, but we soon experimented with verticals.

FIG 1 © RADCOM 191

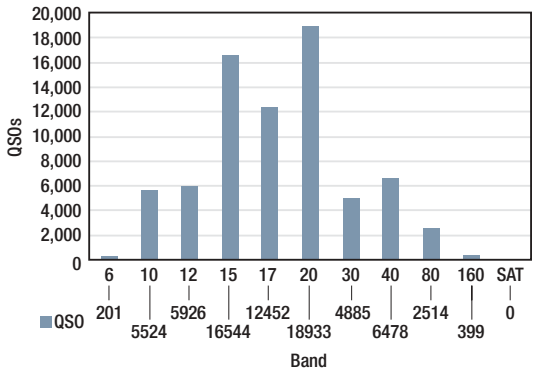


FIG 2 © RADCOM 192

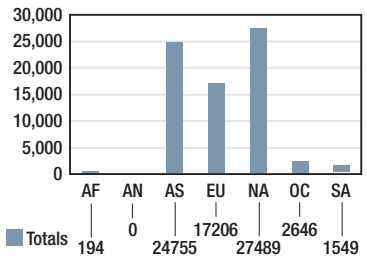


FIG 3 © RADCOM 193

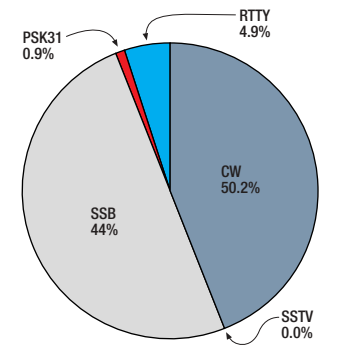


Fig 1
The T33C QSO count per band.

Fig 2
Number of contacts per continent.

Fig 3
Number of T33C QSOs per mode.

LIFE ON BANABA

There is nothing to see on Banaba and once a short sightseeing trip had been completed, off times rapidly became boring. Antenna and generator maintenance reduced the boredom, but not a lot. Some of us went swimming in the warm South Pacific and some went fishing.

Banaba Island is stuck in a time warp. It looks as though the British left the island last week rather than 25 years ago. Many of the houses still stand, although are slowly deteriorating through lack of maintenance. The main island stores still has shelves full of spare parts for lorries and a neat line in welder's helmets. There are approximately 200 nationals on the island including around 100 children of primary school age. It was apparent that many girls become pregnant shortly after puberty. There is no work on the island, the locals grow nothing, export nothing and import everything from Tarawa. They exist on the handouts from a fund created after taking the UK government to court after the phosphate mining ended.

WRAPPING UP

I have insufficient space to tell the complete story of Banaba 2004. By our last operating day we had almost reached our target of 75,000 QSOs and if conditions had not been very poor for four of the days, I'm sure we would have surpassed that. **Fig 1, Fig 2** and **Fig 3** show a break down of the T33C QSOs by band, continent and mode.

We tried daily to get our logs out of the island back to Europe via a PacTOR 3 link to a station in New Zealand or Hawaii, but on several days it was impossible to keep a reliable connection. There was adverse criticism of our online logs for this reason, and it was disheartening, to say the least, when trying our very best to provide a service, to receive such criticism from 'armchair DXers', who should know and understand our operating conditions. Perhaps many of DXers have become used to the fine operations of 9M0C, D68C and 3B9C and the speed of getting accurate information out to the media and have forgotten that there are other remote locations where electricity does not exist, never mind the Internet!

The operators of T33C would like to thank all our sponsors, including the RSGB, CDXC and the GMDX Group, whose details can be found on our website and all our other individual sponsors and helpers, without whose help our expedition could not have taken place. It remains for us now to print and despatch many thousands of QSL cards to the 'deserving'. There will be nine of us from T33C at Friedrichshafen in Germany and I hope we can see some of you there. ♦

WEB SEARCH

T33C DXpedition	www.banaba.de
Banaba culture & history	www.banaban.com
***Coming Home to Banaba* TV documentary**	www.olio.demon.co.uk/banaba

By John Linford, G3WGV

Pennine View, Sleagill, Cumbria CA10 3HD.

E-mail: g3wgv@aol.com

For as long as there has been radio, amateurs have taken their stations to the tops of hills to see what would happen. On VHF they enjoyed the increased line-of-sight range that could be achieved and even on HF improved results could be obtained. It was an enjoyable way to 'play radio', while getting some exercise. It's perhaps a little surprising then that no formal programme for activating summits existed until March 2002!

SOTA: Summits on the Air

Author John Linford, G3WGV, operating 2m FM from Helvellyn, 950m ASL, in the Lake District, G/LD-003.

The idea of Summits on the Air ('SOTA') was first floated some 25 years ago, when some friends and I spent a long weekend walking in the Lake District. We took with us a 2m FM mobile rig, a sealed lead acid battery and a quarter-wave whip antenna. From the top of Helvellyn we made contacts all over the UK. Someone, it was said, should start a programme to encourage this sort of thing.

Well, it took a while but today we have SOTA. Starting as a low-key programme, which I thought might attract a dozen or so participants, the two years since SOTA's inception have seen hundreds of radio amateurs actively participating in the programme. Today there is a thriving community of summiteers and chasers and there is activity practically every day of the week. Weekends are especially busy, with dozens of summits on offer.

SO, WHAT IS SOTA?

From the General Rules: "The purpose of SOTA is to encourage Amateur Radio based activity from the summits of hills and mountains in countries around the world and to provide an award system for Radio Amateurs in all DXCC Entities."

The programme identifies distinct summits in a DXCC Entity and scores them based on height bands. Each summit is given a unique reference number. Activators climb a summit and make a minimum of four QSOs to qualify for the points. Chasers can be anywhere, including on another summit, and get the points for one QSO with a given summit in any 24-hour period. There is also an SWL section which works on the same general principles.

A requirement of SOTA is that Activators must use their own physical effort to get to the top of the hill. Operation from cars, motor bikes, etc is prohibited, as is the use of generators or permanently installed power sources.

The programme deliberately includes lesser summits as well as the highest mountains so that practically anyone can participate. The minimum height for a valid summit is usually 150m ASL. On some of these lower summits, one need only walk a little distance away from the car, whilst many of the larger mountains will require several hours of hiking.

Crowborough Hill in East Sussex is a SOTA summit. This gentle hill sports a road and a residential estate! A valid expedition to this summit, reference G/SE-007, would involve no more than parking your car, walking a few yards and making four or more QSOs. At the other end of the scale activating England's highest mountain, Scafell Pike, G/LD-001, will require several hours of walking and a reasonable level of fitness.

SOTA was designed from the outset to be an international programme. Already, after two years of operation, SOTA is operational in England, Wales, Scotland, Isle of Man, Northern Ireland, Ireland, Germany, German Alps, Austria, Greece and South Africa. Other countries are planning to join the SOTA programme in the near future.

Each DXCC Entity forms an *Association* that determines which hills and mountains will count in the SOTA programme. The Association publishes an *Association Reference Manual* which lists all the summits and sets out important navigational and safety information.

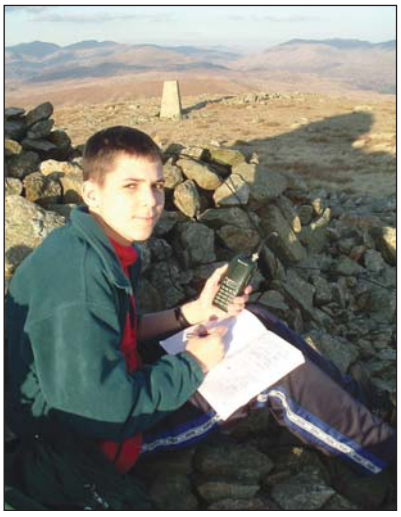
The Internet is used extensively to bring all the SOTA threads together. This is an excellent example of the Internet supporting and enriching amateur radio, demonstrating the fallacy of the argument that the Internet is somehow destroying the hobby.

The General Rules and all the Association Reference Manuals are available for download from the web. There is also an on-line honour roll system for both Activators and Chasers. Recently, an activation notification system has been implemented. Finally, there is a reflector that is used for general discussion about the programme and for notification of activations (see 'Web search' for details).

THE SOTA AWARD SCHEME

Certificates are issued for 100, 250 and 500 points in each section (Activator, Chaser and SWL). 1000 points is a cause of major celebration when the coveted 'Mountain Goat' or 'Shack Sloth' is awarded. Already the programme has several Activators that have achieved Mountain Goat status and a number of Chasers hold the Shack Sloth award.

There is no doubt that SOTA has increased VHF and UHF activity, especially in the more mountainous regions of the UK. One often hears comments that the programme has revitalised activity on bands that used to be dead for most the time. Hopefully this increase in activity lev-



Simon, M3CVN, on 2m FM from Helvellyn, G/LD-003.

Sam, M0SJJ, operates from Whitfell, 573m ASL, in the Lake District, G/LD-032, using 2m FM.

Approaching Helvellyn, G/LD-003, along the magnificent Striding Edge.

els is welcome, even if it does occasionally mean that 2m FM channels are at a bit of a premium at busy times. It's certainly not at all unusual to find half a dozen channels busy with SOTA traffic at the weekend!

Another delightful aspect of SOTA is the way that it has brought young people into amateur radio. Many youngsters enjoy climbing the hills and the greatly improved range obtained on high ground makes the radio experience interesting and worthwhile. There are plenty of examples of people, young and not so young who have been propelled into amateur radio, or who have upgraded their licences as a direct consequence of the SOTA programme.

When SOTA was first mooted, a key principle was that there should be no limitations, other than those imposed by licensing regulations. If you want to carry the equipment to run 400 watts of RTTY then you are at liberty to do so! Most activators, however, content themselves with relatively low power equipment, typically around five watts or so. It is remarkable just how far 5W will go when you are on top of a mountain!

Similarly, SOTA permits and encourages operation on all bands. It's certainly true that a large proportion of current activity is on VHF FM but there is nothing in the rules that says this must be so. Several SOTA Activators are regularly QRV on 40m, either CW or SSB and 30m is becoming popular because of its reliable propagation and the ease of putting up antennas for the band. There is some activity on 60m too and this looks set to increase as more NoVs are issued.

A principal enabler for SOTA is the availability these days of lightweight transceivers. The ubiquitous Yaesu FT-817 has probably done more for the outdoor radio movement than any other radio but there are countless other compact transceivers that do the job. Gone are the days of rucksacks stacked with heavy radios and even heavier batteries. Nowadays it is entirely possible to activate a summit with nothing more than a small handy-talkie that weights little more than a mobile phone!

Although the FT-817 has its own battery pack, generally this is of insufficient capacity for anything more than the shortest of activations, so most people use some sort of external source. Many use Ni-MH battery packs or even small sealed lead-acid batteries. The latter have the advantage of providing good power output throughout the discharge cycle, regardless of temperature. Increasingly, Li-Ion batteries are being used and these offer excellent capacity at remarkably low weight. The only disadvantage with these batteries is their complex charging arrangements.

The next problem is the antenna. For 2m, many people use the SOTA Beam, designed specifically for ultra lightweight operation [see the review on page 52 - *Ed*]. On HF the options are far more varied. I have found that about 15m of wire as an end-fed inverted-V, supported on a roach pole works very well on several bands. I tune it using an LDG Z11 ATU against 10m of counterpoise wire on the ground. This has produced QSOs all over the world on 20m, with just 5W. On 40m and 30m, QSOs are commonplace around Europe. It is truly remarkable what can be worked with such a simple set-up.

For logging, most people use paper and pencil, transferring the log to their computer back in the comfort of the shack. Perhaps we will see a SOTA logbook application running on the latest PDAs before too much longer.

A TYPICAL DAY OUT

The day starts with careful planning, route selection and equipment check-out. There would be nothing more annoying than to spend several hours climbing the mountain only to discover that the battery is flat or you've left the microphone behind. Radio gear, warm clothes, safety gear, etc are packed in the rucksack, map and compass checked, boots on and away we go!

Safety is the paramount consideration and it's vital that the SOTA Activator is competent. The weather in Britain's mountains can change without warning and what started off as a nice sunny day can rapidly deteriorate into a fight against the wind and rain. Only the foolhardy go into the hills improperly equipped in terms of gear and skills.

For most of us, the pace up the hill is slow, recognising that we are carrying some weight and that we want to be fit to play radio when we get to the top. It's as hard to send CW when you are huffing and puffing as it is to speak into a microphone!

Within a few minutes of arriving at the summit the antenna is up, having carefully selected a location that will be out of the way of other people who are out enjoying the fresh mountain air. A lightweight pair of headphones avoids annoyance to those that climbed the hill for a bit of peace and quiet.

Inevitably a few other climbers will be inquisitive and SOTA is prepared for that with leaflets to give out to members of the public explaining what amateur radio is and why we are on top of a hill doing it. SOTA activators are always happy to take the time to explain our wonderful hobby and this enthusiasm has brought several new people into amateur radio.

After some QSOs on 40m and 30m CW I usually give 2m FM a try. Generally there are a dozen or more Chasers anxious for a QSO and it's an unusual activation these days that does not yield 20 plus contacts. After an hour or so, it's time to be getting off the mountain and back home to recharge the battery, fill in the on-line log and start thinking about the next outing.

LOOKING TO THE FUTURE

When the SOTA idea was first mooted none of us ever thought that it would be such a runaway success. There is no question that it has added a new dimension to the amateur radio experience for a great many people and for some it is their principal interest in the hobby. The future will bring more countries around the world into the SOTA programme, heralding the next stage in the evolution of the programme into a truly world-wide activity.

Why not give it a go? ♦

WEB SEARCH

SOTA web site	http://www.sota.org.uk/
On-line database	http://www.stockportradiosociety.co.uk/sota
Summits discussion group	http://groups.yahoo.com/group/Summits/
SOTA Beams:	http://www.sotabeams.co.uk/

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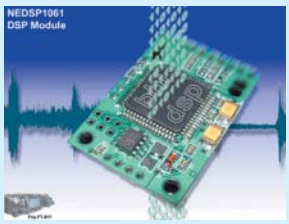

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Reviewed by Alan Poxon, M1EYO

34 Conduit Street, Tintwistle,
Glossop, Derbyshire SK13 1LR.

The SOTA Beams 2m

Active VHF mountain-top operator Alan Poxon took advantage of some good weather to try out this new, purpose-built antenna.

Combining two hobbies has its attractions. I have a colleague whose passion is cave photography and I once had a neighbour who spent most of his summers canoe camping. Although there are obvious rewards from exercising the skills of each pursuit together, these activities place conflicting demands on the equipment. And so it is with Summits on the Air. Hill walking and carrying the equipment to operate a station from the summit inevitably leads to a number of compromises. The radio needs to be of low current drain so that not too much weight in batteries is carried in addition to the safety gear for a mountain journey. Although the height of the summit provides an advantage, activators generally want to carry antennas with the best gain, lowest weight and smallest packed size.

DESCRIPTION

The 'SOTA Beam' was launched last year to meet these specific demands of the 144MHz mountain-top operator. The antenna comprises a 100cm (39.5in) plastic boom into which pack the three 0.55mm diameter (18SWG) wire elements. To assemble the beam, one of the plastic end caps is removed and the three elements slotted into the pre-drilled holes. To feed the antenna, 5m of coax is supplied with two insulated crocodile clips to attach to the two parts of the driven element and a BNC connector for the rig at the other end.

The SOTA Beam comes complete with a guying kit for a SOTA Pole mast that together make up the SOTA Beam system. The guying kit comprises a PVC collar, three nylon cords and three aluminium alloy pegs. The SOTA Pole is the largest four elements of a 6.7m fibreglass fishing rod, giving an antenna height of about 4m above ground level.

The SOTA Beam has two brackets so that it can be attached to the SOTA Pole vertically for FM or horizontally for SSB operation.

A DK9SQ mast can also be used to support the SOTA Beam at about 7m above ground level. A special SOTA Beam kit is available if you choose this option which includes 9m of coax, but not the guying system. The SOTA Beam arrives well packaged with a comprehensive 12-page illustrated manual.

ON THE HILL

Before you can operate from a summit you need to walk there, carrying all of your kit. The weight of the SOTA Beam, at only 188g (less than 7oz), makes it by far the lightest beam in operation by any of the SOTA activators. For example, commercial HB9CV antennas are almost twice the weight and homebrew three-element beams, using the plans on Roger's, MW0IDX, SOTA Wales website, are about 50% heavier.

If you opt for the SOTA Pole, the feeder and guying kit add an additional 226g, plus 605g for the four elements of the SOTA Pole itself, bringing the entire system to just over one kilogram. The pole has a packed length of 115cm (about 45in) which means that it can be carried, along with the SOTA Beam, using the straps on the back or sides of most medium sized rucksacks.

Having arrived at the summit, the SOTA Beam assembles in seconds using the colour coding system for the elements and feeder. The elements come complete with nitrile O-rings to retain them in place but during a dozen summit activations I have found these not to be necessary. With use, however, the holes in the plastic beam may enlarge and the location rings would be needed.

The other major consideration for mountain-top operation is the stability of the antenna and support. The three point guying system has proved more than adequate to hold everything in place in even the strongest winds. In testing, the pegs have held well in the peat of G/SP-002 Black Hill in the Peak District, the turf of GW/NW-024 Trum y Ddysgl in Snowdonia and the rocky ground of G/LD-006 Pillar in the Lake District. The guying cords stood up to the challenge when anchored to rocks on GW/NW-022 Moel Eilio, despite the wind bending the SOTA Pole to an alarming angle.

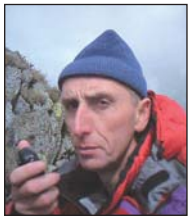
ON THE AIR

In contrast to all the other commercial and homebrew antennas that I have used from summits, the SOTA Beam has always given a very low SWR without any tuning. An SWR of less than 1.5:1 was obtained in all conditions for both FM and SSB operation.

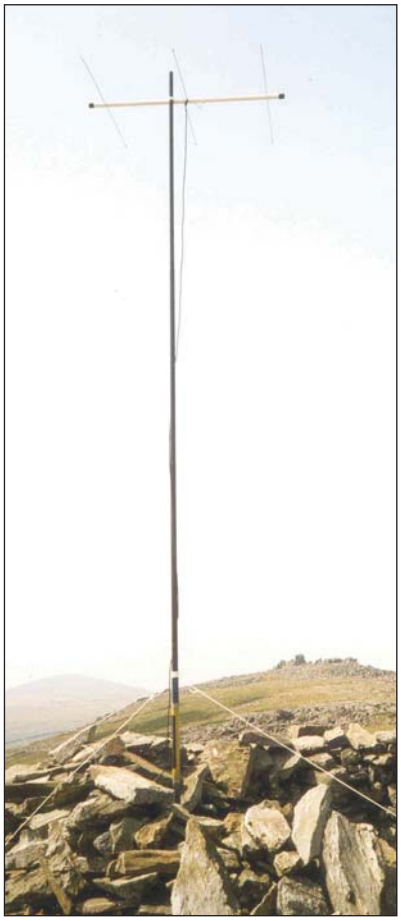
Tests undertaken with Keith G0OXV, the first operator to attain the highest SOTA chaser award of 'Shack Sloth', indicate that the antenna is highly directional which should equate to good gain. The *EZNEC* plot in the instruction manual suggests a gain of 12dBi and a front to back ratio of 14dB. In practice, I have fallen into the habit of using 1W output to the SOTA Beam rather than 2.5W to my usual beam antennas. The signal reports from chasers have been the same and the lower power gives me more time on the air from the same battery pack.

No doubt assisted by a high pres-

portable Yagi



Author Alan Poxon, M1EYO, on G/LD-026 Tarn Crag in QSO with SOTA activist Rob, G4RQJ.



sure system, the SOTA Beam produced good FM contacts into EI, GI, GD and GM from hills in England and Wales. Even difficult locations such as GW/NW-030 Moel Cynghorion, with higher summits on three sides, yielded good long-range contacts using the SOTA Beam that included Robin, GM3PKT/P, on GM/CS-038 An Socach above Glen Shee.

Switching between FM and SSB modes is easily accomplished with the two brackets on the SOTA Beam. The top three sections of the SOTA Pole are collapsed, the antenna is lifted off and slotted back into the new position. I found that the brackets held the antenna in the correct direction on the SOTA Pole with just the push fit in even strong winds. This simple and quick method of changing polarisation will do much to encourage activators to use both modes on the 2m band.

CONCLUSIONS

The SOTA Beam is lightweight, easy to assemble and has good gain in comparison with any of the 2m antennas commonly in use by SOTA activators. I suspect this antenna will quickly become the standard mountain-top antenna against which others are judged.

SOTA Beams are available from ECS Limited, 89 Victoria Road, Macclesfield, Cheshire SK10 3JA; tel: 01625 425700, or via the SOTA Beams website. At £34.95 (inc VAT and P&P) for the antenna, or £44.95 for whole system including a SOTA Pole, this represents very good value for money. Thanks to Richard Newstead, G3CWI, of SOTA Beams for the loan of the antenna for evaluation. ♦

Top left
Assembled SOTA Beam with accessories and SOTA Pole.

Bottom left
Strong wind bending the SOTA Pole on GW/NW-022 Moel Eilio. Thankfully there were enough rocks in the summit shelter to hold everything down.

Centre
SOTA Beam ready for SSB (horizontal) use from GW/NW-020 Craig Cwm Silyn on the Nantlle Ridge.

Top right
The plastic collar and guys supporting the mast.

Bottom right
Additional support provided by a convenient fence post on the summit of GW/NW-030 Moel Cynghorion at 674m (2214ft) ASL. GW/NW-005 Elidir Fawr in the distance.

WEB SEARCH

Summits On The Air:	www.sota.org.uk
SOTA Beams:	www.sotabeams.co.uk
DK9SQ masts:	www.qsl.net/dk9sq
SOTA Wales:	www.geocities.com/mw0idx/sota.html
Richard Newstead, G3CWI:	www.qsl.net/g3cwi

TRANSMISSION 2004

25–26 SEPTEMBER

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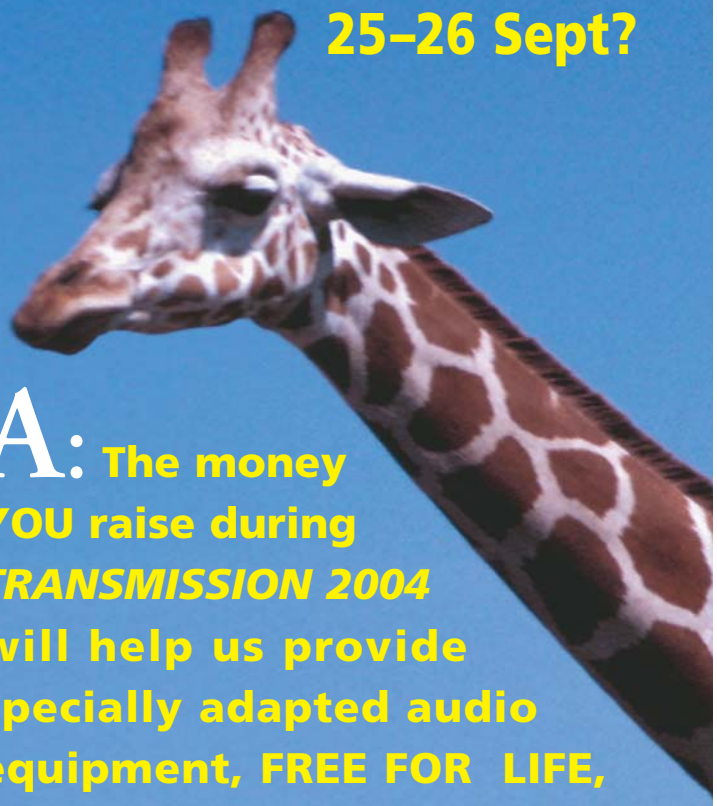

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ALL ABOUT TRANSMISSION 2004

'Transmission' is the annual amateur radio fund-raising event for the British Wireless for the Blind Fund (registered charity number 1078287). This year, 'Transmission 2004' takes place over the weekend of 25 – 26 September.

All radio amateurs are encouraged to take part in order to raise funds for this very worthwhile charity. The idea is that you ask your friends, family, workmates - anyone in fact - to sponsor you for contacts made during the weekend of 25 – 26 September.

This year is slightly different as trophies will be awarded to the individuals and clubs/groups who make the most contacts or raise the greatest amount of money for the charity. Certificates will be sent to all individuals and groups/clubs who either raise more than £10 for BWBF or who make a donation of at least £10 to BWBF. In order to qualify for one of the trophies you must be a current member of the RSGB and resident in the UK. However, overseas amateurs and non-members of the Society are also invited to join in the fun and raise funds for BWBF (they simply do not qualify for the trophies, although they are eligible for the certificates).

Rules:

1. Obtain an official sponsorship form from: 'Transmission 2004', British Wireless for the Blind Fund, Gabriel House, 34 New Road, Chatham, Kent ME4 4QR; tel: 01634 832501; fax: 01634 817485; e-mail: janet@blind.org.uk; or download one from the BWBF website at www.blind.org.uk

2. Ask as many people as you know – family, friends, workmates, other radio amateurs – to sponsor you for contacts made during 'Transmission 2004' on 25 –26 September. Sponsorship can be for either a certain amount per contact or for a single sum, irrespective of the number of contacts made.

3. Sponsored contacts can be made at any time between 0000UTC on Saturday 25 September and 2400UTC on Sunday 26 September.

4. The definition of a "contact" for the purposes of 'Transmission' is a two-way exchange of callsign and signal report. Each station may only be contacted once per frequency band per day. In other words, every station contacted on 25 September may be contacted again, on the same frequency band(s), on 26 September and that second contact may also be counted towards the overall number of contacts made.

5. This is not an amateur radio contest, so sponsored contacts can be made on any band for which you are licensed, including 10, 18 and 24MHz.

6. Sponsored contacts may be made with your own callsign, a club callsign or a GB special event callsign. (Applications for GB special event callsigns must be made in the normal way at least 28 days prior to the event. Full details from AR Dept, RSGB, Lambda House, Cranborne Road, Potters Bar EN6 3JE; tel: 0870 904 7373 or e-mail: ar.dept@rsgb.org.uk).

7. Trophies will be presented to:

(a) the individual raising the most funds for BWBF;

(b) the group or club raising the most funds for BWBF;

(c) the individual making the greatest number of contacts during 'Transmission 2004';
and

(d) the group or club making the greatest number of contacts during 'Transmission 2004'.

Certificates will be awarded to all stations raising at least £10, or making a donation of £10 or more to BWBF. Please send cheques made payable to 'British Wireless for the Blind Fund' to the address in 1. above.

All donations are gratefully received, no matter how small, but the minimum amount to be raised to qualify for any trophy is £50. The minimum number of contacts to qualify for an award in category (c) or (d) is 50 contacts.

8. An "individual" is when only one person operates a station callsign, whether that callsign is a personal callsign, club call or GB special event station. The definition of a group or club is any operation of a callsign by more than one individual. Groups and clubs are invited to operate on more than one frequency band simultaneously.

9. To qualify for the trophies, you must return the sponsorship form and a cheque for the amount raised, made payable to 'British Wireless for the Blind Fund', to arrive not later than Friday 15 October 2004.

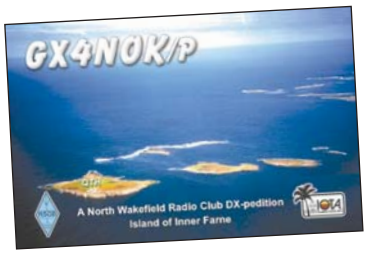
To qualify for the trophies for the greatest number of contacts you must state how many contacts were made during 'Transmission 2004' and enclose a copy of the log. Either a photocopy of a hand-written log or a hard-copy print-out of a computerised log is acceptable. Please do not send the original of hand-written logs as they cannot be returned, and do not send computerised logs on disk. The minimum information required is the date, time, frequency band, and callsign of station contacted. The log should be signed by the licence-holder (or NoV-holder in the case of GB special event callsigns) as follows: "I certify that this is a true copy of the log-book entry for (callsign) during the period 25 – 26 September 2004. (signature)." Sponsorship forms and cheques returned without log copies will only qualify for the trophies for raising the most funds for BWBF.

To qualify for any trophy you must be a current member of the RSGB on 25 September 2004 and be resident in the UK. (However, special certificates will be sent to all stations raising more than £10.)

10. The trophies will be presented at the RSGB HF and IOTA Convention which this year takes place at the Europa Hotel, Gatwick, Sussex over the weekend of 22 – 24 October 2004. The trophies may be taken home by the winners but must be returned as arranged with BWBF for presentation to the winners of 'Transmission' next year.

By Nigel Wears, 2E0NJW

25 Topcliffe Mews, Morley, West Yorkshire LS27 8UL



The North Wakefield Radio Club put on a DXpedition to one of the UK's rarer Islands on the Air groups, the Farne Islands, in April. Nigel Wears describes how it all came about.

An IOTA DXpedition to EU-109

Our DXpedition to the Farne Islands has taught us all many lessons. Perhaps the greatest one is the realisation that when people come together with an aim kept in view, results can be achieved that are quite extraordinary.

I first saw the Farne Islands when travelling by train from Leeds to Edinburgh. At the time I was a new M3 licensee and I was interested in portable operation. On that journey I was thinking of what equipment I would need in my new hobby and where I should go to operate and the answer came with a casual glance out of the train window: the Farne Islands! If I had looked up a moment later I would have missed the sight. Lying between a mile and four miles off the coast of Northumberland, the island group, which counts as EU-109 for the RSGB Islands on the Air (IOTA) programme, comprises some 15 to 28 islands (depending on the state of the tide) split into two sections, the Inner and Outer Farnes.

From that magical moment onwards, my mind was racing as I set about trying to get on to the islands which were ranked in 38th place in the IOTA 'most wanted' table for Europe. I wrote letters and sent e-mails, and help arrived in the form of a letter from the National Trust, stating that it *would* be possible to operate from Inner Farne during the month of April. No other time would be appropriate due to the breeding cycle of the thousands of seabirds that inhabit the islands. No-one would be allowed to stay on the island overnight, but help would be given where needed, and a room would be available in the tower (historic lighthouse ENG040).

ENTER THE NORTH WAKEFIELD CLUB

I kept this letter for a few days and then the realisation dawned that this was a project that needed a team. After thinking of a few ways around the situation, I turned up at the North Wakefield Radio Club committee meeting to try to explain what I had done.

The result is history, and we all feel that we have grown in the hobby because of the experience. Contests were entered to build the team up and to give training in good operating practices. Our Chairman, John, G4RCG, was on hand to help, and the club held several nights aimed at building up the skills that we would need such as how to use our logging software and how to deal with pile-ups. We tried to think of everything that could possibly go wrong and offer training on it. An excellent book on the subject that was used as a guide is *DXpeditioning Behind the Scenes.*

The 20m and 30m stations and antennas.

John, G4RCG, operating on 40m and Chris, M1TRC, on digimodes.

It was decided that we would be able to have three HF stations running constantly as well as digimodes (the first ever from EU-109) and a VHF / UHF station. Station managers were appointed and club members pledged their equipment for the mission. Our thanks must also go to Kenwood for their kind offer of equipment and to Steve at Leeds Amateur Radio for helping with a lot of the things we needed – and especially for his sponsorship of our QSL cards.

Nights were spent learning how to put up tents and masts and 'behind the scenes' work was being done by our coax king, Chris, G1YNH, and 'Mr Logistics' Warren, M0BRK, organising our operating schedules.

Transportation of the team and the equipment proved to be a little tricky. Large boats cannot use the jetty at Inner Farne at low tide, and we wanted the maximum amount of time on the island and so opted for a diver's boat, thanks to a suggestion from a diver in the club, Steve, 2E0OLD.

SETTING UP

After five months of thought and planning, the team arrived on the island at 0800UTC on 17 April. The 20m station was housed sharing a tent with the VHF / UHF station, and another tent held the team dealing with operation on 30, 15 and 10m. Our 40m station and digimode station were in the tower, originally built with monastic connections and now used by the National Trust. The

first sounds of GX4NOK/P were heard within two hours of our arrival on the island, although the 40m and digimode station were off to a later start due to a generator problem. Prepared for anything, we had a spare generator which we had left on the mainland due to its size and weight, and so this had to be collected on a James Bond style mission back to Seahouses, then a taxi to pick up the generator and back by speedboat to the island.

Around 1200 contacts were made on that first day, and after an enjoyable evening together, disaster struck on the second day when we assembled to meet the boat and were told that no crossing could be made because of the bad weather. The equipment was still on the island, and with most of the team having to be back at work on Monday, we were faced with two choices: either to wait to see if the weather would allow us to get to the island to collect the equipment, or to leave it there and operate again on the following weekend. A hasty team meeting was held, and it was agreed to go for the latter arrangement, and this was agreed by the National Trust and our skipper.

SECOND OPERATION

The weekend of 24 / 25 April arrived, and we were back to it. A change of hotel, but luckily the team was only spread between two venues a mile apart. The island wardens couldn't have been more helpful, and they joined in as part of the team. Some passenger boat trips of tourists landed on the island during this weekend, including two boats carrying school parties. We were prepared for this, and the wardens were able to hand out our information sheets to the children.

A feature of the DXpedition was our website (see 'Web search'). Three team members had camera phones which were used to send pictures back to our webmaster, Alastair, who sat at his computer during the whole of the operation, receiving photographs, operator changes, frequencies and all manner of comments that we blasted in his direction. From this, he was able to keep the website updated in 'real time'. We wanted those with Internet access in their shacks to be able to learn something about the Farne Islands and the club, and we hope that having this facility helped in some way. The website recorded just short of 1000 hits, and thank you to those who signed our guest book, which we have printed out as a reminder.

OPERATORS OF GX4NOK/P

Jahn, 2E0JAA	Steve, M0BIU
Alan, G4JKW	Graham, G3CPS
John C, G7JTH	Charles, M3ZYZ
Matthew, M1FLT	Nigel, 2E0NJW
John, G4RCG	Terry, M0JQK
David, G4RQI	Sheila, M3SQK
Ian, M0BFO	Chris, G1YNH
Chris, M1TRC	Warren, M0BRK
Dave, G4IAU	Vic, G4BYG

Warren, M0BRK, and Steve, M0BIU, operate the station with a view (20 metres).

A fond farewell. A last view of the Farnes as the group speeds home.

We were very lucky to have our own husband and wife team of caterers in the form of Terry, M0JQK, and Sheila, M3SQK, who kept all the team fed throughout the DXpedition, and the National Trust staff commented that the pies that we left after the first weekend kept them all fed for days and more than made up for their living quarters being turned into a shack for the week!

We were safety conscious at all times, and there were two qualified first aiders on the team, along with all of the team being covered by our club insurance, which was extended for the duration of the DXpedition.

The operation ended with around 3500 QSOs in the log and hopefully EU-109 moving down the 'most wanted' list. Long skip meant that perhaps only 15% of our contacts were into Britain, but each team member has a special memory: Chris, M1TRC, our Digimode manager, was particularly delighted that the first ever PSK31 contact from EU-109 was with a station in New Zealand. None of us will ever forget the few minutes we spent watching dolphins swimming on the last Sunday morning and none of us will forget the laughs we had with the wardens and with each other, even when things didn't quite go according to plan.

Our congratulations to the RSGB IOTA Committee for the 40th anniversary of the programme, and we hope that our experience will lead to more clubs working together to do something that is really quite extraordinary - it's well worth the effort! ♦

FURTHER READING

RSGB IOTA Directory - 40th Anniversary Edition, edited by Roger Balister, G3KMA. (RSGB). Available from the RSGB Shop www.rsgb.org/shop

DXpeditioning Behind the Scenes, edited by Neville Cheadle, G3NUG, and Steve Telenius-Lowe, G4JVG. (Radio Active publications.) Available from RSGB Shop www.rsgb.org/shop

WEB SEARCH

North Wakefield Radio Club	www.g4nok.org

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By Pat Hawker, G3VA

37 Dovercourt Road, London SE22 8SS.

TT

This month, G3VA presents the latest in the 'huff & puff' stabilisation saga ♦ Short-span antennas & the 'C-Pole' vertical ♦ Using fast switches for balanced modulators ♦ More on the True Antenna Matcher ♦ Ultra-narrow filters using watch crystals

UPDATE ON 'HUFF & PUFF' STABILISER

'TT', July 1973, included some notes from Dick Rollema, PA0SE, translating into English an outline of an ingenious 'Crystal-Stabilised VFO' drift-correction system that had originally been described by Klaus Spargaren, PA0KSB, in the Dutch VERON journal *Electron,* April 1973. The system seemed to offer the promise of the stability of a frequency synthesiser without incurring the excessive spurii and phase noise of the early PLL synthesisers. The system was intended to provide small but stable incremental frequency steps when used with an existing reasonably-stable VFO.

At the time, I added a note: "This VFO-stabilising technique would seem to be along comparable lines to the 'Racalator' [a commercial unit designed for Racal by Keith Thrower that he had demonstrated to me a few months earlier and reported in *Electronics Weekly*]. PA0KSB's system appears to be basically similar, but with a degree of tolerance that makes it highly suitable for amateur operation. Since one is using a DC control system in conjunction with a fundamental [free-running] oscillator, there will clearly be none of the problems of spurious mixer products associated with some types of frequency synthesis. In fact, it seems to represent a VFO technique that could be extremely useful for either HF or VHF operation. I would be interested to hear from anyone who gives the idea a try."

My plea produced an informative and useful letter from a former Hanslope Park colleague and indefatigable trier-out of new ideas – the late Joe Cropper, G3BY. He reported trying out a slightly modified form of PA0KSB stabiliser. He wrote: "So far it looks as though PA0KSB has come up with the answer to the VFO problem. When tuning, the frequency varies normally with virtually no sign of 'steps' (the steps can *just* be heard if tuning is fairly fast but, at normal careful search speed, cannot be heard at all), and then when left stays there. It is *not* a cure for a bad VFO, but the system makes a good one very good." His mixer-VFO with the VFO in the 5 to 7MHz range was found to have a drift of 500Hz in half an hour without the controller; with it the output stayed within a few hertz for 45min. He pointed out that the July notes covered only the barest outline and added some further explanatory notes on "this most promising technique."

G3BY added that watching the control voltage pulses on a scope reminded him of the old 'hit and miss' gas engine governor where this lifts one of the valves to reduce speed resulting in a series of "thump, thump, gasp, thump, thump, gasp, gasp." This encouraged me to name the system as 'the huff and puff VFO', a name which has stuck, although I don't think that PA0KSB ever really approved of it.

The system gradually became known in amateur circles throughout the world. A CMOS version was described by PA0KSB in *Ham Radio,* December, 1977, summarised in 'TT', April, 1978 and later in the 'Building Blocks' chapter of the sixth Edition of *Radio Communication Handbook.* ARRL's *QEX* (February, 1995), published a detailed explanatory article 'Frequency Stabilisation of L-C Oscillators', which I noted in 'TT' July 1996, and supplied photocopies to several interested readers. That year G3DXZ, G3GKG and G7IXH came up with further modified forms, some of which were endorsed by PA0KSB who also prepared a Dutch-text version of his *QEX* article (*Electron,* 1996). Sadly, in 'TT' December 1999, I announced that PA0KSB had become a silent key at the early age of 62 years.

So much for the history. My excuse for including this month a current version of a Huff & Puff stabiliser (**Fig 1**) stems from finding one

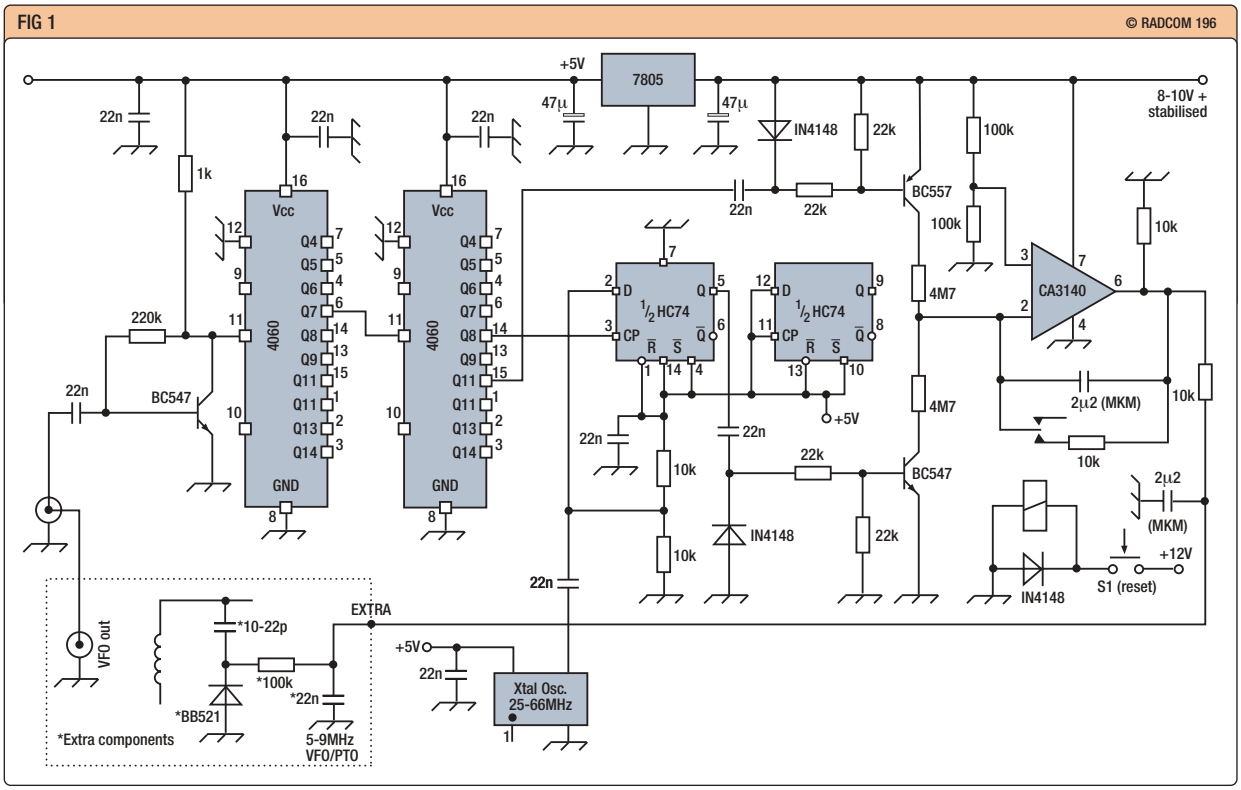


Fig 1
Circuit diagram of the 'Huff & Puff' VFO-stabiliser as implemented by PA0FRI/PA0CMU. (Source: Electron)

described by an old friend of 'TT' – F H V Geerligs, PA0FRI – 'VFO - Stabilisator Getest en Toegepast' (*Electron*, May 2004, pp215/16) in conjunction with PA0CMU. While my interpretation of the Dutch text is abysmal, it would seem that this stabiliser, although based on PA0KSB's 1995 CMOS design, does have some added features that should ensure its suitability for use with any VFO (capacitance- or permeability-tuned) within the popular range between 5 - 9MHz. It can be assembled on a relatively-small PCB. Selection of a overtone crystal unit within the range 25 - 66MHz provides small incremental steps of 4 - 16Hz. Clearly with these small steps, the basic VFO must already have good stability (such transceivers as the Yaesu FT-7, FT-401, Ten-Tec Corsair II and a good home-built VFO are mentioned). When built on a 5.5 x 6.5cm board, it can be accommodated within the transceiver. The 2.2µF capacitor (marked MKM) in the integrator circuit should be a low-leakage type (polycarbonate or polystyrene). If you need further information – and particularly if your Dutch is better than mine – print, photos and more information can be downloaded from PA0CMU's site: http://home.wanadoo.nt/cmulder/frames.htm

SHORT-SPAN HF ANTENNAS & THE 'C-POLE' VERTICAL

I have no idea what is the length of the average British back garden. My own is a narrow strip about 70ft long, just long enough to accommodate a 7MHz half-wave dipole, although it is a long time since I used one, having for many years used either a multi-band large loop or long-wire end-fed antenna folded back and partly running through the roof-space.

But, having often advocated the use of centre-fed doublet antennas (resonant or non-resonant) with open-wire or twin-wire feeders. I noted with interest the recent articles in *QST* and in *RadCom* ('The Doublet

FIG 2 © RADCOM 197

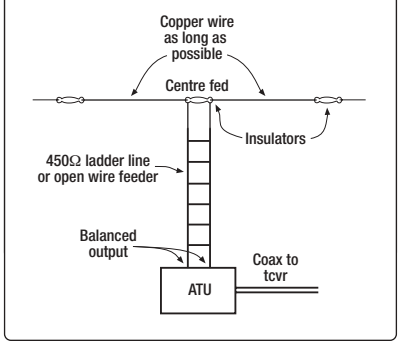
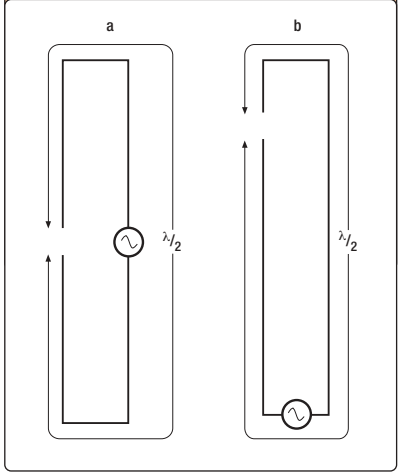


Fig 2
The classic centre-fed 'doublet' (non-resonant dipole) using open-wire or ladder-line balanced feeders and brought to resonance by the ATU. It can form an excellent multi-band antenna with a span much less than a half-wave at the lowest frequency of use.

Fig 3
(a) Vertical half-wave dipole element bent virtually in half; (b) The bent or open folded dipole with a shifted feed-point forms the basis of the 'C-Pole' antenna. (Source *QST*)

Fig 4
Constructional details of KF2YN's C-Pole antenna. Computed dimensions A to E for bands from 14 to 28MHz are shown in Table 1.

FIG 3 © RADCOM 198



De-Mystified' by Brian Horsfall, G3GKG, January 2004, pp53 – 55) on multi-band HF doublet antennas. Both gave much useful information on this "most versatile of antennas", but both may have put off some readers by suggesting (correctly) that, for *maximum* efficiency, the span of the top section should be at least one-half-wave at the lowest frequency of operation – although G3GKG pointed out that the span could be reduced if the ends of the element hung downwards.

If this advice is accepted, then it would rule out the use of a doublet antenna on 3.5MHz and, even more so, on 1.8MHz for the many amateurs whose gardens cannot accommodate anywhere near a 132ft span. Fortunately, as emphasised many years ago: "With an effective ATU, and good open-wire feeder, a 132ft centre-fed dipole does not (contrary to general belief) radiate significantly more power on 3.5MHz than an 80ft dipole fed with the same transmitter power." In other words, a doublet antenna with a top section little more than half the resonant half-wave dipole length and with a span of, say, 70ft with the ends hanging down can prove a thoroughly effective antenna on 3.5MHz. Even on 1.8MHz, such a doublet antenna can be quite useful although radiation efficiency and bandwidth without re-adjusting the ATU will certainly be lower. I would argue that a 70ft centre-fed doublet (sometimes miscalled a centre-fed Zepp) is capable of being used on all amateur bands from 1.8 to 50MHz (and probably above), provided the open-wire feeders are brought through to the ATU without attempting to achieve a match to 50 or 70Ω coaxial cable on all bands, by using feeders of particular length, as in the G5RV or the ZS6AKW (G0GSF) variant. The basic requirement is an ATU capable of providing a balanced output over a very wide range of reactive impedance: **Fig 2** outlines the classic arrangement as noted in 'TT', July 2000.

There are several techniques that will provide a resistive feed-point (though reduced from the nominal 70Ω) for elements having a span of less than one-half-wave; for example, the folded-back element, zig-zag or meander elements. There are also the various full-wave square-loop and phase-loaded quad elements that can have a short span (and turning radius), although these tend to be (although not necessarily) monoband antennas. Recently these have been joined by the various fractal iterations (see 'TT' June 2003 and several 'TT' items in 1998 and 1999). An effective dual-band antenna can be formed by folding back the element, leaving a gap on the lower band, and closing the gap by remote switching for the second-harmonic band. However, this requires a three-quarter-wave span on the lower band (eg about 98ft for 7 and 14MHz, thus requiring a longer rather than a shorter span, but providing a good match to 300 - 600Ω line. I feel a little uncertain about an open folded dipole in which the total wire length is just a half-wave, as the feed-impedance will be very low, reducing its efficiency and reducing operational bandwidth. This can be

FIG 4 © RADCOM 199

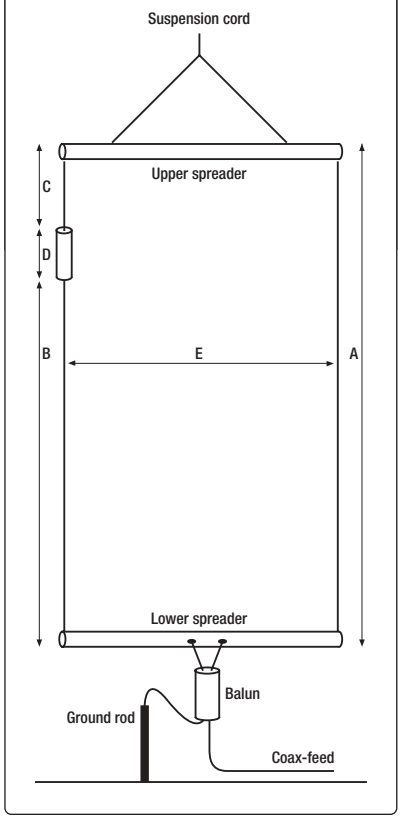


TABLE 1						
Band (m)	2:1 SWR b/w (kHz)	A	B	C	D	E
20	400	177	85	84	8	40
17	540	137	66	67	4	31
15	600	124	60	60	4	20
12	800	100	53	43	4	23
10	800	87	46	37	4	20

Notes: Wire diameter is 1/16in. Height of lower horizontal wire above ground is 12 to 24in (non-critical).

Table 1 – Dimensions (in inches) as modelled by KF2YN keyed to Fig 4.

ameliorated to some extent by spreading the wires further apart than for a conventional half-wave 'closed' folded dipole.

However, the 'open' folded-back element forms the basis of 'The 'C Pole' – A Ground-Independent Vertical Antenna', by Brian V Cake, KF2YN, former G8AFH (*QST*, April 2004, pp37 - 39), subtitled 'KF2YN takes the vertical to new heights with this folded design that doesn't require a counterpoise'. The physical height is that of a quarter-wave monopole, but with reduced ground losses when erected over average earth conductivity.

Fig 3(a) shows a vertical half-wave dipole folded virtually in half with separation between the wires greater than usual for a folded dipole. KF2YN modelled (*EZNEC*) this arrangement on 21MHz with a spacing of about 20in and found the feed-point impedance to be about 25Ω. Such a shortened element could be erected horizontally and fed with open-wire tuned feeders. Feed-point impedance can be changed by varying the ratio of the diameters of the folded wires. However, KF2YN felt that it would be a significant advantage to have the feed-point of a vertical element at or near ground level where the feeder could be dressed away from the antenna. He writes: "Both of these problems can be fixed by rearranging the antenna as shown in **Fig 3(b)**. Moving the feed-point away from the voltage node at the antenna centre increases the feed-point impedance and an exact match to 50Ω can be obtained by shifting the position of the gap at the dipole ends. Unfortunately, doing this places the feed-point at a position where there is a substantial common-mode potential. That is to say, the two antenna feed-point terminals have the same potential relative to ground (in addition to the normal differential potential across the feed-point), and this potential can be several hundred volts for an input power level of 100W. If the coax is connected directly to the feed-point, the natural resonance of the antenna is destroyed and it becomes useless. There are several ways to solve this problem, including the use of an inductively-coupled loop, but I chose to use a balun."

KF2YN points to a ferrite-cored balun as causing the problems

FIG 5 © RADCOM 200

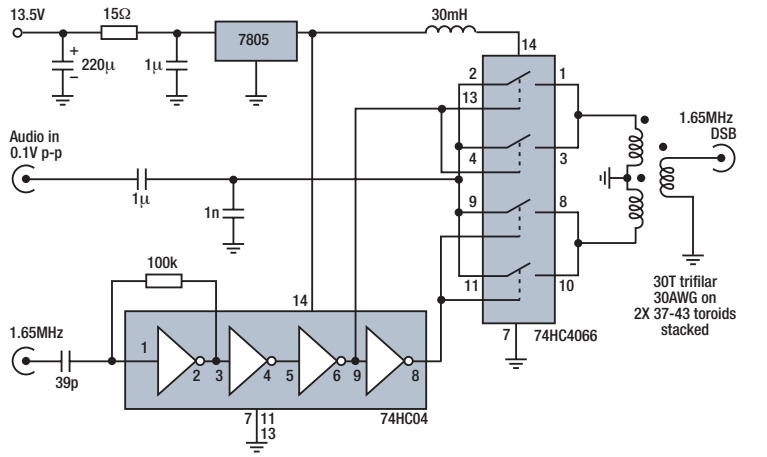


Fig 5
Use of fast switching chip to form a balanced modulator, as used by VK6JDM.

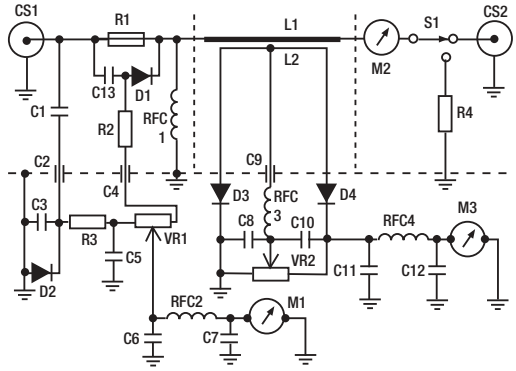
Fig 6
Circuit diagram of the 'Antenna Match' unit described by G6MB in 1955. Component values etc are given in 'TT', December, 2003, p70.

involved in this case. However, he shows that a simple air-cored balun consisting of 60 turns of RG-58/U cable close-wound on a 2in-diameter length of PVC pipe (about 33ft of cable) provides excellent choking action and reduces the line current to about one-tenth of the feed-point current: "This will work fine from 14MHz to 30MHz, but soaks up a fair bit of power, mostly in cable losses." He gives this as about 0.6dB on 14MHz rising to about 0.8dB on 28MHz. He also provides an alternative design using ferrite toroids that reduces power loss to about 0.3dB on all bands.

KF2YN has also computed dimensions of the essentially single-band C-Pole antenna for all bands from 14MHz to 28MHz keyed to **Fig 4**; see **Table 1.**

KF2YN used suitable lengths of $^3/_4$in PVC pipe (schedule 40) for the top and bottom spreaders, with the element wire simply pushed through the tubes. The spacer in the gap is a 6in piece of the same tubing, with holes drilled right through at the 8 or 4in-spacing. He advises that each piece of the element wire should initially be cut to the dimensions given plus two feet or so to allow for securing the wires to the spacer and for adjustment of the resonant frequency and the SWR.

FIG 6 © RADCOM 201



BALANCED MODULATORS USING FAST SWITCHES

Donald Howarth, VK6JDM, writes: "I see in 'TT' a number of discussions regarding the use of the FST3125 and 74HC4066 balanced analogue switches as high level RF mixers. I have not seen any mention of them as balanced modulators.

"My homebrew SSB transmitter uses a 74HC4066 as the basis of the balanced mixer. Whilst there are simpler circuits that will generate a double-sideband suppressed carrier signal, I found the arrangement shown in **Fig 5** was particularly free of carrier feed-through.

"As can be seen, I have not used the usual 2.5V bias of the receiver's mixers. I am only running 0.1V peak-to-peak at the audio port. I imagine that, if a higher level audio signal were used, bias would be required.

"I feel this may represent a useful new use of these fast switch chips."

I should perhaps mention that as long ago as 'TT' November 1975, Chris Bartram, G4GDU, reported the use of CD4016 quad bilateral switches in a third-method SSB generator. This was mentioned in the June 'TT' although VK6JDM's letter was written before this reference was published.

MORE ON THE TRUE ANTENNA MATCH[ER]

Dave Gordon-Smith, G3UUR, writes: "Flicking through the December, 2003 'TT,' I came across the circuit [repeated here as **Fig 6]** of the 'Antenna Match' ascribed to G6MB's two-part article in the May and June 1955 issues of the *RSGB Bulletin.* I immediately recognised the circuit, but neither

the author [Frank Hicks-Arnold, G6MB] nor the name of the unit!

"I first saw this circuit in the December 1953 issue of an old CQ magazine lent to me by Russ Curry, W3DG/G5AEF in 1966. The article was 'The True-Matcher', by Captain R R Hay, W4LW, who acknowledged that Virgil True of the US Naval Research Labs in Washington DC was the original designer, although considerably simplified by W4LW for amateur use.

"G6MB also acknowledges True as the originator, but makes no mention of Hay, W4LW. G6MB's simplified circuit [described originally at an RSGB Lecture at Savoy Place in January 1955] is identical to that of W4LW. It is possible, though hard to believe, that both W4LW and G6MB independently ended up with virtually-identical simplified circuits. I mention this as I know that 'TT' is always interested in making sure that credit goes to the right people.

"In December, G3TEV mentioned how useful he finds this unit when adjusting his ATU. I have also found it very useful for measuring MOSFET amplifier RF input impedances, at power levels of hundreds of milliwatts to tens of watts at frequencies up to 30MHz. The 'True-Matcher' is a handy piece of test equipment, and I can thoroughly recommend it. Having found where to set the controls of the ATU for each band, though, I prefer to monitor my forward and reverse power during operation. It is worth pointing out to those readers who may be considering building one of these units, that the meters for 'Magnitude' and 'Phase' are quite sensitive centre-zero meters (50-0-50 or 100-0-100μA). Undoubtedly, a more modern, smaller version of this unit could be built these days, with ferrite current and phase-sensing transformers."

Probably, G6MB saw and subsequently built his version of the W4RW True-Matcher unit, although his Antenna Match differed slightly in layout and construction. It is a pity he acknowledged only Virgil True as the originator and gave it a new name, not mentioning W4LW's work in simplifying True's laboratory instrument. Virgil True authored 'Automatic Impedance Matcher' in *Electronics,* December 1951, based on *US Naval Research Laboratory Report 3755*, 2 November, 1950.

CQ clearly recognised the value of this unit. An editorial note stated: "*CQ* is proud to be able to bring to its readers this article on the application of a device that has only recently been brought to the attention of radio amateurs. At the time this is being written it is the only practical circuit combining an impedance magnitude indicator, phase-angle indicator and output meter. This is not for the perfectionist, it is for everyone interested in putting the maximum power of his transmitter into the antenna."

Since the December 'TT' notes appeared, there have been a few requests for photocopies of G6MB's two-part 1955 article. With the permission of the Editor as copyright holder, I am willing to do this for anyone seriously interested in building this device (or developing an updated version) on receipt of a stamped-addressed-envelope plus a few stamps to cover the cost of photocopying the eight pages.

FIG 7 © RADCOM 202

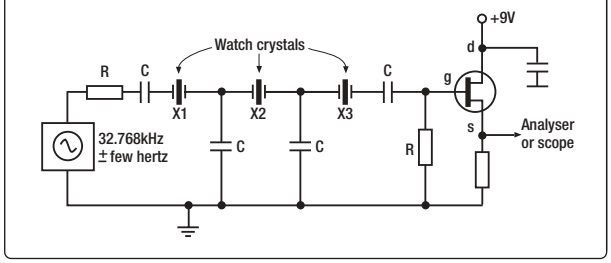


Fig 7 Ultra-narrowband crystal ladder filter using low-cost 32.768kHz watch crystals providing a bandwidth of a few Hz being developed by GW4HBZ. Values of R and C for various filters that have been tested are given in the text.

ULTRA-NARROW FILTERS USING WATCH CRYSTALS

The use of extremely narrow-band selectivity filters to receive Morse or data signals sent at an extremely slow speed has a long history. For example in 'TT', September 1968 in an item 'The Ultimate in QRP', I referred to an RCA project using 100mW pocket transmitters for long-distance communication at very low information rates intended for such applications as allowing a crashed pilot to report his position. This project was described in the March 1966 issue of *RCA Review.*

In this project, the base receiver comprised a communications receiver with a 500kHz IF that was then converted down to 20kHz and passed through a further crystal filter to provide a noise bandwidth of only 0.75Hz swept over a 20Hz bandwidth. The necessary pocket transmitter stability was achieved by placing the crystal, especially cut for a zero-temperature-coefficient turnover at 99°F, in a small enclosure held under the armpit, as a substitute for a crystal oven. The message capability was limited to three bits *per minute.*

Such slow bit-rates have been similarly exploited for years at ELF for communication with submerged submarines and currently also by amateurs at 136kHz to achieve long-distances with antennas having a radiation-efficiency of less than 1%.

It was therefore interesting to receive information from Brian Clowes, GW4HBZ, on recent work on building ultra-narrow-band filters using low-cost watch filters. He writes: "I have always wondered about very narrow-band filters using 32.768kHz watch crystals that typically cost only about 25p each! While this project is still at an early stage, results suggest a 2dB loss with three crystals in a ladder filter (**Fig 7)** giving a 3dB bandwidth of roughly about 2Hz with R = 82kΩ and C = 33pF. I still need to build a highly-stable signal source for this project. Watch crystals cannot be pulled (VXO) very far and the output varies. Possible uses are for VLF, low-speed coherent communication in crowded bands or for VHF/UHF low-signal working. I hope to build receivers for Rugby MSF 60kHz and the German DCF77 77.5kHz transmitters as these are highly stable, always there and would require only stable low frequency local oscillators. It seems that it will be necessary to use very high terminating impedances, much higher than normally used for crystal ladder filters. I am also contemplating using the MK484 chip (similar to the old ZN414, TRF radio chip) combined with 'cheap-to-make' crystal filters to make cheap and simple receivers."

A few days later, GM4HBZ provided a further report on his project: "Using a 3.2768MHz VXO and dividing this by 100 by using a 74HC4040 chip wired with diodes to divide by 50 plus another 4040 to divide by two provides a stable signal source just variable around 32.768kHz. The second 4040 chip stretches and cleans up the fast reset pulse from the first chip. Then with R at 220kΩ and C at 22pF, the 3dB bandwidth is 4.5Hz, 6dB 4.9Hz, 30dB is wide at 30Hz, but this may be largely due to leakage around the filters. The crystals need to be in screened sections. The ripple is about 1dB which suggests the terminating impedance is about right, and the attenuation about 4.5dB. With R at 100kΩ and C at 47pF, the 3dB bandwidth is 2.3Hz, 6dB 3Hz, 30dB wide at 20Hz but, again, may be largely due to leakage around the filter. There is one peak at 1dB above a plateau on either side, and the loss is around 5dB. Matching directly to a tuned circuit at the input (in order to match to a much lower input impedance) proved to be not very successful, due to excessive ripple. A buffer amplifier before the filter may be needed." The project is ongoing.

[I would suggest that somewhat better filter characteristics would be obtained by making the capacitors to earth between X1 / X2 and between X2 / X3 twice the value of C, but this is unconfirmed speculation –*G3VA*]. ♦

Radio Propagation

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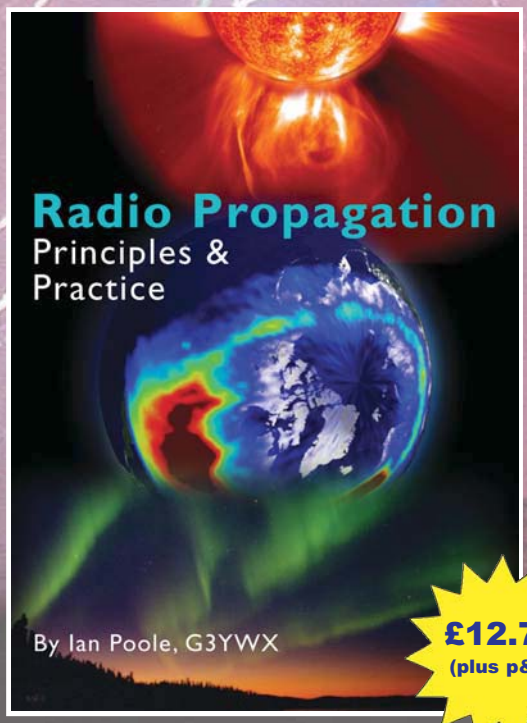

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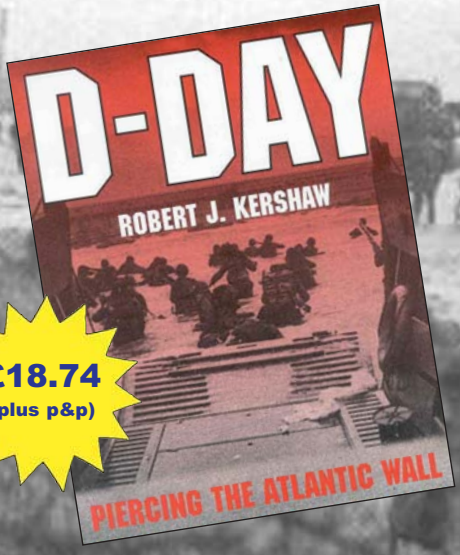

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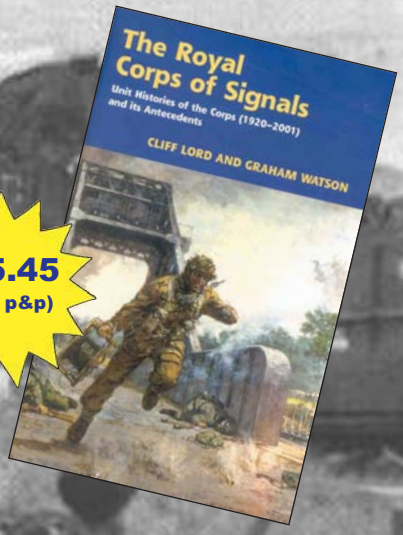

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By Peter Dodd, G3LDO

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ANTENNAS

This month, G3LDO gives details of how to measure the impedance of antennas, particularly the mobile type.

We are fortunate, down here in the Worthing area, to have one of those radio shops, namely GWM Radio, that sell ex-military and commercial equipment and all manner of RF components that you won't find in modern radio parts catalogues, see 'Web Search'. It has been the source of a lot of my RF test equipment over the years. Last week, while discussing with Simon, G0ELN, the proprietor, the merits of some home-brew RF test equipment that was being 'recycled', we got to talking about the noise bridge impedance-measuring instrument.

MEASURING IMPEDANCE

Last month [1] I described how the feed impedance of the High Sierra Sidekick mobile antenna was measured to find what type of matching network would be required to reduce the VSWR. For this I used an HP4085 vector impedance meter. Prior to acquiring this instrument, I used home-brew impedance measuring instruments, one of which was the noise bridge. It was this instrument that was used to identify the problem of feeding the experimental double toroid antenna [2], see **Fig 1**.

All impedance measurement bridges measure the impedance presented to the *unknown* socket by adjusting a calibrated resistance and reactance (in practice, a variable resistor and capacitance) for a null in a detector. The impedance measurement has to be made on a spot frequency. The venerable General Radio 1606 Impedance Bridge used a signal generator as the source so a wide-band null detector could be used. The noise bridge uses a broad-band source (white noise) and a selective null detector (a selective receiver).

The reactance (X) scale is calibrated in ohms X_C (-) or X_L (+) at 1MHz, which has to be divided by frequency to get the true reactance reading. The impedance values can then be plotted on a chart as shown in Fig 1 or on a Smith Chart.

For many years, the balanced bridge was the most popular method of impedance measurement and commercial versions were also available.

If you are measuring the feed-point of an antenna, it follows that the measurement has to be made at the antenna. This means that method is limited to situations where there is access to the antenna *in situ*, which is fine for mobile antennas. Because the noise null detector (ie the receiver) also has to be within earshot, the measuring arrangement may be a trifle inconvenient 20 metres up a mast or on the roof of a house. The problem can be overcome by having the receiver located in the shack, with a small speaker, or a pair of headphones, connected to the output of the receiver via another feeder or a couple of wires from the rotator cable.

Antenna impedance can be measured via an electrical half-wavelength of feeder, which may be the only method available if the feed-point of the antenna is inaccessible.

THE NOISE BRIDGE

The noise bridge comprises an integral noise source, which is fed to a balanced bridge. The unknown impedance is matched to a calibrated adjustable impedance bridge and the match indicated by a noise null in a receiver.

A circuit of a noise bridge is shown in **Fig 2**. ZD1 and R1 act as a noise source, which is then amplified by TR1 and TR2 and applied to the bridge circuit via a toroid transformer. The amplifier circuit can be modified by connecting a capacitor shown in dotted lines. This causes the amplifier to work as a multivibrator and the tone modulates the noise source.

When the values of RV1 and CV1 are equal to the 'unknown' at a specific frequency, the noise output to a receiver used as frequency-selective null detector is minimum, indicating that the bridge is balanced. The accuracy and the depth of the null depends mostly on the layout of the bridge network and the care taken in balancing the bridge.

Full details of the construction and calibration of this noise bridge can be found in [3].

The popularity of the noise bridge has been eclipsed by commercial instruments such as the MFJ-259 and the RF Analyst RF-1 but, to my mind, the RF bridge gives the best indication of actual impedance; and it is a good deal cheaper. ♦

FIG 1 © RADCOM 203

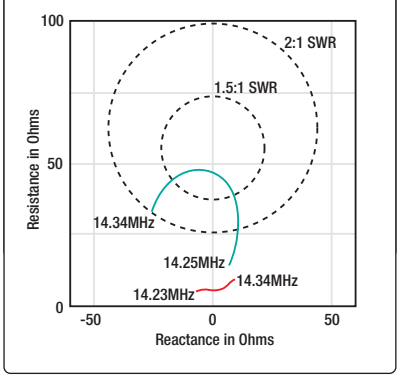

Fig 1
Impedance 'signatures' obtained by making a number of measurements over a range of frequencies on a double-toroid antenna. A direct connection is shown in red while a connection through a shunt matching arrangement is shown in green.

FIG 2 © RADCOM 204

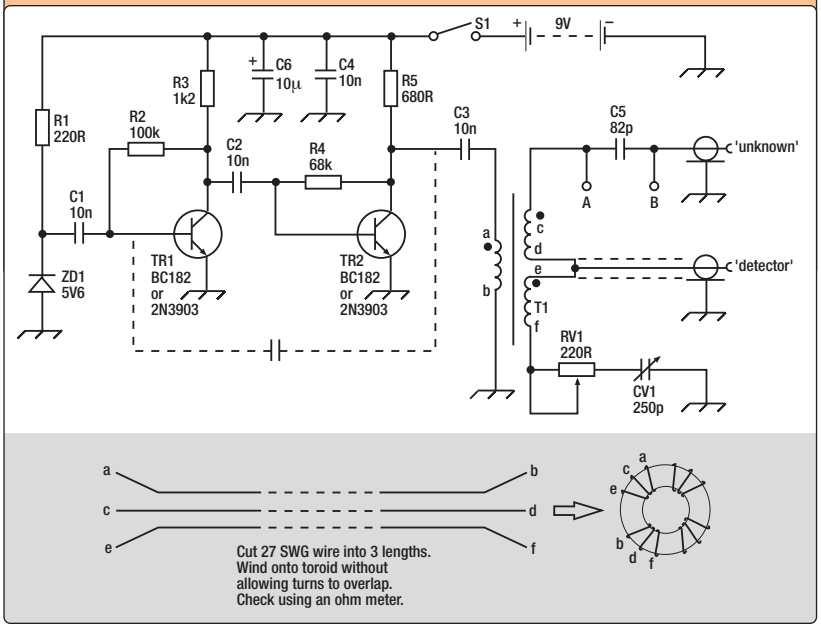

Fig 2
Circuit diagram of a noise bridge designed by G3ZOM.

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[1] *RadCom* June, 2004, 'Antennas'
[2] 'Evolution of the G2AJV Toroidal Antenna', Peter Dodd, G3LDO, *RadCom* August 1994
[3] *The Antenna Experimenter's Guide*, 2nd edition, Peter Dodd, G3LDO.

WEB SEARCH	
GWM Radio	www.gwmradio.co.uk

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Yaesu unveils its new flagship, the FTDX9000 ♦ The RFID is watching you!

Whatever next

Last August, I wrote an item entitled 'Powerplay', in which I highlighted the trend that commercial HF transceivers were increasingly capable of running up to 200W. Specifically I mentioned the (then) brand new Icom IC-7800 and the Kenwood TS-480HX. Little did I know that within a year Yaesu would trump them both with a new flagship transceiver capable of producing up to 400W.

The Yaesu FTDX9000, due to be launched later in the year, is the base station transceiver with just about everything. It has taken Yaesu's experience of building the FT-1000 series and jacked it up to another level. In the FTDX9000, Yaesu has matched the +40dBm third-order intercept point of the Icom IC-7800 and also claims to have "the best close-in dynamic range on the market". Many features of the IC-7800 also appear in the FTDX9000 – features such as dual identical receivers, four antenna sockets, an RS-232C interface, a 15-pin D-type socket for an external VGA display, a USB keyboard socket, a computer network socket and a socket for a flash memory card. Interestingly, the 9000 has its 8-pin microphone socket on the rear panel – the microphone socket on the front panel being an XLR (professional) type. With buttons around three sides of the 7-inch TFT colour display, users can expect more configurability than ever before; and with a socket on the back that interfaces to a rotator, it will be possible to see on the transceiver's screen the direction in which you are beaming.

Continuing the trend of offering two versions of transceivers (eg the TS-480 and the FT-1000MP MkV), the FTDX9000 will also come in two versions – a 400W version with an external power supply and a 200W version with an internal supply. With all this excitement, I almost forgot to mention that it also covers the 50MHz band as standard.

Yaesu's new flagship, the FTDX9000.

ALL-PERVASIVE RFID

Undoubtedly, we are all familiar with Radio Frequency Identification (RFID) tags. They are the passive transponders that I mentioned a couple of months ago as being embedded in London Underground 'Oyster' cards, but they can also be found in 'Dart Pass' pass cards that enable users to drive straight through the toll barriers on the M25 where it crosses the Thames, in the security tags on clothing and CDs in shops, motorcycle 'Datatags', even pets that have been 'chipped'. As the cost of manufacturing them has tumbled they have found their way into increasing numbers of things. As costs continue to fall they are likely to find their way into just about everything else, so here's a vision of the future that you may find slightly disturbing.

You go into the supermarket to buy some groceries. Each item has an RFID tag that contains a unique number. As you walk through the checkout, a reader logs each and every tag. Because the shop's computer has a database of all the tags and the items they are attached to, you don't need to take your items out of the cart and put them on the belt for the bar codes to be scanned, they can be scanned while they are still in it. The RFID tags of the credit cards you are carrying in your pocket are also read and the one you have registered with the shop is charged automatically. This is very convenient, because you don't even need to stop walking, let alone queue!

A few minutes later you are walking down the street past other shops. The checkout scanners of these shops also 'see' and log all the items you are carrying, but because the unique numbers of the tags don't correspond to the items in their stock lists they don't attempt to charge you. As you are passing one shop you notice that someone has dropped a £10 note on the pavement. You pick up the money but decide not to keep it because it too has an RFID tag and its owner is going to come looking for you if you do! You hand the money in straight away. Being thirsty, you pull one of the cans of lemonade that you just bought out of your shopping bag, drink it and throw the can over a fence. That was stupid; in a few weeks' time, when the litter is cleared, the RFID tag on that can is going to result in you being prosecuted for littering.

When you get home, the RFID scanner at your front door recognises all the items you bring in and adds them to your household inventory. Your computer informs you that the chicken you bought last week is now past its 'use by' date and that the packet of biscuits you were given last Christmas is now past its 'best by' date. There is also an e-mail from an electrical shop that highlights a safety issue with a TV that you bought second-hand two years ago, because your scanner logged its RFID tag when you brought it into the house.

The potential problem with all this wonderful technology is that if all the shops permanently log all the tags they scan, everybody's movements will potentially be able to be tracked and advertisers will be able to collect so much data about us all that they will be able to bombard us with individual offers they know that we have a soft spot for. You won't even be able to avoid being tracked by going out with no money, no cards and no phone, because all your items of clothing will also contain RFID tags. ♦

WEB SEARCH	
Yaesu FTDX9000	www.yaesu-museum.de/Galleries/Page10310/FT-DX_9000/body_ft-dx_9000.html www.yaesu.com

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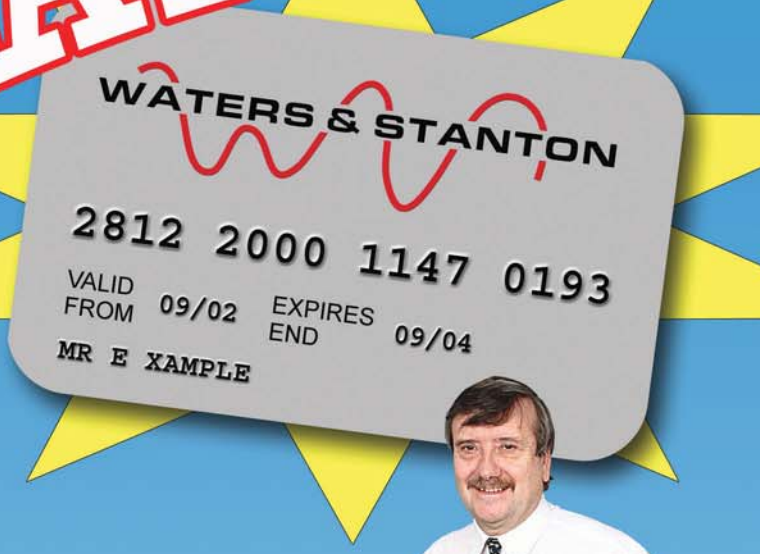

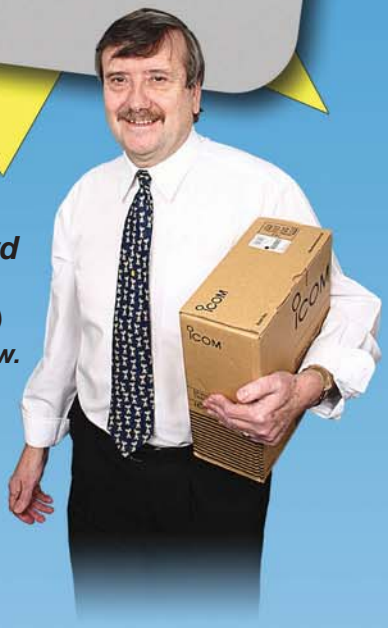

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We all collect magnetic ferrite cores from various sources. Can we use them again? How can we decide what material they are made from, and what their characteristics are? G3SEK starts us off on this journey of discovery...

In practice

NAME THAT CORE?

Q How can I identify an unmarked, unknown ferrite core? What are these cores good for?

A Choosing the right magnetic core is much more complex than, say, choosing the right resistor. And now you're asking how to do that with a completely unknown core? Tricky...

The best way to identify surplus components is usually to find them in a catalogue, and then get hold of the data sheets. This method has become even more powerful in recent years, thanks to the ready availability of catalogues and data on the web. However, it doesn't always work, because many of the components salvaged from mass-produced consumer electronics are custom items that are not in *any* catalogue. This is often true of the magnetic cores used in many TVs, computer monitors and switch-mode power supplies, so we have to find some other way into the problem.

The traditional amateur approach is - try it and see! If it works well enough, then it works. But if it doesn't work, you're left with nagging doubts. "*Could* it have worked, or am I throwing away a perfectly good core because I didn't know enough about it?"

There's no sure-fire solution to this problem, but there certainly are *some* ways to get closer to the answers.

Let's begin by looking at the three major *families* of magnetic core materials. Each family has its own areas of application. There may be applications where a core from another family will work well enough, but often the wrong material just won't work at all. Also within each family there are several *grades* of material, and in some applications the correct grade can make the difference between success and failure. That is why it's so important to identify at least the material family of an unknown core, and if possible the specific grade as well.

Powdered iron materials are made from very fine grains of iron suspended in an insulating resin. Although it looks quite similar to ferrite, powdered iron is not a true ferrite material at all. The separate fine grains of iron reduce losses due to eddy currents, so inductors wound on powdered-iron cores can give high *Q* values. Low RF losses and good temperature stability make the powdered-iron family of materials very good for use in narrow-band filters, tuned transformers, VFOs and other tank circuits. Also powdered iron does not saturate easily, so large cores are capable of handling high levels of RF power in certain selected applications. The frequency range is typically from HF to low VHF, but if low losses are important you need to select the grade quite carefully for the frequency in use. All materials in the powdered-iron family have relatively low permeabilities (typically 10 or less) so high-value inductors may require quite large cores.

Nickel-zinc ferrites are crystalline, non-conducting chemical compounds of iron. They have moderate permeabilities ranging from about 20 to 800, and can be used across much the same HF range as powdered-iron. The higher permeability makes for more compact inductors, but the *Q* and temperature stability are not as good. The lower-permeability grades of nickel-zinc ferrites are also very useful for wideband transformers, whose performance generally extends to higher frequencies.

Manganese-zinc ferrites are again crystalline chemical compounds of iron, and have typical permeabilities of several thousand. The high permeability allows large values of inductance using relatively few turns or wire. The main disadvantages of manganese-zinc ferrites are that they saturate easily, and their magnetic properties are unstable at high temperatures. This family of materials is widely used for the cores of switch-mode power supplies operating at frequencies up to a few hundred kilohertz; but the core design is quite a complex process. The very specific nature of switch-mode transformer design explains the large number of different custom cores, and means that a core taken from one switch-mode power supply cannot easily be used in another one. Also, manganese-zinc ferrites only have low losses at low frequencies, so they are totally unsuitable for applications such as RF tuned circuits. These ferrites do have a very useful RF application, though, for interference suppression where you actually *need* a lossy material to absorb unwanted RF energy. But any absorbed energy goes into heating the material itself, so lossy ferrites are limited to low-power applications.

Now let's see how you could sort through the cores in your junk-box, to find out what family of material each one is made from - and if you're lucky, be able to match it to a similar core in a manufacturer's catalogue.

Where did your mystery core come from? Or more specifically: at what frequency was it being used? If it came out of a switch-mode power supply - as many surplus cores do - it's probably a manganese-zinc ferrite. Nickel-zinc ferrite is generally only found in higher-frequency applications, but these are quite rare in consumer electronics, the major exceptions being the scan coils of TVs or computer monitors that I covered in the February 2004 column. Powdered-iron cores are even rarer as surplus items, though they can crop up in certain kinds of filter chokes.

The size and colour of a magnetic core can sometimes be useful guides. The exact physical dimensions of toroids are often a clue to the manufacturer, so it may be worth measuring the dimensions accurately and then trawling through a few major catalogues. You can't tell much from

FIG 1

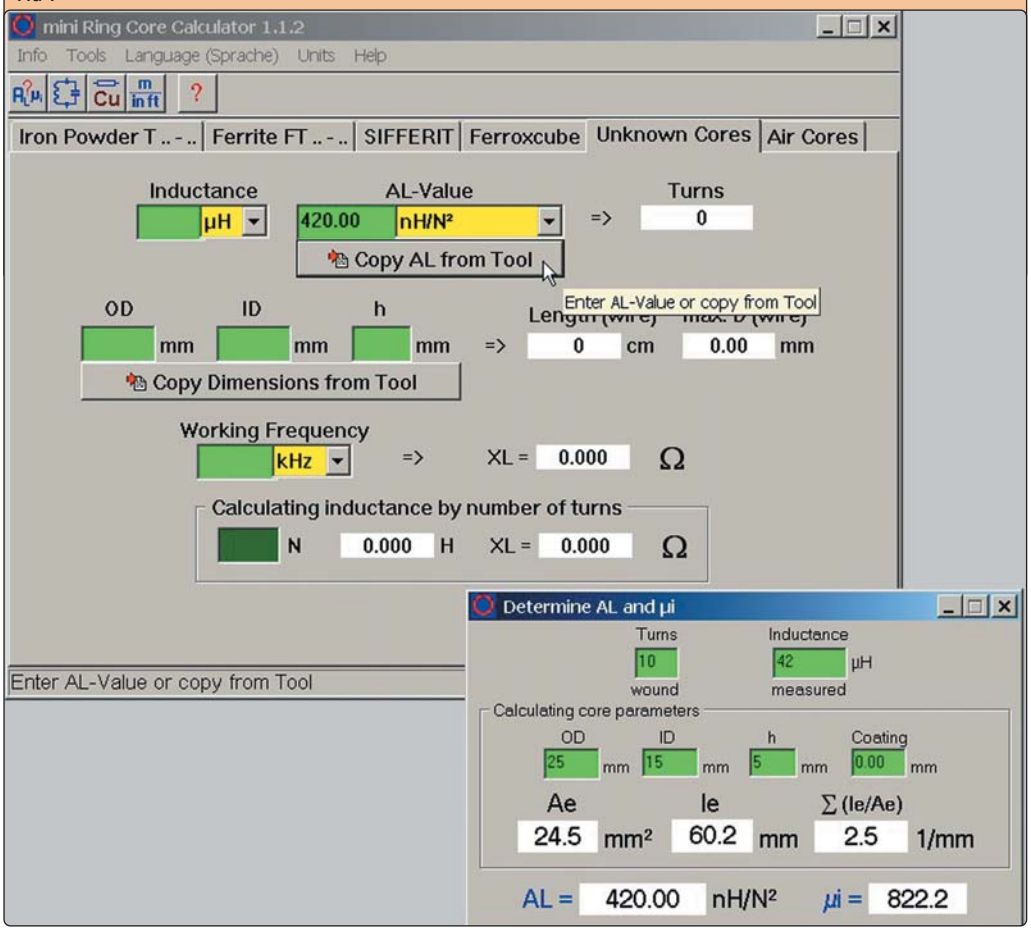

Fig 1
DL5SWB's excellent 'toroid toolkit'.

the native colour of magnetic materials because they're almost all dark-grey to black. If the core is painted, the colours *may* correspond to something in a catalogue... but often it's just paint.

The first electrical test is to apply the prods of an ohmmeter set to its highest range, a few millimetres apart. This will give you a rough notion of the resistivity of the material (scrape any paint off first, of course, and keep your fingers off the metal prods). If the resistance is anywhere between a few kΩ up to about 10MΩ, it's probably some grade of manganese-zinc ferrite; but if it's too high to measure, you could be dealing with either a nickel-zinc ferrite or powdered-iron.

To go beyond these very basic checks, you need to wind a few trial turns of wire onto the core, and make some measurements on the resulting inductor. Specifically, you need to measure the inductance L (or the inductive reactance X_L) and the equivalent loss resistance, R (or $Q = X_L / R$). These measurements need to be made at the actual RF operating frequency. The old-fashioned audio-frequency RLC bridge can measure inductance, but that's all - any loss resistance measurement you make at AF will not be meaningful at RF, so you'll have no idea of the Q of the inductor at its actual operating frequency. Fortunately, more and more amateurs are now able to make R - X measurements at RF, using either a manual impedance bridge, the R - X facility of an 'antenna analyser' such as the MFJ-259B or -269, or even a home-constructed vector network analyser such as the excellent project by N2PK [1]. Not everyone has access to this sort of test equipment yet, but it's already well above the horizon for a significant number of amateurs. If you decide you really need this technology, it's now available, either to buy or to build.

When you have a measurement of inductance and loss resistance for a test inductor wound on your core, you can use this information in two ways. One is to calculate the A_L value of the core, which is the parameter you'd normally use to determine the number of turns needed to achieve the required value of inductance. The normal formula involving A_L is:

$$L = A_L \times n^2,$$

where L is the inductance resulting from n turns on that particular core. But, in this application, you already know L and n, so you can rearrange that formula to find A_L instead:

$$A_L = L / n^2.$$

Now you can search the catalogues to find a core that:

1. Has the correct dimensions; and
2. Matches your measured value of A_L [2].

However, there's a trap here: because of the potential errors in your measurement, and the overlap in permeabilities between the three major families of materials, it's quite easy to identify the wrong core and even the wrong material family. For greater certainty, you have to go back one step further, to calculate the *initial permeability*, μi ('mew-I'), which is a basic property of the core material itself. Combined with your measurement of RF losses, that will help to identify the family of magnetic material; and it can lead you much more reliably towards identifying the actual grade. A very useful program for this purpose is the 'Mini Ring Core Calculator' by DL5SWB - a free download from the web [1]. **Fig 1** shows the main program window, together with the pop-up tool that helps you to calculate A_L and μi from the measured dimensions and inductance of any unknown toroid.

But the 'Mini Ring Core Calculator' can do far more than that - it's a complete toroid toolkit. Its main use is to calculate the inductance of toroids wound on *known* types of cores - and data for hundreds of them are right there in the program. Uniquely, this program contains data for products from both the USA and Europe: the Micrometals range of iron-dust toroids; Fair-Rite ferrite toroids; Siemens/Siferrit ferrites; and Philips/Ferroxcube ferrites. The data include A_L and μi values, physical dimensions and colour codes for each toroid, and there's even a calculator for air-wound solenoid coils. All these features combine to make DL5SWB's program a unique and valuable tool for anyone who ever winds a coil. ♦

NOTES AND REFERENCES

[1] Follow the links from the 'In Practice' website (URL above) which often includes additional information that cannot be mentioned here due to space constraints.

[2] The units of A_L in various catalogues can be confusing. They can include 'nH per turn-squared', 'µH per 100 turns' and 'mH per 1000 turns' - sometimes even in the same catalogue! I'll deal with this topic in a later column.
(The promised continuation of June's item on relay contacts will appear in a future issue.)

By Don Field, G3XTT

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HF

QSL card being used by ZB2EO to commemorate the tercentenary of British Gibraltar (1704-2004).

Members of the March V8JIM DXpedition: Greg, V85GD; Ray, G3NOM / HS0ZDZ; Phil, G3SWH, Jim, G3RTE.

News of special prefixes and award schemes for the Athens Olympics and Euro 2004, plus plenty more DX activity scheduled for July, as Don Field, G3XTT, reports.

I'd been busy putting some editorial thoughts on paper (well, on screen) this month, but there is lots of news so it will have to wait. After a little bit of a lull in DX activity during May and June, the IARU and IOTA contests will bring plenty of island and other expeditions on to the bands during July. Remember, also, that it is now winter in the southern hemisphere, so a good time to work southern African and South American stations on the low bands. What is there to look forward to?

Luigi, IZ5FKK, will operate SSB, RTTY and PSK31 as IM0/IZ5FKK from **Maddalena Island** (EU-041, IIA SS-001) from 5 to 15 July. QSL via his home call, direct or bureau.

Serge, RA3XR, and Nick, UA3YH, were due to join a scientific expedition to **Dikson Island** (AS-005, RR-06-09) from 15 June to 15 September and to operate as RA3XR/0 and UA3YH/0 (or with a special call). QSL via home calls, bureau or direct.

Mark, W4CK, will be active as HR1/W4CK from **Honduras** between 8 and 15 July.

Sebastien, FT1ZL, on **Amsterdam Island** is now allowed to get on the HF bands as a result of recent rule changes to what were previously VHF-only licences. Dany, F5CW / FT5ZB, who passed along this information, says to look for FT1ZL on 28485 or 28495, 24974 or 24954, 21271 or 21191, 18148 or 18138 and 14274 or 14195. He is a phone operator, and has been told how to operate split, but is new to DXing, never having been on HF before. So there is a request to take it easy and have some patience when he shows up from this rare one.

Several operators will be active as CT9P from **Porto Santo Island** (AF-014), from the Lighthouse of Ilheu de Cima (LH 0830/FMA01) between 16 and 19 July. Operation will be on CW, SSB, RTTY and PSK31 on 40 - 10m. QSL via N3SL.

Marc, EA1/ON5FP/P, and Jose, EA1/ON4CJK/P, will be on **Mouro Island**, EU-142, from 23 to 25 July (including the IOTA contest), then from **Gibraltar**, ZB2, 27 to 29 July and from **Ceuta & Melilla**, EA9, 30 July to 1 August. QSL all via ON4ADN.

Paul, FP/K9OT, and Peg, FP/KB9LIE, will be on **Miquelon** (NA-032) from 2 to 11 July. This is a 100 watt operation on all bands. They plan on separate entries (one on CW, one on sideband) for the IARU HF Championship. QSL via K9OT.

Dave, K4SV, and Neil, VA7DX, will operate from **Lesotho** (7P), 29 July to 6 August, **Swaziland** (3DA0) 7 to 11 August and **Mozambique** (C9) 12 to 17 August. They will be on all bands and modes with vertical antennas on the low bands and a Yagi on HF. Last year's callsigns will be reactivated with Dave using 7P8DA and 3DA0SV and Neil using 7P8NK and 3DA0WC. The C9 callsigns were not available at press time. Further information and online logs from K4SV's web page. QSL all calls via K4YL.

Voytek, SP5QF, is active as HF0QF from the Henryk Arctowski Base on King George Island, **South Shetlands**. Voytek will be there until the end of the year. QSL via SP7IWA.

Don, G3BJ, Secretary of IARU Region 1, reports that the **Zimbabwe** radio society has decided to close its bureau, due mainly to huge increase in postal rates within Zimbabwe. At the same time, Graham, M5AAV, writes with news that mail to Zimbabwe is increasingly being tampered with, with any enclosed items such as IRCs and dollar bills being stolen. As a result, most Z2 amateurs now have QSL managers elsewhere in the world. Graham himself has taken on the role for Maurice, Z21KF. If sending mail to Zimbabwe, it is best not to hint at amateur radio on the envelope.

Larry, VQ9LA, reports he will be QRV from **Diego Garcia** until December. Starting in August he plans to put a serious effort into the low bands. He will be active on 30 through 160, CW and SSB. Larry will be vacationing in June and most of July. QSL via the address on qrz.com

Vincent, F5MJV, who is a member of the French Navy, will be departing Europe for the French Polynesian territories (**Tahiti**, **Marquesas** and **Australs**) for a one year stint, starting on 1 July. He has requested an FO5 callsign. Vincent will be running 100 watts and a vertical antenna when operating from a boat. Most activity will be on CW. He will also be operat-

COUNTRIES WORKED, 2004
(sorted this month by Mixed totals)

CALL	CW	SSB	DATA	MIXED
W1JR	221	214	138	245
G3XTT	198	112	75	232
GM0TGE	118	142	0	178
G4OBK	121	82	59	175
G4KFT	165	0	0	165
G3YVH	151	21	0	151
G3SXW	150	0	0	150
G3VDL	147	0	0	147
MU0FAL	135	81	0	146
G3ZRJ	129	9	0	129
G4IRN	117	0	0	117
G4WXZ	78	68	0	115
G3LHJ	87	12	62	114
G3TXF	113	0	0	113
M0BVE	99	0	0	99
GU0SUP	0	0	96	96
G3YMC (QRP)	94	0	0	94
G4FVK	34	69	0	79
VK4BUI	60	31	0	77
G0LGJ/M	0	74	0	74
MM1APX	0	57	62	73
M0BKV	0	61	29	72
M0CNP	4	56	48	72
GM8OEG	24	21	58	61
G4DDL	57	5	10	57
G0GFQ	0	43	12	45
G7CLY	0	38	0	38
M5AEF (1W)	9	20	0	25

ing from several islands with the same set-up. Both rare and semi-rare IOTA stops are expected, along with stops from several other Pacific Ocean countries (ZL, 3D, W6, KH6, VK). Vincent has a web page (in French).

IOTA CONTEST

As always, there will be a number of island DXpeditions centered on the RSGB's popular IOTA contest. Here are the ones I am aware of at the time of writing (over and above operations mentioned already). There will be plenty more than this, though! Firstly, a large multinational group will activate Madeira's Porto Santo, AF-014. QSL via N3SL.

Norman, VY2/W1MO, will be on Prince Edward Island, NA-029. QSL to his home call. The Cray Valley Radio Society, CVRS, will have a group on St Mary's, Isles of Scilly, EU-011. They will be active with their personal calls and the club call G3RCV/P outside the contest. In the contest they will sign M8C. QSL via G4DFI. Seven Belgians will visit Jersey and use the callsign MJ0DLQ/P. They will be on Les Minquiers, EU-099, from 22 to 25 July. Outside the contest they will sign MJ/home call/P. QSL all of them via ON4ON.

Kent, SM0ELV/5, will be on the island of Lilla Olsön, EU-177. QSL to his home callsign. E21EIC will sign /P from Si Chang Island (AS-107). EJ/ON5MF/P will be a multi-op effort from Saltee Island (EU-103). TF7/LX9EG/M will be active from the Westmann Islands (EU-071). And there are several announced operations from the usual DL, SM, LZ, G and I offshore islands. As usual, the NG3K web page is a good place to look for announced contest operations.

SPECIAL PREFIXES

There are many special prefixes being aired at the moment. Firstly, in connection with the Athens Olympics, there are lots of stations operating with SX prefixes. The SX#A/## operations will take place from all Greek regions. The first operation SX9A/99-SX9A/90 was from Crete (EU-015). The second SX8A/89-SX80A/80 is from the Greek islands (DXCC = SV). The very rare prefix SX7A/79-SX7A/70 was due to be active from Thrace and East Macedonia (DXCC = SV), SX6A/69-SX6A/60 from Epirus (DXCC = SV), SX5A/59-SX5A/50 from the Dodecanese Islands (EU-001) (DXCC = SV5), SX4A/49-SX4A/40 from Thessalia (DXCC = SV), SX3A/39-SX3A/30 from Peloponissos, among others from Ancient Olympia where the Olympics Games were born (DXCC = SV), SX2A/29-SX2A/20 from west and central Macedonia (DXCC = SV) and SX1A/19-SX1A/10 from Sterea Ellada, mainly Athens (DXCC = SV).

After that there will be one day operations from SX9A, SX8A, etc until SX1A (one day before the start of the Olympic Games). All QSL cards will be confirmed only via the SV bureau. In addition, Greek radio amateurs can use the special prefixes SX2004 or SY2004 from 1 June to 15 November. Foreign radio amateurs visiting Greece from 1 August to 15 September are allowed to use the special prefix J42004. Operators from CEPT countries, including the United Kingdom, do not need to submit any papers for a licence. Be aware that someone could use SX2004xxx and there is no way to know if the station is from Crete (SV9) or Dodecanese (SV5), unless you ask. Further details from the web page. Incidentally, there still seems to be lots of confusion about the prefix SY which many logging programs (erroneously) associate with Mt Athos. The only station currently active from Mt Athos is Monk Apollo, SV2ASP/A. Any SY stations are operating from Greece, the Dodecanese or Crete.

Amateurs from Portugal, the Azores and Madeira were authorised to use the following special prefixes from 12 June to 4 July during Euro 2004: CT1 = CQ14; CT2 = CQ24; CT3 = CS94; CT4 = CQ44; CT5 = CQ54; CU1 = CU14; CU2 = CU24; CU3 = CU34; CU4 = CU44; CU5 = CU54; CU6 = CU64; CU7 = CU74; CU8 = CU84; CU9 = CU94; CU0 = CU04. The official REP (Rede dos Emissores Portugueses) station will be CS2004REP.

There are new French prefixes available on the HF bands due to privilege upgrades of previous VHF-only licensees. New on HF are F1, F4, TK1, TK4, FM1, FM4, FG1, FG4, FS1, FS4, FJ1, FJ4, FP1, FP4, FY1, FY4, FR1, FR4, FH1, FH4, FO1, FO4, FT1 and FT4.

Special call EO60FO will be aired from the Odessa region of Ukraine until 27 August to celebrate the liberation of the Odessa region in 1944. QSL via the bureau.

AWARDS

With immediate effect, BARTG (the British Amateur Radio Teledata Group) has a new awards manager. Phil Cooper, GU0SUP, has now taken over this post from Nigel, G4KZZ, and will handle all BARTG awards, which includes the well-known QCA (Quarter Century Award), plus the various continental awards. Further details of the awards can be found on the BARTG web pages or by contacting Phil direct (awards@bartg.demon.co.uk).

The Athens 2004 Olympic Games Awards are available for all radio amateurs and listeners who make the requisite number of QSOs with stations in Greece during the period of 15 May to 30 September. Special prefixes J4, SX and SY count 10 points each, 'normal' SV stations count 5 points each and the Radio Amateur Association of Greece's HQ station SZ1SV counts 50 points. A total of 250 points is required for the Bronze Award, 350 for the Silver and 500 for the Gold Award. Each award costs 10 IRCs or 10 euros and the address for applications is RAAG Award Manager, PO Box 3564, 102 10 Athens, Greece.

The Euro 2004 Diploma is for contacts with Portuguese stations (Continental and Autonomic Regions of Azores and Madeira) made between 12 June and 4 July. Contacts with Portuguese stations with a standard prefix, (CR, CS, CT or CU followed by only one digit) count 1 point; with the special prefixes mentioned earlier, 3 points; and with CS2004REP 5 points. The same station can count more than once, but each contact must be on a different band or mode. European stations (outside Portugal) require 100 points to qualify. Stations elsewhere in the world require 50 points. Send a log extract plus 2 IRCs or equivalent (Europe) and 3 IRCs or equivalent for the rest of the qorld, to REP: Rede dos Emissores Portugueses, Award / Contest Manager, PO Box 2483, 1112 Lisboa Codex, Portugal.

LOGBOOK OF THE WORLD

The ARRL's Logbook of the World (LoTW) secure contact database is now fully active for applying for credits towards the various DXCC awards. Although the database itself has been live for some months now, it

QTH CORNER

9M8PSB	Maurizio Bertolino, IZ1CRR, PO Box 2, 12022 Busca - CN, Italy.
ET3AA	Box 60258, Addis Ababa, Ethiopia.
HS72B	Mr Supote Saripan, E20NTS, PO Box 5, Klongtanon, Bangkok, 10222, Thailand.
K4YL	Mike Grose, PO Box 183, Flat Rock, NC 28731- 0183, USA.
ON4ADN	Geert Decru, St Laurentiusstraat 18, 8710 Wielsbeke, Belgium.
ON4ON	Danny Commeyne, Rozenlaan 38, B-8890, Dadizele, Belgium.
TU8/F5LPY	Bernard Jung, F5LPY, 22 rue Champ Saint Pierre, 55430 Belleville sur Meuse, France.
YA8G	Liv Johansen, LA4YW, Kolstadtunet 4c, 7098 Saupstad, Norway.
SP7IWA	Wanda Jakubowska, Ul Dewonska 14/3, 25-637 Kielce, Poland.

was only in May the additional software was made available for the claiming of QSO credits. Already at least one amateur has applied for an initial DXCC award (100 countries) based purely on electronic credits on the LoTW system. One particular benefit for existing DXCC holders is that the new interface allows you to see all your existing credits, rather than having to ask ARRL for a paper printout.

5MHz

John, G3WKL, Chairman of the 5MHz Working Group, reports that "The 5MHz beacon, GB3RAL, is now operational using a temporary aerial awaiting a more permanent aerial installation. The beacon transmits every 15 minutes on Channel FC (5290kHz), based upon the hour as a starting point. The sequence is a callsign followed by a long tone at full power and then nine power steps each -6dB relative to the last. The power steps are repeated twice and then there is a 30-second sounder sequence of 0.5mS pulses at 200Hz prf. Amateurs (with or without 5MHz NoVs) are invited to send reception reports using the station logging form, preferably electronically rather than handwritten, which is available along with guidance on reporting on the 5MHz website."

CORRESPONDENCE AND TABLES

G0LGJ's mobile activities netted ZD8 on 20m and 3B9 on 17 and 15m. He writes that he is using a new Outbacker type antenna which makes it easier to change bands when mobile.

Dave, G4VFQ, writes to say that he is one who still likes to find his own DX, and not rely on external help of any sort. On another topic, he asks how our 3B9C expedition, with its many QSOs, affected Robert, 3B9FR (who Dave has worked several times). Actually, many stations in rare spots get fed up with being at the end of huge pile-ups every time they go on the bands, and I think Robert was looking forward to a reduction in the pile-ups after 3B9C had soaked up demand. But whenever I've heard Robert in recent weeks, he's still getting plenty of callers! Actually, Robert spent a huge amount of time with the 3B9C team, helping us in many ways, but also soaking up lots of ideas for his own operating. Many of us rely on local club meetings, Field Days and such like to improve our operating skills. Someone like Robert rarely sees another amateur, and was thrilled to be a part of 3B9C for those few weeks.

Both Fred, G4BWP, and Colin, MU0FAL, write in strong support of adding 6m to the all-time tables. No-one to date has objected. We'll leave the situation as it is for the next table, but maybe add 6m for the following one. However, do start including 6m totals when you update to G3GIQ, so that Henry can start to populate the tables in anticipation.

Finally, I wanted to recommend IK3QAR's website as a useful one for QSL information (managers and addresses) and a wealth of other handy HF-related information.

THANKS

Special thanks go to the authors of the following for information extracted: *OPDX Bulletin* (KB8NW), *The Daily DX* (W3UR) and *425 DX News* (I1JQJ). Please send items for the **September** issue by 24 July. ♦

WEB SEARCH

5MHz	www.rsgb-hfc.org.uk/5mhz.htm
BARTG	www.bartg.demon.co.uk
Dikson island expedition	http://dx.obninsk.org/dikson_en.htm
F5MJV	http://f5mjv.com
IK3QAR	www.ik3qar.it
IOTA Contest announced operations	
	www.cpcug.org/user/wfeidt/Misc/iota2004.html
K4SV	www.k4sv.com
K9OT	www.mhtc.net/~k9ot
'Minkieboys'	http://users.skynet.be/minkies
Olympic callsigns and awards	
	www.athens2004.com
YA8G page	www.qsl.net/la8g/YA8G.htm
NG3K pages	www.cpcug.org/user/wfeidt/index.html

HF F-Layer, Propagation Predictions for July 2004

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** EUROPE							
Moscow	1.....23	62.....1356	65.....2456	..453332562	.....66..	.....	.....
*** ASIA							
Yakutsk	.....	.....	211....12333	255544566663	...2212.....	.....	.....
Tokyo	.....	.....	.....1..	.....111..	.....1....	.....	.....
Singapore	.....	.....11.	.....121.	.....21..	.....11...	.....1....	.....
Hyderabad	.....	1	233	13453	..21112643..	..111113....	.....
Tel Aviv	6.....455	75.....3777	.43....26776	..211.1277..	.....1.....	.....	.....
*** OCEANIA							
Wellington	.....	.....	.....	.....	.....	.....	.....
Well (NZ) (LP)	.3.....	795.....665	897.....798	785.....98	87	.....7.	.....
Perth	.....	.....	1	.....	.....	.....	.....
Sydney	.....	.....1..	.....11..	.....	.....	.....	.....
Melbourne (LP)	.....	.57.....	4782.....	546.....5	15	.....	.....
Honolulu	.....	.....	.....	...11.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.2....12....2....521.	..21....531.	.....2..	
W. Samoa	.....	.....	.....	...11.....	.....	.....	.....
*** AFRICA							
Mauritius	.....	111	.....121.	.....11..	.....1...	.....	.....
Johannesburg	23.....21	23.....5664	.....741.	.....161....1....21...	..1....1.....2133....		
Ibadan	.....	12.....111	552.....2555	..71..125764..85223 4885.	.....56.	.....	.....
Nairobi	.....	1.....111	31.....122	.3.....2344	..21..12561.	..12212462.....1.113...	
Canary Isles	43.....254	663.....1666	6621....3557	3.61...36777	...76666776.	...33.3.57.	.....
*** S. AMERICA							
Buenos Aires	1.....	663.....15	322.....13	1.1.....22	554	.....53.	.....3..
Rio de Janeiro	.....	21.....12	21.....23	121	....1...1765	....1...164.	.....15..
Lima	.....	11.....1	111.....2	1	153	.....13.	.....1..
Caracas	.....	.....	.....	..1.....1	.....1.	.....1..	.....
*** N. AMERICA							
Guatemala	.....	.....	.....	.....	.....	.....	.....
New Orleans	.....	.....	.....	1213351	.....12.	.....	
Washington	.....	1.....	331.....1	2...1....135	1111261	.....2.	.....
Quebec	2.....1	63.....16	21.....23	1221	.....3..	.....	.....
Anchorage	.....	.....	.....	11111	.....	.....	.....
Vancouver	.....	.....	.....	.....11.	.....	.....	.....
San Francisco	.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....11...	.....211.....	.....11..	

Key: Each number in the table represents the expected circuit reliability, e.g. '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. Black is shown when the signal strength is expected to be low to very low, blue when it is expected to be fair and red when it is expected to be strong.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at http://members.aol.com/g4fkhgwyn The page is updated monthly. The provisional mean sunspot number for May 2004 issued by the Sunspot Data Centre, Brussels, was 41.5. The daily maximum / minimum numbers were 73 on 16 May, and 16 on 7 May respectively. The predicted smoothed sunspot numbers for July, August and September are respectively: (SIDC classical method - Waldmeier's standard) 40, 38, 37 (combined method) 49, 48, 47. Longpath predictions are shown with (LP) following the path name. Higher input power and superior aerials have been used for these predictions; less well-equipped stations may find the longpath predictions somewhat inaccurate.

By Roger Balister, G3KMA

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IOTA

RSGB IOTA Manager Roger Balister clarifies some IOTA rules. And the first Foundation licensee to gain an IOTA 100 Islands certificate has been announced.

Congratulations to Charles Wilmott, M3ZYZ, of Royston, South Yorkshire, on becoming the first M3 licensee to qualify for the IOTA 100 Islands certificate. As expected with low power, 73 of the 100 credits were for contacts with European IOTA stations. However the remaining 27 were outside Europe, with nine in Oceania - that's good going - and one was the statutory contact with Antarctica. As Charles says, a power limit of 10 watts is quite a handicap, but use of a beam and the practice of staying on frequency during short breaks in operating by the island station or getting there before the pile-up starts have together helped him log the contacts. The current total worked approaches 160 IOTA groups, but, as Charles comments, it is becoming increasingly difficult as the 'local' ones he needs are now far fewer and the distant ones are, as always when running low power, much harder. Nevertheless, he is determined to persevere.

IOTA 2004

JULY 2004

In addition to many European counters look for:

AF-003	ZD8	Ascension Island
AF-004	EA8	Canary Islands
AF-005	D4	Cape Verde, Leeward Islands
AF-014	CT3	Madeira Islands
AF-022	ZD7	St Helena Island
AF-029	ZD9	Tristan da Cunha Islands
AF-030	ZD9	Gough Island
AF-086	D4	Cape Verde, Windward Islands
AN-016	Various	Antarctica

AUGUST 2004

EU-089	CU8/9	Flores Island
NA-018	OX	Greenland
NA-021	8P	Barbados
NA-027	VO1	Newfoundland
NA-032	FP	St Pierre & Miquelon
NA-063	CY0	Sable Island
NA-094	CY9	St Paul Island
SA-002	VP8	Falkland Islands
SA-003	PY0F	Fernando de Noronha Archipelago
SA-026	PP5	Santa Catarina State Centre group
SA-046	PY7	Pernambuco State group
SA-068	8R	Guyana group

SEPTEMBER & OCTOBER 2004

There are numerous counters for premium points. Look for island groups in the US, the Caribbean and South America.

Table 1: Some of the regularly activated island groups counting for premium points during July to October 2004. For further information on this current activity programme, see the CDXC website.

Charles adds: "I would like to say thanks to all the DXpedition operators for the trouble they go to to please us, but my main thanks must go to those operators who recognise that low power stations are out there in the pile-up, and a break in transmission, for whatever reason, is often all that we need! Thanks also to the IOTA group at RSGB for all the information that they provide on a regular basis." Thanks, Charles, I'm sure these comments are appreciated. Carry on the chase as I know you will from the enthusiasm displayed in your letter.

NEW IOTA CHECKPOINT

After more than 10 years of checking cards Phil, G4WFZ, has relinquished his post as checkpoint for England (prefixes G0 and M0), the rest of the UK, Channel Islands, Isle of Man and all British SWLs. We welcome as his replacement John Butcher, G3LAS, who is well-known as the current Chairman of CDXC (the UK DX Foundation). His address is John Butcher, G3LAS, Westlands, Westland Green, Little Hadham, Ware, Herts SG11 2AJ and his e-mail john@johnbutcher.net

RULE CLARIFICATIONS

The new *RSGB Directory - 40th Anniversary Edition* [available from the RSGB Shop - *Ed*] includes a number of rule clarifications. Three are worth mentioning. The first makes it clear that contacts made when an island station is operating equipment by remote control are not valid for IOTA awards. The second extends and tightens the validation requirements for operations by yachtsmen who have an on-board operational amateur radio station to ensure that only 'land-based' contacts are credited.

The third clarification relates to the requirements for outgoing SWL reports and cards submitted for credit. The cooperation of transmitting amateurs is requested to make them work. In future each outgoing SWL report should list at least two and preferably three QSOs heard. The QSL card submitted for credit should list the callsign and contact details of at least one and preferably two QSOs. IOTA Checkpoints now operate a system of checking SWL cards submitted against *DXCluster* and other Internet resources for 'matching' spots - appearance of these or over-frequent mention of one particular callsign as the station worked could be taken as indicating irregular practice and have serious consequences.

IOTA ACTIVITY

Four new groups have been activated in the last two months, details above. Two involved extended journeys from the mainland. Sebastien, F8DQZ, spent 11 hours aboard a 'typical African' boat to reach the Tristao Islands in northern Guinea where he operated for 10 days as 3XDQZ/P (AF-096). "I transmitted with a lieutenant, major, and colonel from the Guinean army in attendance - now they are very good friends, and I came back to the continent in two hours with a military speed-boat." IOTA makes friends!

An Australian led team made it to Viney Island in Western Australia's remote Bonaparte Archipelago to activate VK6AN (OC-266). Again an arduous journey and Murphy was not far away. Several days into the operation one of the operators, Dan, VK8AN, slipped and dislocated his shoulder. Attempts to 'right' it on the island failed and a helicopter was called in to fly him to a hospital on the mainland. All's well now, but not something one wants on a DXpedition! ♦

NEW REFERENCES

AF-095/Pr	TJ	Cameroon group (Cameroon)
AF-096/Pr	3X	Guinee-Maritime Province North group (Guinea)
AS-169	VU	Maharashtra State group (India)
OC-266/Pr	VK6	Western Australia State (North Coast) Centre group (Australia)

Charles Wilmott, M3ZYZ, the first Foundation licensee to qualify for the IOTA 100 Islands certificate.

WEB SEARCH

RSGB IOTA Programme:	www.rsgbiota.org
IOTA Manager's website:	www.g3kma.dsl.pipex.com
IOTA Contest rules:	www.rsgbhfcc.org
CDXC:	www.cdxc.org.uk

RSGB IOTA PROGRAMME, PO BOX 9, POTTERS BAR, HERTS EN6 3RH
E-MAIL: IOTA.HQ@RSGB.ORG.UK

By Bob Treacher, BRS32525

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E-mail: brs32525@compuserve.com

Has the introduction of the Foundation licence led to a drop in the activity of listeners? Bob Treacher puts forward this theory and, on a more positive note, reports on some good DX logged by listeners during April.

Foundation licence cause of decline in SWL activity?

One man's meat is another man's poison! That seems to be the thread of correspondence received for this column. The Foundation licence has certainly been good news in terms of getting more people licensed in the British Isles, but the down side seems to be that many once-active short wave listeners have grasped with both hands the opportunity to join the transmitting ranks. It would be interesting to know how many keen listeners have now swapped listening for an M3 (or other) licence in the last 12 or 18 months. Let me have your old RS number and your new callsign and I will include them in a future 'SWL' column. You can either e-mail me: brs32525@compuserve.com, or you can use the postman.

It should be noted that the 'SWL Challenge' has been discontinued due to insufficient support. Another SWL contest to fall is next January's LF Bands Contest. The Cray Valley Radio Society, which took over the running of this contest a couple of years ago, has been disappointed with the level of support. If any other society or amateur radio company or organisation would like to sponsor the event, please let me know.

CY9A: one of the QSLs received from an IOTA DXpedition during the RSGB IOTA contest in 2003.

CORRESPONDENCE

Being a transmitting amateur does not suit all. Some, like Keith Farthing, M0CLO, does not get the enjoyment from being licensed that he does from SWLing. He uses a Yaesu FRG-7700 receiver and a not-very-high G5RV, but his list of recent countries heard included C3, CN8, EX, HZ, JW, T7, XT2 and 3V8.

Douglas Johnstone, BRS54163, reports that his local council approved his plans to erect an antenna so he could improve his short wave listening. He has permission to erect a rotatable loop antenna 15m above ground. He has listened to various contests, including *CQ* WPX, recently and may start to enter once he has improved his receive set up.

Robert Small, BRS8841, considers that the bands during April were in quite a reasonable shape. His best DX was 3B9C from Rodrigues, but it was not a new one as he had already heard 3B9 on all bands! By the time you read this, QSL cards will be available for all SWL reports that match the log: requests to me with an SASE, or $1 or an IRC for return postage. Robert heard the expedition on HF but was pleased to also log 3B9C on 1.8MHz CW and 3.5 and 7MHz SSB and CW. 7MHz had also provided YS3/YN4SU, AT0BI (AS-169), 5K1X and F5LPY/TU8. 10MHz gave Robert two new DXCC entities: TJ3B and V8PMB. He also heard 7Q7MM and VI3BR (OC-228). 14MHz had been best early and late in the day. DX highlights on this band were VK9NB, 3B9C, 5W0SS, PJ4/DF7ZS, YK2A, KH8/DF2SS and HC1HC. 18MHz provided Robert with a new DXCC country in the shape of TJ3MC/P. Other DX included H44MS, 5T0EU, T33C, HS72B and HL2WP. Robert also heard T33C on 21MHz. He commented that 21MHz was probably the best band through April. He also logged 5H1BP, VP5B, 5V7C, 9K2OO, A52PRO, V73GJ and VK6AN (OC-226). TJ3G was a new one on 24MHz CW. There are still openings on the band, but it is quiet for much of the time. As proof, Robert also mentioned YA/DL2JRM, 3B9C and 3XDQZ (AF-096).

Mike Luxton, RS188317, has only been listening since mid-2003. He enjoys catching band openings to the USA. He QSLs direct as he is keen to receive cards as soon as possible after hearing the station. He has received cards from all the USA stations that he has QSLd. One, KF2DT, commented that Mike's had been the only SWL report he had received direct.

Peter Webb, RS53907, wrote again but had little to report because of the extended poor band conditions. He gets his thrill from hearing strong DX stations, but is not keen on pile-ups.

JULY HAPPENINGS

July is an interesting month for listeners. There is the opportunity to help out your local club at VHF NFD and on 24 / 25 July is the RSGB IOTA contest, which has an SWL section, of course. There are several listeners who are keen on IOTA but, if you are not yet involved, that weekend will provide the perfect opportunity to get your island collecting off to a great start. One operation quite near home will be the Cray Valley RS's expedition to the Isles of Scilly (EU-011) as M8C. The team will also be active before and after the contest. QSL will be 100% for all correct reports via G4DFI. Also, as we will be in the midst of 'summer conditions', it might be interesting for listeners to monitor 24 and 28MHz during daylight hours to see how many short skip Sporadic E signals can be heard.

Please let me have your news and views for the September 'SWL' column by 5 July. ♦

ALL-TIME DXCC ENTITY TABLE

Robert Small, BRS8841, is the only SWL to provide his All-Time scores for our new table. I look forward to receiving further entries to publish in a future 'SWL' column. Even if you are now an M3, you can still add your SWL scores to this table. I also look forward to scores for our new 2004 annual table.

SWL	1.8	3.5	7	10	14	18	21	24	28	Total
BRS8841	165	297	319	263	347	313	341	286	318	2649

By Tim Kirby, G4VXE

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Contest

This month, major RSGB contests for both the HF and VHF contest enthusiasts: the RSGB IOTA Contest and the VHF Field Day.

Once again, it's time for the most successful international contest in the RSGB's programme of events: the RSGB IOTA Contest. The contest has developed beyond one solely for IOTA enthusiasts and has built a strong following. This year the contest takes place on 24 / 25 July between 1200 and 1200UTC. UK stations count as an IOTA contact, so you can be sure that you will be quite popular if you make an effort and show up, even for some casual contacts. The more serious contesters will make some big QSO numbers - and, of course, the key - high numbers of IOTA groups. If you have even a passing interest in IOTA, it's a good weekend to come on and boost your tallies.

Most of the major contest programs support the IOTA contest now, so you should have no problem submitting a Cabrillo entry. Before you submit the log, please make sure that you have made it clear what section you are entering: last year many stations did not do this, so may have been classified in sections different to the ones that they intended to enter. If you don't have a program that supports IOTA, then grab a copy of *SD* for IOTA; it's free and can be downloaded from www.ei5di.com

VHF NFD

The major event in the VHF Contest Calendar takes place on 3 / 4 July: VHF NFD. We hope for a bumper entry this year as it's a great weekend to get out portable and make lots of contacts. If you're stuck at home you can be guaranteed that there will be signals on bands where normally it's rather quiet. The 3rd 144MHz Backpackers contest runs from 1100 - 1500 on 4 July and normally gives Backpackers stations the chance to work some excellent DX. If good conditions exist well over 1000km ought to be possible, even for a 3W station. Have a go and let me know how you get on.

LOW POWER FIELD DAY

A contest that has been growing in popularity over the last few years, with the greater availability of good quality QRP rigs, has been Low Power Field Day. This runs on Sunday 18 July on 3.5 and 7MHz. There are two sessions; the first running from 0900 - 1200 and the second from 1300 - 1600. There has been some confusion in the past, so please note that both bands may be used in either session. This event appears to have been getting more competitive recently and we look forward to seeing a good scrap for the top places again this year. ♦

Clive, GW3NJW (right), receiving the G2QT Trophy from Ed, G3SQX.

CONTEST CALENDAR

HF Contests

Date	Time	Contest	Mode	Bands	Exchange
1 Jul	0000-2359	RAC Canada Day	CW/SSB	1.8-144	RST+SN
3/4 Jul	1100-1059	DL DX RTTY	RTTY/PSK	3.5-28	RST+SN
5 Jul	2000-2130	RSGB 80m Club Championship	CW	3.5	RST+SN
10/11 Jul	1200-1200	IARU HF Championship	CW/SSB	1.8-28	RST+SN
10/11 Jul	1200-1200	UK DX RTTY	RTTY	1.8-28	RST+Area Code
14 Jul	2000-2130	RSGB 80m Club Championship	SSB	3.5	RST+SN
18 Jul	0900-1200 & 1300-1600	RSGB Low Power Field Day	CW	3.5 /7	RST+SN+Power
22 Jul	2000-2130	RSGB 80m Club Championship	DATA	3.5	RST+SN
24/25 Jul	1200-1200	RSGB IOTA	CW/SSB	3.5-28	RST+SN+IOTA Ref (G=EU-005)

VHF Contests

Date	Time	Contest	Mode	Bands	Exchange
3/4 Jul	1400-1400	RSGB VHF NFD	ALL	50-1.3G	RST+SN+Locator
4 Jul	1100-1500	RSGB 144MHz Backpackers	ALL	144	RST+SN+Locator
6 Jul	2000-2230 Local	RSGB 144MHz activity & Club Championship	ALL	144	RST+SN+Locator
11 Jul	1100-1500	RSGB 50MHz Backpackers	ALL	50	RST+SN+Locator +Postcode
13 Jul	2000-2230 Local	RSGB 432MHz activity	ALL	432	RST+SN+Locator
18 Jul	1100-1500	RSGB 144MHz Backpackers	ALL	144	RST+SN+Locator +Postcode
20 Jul	2000-2230 Local	RSGB 1.3GHz/2.3GHz activity	ALL	1.3G/2.3G	RST+SN+Locator
27 Jul	2000-2230 Local	RSGB 50MHz activity	ALL	50	RST+SN+Locator

2nd 1.8MHz CONTEST, 2003

Sixty-seven logs and four checklogs were received for the second topband contest for 2003, continuing the steady increase in activity over the last three years, all except nine of them by e-mail. Overseas stations are again reminded that they gain no points for working non-UK stations. American stations were logged from areas 1, 2, 3 and 4 and some operators claimed each for bonus points. In fact the DXCC country list is used for Bonus claims and only one American bonus can be claimed even if you worked all four areas.

Congratulations to Don Beattie, G3BJ, who wins the Victor Desmond Trophy as best UK station with 1019 points, just 5 more than Fraser Robertson, G4BJM, with 1014. Third overall and winner of the Maitland Trophy for best Scottish entrant over the two contests in 2003 was Stirling ARC, GM6NX, operated in both contests by Ian Watt, GM4ZRR.

The Overseas Section was won by Alfirdas Uzdonas, LY2BW, who beat last year's winner Gediminas Lucinskas, LY3BA. Thank you all for taking part, I hope you enjoyed the contest. ***Sid Will, GM4SID***

UK Stations

Pos	Callsign	QSOs	Bonus	Points
1	G3BJ	215	82	1019
2	G4BJM	213	81	1014
3	GM6NX (op GM4ZRR)	192	78	948
4	G4TSH/P	189	78	945
5	GU4YOX	191	81	939
6	G3GLL	186	75	915
7	G3ZGC/P	178	74	898
8	GW0GEI	186	69	882
9	G3KLH	160	69	813
10	G3WPH	161	63	783
11	G4RCG	159	68	769
12	G4IUZ	141	71	764
13	GM4SID	137	65	721
14	G3XGC	130	68	706
15	G3TJE	131	64	695
16	G3YEC	127	61	674
17	M0AJT	123	62	670
18	G3XTT*	119	56	637
19	G3VYI	118	58	632
20	G3KKQ	112	58	623
21	G3UFY	118	57	621
22	G3PJT	102	58	578
23	G4EBK	107	52	572
24	GM3CFS	87	53	514
25	G3JRM (op G4CKH)	96	50	500
26	G3LHJ	81	46	467
27	G3SWC/P	81	47	466
28	G3KKP*	73	48	459
29	G4OGB*	64	41	397
30	G3LIK	57	40	368
31	G3GMS	57	40	365
32	G3RSD*	50	35	325
33	G3GMM	48	36	309
34	GM3UM*	41	31	278
35	G3SQX*	41	30	273
36	G3YMC*	13	12	99
37	G3ZRJ*	3	3	24

* = Error-free log. Checklog from G0KRT

Overseas Stations

Pos	Callsign	QSOs	Bonus	Points
1	LY2BW	63	41	385
2	LY3BA	54	36	339
3	OK1AY*	54	35	337
4	PA0BWL	46	35	310
5	DK8JH	46	32	295
6	SM1TDE	40	32	274
7	EW8DX	42	31	267
8	PA0DVM*	37	29	256
9	PA3BFH*	32	25	221
10	SQ9CAQ	32	27	219
11	EI7GY	31	25	210
12	PA0JNH*	26	22	188
13	PA0LOU*	26	21	183
14	UA6JFG	26	22	179
15	DL3BRA	24	21	171
16=	PA3CRC	26	19	161
16=	DK3UZ*	22	19	161
18	SP1DTG*	21	19	158
19=	OK2ZJ	25	15	144
19=	DJ9WH	20	18	144
21	YO5CBX	21	17	142
22	DL3DRN	18	15	129
23	RA1AR*	16	16	128
24	PA3AFF	16	14	115
25	PA0FAW	12	11	85
26	YL2II*	9	8	67
27	US0QG	8	8	61
28	DL3KWF*	6	5	43
29	UY5TE	6	6	39

*= Error-free log. Checklogs from LA7SI, PA5TT, SP4GFG.

AFFILIATED SOCIETIES CONTEST (80m) CW, 2004

January saw another successful CW Affiliated Societies team contest. An incredible 30,000 QSOs took place within the four-hour period from 224 entrants within 76 affiliated teams. As always, competition was fierce within both the individual and team sections and only a handful of QSOs separated the leading stations right through to the end.

Once again Lichfield ARS (G0MTN, G3SJJ, G3NKC, G4XUM, G3VHB) head the team table with 12,150 points, collecting the Edgware Trophy, closely followed by runners-up Chiltern DX Club A with 11,870.

In the individual section Lichfield's Chris Burbanks, G3SJJ, picks up the Marconi Trophy for a third time win with 2620 points, followed by Chiltern DX A's Dave Lawley, G4BUO, with 2550 points. A Certificate of Achievement is also awarded to M3RRH as the leading Foundation licensee. Congratulations to all.

Conditions during the event were commented on to be "below par", especially during the first hours, with many entrants experiencing unusual variances of propagation. However, early rates and final scores are not far from what have been seen from previous years.

As to be expected from an event such as this, the majority of activity came from within the UK. Nevertheless many QSOs were made with countries right across Europe in the later stages of the contest.

A special mention should be made of an SWL log received from ZL2JKY, noting over a dozen entrants' signals being heard. This highlights the potential of 80m at sunset during this time of year.

Many thanks to all the competing teams and their members who took part. Once again AFS proves itself to be an event not to be missed. ***Tim Elwell, M0BEW***

Team Listing

Pos	Club	Call 1	Call 2	Call 3	Call 4	Call 5	Score
1*	Lichfield ARS 'A'	G0MTN	G3NKC	G3SJJ	G3VHB	G4XUM	12150
2	Chiltern DX Club 'A'	G4BUO	G4DJX	G4IFB	G0CKP	G3RTE	11870
3	De Montfort University ARS 'A'	G3ORY	G0WWW	M0TTT	G4EOF	G4ARI	11410
4	Addiscombe ARC	G3UFY	G4ALE	G3VYI	G3RQZ	G3JJZ	10250
5	Peterborough & District ARC	G5LP	G3KHZ	G3PJT	G4BJM	G3MCK	10000
6	Grimsby ARS 'A'	G3TBK	G3RSD	M0AJT	G3PDL	G4EBK	9650
7	GMDX Group 'A'	GM3JKS	GM6NX	GM3YTS	GM3YOR	GM4CXM	8890
8	Newbury & District ARS A	G0ORH	G3KLH	G3NVO	G4FON	G3ZGC/P	8750
9	Sutton and Cheam RS	G0KBL	G3DCZ	G4CWH	G4ERW	G4HSD	8450
10	RNARS Colchester	G3GLL	G3OOK	G3YAJ	G3YEC	G0IBN	8240
11	Horsham Amateur Radio Club 'A'	G3LET	G3WZT	G3OGP	G3ZBU	G3SWC	8170
12=	Echelford ARS 'A'	G4TSH/P	G3KKQ	G4IRN	G3NOH	G3EAO	8000
12=	Hadley Wood Contest Group	G0IDA	G3KTZ	G4KZD	G3ZVW	G6BOX	8000
13	Norfolk ARC 'A'	G3LDI	G3VZT	G3PDH	G4DYC	G4ODC	7670
14	Stockport Radio Society 'A'	G0LZL	G3SVW	G3SHF	G3OAG	G3RTU/P	7460
15	Bristol Contest Group	G3XSV	G3TKF	G3YHV	G3SWH	G3RFX	7120
16	RAFARS Waddington 'A'	G4KGG	G2AFV	G3SET	G3KWY	G0RAF	6980
17	Contest Cumbria	G3IZD	G4IIY	G3WGV	G3JYP	-	6570
18	Three As Contest Group	G3SXW	G3TXF	G3WVG	-	-	6560
19	Dragon ARC	GW0GEI	GW3HCL	GW3EIZ	GW8IZR	GW3PRL	5880
20	Maidenhead & DARC	G3TWG	G3PQA	G4CJY	G4MQC	G4WJS	5830
21	Torbay ARS 'A'	G3LHJ	G4EDG	G0RDO	G0IVZ	G3SNU	5820
22	Cheltenham ARA	G3NKS	G4MEM/P	G3IFB	G3LME	-	5200
23	RNARS Rosyth	GM4SID	GM3CFS	GM3UM	MM0WPM	GM3XGX	4760
24	Crawley ARC 'A'	G6RC	G3VKW	G3KAU	G3BBR	G3YSX	4700
25	Lichfield ARS 'B'	M0BEW	G3ZBE	-	-	-	4320
26	Chesham & DARS	G3MEH	G3VRY	G3XZG	-	-	4310
27	Chiltern DX Club 'B'	G3XTT	G3WPH	-	-	-	4080
28	Yeovil Amateur Radio Club	G3BPM	G3ICO	G3GC	G3CQR	G3TSK	4040
29	Contest Cambria	GW3SQX	GW4BLE	MW5EPA	-	-	4010
30	GMDX Group 'B'	GM4AFF	GM4ZRR	GM3PPE	GM0VIT	-	3650
31	Farnborough & District RS	G0VYR	G3HEJ	G4BJQ	-	-	3390
32	Edgware & DRS 'A'	G4KEW	G4IUZ	G3ASR	-	-	3330
33	Stevenage and District ARS	M0DAL	G4DDX	G0WAT	-	-	3020
34	RNARS Plymouth	G4KJD	G0JCY	G3AQM	-	-	3000
35	Reading and District ARC	G0LHZ	M0DHO	M5ALG	-	-	2980
36	Scunthorpe Steel ARC	G4OGB	G0OKF	G4JRY	G4GZB	-	2850
37	Flight Refuelling ARS	G0WAL	G3PFM	G4POF	-	-	2840
38	Maidstone Amateur RS	G3TRF	G3ZYV	-	-	-	2520
39	RNARS Birmingham	G3TZM	G4TNI	-	-	-	2400
40	Horndean & District ARC	G0MBQ	G4FBS	G0RPX	G8BLH	-	2300
41	Stratford on Avon & DRS	G0MRH	G3XZO	-	-	-	2300
42	Milton Keynes ARS	G0GGU	G3HIU	M0TIF	G4TZR	-	2170
43	Yorkshire Cluster Support Group	G4BYG	-	-	-	-	2100
44	RNARS Portsmouth	G3LIK	-	-	-	-	1970
45	Northampton RC	G3GWB/P	-	-	-	-	1930
46	De Montfort University ARS 'B'	G3SDC	-	-	-	-	1900
47	Guilford and District Radio Society	G3ZDD	G0EFO	-	-	-	1860
48	GMDX Group 'C'	GM3POI	-	-	-	-	1840
49	Southdown ARS	G1KAR	G3SVL	-	-	-	1830
50	RAFARS Waddington 'B'	G3ZDW/P	G3IGU	G0SWO	G3UYV	-	1680
51	RNARS Chatham	G4FRN	G0SCY	-	-	-	1650
52	Leicester RS	G0WBC	G0LZA	-	-	-	1620
53	Kettering and District ARS	G4KXG	-	-	-	-	1510
54	Lowestoft & District and Pye ARC	G4CKH	G4RLS	-	-	-	1450
55	RAFARS Devon	G3LUW	-	-	-	-	1430
56	Stockport Radio Society 'B'	G3GMM	G0IGB	-	-	-	1420
57	Newbury & District ARS 'B'	M3ESO	G3RVM	-	-	-	1400
58	Glenrothes and DARC	GM0VFD	GM4WLN	GM3YBQ	-	-	1390
59	RAFARS Cosford	G4CWN	M0BYJ	-	-	-	1260
60	RNARS Newcastle	G3AWR	-	-	-	-	1100
61	Grimsby ARS 'B'	M0BZU	-	-	-	-	1090
62	Echelford ARS 'B'	M0AJM	G3JUL	-	-	-	1050
63	Cockenzie & Port Seton ARC	MM0CPS	-	-	-	-	1020
64	Worthing & District ARC	G4SLE	-	-	-	-	1010
65	Gloucester ARES	G3MA	-	-	-	-	1000
66	Meirion ARS	GW3SB	-	-	-	-	960
67	Colchester RA	G4KTI	-	-	-	-	790
68	RAFARS Shoreham	G4KLF	-	-	-	-	750
69	Chelmsford ARS	G4ZUL	-	-	-	-	600
70	Horsham Amateur Radio Club 'B'	M3RRH	-	-	-	-	580
71	Wythall Contest Group	M0COP	-	-	-	-	510
72	Torbay ARS 'B'	G0WWD	M3NSB	-	-	-	430
73	Norfolk ARC 'B'	G3PZX	-	-	-	-	410
74	Crawley Amateur Radio Club 'B'	G4LEG	-	-	-	-	300
75	Basingstoke ARC	G3XNI	-	-	-	-	190

Individuals Listing

Pos	Call	Score
1*	G3SJJ	2620
2	G4BUO	2550
3=	G3WVG	2480
3=	G4DJX	2480
4	G4XUM	2470
5	G3TXF	2450
6	G3NKS	2440
7	G3ORY	2400
8=	G0WWW	2380
8=	G3VHB	2380
9	G3NKC	2360
10	G0MTN	2320
11=	M0BEW	2310
11=	G0CKP	2310
12	G3UFY	2300
13	G4IFB	2280
14=	G5LP	2270
14=	M0TTT	2270
15	G3TBK	2260
16=	G4TSH/P	2250
16=	G4ERW	2250
16=	G3RTE	2250
17	G3KLH	2210
18	G4EOF	2200
19	G4ALE	2190
20	G4ARI	2160
21	G4BJM	2150
22=	GM3JKS	2120
22=	G3VYI	2120
23	G3KHZ	2110
24=	G4BYG	2100
24=	G3WPH	2100
25	GW3SQX	2080
26=	G0KBL	2070
26=	G3LDI	2070
27	G3LET	2040
28=	G3ZGC/P	2020
28=	G3RQZ	2020
29=	G4CWH	2010
29=	G3ZBE	2010
30	G3PJT	2000
31	G3XSV	1990
32=	G3ZVW	1980
32=	G3XTT	1980
33=	M0AJT	1970
33=	GW0GEI	1970
33=	G3LIK	1970
33=	G3KTZ	1970
33=	G3IZD	1970
34=	G3PQA	1960
34=	GM6NX (M)	1960
35	G3RSD	1950
36=	G4WJS	1940
36=	G3KKQ	1940
37	G3GWB/P	1930
38	G3WZT	1920
39	G3SDC	1900
40	G3GLL	1890
41	G3VZT	1860
42	GM3POI	1840
43	G3TKF	1830
44=	G4OGB	1790
44=	G0LZL	1790
45=	G0IDA	1780
45=	G4IIY	1780
46	G3PDL	1770
47	G3OOK	1760
48	GM4AFF	1750
49	G3OGP	1740
50	G3SVW	1710
51	G4EBK	1700
52	G0ORH	1690
53	GM3YTS	1680
54=	G3PDH	1670
54=	GM4SID	1670
55	G4KGG	1650
56=	G3SXW	1630
56=	G4KJD	1630
56=	G3XZG	1630
57	G3JJZ	1620
58=	G3LHJ	1610
58=	G3YAJ	1610
58=	G3SHF	1610
58=	G2AFV	1610
59	G3VRY	1590
60	GM4CXM	1570
61=	GM3YOR	1560
61=	G3SVL	1560
62=	G3YHV	1550
62=	G4KZD	1550
62=	G3WGV	1550
63=	G4IRN	1540
63=	G3HEJ	1540
64	G0EFO	1520
65=	G4KXG	1510
65=	G3ASR	1510
66=	G4FON	1500
66=	G0IBN	1500
67=	G3NOH	1490
67=	M0DHO	1490
68=	G0WAT	1480
68=	G3YEC	1480
68=	G3ZYV	1480
69	G3MCK	1470
70	G3SET	1450
71	G3LUW	1430
72=	G4EDG	1410
72=	G4DYC	1410
73=	G4IUZ	1390
73=	G3OAG	1390
74	G3RVM	1370
75	G4DDX	1340
76	G3NVO	1330
77=	G3DCZ	1270
77=	G3JYP	1270
78	G6RC	1260
79	G3SWC	1240
80=	G3TZM	1230
80=	G3ZBU	1230
81=	GM4ZRR	1210
81=	G3KWY	1210
82=	G0WBC	1200
82=	G0MBQ	1200
83=	G0RDO	1170
83=	G0MRH	1170
83=	G4TNI	1170
84	G0LHZ	1160
85=	G3TWG	1130
85=	G3XZO	1130
85=	G3PFM	1130
86=	G4FRN	1100
86=	G3AWR	1100
86=	G4MEM/P	1100
87=	M0BZU	1090
87=	G3ICO	1090
87=	G3MEH	1090
88	GW4BLE	1070
89=	GW3EIZ	1060
89=	G0RAF	1060
90	G3BPM	1050
91	G3TRF	1040
92=	G3SWH	1030
92=	GW3PRL	1030
93	MM0CPS (M)	1020
94=	G0IVZ	1010
94=	G4SLE	1010
94=	G3VKW	1010
95	G3MA	1000
96=	G4BJQ	990
96=	GW3SB	960
96=	G3RTU/P	960
97=	G3IFB	950
9 7=	G0WAL	950
98	G3ZDW/P	940
99	GM3CFS	930
100=	GW3HCL	920
100=	G3GMM	920
101=	GW8IZR	900
101=	GM3UM	900
102	G3GC	890
103=	MW5EPA	860
103=	G0VYR	860
103=	G0GGU	860
104=	G4HSD	850
104=	GM3YBQ	850
104=	G3BBR	850
105=	G0JCY	830
105=	G3YSX	830
106	G4FBS	820
107	G4KTI	790
108	G3EAO	780
109	G4CJY	770
110=	G3CQR	760
110=	G4POF	760
111=	G3KAU	750
111=	G4KLF	750
112	G4CKH	730
113=	G3RFX	720
113=	G4RLS	720
113=	M0AJM	720
113=	G6BOX	720
114	G3LME	710
115	MM0WPM	680
116	G4ODC	660
117	M0BYJ	650
118=	G3SNU	620
118=	G3IGU	620
119=	G3HIU	610
119=	G4CWN	610
120	G4ZUL	600
121=	GM3XGX	580
121*=	M3RRH	580
122	G0SCY	550
123	G3AQM	540
124	M0COP	510
125	G0IGB	500
126	G0OKF	490
127	GM3PPE	460
128	G4KEW	430
129	G0LZA	420
130	G3PZX	410
131=	G4JRY	390
131=	M0TIF	390
132	G3ZDD	340
133=	G3JUL	330
133=	M5ALG	330
134	G4TZR	310
135	G4LEG	300
136	GM0VFD	280
137=	G0RPX	270
137=	G1KAR (M)	270
138	GM4WLN	260
139	G3TSK	250
140	GM0VIT	230
141	M3NSB	220
142	G0WWD	210
143	M0DAL	200
144	G3XNI	190
145	G4GZB	180
146	G0SWO	90
147=	G4MQC	30
147=	M3ESO	30
147=	G3UYV	30
148	G8BLH	10

Checklogs: DK3UZ, G3VQO, LY2LF, PA1W, G3GUL, GM4FAM, LY3BA.

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Norman Fitch muses over the reasons for the apparent lack of activity on the VHF / UHF bands and offers a possible explanation. For those who made the effort, there was some good DX to be worked, particularly on 6m.

VHF/UHF

The topic of activity, or rather the apparent lack of it, on the VHF/UHF bands is mentioned every month in the correspondence I receive. When amateur radio started up again after the end of WWII we were all 'at it' buying up all kinds of high quality military surplus, which we converted to work on the amateur bands.

Pre-war licensees were itching to get back on the air and many thousands who had been involved in radio communication in the forces were keen to get an amateur radio licence, many of them being exempt from taking the RAE due to their military qualifications. Consequently activity was high and grew steadily for many years.

The vast majority of operation was on AM and CW using basically simple equipment. There wasn't much new, affordable amateur gear available in Britain, so the majority of us built our own gear from designs in the many amateur radio publications or modified the surplus stuff.

Today we have repeaters and satellites and many different transmission modes together with a vast amount of reasonably priced commercial equipment. With the advent of computer software, such as Joe Taylor's, K1JT, JT44 family of programs, moonbounce communication is possible for the average station instead of having to run high power and large antenna arrays.

With many more bands and modes available it is no wonder that 'conventional' phone and CW activity has decreased. Nevertheless, we still have the capability to take advantage of a good tropo lift, a fine Sporadic E opening or a big aurora. The other opportunity for 'conventional' operation is contests and there are still many successful groups who are keen to participate.

The major VHF event of the year is upon us, VHF National Field Day over the 3/4 July weekend. So, whether you are a member of a group heading for the countryside, or one of the majority who'll be at home, have a go even if you can only spare a couple of hours to give away some points. The event is a great way to pile up your totals for the Annual Table. The dates and rules for all the RSGB VHF/UHF contests can be found on the Blacksheep website - see the list.

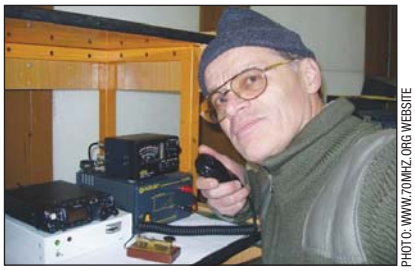

PHOTO: WWW.70MHZ.ORG WEBSITE

This is Zeljko Ulip, 9A2EY, making the first 4m contacts after Croatian amateurs were granted permission to use the band on 26 December 2003.

SOLAR AND GEOMAGNETIC DATA

In the 30 days to 11 May the 10.7cm solar flux averaged 97.8 units, the first time it's been below 100 for a long time. The maximum of 117 was recorded on 22 April while the minimum of 85 occurred on 7 May. Sunspot numbers are now generally low, the maximum being 108 on 19 April with a minimum of just 28 on the 27th. 19 new regions were logged last month. Geomagnetic activity was also low, the mid-latitude A-index at Fredericksburg only being in double figures on five days. The maximum was 16 on 23 April while minima of just 2 were recorded on 14 and 22 April.

BEACON NEWS

Members of the Blacksheep Contest Group have activated a new 50MHz propagation beacon, GB3BAA, located near Tring, Hertfordshire (IO91PS), as a replacement for the GB3NHQ beacon which closed down some years ago. It became operational on its licensed frequency of 50.016MHz at 1510UTC on the 20 April. Reception reports would be most welcome, and should be sent to the keeper Iain Philipps, G0RDI, (QTHR) or via e-mail to gb3baa@77hz.com

Dave Boniface, G3ZXX, has confirmed that the 4m Wessex beacon GB3WSX - not GB3SWX as erroneously given in the May column; blame it on my dyslexic keyboard! - is now QRV running 22dBW from IO80QW since 1630 on 6 May. The antenna is a 5-ele Yagi at approximately 90ft AGL beaming at 70°. It keys its callsign and locator on a 60s cycle. Future plans include synchronised antenna switching and low-level signal mode outputs, JT44 / FSK441 / PSK31, to be added when resources become available. Reception reports would be appreciated and can be e-mailed to gb3wsx@twxrg.info

MOROCCO ACTIVITY

André Breguet, HB9HLM, will be activating his Moroccan callsign CN2DX again this summer between 12 July and 8 August based in IM63. 6m and 2m operation is planned using 100W and a 3-ele Yagi on 6m and 800W to an array of four 15-ele DJ9BV Yagis with a 25dB gain preamp on 2m. He will also be operating mobile a lot from rare grids with 100W to a quarter wavelength antenna on 6m and 50W to a five-eighths wavelength antenna on 2m. For the most part operation will be on 2m with Si Muhammad, CN8PA, who will be QRV 'in parallel' from his own QTH running 50W to a 9-ele Yagi. As usual, no skeds will be taken. QSLs should go to HB9HLM.

MOONBOUNCE

On 23cm Howard Ling, G4CCH (IO93) found that conditions over the 1/2 May activity weekend were very good and his echoes peaked at S9 and were detectable at only 5W. On the 1st he completed with DK7LJ, who was S8 with his 1kW solid state PA at the feed of his 9m dish, OH2DG*, N2UO*, G4DZU* and W2UHI*. On the 2nd WA6PY* was S5 with his new 3.6m dish. Previously on 24 April he contacted W2DRZ* operated by KA2ONY. He had little free time so has made little progress with the CT1DMK Reflock / G8ACE PLL local oscillator project. He checked his oven controlled crystal oscillator (VXCO for the PLL) frequency with his GPS-locked counter and it's settling down nicely with only 10Hz drift at 1268MHz over a month.

Al Katz, K2UYH, editor of the May *432 and Above EME News*, reports good activity in April with the 3B9C operation generating a lot of interest. There seemed to be plenty of stations QRV in the second leg of the European World Wide contest. On 23cm it appears that the F6KHM team were leaders with 48x32 with OZ4MM in second spot.

Simon Freeman, G3LQR (JO02), was QRV for a while in the 27/28 March contest and worked 16 stations on 23cm before a blown 22 Ω resistor in the high voltage line

ANNUAL VHF/UHF TABLE - JAN TO DEC 2004

Callsign	50MHz Dist	50MHz Ctr	70MHz Dist	70MHz Ctr	144MHz Dist	144MHz Ctr	430MHz Dist	430MHz Ctr	1.3GHz Dist	1.3GHz Ctr	Total Points
G4DEZ	57	30	27	3	81	10	36	10	10	2	266
G3FIJ	17	3	8	1	24	5	13	4	1	1	77
M0XLT	10	16	-	-	8	1	-	-	-	-	35
G8RWG	-	-	-	-	18	6	-	-	-	-	24
G4APJ	0	2	-	-	-	-	6	3	-	-	11

The District Codes are the 124 listed on page 56 in the January 2003 RadCom. Up to 6 different GI stations and up to 3 different GM stations in each Scottish district may be counted. Countries are the current DXCC ones plus IT9.
The deadline for the nest issue is 13 July.

caused a PA failure. He is working on a YD1336 PA for 23cm with the loan of a tube from Sam Jewell, G4DDK, who is hearing 23cm signals with his 2.3m dish.

Peter Blair, G3LTF (IO91), found high activity on 23cm in the 27/28 contest weekend when, for a change, the local weather conditions were good. On the 27th he completed with SK0UX, LA8LF, LX1DB, JA6AHB, IK2MMB, G4CCH, SM3AKW, OM6AA, DF3RU, F1ANH, ZS6AXT, OK1CA, OZ6OL, 9H1ES, GW3XYW, F6KHM, OH2DG, F6CGJ, PA0SSB, K2UYH, ON5RR, K0YW, HB9Q, W2UHI, K5JL, K4QI, VE6TA, OZ4MM, WA4NJP, VA7MM, NA4N for initial #205, W2DRZ and K5GW. Next day brought DL0SHF, JA8IAD, DL1YMK, K9SLQ #206, N2IQ, IK3COJ and WA6PY for a claimed score of 41x28. On 70cm he had several tries with 3B9C but failed to work them but on 2 April PA0PLY was #379 and a good signal and VK3UM* was 559/559.

On 27 March Stuart Jones, GW3XYW (IO71), completed with OZ4MM, F6KHM, G4CCH, OZ6OL, SM3AKW, F1ANH, LA8LF, SK0UX, ZS6AXT, JA6AHB, G3LTF, K5JL, K2UYH, DF3RU, K0YW, WA6PY and IK3COJ. Next day he worked DL1YMK, OH2DG, OZ6OL again and F6CGJ, a total of 20 valid QSOs in 11 countries.

The July activity weekend is 10/11 when London latitude stations will have 28.7 hours of Moon time. The declination varies from +9.04° to +17.12° and the 144/432MHz sky temperature ranges from 341/25K to 409/29K. The signal degradation referred to perigee is -1.38dB to -1.65dB and the Sun offset at Saturday midnight is -71°.

BAND REPORTS

50MHz

After some time in the doldrums, 6m came to life in the last week of April with the first of the summer Es. On the 24th Robin Burrows-Ellis, M1DUD, completed two Es QSOs with IK7LMX (JN80), the second when both were only running 1W. In the short RSGB contest next day he worked four stations, ODX being GD0EMG* (IO74) at 461km. His club station, GX7VHF, was QRV in the Nordic Activity Contest on the 27th when there was somewhat unstable Es propagation to the Balkans. He lists Z37CXY (KN02), IW9AUL (JM68), YU1ACR (KN13), IT9QQB (JM77), T94FC and T99C (JN93), IT9RNW (JM77), T98T (JN84), YU1AST (KN03), LZ1AQ and LZ3RX* (KN12) and LZ1AG (KN22) who was ODX at 2072km. Robin will be QRV as OZ/M1DUD/P from JO45 in the first two weeks of August.

Welcome to Kevin Jackson, M0XLT (IO83), a new contributor from Airdale in the Yorkshire Dales who uses an IC706 MkII to a triband collinear antenna. A committed fan of the VHF/UHF spectrum for over 30 years he likes the 50MHz part for its variety of propagation modes. His Es QSOs were impressive and on 27 April he worked IZ6BXV (JN72), IW0GPN (JN62), IZ5EKV, IW5ACZ and IZ5FSO (JN53), IK1TXM (JN44), F1HKR (JN23), EH7HG and EH7RM (IM87) between 1252 and 1426. Next day brought CT1HZE (IM57) at 1436 and on the 29th at 1214 IW0GPN and IW0BET (JN61).

In May on the 1st in a 14min session from 0950 he completed with OE5GWP (JN67) and two S5s in JN76. From 1226 on the 6th he worked S57RR and IW3SNU (JN65), IW4DGS (JN64), HB9SJE (JN47), I6NO (JN63), S56HCE (JN75), OK2YT (JN88), IW3HQD (JN55), IK3TPP (JN65), OE3MPL (JN78) and DL5CR (JO61). But the best opening was on the 10th from 1200 when he made another 21 QSOs with stations in EH5 and 7, F, I0, 5 and 6, IM0, OK and SP9. Kevin has entered the Annual Table.

Bryn Llewellyn, G4DEZ (JO03), was QRV for 12 hours in the Es opening on 10 May and worked a few Ukrainian stations in KO50 but his best DX were LZs in KN33 and 34. Mike Price, G6HOU, was also QRV between 1318 and 1551 working stations in CT, EH, I, OE, OK, S5, SP and YU. In an unexpected direction he contacted OY9OY (IP62) but missed out on 9H due to the big pile-up. ODX was YZ1EW (JN94) at 1724km.

David Whitaker, BRS25429 confirms that 10 May was the best Es opening so far this year and he was hearing the odd signal from UR5TW at 1135 but half an hour later the band started to open to Eastern Europe and then to the south, remaining open till 1910. He reports that Ken Osborne, G4IGO (IO80), was hearing/working stations in the Middle East - OD, ZC4, 5B - at one time and worked into GM, TF, OY and some Scandinavian countries.

Clive O'Hennessy, GM4VVX (IO78), heard his first Es signal on 29 April when he worked F6KHM who seemed to have his personal path to north Scotland for 10min. On 6 May he thinks he was at the fringe of the opening to DL, F, I, S5 and 9A when all QSOs were dogged by deep QSB. On the 8th at 0700 he worked into OH followed by "...teasing bursts of Es until 1300 when there was 10min of a good path to ES for QSOs."

John Palfrey, EH7IT (IM87), has added to his 6m score in recent weeks thanks to trans-equatorial propagation (TEP) and on 29 March he worked ZS6NK* (KG46) and ZS6OB (KG44). On 7 April Z22JE (KH52) was a new country as were 9J2HK* (KH44) on the 17th and 7Q7RM (KH74) on the 21st. On the 28th, Es brought 16 contacts with DL, F, G and PA stations in seven new grids in the 1345-1600 period. On the 29th, 1144-1204, there was more Es to G and EI3IO and a QSO with G4DHF around 1700. On 1 May he contacted DL5NAM (JN59) at 1720 and on the 3rd, from 0905 he worked several Is, S59F and F5BEV and at 0934 SP7RJF (KO10) at 2446km, presumably double-hop. John is now up to 88 grids and 31 countries on 'the magic band.'

Ted Collins, G4UPS (IO81), opened his Es account at 1617 on 23 April with OE6BMG* (JN77) followed by OE3GJB (JN87), YU7OP and YO2IS* (KN05), SM7AED (JN65), OE6MDF (JN77), YO7VS*, YO7XL* (JN95) and YU7AP (KN05), all signals fading out by 1730. On the 28th at 1525 he contacted EH6VQ (JM19), EH3LL (JN01) and EH7TV (IM98) with fade-out by 1610.

70MHz

From the 4m website - see the list - comes a claim from Andy Kissack, GD0TEP, for another 'first' made during the RSGB Contest on 11 April between GD0EMG, the callsign of the Northern Lights (Manx Kippers), and 9A3AB (JN75) when RS59 SSB reports were exchanged. The website has a good 'Photos' section.

G4DEZ has now repaired his antenna installation. The first problem was a bad N-type connector that had become undone at the antenna and the second was that the 12V supply to the masthead preamp was reaching the box all right but the internal connection to the circuit board inside had come off. Even so, he somehow managed 13 QSOs in a recent contest.

GM4VVX was out /P for the 11

April contest but only made three QSOs with other GMs in poor conditions. On 9 May he was out again for the CW contest but fared even worse making just one contact with G3JYP (IO84). He copied several other Gs but only received 'QRZ?' from them so asks, "Do you get a gold star for attendance?" His plea through this column for a 4m amplifier bore fruit with a couple of replies, but he was surprised at the high bids made on e-bay for a very old ex-PMR unit.

144MHz

Geoff Grayer, G3NAQ (IO91), was only able to operate for a short period in the 2m section of the IARU contest on 2 May when propagation to the east and south-east was average but poor to the south with nothing worked from the Bordeaux area or Spain. Between 1200 and 1320 he worked F6FNL/P (JN36), F4ARU/P (JN27), DK0HN (JO31), F4CQY/P (JN28), F6KIM (JN38) and DK0GTH (JO50) ODX at 854km and who sent serial number 797, the highest logged. Geoff's station comprises a TS-830S, home-brew 1970s transverter with a QQV06-40A PA and 17-ele Yagi at 65ft AGL, the QTH being 600ft ASL.

Ken Punshon, G4APJ (IO83), fancied a bit of portable operation so set up his equipment on 9 May. After working a few stations he discovered that the contest he wanted to operate in was the following week. Nevertheless, there was a surprising amount of activity and it gave him a chance to burn in his new generator.

Niels Montanana, G8RWG (JO01), got his second Yagi back over Easter but finds activity low outside of contest periods. While in the shack he monitors 144.300MHz keeping the antennas pointed east and can usually work 400-500km in poor conditions. There was a high level of activity in the 1/2 May contest and the majority of stations worked were DLs with a handful of Fs. He made 14 QSOs over 600km and DL0GTH (JO50) at 750km and DK0ES (JN48) at 755km were ODX. The Activity Contest on the 4th brought out the regulars in poor conditions, but as the session coincided with the Nordic Activity Contest he managed to work DC0NAC/P (JO43) at 690km.

GM4VVX concludes it was a quiet month with the only QSOs being auroral ones. There was a big event on 3 April from 1600 bringing CW contacts with DK, G, GI, ON, OZ, PA and SM stations and SSB QSOs with G, GI, GM, ON, OZ, PA and SM stations. Clive made a few SSB QSOs on the 6th with EI, G and GM stations and on the 23rd with one SM on CW. He did a propagation mode analysis from his log of just under 4000 contacts and on 2m 98.2% were auroral, 1.75% local tropo and just 0.05% were *via* Es, all since moving to IO78 in 2000.

SIGN OFF

Thanks to Neil Clarke, G0CAS, for the March issue of *SunMag* and to Andy Barter, G8ATD, for the Spring edition of the quarterly magazine *VHF Communications*. Copy for the **September** issue should reach me by **13 July** and for **October** the date is **10 August**. My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk ♦

WEB SEARCH	
Contest calendar:	www.blacksheep.org/vhfcc
4m website:	www.70mhz.org
G0CAS (SunMag):	www.g0cas.demon.co.uk
VHF Communications:	www.vhfcomm.co.uk

HELPLINES

IMPORTANT NOTICE

Respondents to items in the 'Helplines' column are advised not to send original documents, but to copy them and send the copies. This is to protect your (often valuable) property in those very few instances where the originals are not returned.

♦ Bill, GW3DGT, has an AVO All-Wave Oscillator (No 6784-1043). He would welcome any information about it, eg handbook, circuit diagram, for this heavy piece of equipment. GW3DGT, tel: 01834 831 369.

♦ Jack, G3JKT, would appreciate any information about a Sony receiver ICF-2001, such as an instruction book or copy thereof. All expenses will be repaid. G3JKT, QTHR. Tel: 01255 830 644.

♦ Norman, G8CXL, requires a replacement users' booklet for his Metex M-4650 digital multimeter. All copying expenses will be paid. G8CXL, QTHR. Tel: 01926 452 404.

♦ Phil, G3SES, requires technical information, particularly PSU requirements, for the Racal 819 Active Probe. All expenses will be paid. G3SES, QTHR. Tel: 01244 383 954, or e-mail: philg3ses@aol.com

♦ Steve, G0EVJ, needs any paperwork relating to the Howes DCRX board for 40m. He will meet all costs. G0EVJ, QTHR. Tel: 01543 251 915.

♦ Ray, G3HRH, would like to borrow or purchase the circuit diagram and, better still, the service manual for the Marconi TF2008 signal generator. The military code is Generator Signal CT561/3. Postage will be refunded. G3HRH, QTHR. Tel: 01962 712 045, or e-mail: g3hrh@btinternet.com

♦ Bruce, G3WCE, has successfully built a copy of a KW2000A transceiver. He now wishes to undertake further similar projects, and wishes to obtain components from the KW range of equipment. Parts require include bandswitches, VFO enclosures (2000/2000A/Vespa), inductors (in cans), etc. G3WCE, QTHR. Tel: 01692 538 794.

♦ Ray, G3RSB, would like to obtain either an MC1414L or LM1414 chip to make possible the repair of a Gould oscilloscope. G3RSB, QTHR. E-mail: ray@g3rsb.karoo.co.uk

♦ Chris, MM1LJB, is trying to discover the callsign of his late grandfather, by the name of Ted Sims, who lived at 36 Steele Street, Rugby. He was active in the 1960s. Would anyone with any information about him, however insignificant, please contact Chris. MM1LJB, QTHR. Tel: 07745 945 238.

Vine Antenna Products

Taranaki, Four Crosses, Powys SY22 6RJ. Tel 01691 831111, fax 01691 831386. Email - info@vinecom.co.uk - Web Page www.vinecom.co.uk. Callers welcome by appointment please..

SteppIR Fluidmotion Antennas (RadCom review Feb 04)

Selling like hot-cakes!! A dipole, 2,3 or 4 element yagi, and verticals that cover between 14 and 54 MHz with no gaps, with very low VSWR throughout that entire range. No need to set the antenna for "Phone" or "CW". These antennas are always the correct length. They are remotely tuned from the shack with a desk-top controller, which can also be interfaced to your transceiver so that the antenna length adjusts automatically, reading the frequency from your radio.You can also design your ideal antenna using modelling software and implement from the controller menu, without leaving the shack. There are no fault-prone traps with these antennas. The yagis cover six bands with the lowest visual impact, and the verticals cover the full frequency range with one slim element. Keep neighbours happy with a SteppIR antenna!

Vine now stocks OPTIBEAM from Germany (RadCom review Aug 03)

Radcom's reviewer described the antenna as "the best of the best" We are pleased to offer the full Optibeam range for those who prefer traditional aluminium antennas.Models available for WARC, traditional HF bands, HF + 40m, etc. Contact us for more details for the *Mercedes-Benz* of multi-element HF antennas.

ACOM 1000 *HF+6m* Amplifier (RadCom review March 01)

- **Up to 1kW output**
- **160-6m inc WARC**
- **Matches up to 3:1 SWR loads**
- **Easy-Tune aid**
- **Fully protected**
- **LCD Display inc PEP metering**
- **Mil-spec quality**

This amplifier, and the automatic 2000A, were described by Peter Hart as "**highly recommended**", and "**beautifully constructed and engineered**". These extremely well-made and reliable units are the choice of operators who require RELIABILITY as well as HIGH POWER. Here are a few user comments about the ACOM 1000 - "I am really glad and delighted that I made this choice as it has lived up to all my expectations and more !!" (GI4MMJ) - "I worked for many years in the scientific instrument business, and in my opinion, this equipment is of that standard." (G3IOE) "Superb" (G0CHQ) "It's very quiet with almost no fan noise and a silent changeover relay....A very well built and civilized amplifier". (EI6IZ) Check our website for pictures, specs and many other complementary user comments.

ACOM 1000 (160-6m) is now back in stock at £1,599. ACOM2000A automatic 2KW no-tune (160-10m) £4,295. ACOM 1006 (6m) £1,299

Rotators & Filters

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INRAD I.F. Filters make a good radio really superb!. Models are available for nearly all transceivers. Still available - kits to improve the **FT1000MP and FT1000MP MkV** For **just £54.95** inc postage.

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New - HF mini-beam

From Germany, the **Optibeam OB6-3M** consists of a Moxon Rectangle for 20m, and yagis for 15 and 10m. Maximum performance is packed into a turning radius of only 14ft, with a 10ft boom. Optibeam's low-SWR feed system gives a VSWR of less than 1.6 to 1 at band edges. An external tuner also gives acceptable results on 17 and 12 metres.

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ELECTRONICS

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RG213U (eq U R67), M ii spc, 50ohm	75p/m
URM43,5mm dia, 50 ohm, single conductor	35p/m
RG58CU, 5mm dia, 50 ohm stranded conductor	35p/m
RG1 74U, 2.3mm, 50 ohm Mini Coax	40p/m
RG11U,10.3mm, 75 ohm low loss Coax	£1/m
URM70,6mm, 75 ohm Tx grade Coax	35p/m
BT2002, 5mm, 75 ohm double screened Coax	35p/m
RG62AU, 6mm dia, 95 ohm Coax	50p/m
TV, 75 ohm, low loss Downlead	30p/m
MINI 8 low loss 7mm dia, 50 ohm coax	50p/m
POLYESTER (Dicrom type) 4mm GUY ROPE	30p/m
RG214U	£2/m
RG223U	£1/m
75 ohm Twin balanced Feeder, Light/Med 400w PEP	30p/m
300 ohm Ribbon standard light duty	30p/m
300 ohm Ribbon, HD USA Slotted type	65p/m
3 Core Mains/Rotator Cable, 5 amp	30p/m
6 Core Rotator Cable	50p/m
8 Core Rotator Cable	70p/m
Aerial Wire, light duty PVC coated	8p/m
Aerial Wire, medium duty PVC coated	10p/m
Aerial Wire, heavy duty PVC coated	25p/m
16swg HD copper	25p/m
16 swg stranded copper	25p/m
Single core screened, 2.3mm dia	20p/m
Two core screened, 5mm	30p/m
6 core screened, 5mm	40p/m
Red/Black DC power cable, 8 amp	30p/m
Red/Black DC power cable, 15 amp	45p/m
Red/Black DC power cable, 20 amp	£1/m

Postage on cables - up to 20m £3. over 20m £5.

CONNECTORS ETC

Self Amalgamating Tape	£4.50	Dipole centre boxes	£3.50
4" Dog Bone insulators	75p	Polyprop Egg insulators	60p
Mil Spec P.Sleeve N plugs 10.3mm	£3.00	Mil Spec P. Sleeve BNC plugs 5mm	£1.70
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Greenpar N Panel sq skt	£2.50	Mil Spec P.Sleeve PL259 plugs 5mm	£3.00
SMA Adaptors to BNC skt/N/skt/SO239	£3.00	Mil Spec P.Sleeve PL259 plugs 10.3mm	£3.00
SPECIAL N PLUG for W103	£5.80	Special PL959 for W103	£1.70
ADAPTORS BNC/SO239	£1.80	PL259/BNC skt	£1.80
N plug/SO239	£2.50	N PLUG/BNC skt	£3.00
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ICOM IC-202S BLUE EMBLEM 2M SSB	£195.00
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KENWOOD TR-9130 2M MULTIMODE	£175.00
YAESU FT-726R 2/6/70 FITTED	£295.00
YAESU FT290R MK2 BOXED	£175.00
YAESU FT-8100 DUAL BAND FM	£195.00
KENWOOD TH-F7 DUAL BAND HANDIE	£195.00
NAVICO 2M 25WATT FM MOBILE	£75.00
DRAE VHF WAVEMETER	£15.00
ICOM VOX UNIT HS-10SA	£20.00
YEASU FT-290R MK MOBILE MOUNT	£15.00

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By Simon Lewis, GM4PLM

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MICROWAVE

GM3PLM makes his farewell appearance as author of the 'Microwave' column, and introduces Sam Jewell, G4DDK, who will be taking over in September ♦ Latest on the UK Microwave Group ♦ Details of the 24GHz beacon at Schiphol airport

Welcome to my last Microwave column! Due to personal changes and work commitments, I have decided to emigrate to Germany and will no longer reside in the UK from July. As this is really a UK-orientated column, it is not correct that I should edit it when I do not live in the country, so this will be my last. However, your new columnist is one of the most familiar names on the UK microwave scene in the UK and I am sure he will continue to do the column justice. Sam Jewell, G4DDK, is well known for his equipment design and most microwavers will be familiar with the DDK range of local oscillators that appear in much of our equipment. Sam is also very active both on and off air, and is a well-known face around the UK Microwave Roundtables and a key figure in the arrangements of the excellent autumn Martlesham meetings. He is also a committee member of the UK Microwave Group and so is in a great position to bring you all the latest news from the microwave world. I am sure that the column will continue to bring you the best in microwave content. Good luck Sam!

As for me, I will still be active in the microwave world. Indeed, I will be more active on the microwave bands in the near future than I have in the past ten years! Having obtained a new callsign (DL4PLM), I am now in the process of finding a new QTH in the Nord Rhein Westfalen area in and around Düsseldorf. With that, of course, comes a new shack and a new antenna array. I have also been introducing some of the local club members to microwaves for the first time and recently demonstrated 10GHz at the club; for some it was their first experience of microwaves and they were pleasantly shocked at the capabilities of a small 3cm system. So there is plenty to keep me going in Germany and I will also have an opportunity to see some of the best amateur radio exhibitions and meetings such as Friedrichshafen, Weinheim and many others! I will continue to edit the *DUBUS* Microwave Europe column and will also send Sam some updates on what is happening in Europe for the column. Thank you for your support over the years, I have enjoyed writing the column and hopefully will now find time to see more of you on air!

News from the UK Microwave Group (UKµG) now. As discussed in previous columns, the RSGB has agreed that the UKµG can absorb the running of the *Microwave Newsletter* currently published by the Society. This handover has now been agreed for 1 July and the next issue after that date will carry the logo of both organisations. Subscriptions and renewal dates for membership of the UKµG have now been set, and the latest information and news can be found on the group's web pages.

Schiphol tower

The 24GHz beacon in the Schiphol tower.

BEACON NEWS

Hans, PA0EHG, sent details of the 24GHz beacon at Schiphol Airport. He says: "This is to inform you that the 24GHz beacon at Schiphol is now again QRV on 24048.200MHz. Power output is 150mW into a 24cm dish beamed to G3LQR and 800mW into an omnidirectional antenna. Both outputs have the same frequency. Further information, including pictures, is published on my website. The beacon is, in fact, almost completely new, with an OCXO designed by G8ACE and a new multiplier from 12 to 24GHz giving 150mW. Then, a directional coupler of 20dB is followed by a amplifier with 800mW. I would welcome any receive reports."

The beacons at Schiphol Airport are well sited and are on top of the Air Traffic Control Tower! The location is 90m above ground under a radome for the radar antenna. Some amplitude interference from the radar antenna can be heard on the beacon signals. Its locator is JO22JH or JO22JH13. Hans's website also carries details of the other beacons at the tower and, as they are well sited, it is worth noting their frequencies.

FINALLY

Thanks for your support over the years. Good luck, enjoy your microwaving, and see you on air! 73, Simon, GM4PLM/DL4PLM. ♦

WEB SEARCH	
PA0EHG	http://home.planet.nl/~alphe078/

Jeremy Boot, G4NJH

E-mail: g4njh2@ntlworld.com

Packet Radio – Still Surviving

If you thought packet radio was a technology of the past – read on!

It is a long time, I admit, since I first played about with packet radio. It was an invaluable means of getting to grips with the concept of packets of information, data rates, polling and acknowledgements, routing and all sorts of other new things and, when I went on to Internet, I was very grateful for that initial grounding. It reduced the learning curve.

When the Internet came into its own, I, for one, foolishly thought that packet, which remains essentially slow and not private (well, amateur radio isn't supposed to be private) would decline. Has it? Well, no; the presence of e-mail and the Internet has lessened the need for it, but it has a niche of its own and it's alive and well. So I thought I would look for some web pages to tell me more.

ORIGINS AND EXPLANATIONS

What is packet radio? Where does it come from? I started at the TAPR Pages (Tucson Amateur Packet Radio). I read: "Packet radio has been around since the mid-1960s, but was first seen on the amateur bands in 1978 through research done in Montreal, Canada in 1978, the first transmission occurring on 31 May." The first kits, TNC1 and 2, were around in 1982 and allowed the first Terminal Node Controllers (TNC) to be connected up to existing radios, and after huge growth in the 80s and 90s worldwide, it continues: "No longer is it just packet radio, but now it is bulletin board systems, DX Clusters, chat bridges, networking, emergency communications, satellite operations and much more". It goes on to elaborate on nodes, nets and bulletin boards and satellite use. Read about AX25, Rose, KA-Nodes, Net/Rom, AMPR. It's a good place to start and a useful background. Such terms as SMTP, and FTP will probably be familiar to most Internet users now, so it isn't as strange as it appeared all those years ago.

On now to the aptly-named Packetradio.com - enter Buck Rogers, K4ABT (in the 21st century...), to tell you all about packet, and how to wire various TNCs. The basic primer is very practical: "A 'Terminal Node Controller' is similar to the modem you use when connecting to the Internet. One difference is that the TNC is used to interface the terminal or computer to the RF or radio (wireless) medium. There is one other, *very* significant difference. Inside the TNC, we have added some internal firmware called a 'PAD'. The PAD or packet assembler / disassembler captures incoming and out-going data and assembles them into 'packets' of data that can be sent to and from a data radio or transceiver." Good.

BRITISH PAGES

Looking for British pages, I came across the Fourpak Packet Group's pages. They were updated on the very day I accessed them. There is an interesting account of the 2003 Conference with articles of interest including satellite links and Internet-linked nodes and the possibility of linking WAP phones and packet. I was taken by an article 'Enabling Windows Users to Access TCP/IP Hubs Over Radio', by G3ZFR. I leave you to read the rest. Still looking for useful UK links, I stumbled (blush)... on my own G4NJH pages which reprint (with permission) an article I wrote on packet radio back in 1998 in the now-defunct *Radio Today*. Some of the links are no longer valid, not surprisingly, but many are.

CLUSTERS AND SOFTWARE

One of the ways packet and Internet interface is by the DX Packet Clusters, something I wrote about some months ago and which is an impressive way of gathering real-time knowledge of what station is on what frequency. Users can input either by packet or by Internet access. One such page, listing what is available, is from NG3K with lists of DX Clusters, a tutorial and a good list of available software. Of use also to SWLs and others will be the *RXCLUS* software by HB9BZA.

Speaking of software for packet, you could do worse than visit the Peak Systems pages (G4IDE), which will give you the latest version of the *WinPack* software. It is shareware by the way, so have your £10 ready. For more software with the Mac in mind, see the G0OAN software page, which seems to include not only the standard stuff, but also something to allow you to play chess over packet! Other links to packet software are to be found at the DX Zone pages, and include, not only TNC, but BBS software of all sorts. See also what looks like very versatile software on the SV2AGW pages.

The PacComm web page.

EQUIPMENT AND MANUFACTURERS

What equipment is available and where do you go to get it? I don't review commercial links, so I am quite unbiased. You could do worse than start with G6DPP's pages of UK outlets (not just for packet, either). Some, I suspect, are a little out of date, but it's still a good list. On similar lines, see the G4JKQ pages, which include a TCP/IP listing of Telnet numbers. See also Kantronics, Baycom and PacComm, who make TNCs, etc – the list is not meant to be exhaustive.

STILL OURS, STILL THERE

In the past, you depended upon little more than a TNC and a dumb terminal, the combination of computer, software and TNC making the whole experience much more enjoyable and versatile. Internet has the undoubted upper hand when it comes to connectability and speedy reliability, but packet is ours and it works by good-old radio using nodes and links. It still has its specialist niche and it is an excellent gateway to other data aspects of the hobby. The DX Clusters and their interfaces with packet are super aids to operating and, again, unique to ourselves and to our needs. No, packet is not dead and is there for you if you want it. I leave readers to peruse these and other pages to see what more they can find. ♦

WEB SEARCH

TAPR	www.tapr.org/tapr/html/pktf.html
PacketRadio.com	www.packetradio.com
Fourpak	www.g8pzt.pwp.blueyonder.co.uk/fourpak/pk2003/minutes.htm
NG3K	http://cpcug.org/user/wfeidt/index.html
G4IDE	www.peaksys.co.uk/
G0OAN software page	www.g0oanint.demon.co.uk/packet.html
RXCLUS, HB9BZA	http://rchalmas.users.ch/rxclus/index.html
DX-Zone	www.dxzone.com/catalog/Software/Packet/
G6DPP pages	www.g6dpp.com/link1/
G4JKQ pages	www.qsl.net/g4jkq/links.htm
G4NJH (packet)	www.innotts.co.uk/asperges/packet.html
SV2AGW	www.raag.org/sv2agw/pepro.htm
Kantronics	www.kantronics.com
Baycom	www.baycom.de/
PacComm	www.paccomm.com/

John Heath, G7HIA / M3BBX

Chestnuts, Desford Lane, Kirkby Mallory, Leicestershire LE9 7QF.

E-mail: g7hia@amsat.org

Something for everybody

A broad coverage of items, including: Latvia activated by satellite; the Shadow Project approved for the *ISS*; amateur astronomer captures the *ISS* in transit across Jupiter; the GEO meets in Leicester.

A recent trip to Riga in Latvia, enabled National Space Centre Radio Society member Andy Thomas, G0SFJ, to activate YL on satellite. This is possibly the first time that the YL call has been active on Saudi Sat *SO-50*. For the first orbit in range of the UK, Andy operated from Jurmala beach, grid square KO16WX, using the Society's Kenwood THD-7 hand-held, with 5W to an Arrow antenna. The first three contacts on 24 April were with G8ATE, G7HIA and G3LRG. More details from Andy on his return. Thanks to Gunnars Postniek, YL2PG, who provided the image.

APPROVAL FOR RUSSIAN SHADOW PROJECT

Robin Haighton, VE3RH, President of AMSAT-NA confirmed recently that the Shadow Project has been approved for the *ISS*. As reported previously in this column, there is an opportunity for the amateur radio community to take part in this experiment by monitoring packet radio signals from the *ISS*. The first version of the *DOS* software, *HostCom*, can be downloaded from the site (find it in the section 'Ground Air'). It is not exactly user-friendly. However, members of Welland Valley ARS did manage to get it working and controlling a TNC. They carried out a comprehensive series of transmission and reception tests, which they have reported to the project sponsors Tsniimash, Central Institute for Machine Building. Hopefully, an improved version of the software will be available soon. If anyone would like to help on the software development, Vycheslav Batukhtin, RV3DGA, and the team would welcome assistance.

ISS TRANSIT OF JUPITER - A WORLD FIRST FOR G8DVW?

The remarkable image was captured by Robin Leadbeater, G8DVW, using a computer-controlled 8in reflecting telescope with a webcam connected to a laptop to take a video of the transit at 15 frames per second. As Robin explained, the resulting image shown here is a composite of the frames showing the *ISS*. A longish exposure ($^1/_{50}$s) was used because of cloud cover; this led to some of the images being slightly 'tailed'. At $^1/_{1000}$s, sharp images can be obtained, showing structural detail. Robin gets his transit data from Tom Fly in the USA, see 'Web Search'. Moon and Sun transits are predicted, and Tom has recently improved his accuracy to give planetary transits. If you want to try this, Robin points out that you need to be spot-on with choosing your location. The ground track for this transit of Jupiter was only 200m wide.

The technique is to plot the co-ordinates using something like *AutoRoute Express*, then check out suitable observing sites. Congratulations to Robin and thanks for providing details of how it is done.

Top left
YL/G0SFJ/P on Jurmala Beach, Riga.

Top right
Members of the Werkgroep Kunstmanen from the Netherlands learning the finer points of *Meteosat 8*.

Above
A superb ISS transit across Jupiter, captured by G8DVW.

GEO MEETING IN LEICESTER

The recently-formed Group for Earth Observation chose The National Space Centre in Leicester as the venue for its first members' meeting. Francis Bell, GEO's Chairman, welcomed some 60 or so delegates who enjoyed a packed programme of talks and presentations. Speakers included Gordon Bridge of Eumetsat, Arne Van Bella from the Dutch group, and software guru David Taylor, author of some of the best image-processing software available for use with weather satellite image data. Of particular interest to many, including G7HIA, were the presentations of data capture from *MSG-1*, now called *Meteosat 8*, the latest in the *Meteosat* Geostationary Weather satellite series. The data collected by the satellite are being disseminated using the TV broadcast satellite *Hot Bird 6*. Consequently, for around £200, it's possible to set up a complete system for receiving and processing the data. All that's needed is a TV-size dish, PC card, and software. This makes full Earth images and regional 1km resolution weather satellite images available to the home or education user at a fraction of the cost and complexity of older systems. With 12 spectral channels, including infra-red for night-time imaging, there are exciting possibilities for image processing following data capture. Anyone in science or geography teaching would, I am sure, find this facility a great asset for many classroom projects.

RUSSIAN CAP BADGE

The badge, shown in the last 'Space' column, is, in fact, Ukrainian, as evidenced by the national flag in blue and yellow. Thanks to everyone who replied. I had no idea Military Heraldry was so interesting. With the help I received, investigations are ongoing, and I hope to have a report for the next column.

PCSAT2 PASSES FLIGHT TEST

Towards the end of March, *PCSAT2* passed its final out-gassing tests and was declared ready for launch. It will fly on the first Shuttle mission in 2005. The out-gassing specifications are some of the most stringent in the space programme and are naturally of concern to the satellite team, since all of *PCSAT*'s parts were off-the-shelf Kantronics TNCs and a Hamtronics transceiver, including original plastic parts. Thanks to Bob Bruninga, WB4APR, for the report, and the pioneering work he is doing with his Navy Cadets in building low-cost satellites. *PCSAT2* promises to be another useful and valuable addition to amateur radio.

ROSETTA HEARD ON 8.4GHz

This is not a reference to Spanish interference. *Rosetta* is the name given to Europe's comet-chasing spacecraft. Charlie Suckling, G3WDG, copied the spacecraft using a 3m dish and the same system used successfully to monitor signals from *Mars Express* and *Mars Odyssey*. The signal strength recorded from *Rosetta* was 14dB at around 2.5kHz bandwidth and 50dB at 1Hz bandwidth (using *AO40RCV*). Thanks to Charlie, who posted his report to the AMSAT bulletin board. If you are interested in having a go, down-converters for 8.4GHz are available from DB6NT. ♦

WEB SEARCH

Shadow Project	www.tsniimash.ru/TSNIIMASH-eng.htm
Transit data from Tom Fly	http://iss-transit.sourceforge.net
GEO	www.geo-web.org.uk
8.4GHz down-converters	www.db6nt.com
PCSAT2	www.ew.usna.edu/~bruninga/pcsat2.html
Rosetta	There are several good sites; feed Rosetta to your search engine

By Trevor Brown, G8CJS

E-mail: chairman@batc.org.uk

ATV

This month, G8CJS reviews the recent BATC Bi-Annual General Meeting, the current status of ATV repeater licences, and notes the new BATC cyber-membership scheme. What is it? Read on...

The BATC BGM and ATV get-together was set for 9 May but, for many of the faithful, the event started the night before with drinks, dinner, and a chance to renew old acquaintances and exchange ATV stories. The bar was well populated!

Events started in earnest the next day. The first lecture was about digital ATV with Ian Waters, Noel Matthews, and Dave Crump. DATV and all the various options were explained and two live QPSK links were demonstrated across the room using large ex-commercial equipment and the new AGAF modules. For those who have not seen this module set, it comprises two Eurocard-size modules that take in YC or composite video and produce 20mW of RF on 70cm. The AGAF also provide the circuit diagram of a simple 24cm-compatible up-converter

Ian demonstrated some of the quirks of this system, such as no white noise when 'tuning the band', the audio delay, and the fact that the receiver retains the last picture when the transmitter is turned off. Ian has since bought the BATC-loaned modules he was initially evaluating. Noel and Dave went into the various options and came up with an advisory plan. This is not in any way mandatory, nor is it intended to restrict experimentation. It's just that initial tests have indicated these may be the best starting points, taking into account spectrum efficiency and robustness to multipath and low signal strengths, etc.

Carlos Eavis, G0AKI, of the Repeater Management Committee was next, and outlined some of his day-to-day headaches. He painted a rather bleak picture of 70cm post-9/11, with an increased presence of the Primary User. In contrast, with his other hat on as the manager of GB4FUN, he remarked on the success of its appearances at local schools; ATV and, in particular, the 'Hat Cam', go down well with the children.

Graham Shirville followed with an upbeat presentation about ATV and the Amateur Radio on the International Space Station (ARISS) programme. All the video lectures were filmed and it may be possible to web-stream this one on the BATC site as it is an interesting proposal, one that I think merits more attention.

Stands everywhere, but some people needed convincing about the bargains!

Yorkshire Television OB unit restored by Paul Marshall and painted in Tyne Tees colours for its appearance in the ITV programme 'The Royal'.

The final lecture of the day was by Mike Cox, the BATC president, and covered the rise of the IBC (The International Broadcast Convention). It is held every September in Amsterdam and is where all the broadcasters buy their new toys. It has an attendance of 45,000 and has hosted a BATC stand on at least three occasions in the past.

I also met the youngest radio amateur I have come across to date – Oliver Crump M3OCR. Oliver helped man one of the TV cameras at the event, and the pictures he produced were excellent – many thanks. There was also the usual trade stand and a guest appearance from a Vintage Outside Broadcast Truck. This one started life at YTV in 1968 and is now repainted in Tyne Tees TV Colours as it was used in an episode of ITV's Sunday night drama 'The Royal'. The truck is the private property of club member Paul Marshall.

PROPOSED DATV OPTIONS

70cm	QPSK	I2Msymbols, 1/2 FEC IPAL + audio in 2MHz
23cm	QPSK	I4Msymbols, 1/2 FEC = 4MHz
13cm	COFDM	at 2.4GHz 1/8 guard interval, 1/2 FEC
13cm	QPSK	I4Msymbols, 1/2 FEC = 4MHz
3cm	QPSK	I4Msymbols, 1/2 FEC = 4MHz – as 23cm

NEW ATV REPEATER LICENCES

We have had a new batch of ATV repeater licences since our last column.

GB3FV	23cm cross-band 2390MHz in 1312MHz out	Wisbech
GB3WV	23cm 1249MHz in 1310MHz out	Cornwall
GB3DH	13cm 2388MHz in 2440MHZ out	Derby
GB3FT	13cm 2388 & 10315MHz in 2440MHz out	Newbury
GB3TZ	13cm 2388MHz in 2440MHz out	Luton
GB3BH	13cm 2340MHz in 2440MHz out	Watford
GB3KM	13cm 2328 & 2388 in 2440MHz out	Co Durham
GB3LX	3cm 10425MHz in 10240 MHZ out	Lincoln (co-sited with GB3VL)
GB3RV	13cm additional digital QPSK 10065MHz out	Brighton, E Sussex

There is only one with a 23cm input, and that's in Cornwall but, fingers crossed, more are on the way. This leaves only six applications in the system at this present time!

BATC CYBER-MEMBERSHIP

BATC have now introduced 'Cyber-Membership'. This is initially for overseas members who often suffer postal delays in receiving the club magazine *CQ-TV*. Now they will enjoy a reduced subscription rate and be able to download their magazine as soon as it is published. See the BATC website for more details. ♦

WEB SEARCH

BATC: www.batc.org.uk

TRAINING

ADVA	Advance! The Full Licence Manual	£9.99	£8.49
IMED	Intermediate Licence Book	£5.79	£4.92
FNOW	Foundation Licence - Now !	£3.99	£3.39

BEGINNERS

AREX	Amateur Radio Explained	£9.99	£7.49
PAFN	Practical Antennas for Novices	£7.99	£6.79
PRFB	Practical Receivers for Beginners	£14.99	£12.74
HRFD	Ham Radio for Dummies NEW	£14.99	£12.72
BNHC	The Best of the New Ham Companion	£9.99	£8.49

LOGGING

DL04	Deluxe Log Book & 2004 Diary	£4.99	£4.24
DLBC	Deluxe Log Book Cover	£9.99	£8.49
	Deluxe Log Book and Cover Set	£9.99	
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In part 1 of this two-part article, measured field strength data were presented, measured using laboratory instrumentation and a calibrated field site, supported by numerical modelling, to determine by experiment and by simulation the radiation efficiency of small (compact) transmitting loop antennas. These studies gave a fairly accurate measure of radiation efficiency, as well as validating the computational electromagnetic code, *NEC-4D*, that is used.

Electrically-small transmitting

The purpose of this article is to describe how to determine experimentally the loop's radiation resistance, a parameter that is difficult to infer accurately, since its value is small with respect to loss resistances and the inductive reactance of the loop. Mike Underhill, G3LHZ, has published a series of papers (see for example his most recent overview treatise [8]), claiming that the classical formula for radiation resistance, which has been used for more than 60 years, as well as the value calculated by *NEC*, are too low for electrically-small loops by an incredibly large factor of 1000.

Such an unsubstantiated (in my view) claim is not in accord with my experience, based on measured and simulated data, and operational experience in using small loop antennas, in both field site and base station environments, for more than two decades.

CLASSICAL EQUATIONS

The performance of electrically-small antennas can be calculated by determining the ratio of power radiated, *Pr*, to power input to the antenna system, *Pt*. The total power radiated by an antenna system can be calculated rigorously by integrating the radial outgoing Poynting Vector E x H, where E and H are the electric and magnetic fields, over a hemispherical surface centred on the antenna, at a radial distance great enough to be in the propagation region. That is the region where the only terms of E and H that contribute to the average flow of power are the radiation or inverse-distance terms. But, practically, we do not determine the efficiency of small antennas in this way, although we could theoretically.

The power radiated can be calculated from **Equation 5**, where the radiation resistance, *Rr*, is a dissipationless resistance, and its value corresponds to the power radiated. It has been said in early literature that *Rr* is a fictitious resistance. But *Rr* is real, since its value can be calculated and measured. For an electrically-small vertical monopole, the current, *Ia*, can be measured and, knowing the power radiated, from field strength measurements (see Part 1), *Rr* can be determined. But, for a small loop, the current, *Ia*, is not measured (at least not simply). And so we must determine *Rr* in other ways.

The radiation resistance, *Rr*, for a single-turn electrically-small loop antenna in free space can be calculated from the **Equation 6**, the classical equation [9], where *A* = loop area, and λ = wavelength.

The radiation efficiency, η, for electrically-small antennas can be estimated from **Equation 7**, where *Rr* is the radiation resistance, *Rc* is the conductor loss resistance for the loop and *Rg* is the ground-induced loss resistance for the loop in its operational environment. *Ras* is the series (antenna system) loop resistance.

Some authors writing about small loop antennas have used the *Q*-factor as radiation efficiency parameter. Certainly, radiation efficiency is a function of *Q*; the higher the *Q*, the greater the radiation efficiency. The radiation efficiency can be determined alternatively from the ratio of the antenna system *Q*-factor (*Qas*), for the loop in its operational environment, divided by the lossless *Q*-factor (loop reactance divided by the radiation resistance), as in **Equation 8**.

Since the inductive reactance for the loop Xa >> *Ras*, the antenna system bandwidth is small, and the loop's *Q*-factor, *Qas*, is given by **Equation 9**.

The inductive reactance, *Xa*, and resistance, *Ras*, can be measured directly, but certainly not by the average radio amateur, because precisely-calibrated laboratory instrumentation must be used. However, since the loop is tuned and matched operationally, the operational bandwidth for the antenna system can be measured easily, by measuring the bandwidth for SWR < 2:1, where *f* is the frequency and *BW* the bandwidth, **Equation 10**. But the operational bandwidth is not the (unloaded) antenna system bandwidth given by Equation 9, which I discuss below.

The inductive reactance of the loop can be calculated from one of the many equations available for the inductance of a single-turn coil. The inductive reactance can be derived from **Equation 11,** where *f* is the frequency in MHz, *D* the diameter of the main loop, and *d* the conductor diameter [10].

In what follows, I will compare parameter values determined using these classical equations with values based on experimental measurement, and I will compare these val-

Equation 5

$$P_r = I_a^2 R_r$$

Equation 6

$$R_r = 31200 \left(\frac{A}{\lambda^2}\right)^2$$

Equation 7

$$\eta = \left(\frac{Rr}{Rr + Rc + Rg}\right) 100 = \left(\frac{Rr}{Ras}\right) 100$$

Equation 8

$$\eta = \left(\frac{Qas}{Q(lossless)}\right) 100$$

Equation 9

$$Qas = \frac{Xa}{Ras}$$

Equation 10

$$Q(operational) = \frac{f}{BW}$$

Equation 11

$$Xa = 3.9478 fD \left(1n \left(\frac{8D}{d}\right) - 2\right)$$

loops Part 2

ues with those determined by simulation (numerical modelling using the MOM code *NEC-4D*).

RADIATION RESISTANCE

For the three referenced AMA loops, see Part 1 (3.4m, 1.7m and 0.8m loop diameters) and for three frequencies (3.75MHz, 7.15MHz and 14.2MHz), Equation 6 gives values for *Rr* equal to 63, 51.8, and 39.6mΩ respectively. Compare these values with those computed more rigorously by *NEC-4D* (loop untuned in free space): 72.2, 59, and 38.6mΩ respectively.

THE LOOP'S SERIES RESISTANCE INFERRED FROM MEASURED BANDWIDTH

The series resistance for a small loop in its operational environment is more complicated than one might infer by simple analysis. The loop's impedance depends upon the frequency, the loop diameter, the conductor diameter, and the material used determines the conductor loss resistance. An important parameter is ground-induced loss resistance, particularly when the loop is used on the lower frequency bands (loops employed for the 160m, 80m and 40m bands are typically vertically-orientated and installed at quite a low height over ground). Since the loop is tuned, this alters the current distribution on the antenna. Simple analysis takes no account of the change in the current distribution around the loop resulting from tuning. Since the loop is typically not tuned and fed at the same location, tuning alters the current distribution on the loop, and to some extent the resistive component of the impedance of the antenna system.

According to *NEC-4D*, for a 1.7m loop (an AMA-8) at a base height of 2m over average ground, the untuned loop impedances at 7MHz, 10MHz and 14MHz are 0.21 + j199Ω, 0.63 + j300.5Ω and 2.57 + j472.6Ω, respectively. When tuned, the loop impedances are 0.17, 0.377, and 0.867Ω respectively. Simple analysis assuming a uniform current distribution on the loop will not predict this (certainly unexpected) difference between tuned and untuned impedance (resistive component).

Continuing, the tuned loop's unloaded *Q*-factor can therefore be calculated from Equation 9. For 7MHz, 10MHz and 14MHz, the loop's *Q*-factors are 1171, 797 and 546, and the corresponding bandwidths are 6, 12.5, and 25.6kHz respectively (according to *NEC-4D*).

Now, when we measure the bandwidth by measuring SWR, the transmitter's output impedance must be taken into account, since the tuned power amplifier is a part of the equivalent circuit, which comprises the power source and the antenna system. For maximum power transfer the transmitter's output impedance is the complex conjugate of the antenna impedance [11], and while not representing a loss, this increases the operational bandwidth of narrow-band antenna systems. Theoretically, the bandwidth can be doubled, since the output impedance of the tuned power amplifier (for maximum power transfer) is equal to the load impedance. However, based on the author's practical experience, the realised practical operational bandwidth is somewhat less (practically, the increase in *BW* for a narrow-band antenna system is by a factor somewhat greater than 1.5).

The measured bandwidths, by the SWR method, for the AMA-8 (a 1.7m-diameter loop) at 7MHz, 10MHz and 14MHz are 10, 20.6 and 41.3kHz respectively, see **Fig 7**. Therefore, the operational bandwidth (Equation 10) is greater than the antenna's bandwidth by a factor of about 1.64 (this factor is nearly the same for all three frequencies). The loop's operational *Q* is therefore lower than the antenna system *Q* by this same factor. This is in accord with the author's previous experience for electrically-small antenna systems.

FIG 7 © RADCOM 194

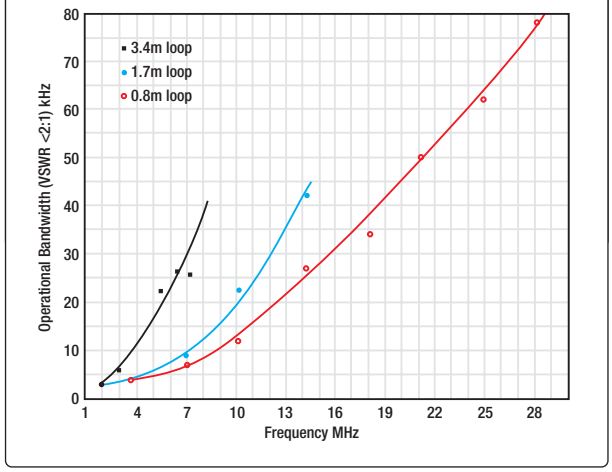

Fig 7
Measured operational bandwidth (SWR < 2:1) versus frequency for three AMA loops.

RADIATION RESISTANCE INFERRED FROM MEASURED BANDWIDTH AND RADIATION EFFICIENCY

The absolute ground-wave field strength (at a frequency of 3852kHz) for a known transmitter power (measured by a Bird wattmeter) was measured on a calibrated flat field site, for the AMA 8, a 1.7 m-diameter loop, base height 1.4 m. A radiation efficiency, η, equal to 4.7% was determined (see Part 1). The operational bandwidth for this loop (80m band) is about 4kHz (see Fig 7).

To determine the effective radiation resistance, in accordance with Equation 7, we need to know the antenna system resistance, *Ras*. The inductive reactance for the loop, according to Equation 11 is 104.8Ω (compared with 105.8Ω according to *NEC-4D*). The measured operational *BW* of about 4kHz corresponds to a loaded *Q*-factor (Equation 10) equal to 963.5. The unloaded *Q*-factor is, according to my discussion above, equal to 1.64 x 963.5 = 1580. Hence, from Equation 9, *Ras* = 66.3mΩ. So according to Equation 7, for a radiation efficiency of 4.7%, and *Ras* = 66.3mΩ, *Rr* = 3.1mΩ (loop in its operational environment). ▶

The theoretical value (according to *NEC-4D*) for *Rr* in free space is 4.2mΩ (compared with 3.1mΩ determined above). The theoretical value for *Ras* is 70.3mΩ (compared with 66.3mΩ determined above). The theoretical radiation efficiency is 5.9% (compared with 4.7% measured).

Theoretically (for reader interest) we can determine that the conductor loss resistance for our loop is 40.7mΩ, and the ground resistance loss (loop 1.4m over average ground) is 29.6Ω.

Let us now look at Equation 8 (for those interested in the relevant values of the loop's *Q*-parameters). The lossless *Q*-factor *Q (lossless)* = *Xa* / *Rr* = 25,190, and *Qas* = *Xa* / *Ras* = 1505 (according to *NEC-4D*). The corresponding radiation efficiency is therefore (as above) 5.9%.

LOOP-AND-DIPOLE MODES AND RADIATION PATTERNS

The 1997 attention-catching paper of Mike Underhill, G3LHZ, entitled 'Magnetic Loop or Small Folded Dipole?' [12], is the beginning of the present controversy.

Certainly, the two lowest-order modes that exist on small loop antennas correspond to the true loop, otherwise known as the magnetic dipole zero-order mode, and the folded-dipole mode is the first-order mode. I have been numerically and experimentally modelling loops for about a decade. The antenna system parameters predicted by *NEC* are in agreement with measurement, and these parameters are characteristic of what we expect for an electrically-small loop antenna.

Alan Boswell, G3NOQ [13], has rigorously analysed small loops, using a moment method code. The two mode amplitudes were extracted from the results as a function of frequency. The zero-order mode consists of a current which is constant around the loop, while the first-order mode has a single wavelength of standing wave round the circumference, with a reversal in current phase in the semicircle opposite the feed point. The result of Boswell's analysis is summarised below.

For a frequency at which the loop circumference is λ/8 (say at a frequency $f_{reference}$), the loop mode produces 12dB more radiated field than the folded-dipole mode. The latter becomes less significant for lower frequencies (-18dB for $f_{reference}/2$); and more significant for higher frequencies. The two modes are of equal significance at approximately 2.8 times $f_{reference}$ (loop perimeter 0.35λ).

For our AMA 8 (1.7m-diameter) loop, which tunes from 3.4MHz to 15MHz, the loop perimeter at 15MHz is 0.25λ. But, for my study, this topic is of academic interest, since *NEC* correctly computes the antenna's radiation characteristics.

G3LHZ has also written on directionality, namely on a unidirectional pattern that he apparently observed [14]. Unidirectional patterns are also claimed for the Ciro Mazzoni loops [15]. I have looked into these unidirectional pattern claims [16]. In my opinion, the unidirectional patterns observed are due to feeder unbalance (gamma match methods used to match the loop, and asymmetrical arrangements for the tuning capacitor used by G3LHZ), which induces current to flow on a metal support mast, or on the outer surface of the coaxial cable used to feed the loop. The AMA loop is perfectly balanced and, according to *NEC*, the induced current on the support mast or the feeder coaxial cable should be zero.

CONCLUSIONS

The characteristics of a small loop antenna can be predicted by *NEC-4D*. The predicted radiation resistance for an untuned loop in free space is essentially identical with the value calculated by the classical formula that has withstood the test of time (the classical formula referenced dates back more than 60 years).

It is concluded, therefore, that (for practical purposes) the efficiency of small loops can be estimated using this classical formula for radiation resistance, the measured bandwidth for the loop in its operational environment, and the reactance of the loop from a simple formula for inductance. But a caution discussed here – the operational bandwidth is greater than the antenna's bandwidth, and the unloaded antenna's bandwidth must be used to compute the series resistance for the loop.

The radiation resistance given by Equation 6 is not quite right, since no account is taken of the actual current distribution on the loop (determined by the method of tuning and the coupling between the currents on the loop and its image in the ground) but, for practical purposes, the radiation efficiency can be estimated with sufficient accuracy using this equation. Field strengths rigorously predicted by *NEC-4D* and measured field strengths agree within experiment uncertainty.

However, in the final analysis, it is the space-wave gain and radiation patterns that are of more interest to the radio amateur, and radiation patterns are not simply predicted. In **Fig 8** the space-wave gain (in dBi) is shown for three AMA loops versus frequency (base of loop at height 3m, average ground).

In Part 1, I presented some information on radiation patterns (loops both horizontal and vertical). But, for those interested in a more detailed study of the loop in its operational environment of interest, Roy Lewallen's *EZNEC* program can be used, using the *NEC-2* engine (*NEC 2* is in the public domain). ♦

FIG 8 © RADCOM 195

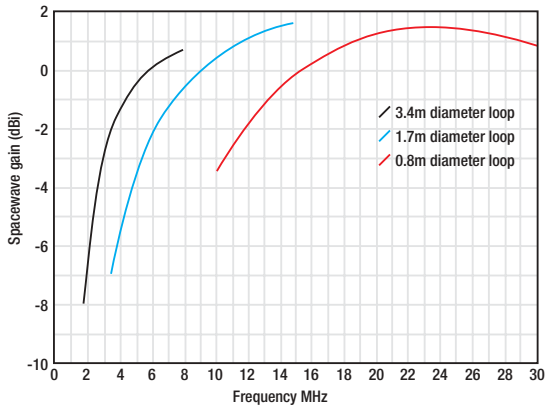

Fig 8
Space-wave gain for three AMA loops versus frequency, base height of loops 3m, average ground. Note: the loops are mounted vertically, and so the ground in front of (and beneath) the loop influences the gain shown.

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[12] M J Underhill, & M Blewett, 'Magnetic Loop or Small Folded Dipole?', IEE Seventh International Conference on HF Radio Systems and Techniques, 7 - 10 July 1997, Conference Publication No 441, pp216 - 225.

[13] A Boswell, 'Loop Antennas in the 3-30MHz Band', IEE Conference on HF Radio Systems and Techniques, 10 - 13 July 2000, Conference Publication No 474, p33. Also A Boswell, J A Tyler & A White, 'Performance of a Small Loop in the 3 - 10MHz Band', submitted for publication in IEEE Antennas & Propagation, to be published 2004.

[14] M J Underhill, & M Blewett, 'Unidirectional Tuned Loop Antennas Using Combined Loop and Dipole Modes', IEE HF Radio Systems and Techniques, 10 - 13 July 2000, Conference Publication No 474, p37.

[15] Ciro Mazzoni Radiocommunicazion SNC, Verona, Italy, 'Loop-Rapporto Fronte/Retro 6dB', see www.ciromazzoni.com

[16] J S Belrose, 'Compact Loops Revisited', AntenneX Online Magazine, March 2001 issue (13-page article).

Members' Ads

FOR SALE

1.3kW HF linear amp, Pioneer S-72H by Linear Amp UK. In exc as-new cond, 50W drive 800W out. Recently serviced with new set of four 572B tubes and flashover protection installed. Original man and box. Buyer collects or pays postage, £800. Bob, M0MJA, 01392 276 050 / 07949 537 081 (Devon). E-mail: m0mja@aol.com

ALINCO DJ-193 2m tcvr h/h, all accs, man, boxed, £75. Carriage free. Lou, M0ATN, 01274 567 594 any time (Bingley).

ALINCO DX-70TH unused, £350. Unused sep cable, £25. G450 rotator with cable, unused, £265. FT-757GX HF all-mode, £275. Matching FC-757AT auto-ATU, £135. Matching FP-757HD PSU/spkr unit, £85. Matching MD1 base mic, £60. All exc cond. FRG-100 0-30MHz rcvr, mint, £225. FRG/8800 0-30MHz all-mode rcvr with internal FRV-8800 VHF conv 118-174MHz exc cond, £240. GS-065 bearing unused, £35. Icom R7000 0-2000MHz as new, £450. IC-R7100 0-2000MHz as new, £495. FT-736R VHF/UHF all-mode base, exc cond, £435. FT-1000MP as new, £1150. FL-7000 HF amp, int auto-ATU and PSU, as new, £950. Full set of FT-1000MP filters, £295. FT-847 HF, VHF, UHF, 6 and 4m all-mode as new, £795. Microwave Modules 50W UHF amp, £65. Most items as new with original packing. 01953 884 305 / 07970 214 039 (Watton).

ALPHA power ETO-91B amp 10-160m inc WARC, mint, low hours, man, boxes, £1500. Kenwood TS-480HX, HF/6m tcvr, as new, boxed with all supplied accessories, £700. Icom IC-706 MkI HF/6m/2m tcvr, mint, boxed with all supplied accessories, £300. Collect from South Wales or carraige extra.

SILENT KEYS

We regret to record the passing of the following radio amateurs:

2E0NPB	Mr N P Batchelder	06/05/04
G0FVW	Mr A G Dent	13/04/04
G0LBG	Mr L Hancox	04
G0PJI	Mr J V McBride	
G0VIS	Mr D Imber	
G2HIX	Mr G G P Holden	19/04/04
G2QA	Mr T Simkins MBE	10/05/04
G3FBR	Mr J Lewis	23/04/04
G3FKJ	Mr W F Jeffery	19/04/04
G3JSW	Mr D K Clarke	30/04/04
G3KES	Mr D G O White	15/04/04
G3YHP	Mr R Rayner	19/04/04
G3YSV	Mr D Heaton	21/05/04
G3ZUF	Mr R B Peters	02/03/04
G4BHY	Mr H Kleeman	15/04/04
G4DDU	Mr F Slade	11/05/04
G4JEP	Mr E V Towndrow	04
G6NA	Mr H C Spencer	
G8GOJ/M3GOJ	Mr A Hobbs	04
GM0NOZ	Mr S Bremner	04
GM6FT	Mr R T Frost	07/05/04
GW8FOD	Mr L Hutchins	16/04/04
M0AFN	Mr H W Williams	25/09/2003
RS95179	Mr P D Sollitt	04/04

Wyn, GW3YGH/VR2AX (details in qrz.com), 01792 367 790 (Swansea). E-mail: vr2ax@attglobal.net

BENCHER Skyhawk triband 10-ele beam, £400 ono. Force 12 7-ele beam for 12/17m, £200. Both superb performers. All full-size elements. Moonraker HBV2 2-ele 40/20m beam, £100 ono. All items perfect cond. Al, G4DJZ, QTHR, 01733 321 505 (Peterborough).

COLLECTORS' set. All Yaesu. FT-902DM digital readout snag, FC-902 ATU, SP-901P speaker, FV-901DM VFO, reader YR-901, YK-901 keyboard, tvtr FTV-901R, Scope YO-901, Monitor YVM-1, Power/wattmeter YP-150, YD-148 Dynamic mic. Two transverter modules 2m & 70cm. All boxed with mans. All purchased new by me. Will not split, free delivery within 50 miles. Offers around £1100. G4KJV, QTHR, 01249 720 456 (Chippenham).

COLLINS 31L linear amp with man, £350. Cushcraft A3 beam, dismantled, in box with instructions, £200. Sale due to change of address. Cash and buyer collects. 01323 738 840 (Eastbourne).

CREATE CD-318B 4-ele triband HF Yagi, 5m boom, sturdily constucted, good cond, great DX ant, £100. G3HQG, 0114 247 0277 (Sheffield). E-mail: gordon.atkins@iclway.co.uk

CUSHCRAFT A4S HF 4-ele Yagi with 40m ext kit. Both in vgc, £325. G4ZWY, 01885 488 100 after 6pm (Hereford). E-mail: g4zwy@hotmail.com

DRAKE TR7 with remote VFO RV7, spkr, desk mic and h/duty PS7 PSU, user and service mans. Prefer buyer collects, £250 no splits. G3GJX, QTHR, 01428 683 448 (Godalming).

FRG-7 rcvr, SSB filter and FM mod, £60. Jobo print processor, inc 3 drums, £50. Philips colour analyser PCA-2060, £50. G3INU, 01438 369 128 (Stevenage).

FT-1000MP MkV Field, new, Feb 04. Box, man, orig packing, £1485. MD-100 desk mic, £90. YH-77STA phones, £35. MLS-100 12W speaker, £20. FH-1 remote control keypad, £24. All as new, boxed. G0EOL, 01606 594 205 (Winsford).

G2DYM anti-interference dipole with air-cored balun, £115 complete. Hy-gain AV-620 HF vertical, 6,10,12,17,20m, vgc, £195. 24in T&K wall brackets, £12. Alum 2in scaffold tube, various lengths, cheap! G0EOL, 01606 594 205 (Winsford).

GOING QRT. FT-890, built-in ATU, mic, man, £400. ICR-7000, mans, £400. Topward 20MHz DB scope, man, £125. DJ-580, charger, man, £99. FT-480, mobile mount, mic, man, £140 ono. Farnell sine/ square oscillator 10Hz-1MHz, £35. KW Ezeematch, £49. Hustler 5BTV vertical, little used, 18 months old, £90. Buyer collects or pays postage. G4GWG, QTHR, 01942 211 397 (Wigan).

HEARING problems cause sale: Icom 720A HF 100W tcvr c/w Icom PSU and ext speaker. Also MFJ-941E ATU. All mans, phone for full spec, £425. Also Heil HMM mic, £45. Carriage at cost. Rod, GW7RDV, 01352 715 244 (Holywell, Flintshire).

ICOM 738 + SM-8 mic, one owner, vgc, £600 ono. Boxed with mans. 01803 882 769 (Brixham). E-mail: penn1969@hotmail.com

ICOM 756PRO immac, boxed, extended warranty, free repairs next two years, £1050. Cushcraft R8 8-band vertical, 1 year old, £250. Yaesu 709 70cm h/h, charger, mobile/desk mount, headset. Tiny packet TNC with all radio/computer cabling for Yaesu, £150. M Element, G0EBD, 01743 367 087 (Shrewsbury). E-mail: sheila.element@virgin.net

ICOM IC-2-uAT h/h tcvr, 140 to 160MHz, GB/USA/shipping bands, 0.5kHz shift, 1W & 0.1W. BC-50U desk charger. BP-21 battery pack. BP-22 battery pack. BP-23 battery pack. BP-25 charger. IC-CP1 car charger. Antenna. Mans. Circuit diagrams. Shoulder carrying bag. £110. G3AAG. E-mail: g3aag@aol.com

ICOM IC-7400 boxed, unused, purchased Nov 03, £900. Palstar PSU also available. Leader LBO-523 dual 40MHz scope, £80. MFJ-269 c/w NiMH batteries, mint, £250. Levell audio oscillator, £10. All cash and collect. G3ZYL, 01566 782 463 (Launceston).

ICOM R-7000 rcvr, £400. FRG-7700 with FRV-7700 VHF converter, £130. Yaesu FT-221 2m tcvr, faulty, £80. ERA Micro Reader, £22. FDK Multi II, 2m FM, £35. FDK Multi VII 70cm FM, £35. Lots Heathkit test equipment: VVM; audio generators. Carriage extra. 01708 373 366 (Hornchurch). E-mail: martinfoster@ntlworld.com

KENWOOD TM-701E, 2m/70cm FM mobile, small, 25W out on both bands, with photocopy of man. Works fine, but one small fault – the tuning knob on the front panel does not work, *but* the up/down buttons on the mic do, so no problem. Because of this fault, really cheap dual-bander for only £85. Dennis, G3HCM, 01427 752 284 (Lincs). E-mail: deng3hcm@aol.com

KENWOOD TS-2000 little used, never on tx, mint cond, boxed, mans, £1100. 01954 212 989 / 07818 017 149 (Cambridge). E-mail: hilld@tiscali.co.uk

KENWOOD TS-850S, man, boxed, may be seen working. Buyer collects or pays postage, £550. Shure desk mic, £50. Dennis, M0CYU, 07791 105 184 (York).

KENWOOD TS-850SAT, with DRU voice recording unit, also Kenwood PS-430 PSU. Box and man, £650. Kenwood TS-870 + Palstar PS-30m PSU. Box and man, £800. G0EHQ, QTHR, 01527 879 636 (Bromsgrove).

MATCHED pair 6146B valves boxed, £40. Kantronics RF Communication TNC, Version 2.85, inc cables, £55. Standard CSA-160, Rapid desktop charger, £40. G3BJD, 01946 820 937 (Egremont). E-mail: john@maxwell85.freeserve.co.uk

CONGRATULATIONS

to the following, whom our records show as having reached 60 years' continuous RSGB membership this month:

60 years

RS8618	Mr A R Cameron
G2AAN	Mr J H Clarke
G2CAZ	Mr M S Ellis

MFJ ATU mod 989C, built-in dummy load (300W), high power 1.5kW, new with box, £275 ono. M0CJW, QTHR, 01522 789 959/07973 462 268 (Lincoln).

MFJ-1026 noise-cancelling signal enhancer and bhi NES10-2 DSP noise-eliminating speaker, both virtually new with instructions. Offers? Peter, G2ART, 01704 566 140 (Southport). E-mail: petercawson@hotmail.com

MFJ-934, ATU/artificial earth, exc cond, £95. Kenwood TH-D7E 2m/70cm h/h tcvr, charger, man, also exc cond, £150. Carr extra both items. Nigel, G4EJW, QTHR, 01278 784 734 (Burnham on Sea). E-mail: nigel@g4ejw.freeserve.co.uk

MFJ-969 ATU, HF + 6m. As new, box, man, £125. WHP4A TVI filters (3), £5 each. Ferrite rings (5), £1 each. Kent twin-paddle key, £55. Kent straight key, £40, both boxed, as new. G0EOL, 01606 594 205 (Winsford).

MML 425/50 linear with pre-amp, £50. Hansen 70cm power meter, £15. Welz coax switch, £10. Polyphaser 2m, £12. Cossor CDU-150 twin channel CRO, DC - 35MHz, £58. Heathkit IG-18 sine/square generator, £20. AU-118 audio power meter, £10. Vgc, most with mans. Prefer buyer inspects and collects. G2BFO, QTHR, 023 9225 5459 (Waterlooville).

PETTER 5kW diesel generator, 240V with electric-start diesel engine, needs attention, offers? Buyer must collect. G0FMU, 01277 227 932 (Brentwood). E-mail: alan@alanturner.me.uk

SHACK clearance, all mint cond. TS-830S, £375 delivered. Spare, hardly-used 200W Icom 775 base station, full of narrow filters. SM-20 desk mic SP-20 spkr with filters, £1825 delivered. High-power Yaesu FM rig, £150 delivered. Kenwood 70cm multimode, virtually unused inc 48-ele, £375 delivered. Low-use high-power 2m Discovery linear, £950 delivered. Trev, G2KF, 07974 892 179 (Cornwall).

SILENT Key (G4IOP). WPO communications Alpha SSB tcvr (condition unknown), offers? Amstrad CB-901 spectrum 10m conversion, with 8kHz IF filter fitted and 25W PA, £45. Manson EP-925 25A PSU (variable voltage), £50. Codar AT5 AM rig with PSU, £60. Trio rcvr model JR-599 Custom Special with matching SP-599 spkr, £80. Bencher, chrome, twin paddle key, £40. Telequipment oscilloscope, model S-51B, £35. Signal

Generator, Tech model TE-20D, £20. Avometer model 8, £30. Weller solder stations (2), £30. Yaesu rcvr model FRG-7000 (117VAC), £50. Icom tcvr IC-756, HF & 6m, £600. Or take £950 for the lot, buyer collects. Alan, G0RTH, QTHR, 07905 491 866 after 6pm (Basildon).
E-mail: alelcoate@yahoo.co.uk

SILENT Key pristine Yaesu Musen FT-DX401, matching desk mic, speaker, spare valves, Yaesu Musen FF-50DX low-pass filter, Heathkit PM-2 tuning meter model EA-204, two-tone generator, Hansen SW-3 SWR bridge, orig packaging mans. BC-221 frequency meter, antenna scope. Offers please? G3YOL, 01934 843 144 (Weston-Super-Mare).

STRUMECH telescopic tower, heavy-duty 3-section tiltover, P60 heavy-duty winches, £350. HF log-periodic 10-ele, boom 26ft. G4RL, QTHR, 01228 513 554 (Scotby Village, Carlisle).

VERSATOWER P-40, inc ground post and winches but missing rotator cage, £150. Cobwebb antenna 20-10m inc WARC, £125. Buyer collects (both items). G3ZST, QTHR, 01926 817 904 (Leamington Spa).
E-mail: trevor@surgey6902.fsnet.co.uk

YAESU 1000MP, 500 and 250Hz filters and 500Hz in sub rcvr, keypad, original packing, prefer buyer collects, £1000. G3PJT, 01223 263 137 (Cambridge).
E-mail: g3pjt@whsmithnet.co.uk

YAESU FT-1000MP, 100W HF tcvr with Collins 500Hz mechanical filter, and 250Hz CW filters, £950 ono. 5yr warranty with Martin Lynch, exp 8/09/04. G0FSP, QTHR, 01476 562 641 (Grantham).
E-mail: John@bramble-corner.fsnet.co.uk

YAESU FT-100MP, filters, SP-8, base mic and extended warranty. Heatherlite Hunter amp, recent new valve and service. Kenwood TM-241E 2m FM tcvr, 5/10/50W outputs. Altron Tower 3-15m sections, base tiltover with winches. Hy-gain TH3jnr 3-ele beam. Kenpro KR-600RC rotator & controller. Kenwood 1kW low-pass filter. Vibroplex chrome side-paddle CW keyer. Antenna switches, power meters, external filters. Full list available. Sensible offers—buyer collects or carriage extra. Dave, G4SKX, QTHR, 01642 895 890 (Cleveland).

YAESU FT-101Z all bands, analogue dial, mans, £150. Two Avometers model 7, £10 each all GWO – ono. G3HRN, QTHR, 01952 811 168 (Telford).

YAESU FT-101Z MkIII with Yaesu FC-902 companion ATU, both exc cond, £300, mans incl. Spare PA & driver valves (GE). Yaesu FRG-8800 rcvr, vgc, no VHF converter, £250. George, GM3EFH, QTHR, 01382 552 846 (Tayport, Fife).
E-mail: george.syme@virgin.net

GB CALLS

These callsigns are valid for use from the date given, but the period of operation may vary from 1 – 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 – 10m); V = 6 and/or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet. Please send operational details of your special event station to the RadCom office at least five weeks before publication. The only QSL Bureau sub-manager for special event station callsigns is as follows: GBxAAA-MZZ – Mike Evans, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR, e-mail mw0cna@ntl world.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-manager?

1 Jul	GB4OL: Operation Overlord. Vale Of Glamorgan. LH2 (GW4XKE)
	GB4YOU: Youlbury. TLH27 (G0REL)
	GB4YOU: Youlbury. TLH27 (G0RJX)
2 Jul	GB4IE: Islay Expedition. Islay, Argyll. TLH27 (G1YQY)
3 Jul	GB0CVS: Cornelius Vermuden School. LH2P (G7IIO)
	GB0SNG: South Normanton Gala. LH2 (G0OKD)
	GB4BOB: Borough Of Broxbourne. Cheshunt, Herts. L2 (M5AJK)
	GB4FT: Fordown Tower. LH (G4XKF)
	GB4HS: Hollowell Steam. LHV27 (G0OFB)
7 Jul	GB0RAF Barnard Castle, Co Durham. L27 (G0NRK)
9 Jul	GB2RVS: Rettendon Village Show. Essex. (G4ZPE)
	GB4CI: Calf Island. Calf Of Man. LH27P (MD0IOM)
	GB4COM: Calf Of Man. LH27 (MD0IOM)
10 Jul	GB0FNM: Fort Nelson Museum. Hampshire. TLH2 (G0PPH)
	GB0RP: Roath Park. Cardiff. LH2 (GW0WHT)
	GB2MOF: Museum Of Flight. East Lothian. LH (GM4UYZ)
	GB2SCR: Swindon Cricklade Heritage Rwy. Wiltshire. TLH27 (G4MDT)
	GB4JLC: John Lowther Centre. Glendon, Kettering. LH (G4MRA)
	GB4QES: Queen Elizabeth Show. Petersfield. TLHV2 (M1SKA)
	GB5BDS: Bishop David Sheppard. Southport. LH2P (G7LFC)
	GB5RSR: Ribble Steam Railway. Preston, Lancs. LH (G1PIE)
11 Jul	GB4CH: Childrens Hospital. Manchester. LH2 (G0KEV)
	GB8SF: Scarecrow Festival. Rotherham, S Yorks. LHV27 (G8LGC)
17 Jul	GB0PLS: Peterhead Lifeboat Station. Peterhead Harbour. LH2 (MM0EDZ)
	GB4HKF: 4th Hereford Kite Festival. Hereford. TLHV27 (G0WZY)
	GB4SMF: St Margarets Fayre. Lincolnshire. LH2 (G4FI)
	GB5NF: Neston Fete. LHV27 (G4SKN)
18 Jul	GB2ELC: Exeter Lions Club. Devon. H (G7SZB)
	GB6MMR: McMichael Rally. 2 (G4KWT)
20 Jul	GB2EIJ: Essex International Jamboree. TLHV2 (G6ZVV)
21 Jul	GB6LOG: Liberation of Guam. Southampton. LHV2 (G0SWY)
23 Jul	GB0VWW: Vintage Wings and Wheels. TLH27 (G4DBS)
	GB2ATC: Air Training Corps. 2 (G4PSH)
26 Jul	GB4CW: Cowes Week. Isle Of Wight. (G0MWU)
28 Jul	GB6LOG: Liberation of Guam. Kent. LHV2 (G4WYG)
29 Jul	GB4YOU: Youlbury. TLH27 (G0REL)
	GB4YOU: Youlbury. TLH27 (G0RJX)

YAESU FT-202R FM handheld tcvr covering 145.500, 525.550 S19 and London repeater. The set uses AA batteries, and a charger is included, £25. W H Smart, G6DJE (Leighton Buzzard). E-mail: wsmart159@aol.com

YAESU FT-757GX, 757AT and 757HD all working, £400 the lot, plus SEM Z-match. Best offer secures. Norman, G4SFO, QTHR, 01788 810 344. E-mail: g4sfo@aol.com

WANTED

£300 offered for IC-703, or £200 offered for IC-718, or £250 offered for FT-817, £10 offered for FT-847 service sheets. 0161 775 8444 (Irlam).

23cm handheld/portable/mobile equipment. John, G3PAI, QTHR, 01394 460 298 (Woodbridge). E-mail: word.factory@zetnet.co.uk

CAPACITOR air-spaced variable 500pF or 350pF for 200W ATU. Ex-equipment preferred. Dick, G3PXM, 01297 553 092 (Devon). E-mail: richardpavey@onetel.com

DISABLED fan of old days seeks pre-1970 QSL cards log books etc. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk, IP18 6PQ.

EDDYSTONE 888 or 888A rcvr. Price on condition. Gary, GW2ABJ, 01639 773 295 (Neath). E-mail: gary.edwards5@ntlworld.com

HAMEG oscilloscope HM203-5 man. Can photocopy and return. Frank, GM3JKS, QTHR, 01465 821 228. E-mail: frank@knockycoif.demon.co.uk

HF minibeam. State bands covered and turning radius. G3RHR, QTHR, 01423 868 139 (Harrogate). E-mail: g3rhr@lineone.net

I'M looking for an SCR-522 VHF aircraft tcvr and parts, comprising BC-624, BC-625 etc, often used post-war for 2m. British version was TR-1143 / TR-5043. Also BC-348 HF rcvr, 1950s and 60s *Practical Television* and *SWM*. Thanks. Ken, G3XSJ, 01453 845 013 (Gloucestershire).
E-mail: ken.brooks@iee.org

KW-2000 series, 201/Vespa not working or poor cond for parts only, for construction project. Also wanted *Practical Wireless* 1950-1970, prefer complete years. G3WCE, QTHR, 01692 538 794 (North Walsham).

MORSE keys wanted please. Early brass keys, especially by Marconi, GPO etc, but all considered. John, G0RDO, 01626 206 090 (Newton Abbot).
E-mail: john@morsemad.com

R-820 Kenwood rcvr wanted. Allan, 07774 895 865. E-mail: bear160@fsmail.net

SILENT key clearout or just not needed. I collect QSL cards for their historic interest, preferably from periods before 1970. Please don't throw them away. I can collect or arrange collection. Tony, G4UZN, 01132 693 892 (Leeds). E-mail: g4uzn@qsl.net

UT-66 speech sythesiser unit for Icom 775. G0NSC, 01226 388 587 (Barnsley).

YAESU FT-102 and FC-102 mans or copies of adjustments and, if possible, circuit of FT-102. All expenses will be met. GW2FYV, 01792 296 210 (Swansea).

YAESU FT-890AT in top cond, c/w box etc. Also FT-707 or 'S'. Also Grundig SAT-700. Mike, 07798 737 274 (Epsom).

YAESU workshop man for FT-101ZD MkII. Also YP-150 dummy load/wattmeter, QTR-24 world clock, must be vgc. 01702 528 288 (Southend-on-Sea).
E-mail: smithclamp@tiscali.co.uk

RALLIES

TI – Talk-In; **CP** – Car Park; **£** – admission; **OT** – Opening Time – time for disabled visitors appears first, eg (10.30/11am); **TS** – Trade Stands; **FM** – Flea Market; **CBS** – Car Boot Sale; **B&B** – Bring and Buy; **A** – Auction; **SIG** – Special Interest Groups; **MT** – Morse Tests; **MA** – Foundation Morse Assessments; **LB** – Licensed Bar; **C** – Catering; **DF** – Disabled Facilities; **WIN** – prize draw, raffle; **LEC** – LECtures/ seminars; **FAM** – FAMily attractions; **CS** – Camp Site.

4 JULY 2004

MILTON KEYNES ARS Annual Rally – St Paul's School, Chaffron Way, Leadenhall, Milton Keynes. OT 9am. TI on 145.550MHz and 433.550MHz. Venue 3 miles from jn 14 M1 and 1/4 mile from local Maplin store. Malcolm, M0MBO 01525 874 075, or rally@bletchley.net [www.mkars.org.uk]

NORFOLK ARC Barford Radio Rally – Barford, 9 miles SW of Norwich, near A11 and A47. OT 10am CP, TI, CBS, B&B, C, TS. David, G7URP, 01953 457 322 or 01953 458 844, or radio@dcpmicro.com [www.norfolkamateurradio.org]

YORK RC Rally – York racecourse. OT 10.15 / 10.30am. C, CP free, B&B, DF, WIN, TI, SIG. John, G4FUO, 01937-832139, or Alex, G0WUY, 01904 423 871. [www.yorkradioclub.net]

10 JULY 2004

CORNISH RAC Radio Amateur and Computer Rally – Penair School, Truro. OT 10.30am. TS, B&B, C. John, g4ljy@dsl.pipex.com, or Ken, ken@jtarry.freeserve.co.uk

11 JULY 2004

SWINDON & DARC Steam & Radio Fun Day – Swindon & Cricklade Railway, Blunsdon. OT 10am, £3.50, £2 children/OAP, £10 family. CP, C, DF, FAM, CS, TI on 145.550MHz, steam engine trips. Incorporates the car boot sale postponed from 27 June. Ian, 2E0ZVG, ibrowne2@ntlworld.com [www.swindonradioclub.org.uk]

18 JULY 2004

FENLAND RG Horncastle Summer Amateur Radio Rally – Horncastle Youth Centre, The Old School, Cagthorpe, Horncastle, Lincs (nr Horncastle Police Station). OT 10.30am, £1. C, DF, TI on 145.550MHz. Chris, G0PXB, 07749 715 165. [www.fenlandrepeater.org.uk]

McMichael Amateur Radio Rally & Car Boot Sale – Reading Rugby Football Club, Sonning Lane, Sonning, Berks, just off the A4 at Sonning. Min, G0JMS, 0118 972 3504, g0jms@radarc.org

23 – 25 JULY 2004

LY Hamfest 2004 – Raudondvaris, nr Seduva, N Lithuania. OT 12 noon on 24 July. Request a lift from Kaunas or Vilnius by

e-mail to lrmd@qsl.net FM, A, WIN, CS, tug o' war, live music, dancing through night. Ladies' programme. Antanas, LY1DL, zdramys@kagi.com [www.qsl.net/lrmd/hamfest/]

24 JULY 2004

ALTON & DRC Rally – Valley Nurseries, Basingstoke Road, Alton, Hants. OT 10am, £1. CP free, C, DF, TI on 145.475MHz. Richard, G4IBW, 01428 717 524, g4ibw@uku.co.uk, g4ibw1@aol.com

25 JULY 2004

COLCHESTER RAC Rally 2004 – St Helena School, Sheepen Road, Colchester. OT 10am. TS, B&B, CBS, RSGB stall, clubs and associations, C. James, M0ZZO, 01255 242 746, james@mcginty.net, or Gary, M0JJH, 01621 818 620, gary@garycavie.com

30 JULY – 1 AUGUST, 2004

AMSAT-UK Space Symposium – University of Surrey, Guildford. Day pass £10; 2 – 3-day packages inc meals and university accommodation also available. LEC, tours of satellite control centre, beginners' sessions, antenna testing up to 24GHz, GB4FUN available for visitors' use, B&B, etc. Jim, G3WGM, 01258 453 959, or g3wgm@amsat.org [www.uk.amsat.org]

1 AUGUST 2004

LORN ARS Radio & Computer Rally – * New venue ***** – Crianlarich Village Hall, 12 miles N of Loch Lomond at jn A82 & A85. £1. TI, TS, B&B. Shirley, GM0ERV, 01631 566 518, or John, GM8MLH, 01838 200 304.

7 AUGUST 2004

RUGBY ATS Rally – Stanford Hall, Lutterworth, Leics (follow the signs for Stanford Hall from M1 jn 20). OT 10am, TI on 145.550MHz. Please note that this is a Saturday event! Tony, G0OLS, 01455 552 519, thumph3426@aol.com

8 AUGUST 2004

FLIGHT REFUELLING ARS Hamfest – Cobham Sports and Social Club Sportsground, Merley, Wimborne, off A31 (signposted). OT 10am, £3 - correct money please. TS, CBS, LB, C, TI on 145.550MHz. Overnight camping on Saturday, but caravans require booking. Mike, M0MJS, 01202 883 479, or hamfest@frars.org.uk [www.frars.org.uk]

13 AUGUST 2004

COCKENZIE & PORT SETON ARC 11th Annual Junk Night – Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton. OT 6.30pm, £1. Tables free – first come, first served, WIN, C, DF. Bob, GM4UYZ, 01875 811 723, gm4uyz@btinternet.com

29 AUGUST 2004

HUNTINGDONSHIRE ARS Rally – Ernulf Community School, St Neots (nr Tesco superstore on A428). OT 10am, £1.50. CBS on hard standing, indoor hall, C, TI on 145.550MHz. Peter, M5ABN, 01480 457 347 (6 – 10pm), peteherbert@aol.com

TORBAY ARS Communications Fair – Churston Ferrers Grammar School, Churston, Brixham. OT 10am, £2. CP free, TS, C, DF, WIN, No B&B, but private sale noticeboard. Anna, M3LMG, 01803 812 117, rally@tars.org.uk

5 SEPTEMBER 2004

Telford Rally – RAF Cosford Aerospace Museum, on A41, one mile south of jn 3, M54. OT 09.30 / 10am. Admission free, CP free, TI on 145.550MHz. Bob, M0RJS, telford-rally@somervilleroberts.co.uk

11 / 12 SEPTEMBER 2004

49th Weinheim VHF Convention – Karl Kübel Schule, Bensheim. LEC, FM, TS, CP, CBS. [www.ukwtagung.de]

12 SEPTEMBER 2004

Vintage Valve Technology Fair – Haydock Park racecourse, nr Wigan, on A49, 5 minutes from jn23, M6. OT 9.30am, £2. CP free. Up to 200 stalls selling vintage comms, domestic, military receivers, Hi-Fi, gramophones, telephones, valves, vinyl. Trevor, 01274 824 816. [www.myciunka.supanet.com/VVTF2003 (case-sensitive)]

19 SEPTEMBER 2004

LINCOLN SWC Hamfest – Newark Showground, at jn of A46, A1 and A17 at Newark. Baz, 01636 612 440, m3dmv@btopenworld.com [www.hamfest2004.secretbunker.org.uk and www.lswc.co.uk]

1 / 2 OCTOBER 2004

LEICESTER Amateur Radio Show – Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or g4afj@argonet.co.uk

1 – 3 OCTOBER 2004

WACRAL 2004 Conference – Geoff & Jan Grundy, 01323 721 352, g4yjw@wacral.org

3 OCTOBER 2004

BELGIUM Amateur Radio & Computer Rally – Michel, ON7FI, 0032 64 849 596.

10 OCTOBER 2004

GREAT LUMLEY AR & ES Rally – Nancy, 0191 477 0036 or 07990 760 920, nancybone2001@yahoo.co.uk

17 OCTOBER 2004

BLACKWOOD & DARS Rally – George, 2W1JLK, 01495 724 942, or Dave, GW4HBK, 01495 228 516.

HORNSEA ARC Annual Rally – Richard, G4YTV, 01964 562 498, g4ytv@aol.com

22 - 24 OCTOBER 2004

RSGB International HF & IOTA Convention (HFC2004) – John, G3WKL, chairman@rsgb.org.uk [www.rsgb.org.uk/hfc]

24 OCTOBER 2004

GALASHIELS & DARS Annual Rally – Jim, GM7LUN, 01896 850 245.

6 / 7 NOVEMBER 2004

18th North Wales Radio, Electronics & Computer Show – [www.nwrrcw.org.uk]

14 NOVEMBER 2004

Kempton Park Rally – Paul, M0CJX. [m0cjx@ntlworld.com]

SOUTH YORKSHIRE REPEATER GROUP Great Northern Hamfest – Ernie, G4LUE, 01226 716 339 or 07984 191 873.

5 DECEMBER 2004

BISHOP AUCKLAND RAC Rally – Mark, G0GFG, 01388 745 353, or Brian, G7OCK, 01388 762 678.

21 - 23 JANUARY 2005

CONTEST CLUB FINLAND 10th Anniversary – [www.qsl.net/ccf/]

6 FEBRUARY 2005

SOUTH ESSEX ARS Radio Rally – Brian, G7IIO, 01268 756 331 or briang7iio@yahoo.com [www.southessex.ars.btinternet.co.uk]

15 MAY 2005

MIDLAND ARS Drayton Manor Radio & Computer Rally – Norman, G8BHE, 0121 422 9787 or 07808 078 003, nlgutteridge@aol.co.uk [www.midamradio.co.uk]

RSGB MEMBERS' ADVERTISEMENTS

RSGB Members wishing to place an advertisement in this section should use the official form printed in *RadCom* each month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged *pro rata*. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsigns and QTHR, provided their addresses in the current edition of the RSGB Yearbook are correct. RS members will have to provide their names and addresses or telephone numbers. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition. Please do not send members' advertisements to Manning Publishing Ltd (advertising agents). The closing date for copy is the first day of the month prior to publication, eg the deadline for the May issue is 1 April.

Warning: ***Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid. Members' Ads also appear on the members-only website: www.rsgb.org/membersonly/membersads***

The Member's Ads order form is published below. If members do not wish to cut the form out of the magazine, photocopies will be accepted, as will recent copies of the form from previous months, or recent copies of the carrier sheet. As a last resort, members may also send in their advertisements on seperate sheets of paper, but if you choose to do this, you must supply an accurate word count–and, of course the correct fee in the normal manner.

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Application form for one For Sale, Exchange or Wanted advertisement. Do not mix classifications on this form; seperate applications must be made.

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MISCELLANEOUS

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Business Cards

The last word

Note: 'The last word' has received a very large postbag in recent weeks and there is only enough space for a selection of letters to be published here. Some more letters are published on the RSGB members-only website at www.rsgb.org/membersonly/lastword

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be e-mailed to radcom@rsgb.org.uk Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right to not publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible. Some letters not published in RadCom may be published on the RSGB members-only website at rsgb.org/membersonly/lastword

Improving amateurs' rights

From: Roger Piper, G3MEH

I was saddened to read in David Lauder's 'EMC' (*RadCom*, June, p60) of Ofcom's policy in dealing with cases of, for example, amateur radio transmissions affecting a neighbour's TV set. I'm not convinced that most members of the public know whether or not their installation includes an aerial amplifier, but that aside I'd like to draw attention to the negative effect that policy has on the future of our hobby.

Most neighbours go out into the market place without the benefit of prior knowledge of EMC problems and buy and install, or have installed, equipment intended for domestic use in good faith. Finding that their equipment malfunctions during transmissions from a nearby radio amateur those who, for whatever reason, prefer not to accept the amateur's offer of help find that the official remedial route offered by Ofcom requires them to spend money, at least for a call-out charge from their local dealer / installer, when as far as they are concerned there is no problem with their equipment because it functions correctly when the amateur doesn't transmit. Faced with this situation many, as a matter of principle if nothing else, look for an alternative solution.

The first technique commonly used is that of neighbourhood social pressure. While the amateur him / herself may be able to handle the effect of this it's often indirect, with family members and other neighbours being deliberately involved resulting in a situation where the amateur has little choice but to limit or cease operation in circumstances when technically and legally he / she shouldn't have to, in order to keep the peace. The second technique often used is to line up an official body which provides a free service to provide an alternative solution and first port of call is usually the local planning authority. Planning permission for amateur masts and aerials is difficult to get in many areas and amateurs tend unofficially to put up modest temporary installations, similar in scale to local domestic receiving aerials, which would otherwise not attract much attention. When threatened, rightly or wrongly, with an enforcement order it's not unusual for amateurs to take the line of least resistance and dismantle their aerials to satisfy the planning authority, making do with indoor aerials and low power or giving up completely.

What can be done to improve our rights? One change I'd like to see is the introduction of a system where the amateur has the opportunity to state, voluntarily, on the neighbour's interference form that he / she (the amateur) believes the problem to be one of inadequate immunity but agrees whatever the cause to underwrite reasonable Ofcom charges on a 'no fault' legal basis. At least that way neighbours would have no reasonable excuse for not following the official, Ofcom, route.

'Unprotected Service'

From: Robert Lane, G4NQX (previously G8VLQ)

It is with some interest I read the note regarding the term 'Unprotected Service' (*RadCom* June 2004 p5) and its true meaning within the licensing system. It is due to this misnomer that my interest in amateur radio was killed off some 18+ years ago. I had been a very active VHF / UHF DX squares chaser with an excellent weak-signal station set-up. My problems started when a new council residential home was built on previously empty land adjacent to my property. Within the [home's] laundry room a commercial washing machine / tumble dryer was installed, this standing some 2.5 metres tall. I quickly discovered that *all* bands were subject to S9+60dB noise! The near station emissions were 'end stopping' but 500 yards away dwindled quite dramatically. The noise on all bands was so bad that operation was impossible at any time, night or day. I contacted the manufacturers, who in all fairness were quite helpful at first, sending out an engineer to check the machine. He declared it fault-free and after a quick chat decided he was not obliged to do any more about it. I then contacted the Radio Investigation Service and requested a visit. This was duly done, but to my surprise it was *my* station that was checked out and test transmissions made! I then had a long discussion with the investigator (himself an amateur) and was informed that the amateur bands were not a 'protected service' and there was nothing he could do as no commercial bands were affected, the noise only manifesting as a very small signal on station-free areas of medium wave. I was finally told the only solution was to move house! Not wishing to do this at the time I dismantled my station and sold it off, all interest at the time effectively killed off.

Life has moved on and so have I. I'm now out in the country with no immediate neighbours and a rekindled interest in amateur radio. I have an HF / VHF set-up and in particular a 6m interest, a band that wasn't available back then. My son has recently passed his Foundation licence and is looking forward to his callsign to join me on the bands.

Looking back I don't think I could have approached the problem any differently. The RIS and the licensing agency did not want to know and each in turn expressed the same sentiment, "sorry, the Amateur Service is not protected." To this day I thought this incorrect: we were allocated exclusive bands to use and as such should have been granted freedom from interference. My belief still holds, especially in the light of the proposed Internet over power line transmission debate.

[Angus Annan, MM1CCR, Chair RSGB EMC Committee responds: "I am sorry to hear that G8VLQ felt obliged to give up 18 years ago as a result of an EMC issue, but delighted to have him back to amateur radio now as G4NQX. The RSGB EMC Committee has dealt with a number of cases similar to this in more recent years and through the efforts of the local (now Regional) EMC Coordinators, these cases are usually resolved amicably through cooperation and rarely reach the stage of a complaint to the investigation services. The official position remains that Amateur Radio has no entitlement to protection, but the EU EMC Regulations have eliminated many potential sources of EMC problems from electrical equipment."]

Re 'MI3s disliked'

From: Peter Lowrie, MI5JYK, Regional Manager, Northern Ireland

I read with much dismay not only as Regional Manager but as an active amateur here in Northern Ireland the letters about the dislike of MI3s and the poor operating standards detailed by MW0KEV ('The last word', June). I do acknowledge that in some quarters the Foundation has its critics and some are very vocal about it. However, it is not the general consensus of the amateur community in Northern Ireland who by and large, as in other parts of the UK, welcome the Foundation and what it has achieved.

One of the concerns appears to be that the exam isn't as hard as the old RAE, and there is no CW test, combined with apparent 100% pass rates. But to draw an analogy, today's driving test is far harder then when I sat mine; then there was no

written exam etc, so does this mean that I shouldn't drive on the same roads that I pay a licence for because I sat an easier test?

Most of the MI3, MW3 MM3 M3 etc stations that I have worked have had good operational skills, in fact some worked during HF and VHF contests would put some seasoned operators to shame. Granted there have been occasions when I have encountered bad operating but a little understanding and tolerance goes a long way, combined with a little bit of constructive criticism - as opposed to destructive. Perhaps it's time to look more closely at our own operating faults than those of others.

The Foundation may not be ideal in everyone's eyes but it is well named as it gives you a platform to build on and progress if you so desire.

IARU World Amateur Radio Day

From: R Horsley, G0MRH

Reference your request on the RSGB website for news of activities dedicated to World Amateur Radio Day (WARD), I can pass on my own involvement and that of the Stratford upon Avon & DRS. I first heard of WARD in 1997 and finding an excuse to go on air I ran my station from home on 20 September 1997 - in those days WARD was on the third weekend of September. The society callsign was used /P. This arrangement continued in 1998 and 1999. In 2000 the day was changed to l8 April and again I ran the station from my QTH. In 2001 the station was not run but in 2002 with the opening of the society's shack at our meeting place the society station was run from there on 18 April. Due to a mixture of commitments I again ran my home station for a short time on 18 April 2003. This has been a lone venture until this year, 2004. Hoping to encourage other members, the society shack was used and one new member assisted me for part of the time.

On each of these occasions the participation has been at a leisurely pace, generally for eight or nine hours of the day. QSO rates varied depending on propagation conditions, the cycle of activity found on weekdays and amount of interest. Neither my own or the society's station can be considered good for DX working, so most contacts have been around Europe. This year with computer logging the DXCC listing came to 10 out of 27 QSOs. QSO counts range from the lowest at 13 to around 30. Most stations - about 95% - had never beard of WARD until it was explained. QSL cards are sent to all the stations worked but the return rate is less than 10%.

I hope this gives a fair record of my own involvement and the result of the activity. Clearly WARD is not getting the publicity to encourage a lot of activity.

QTH for sale ads

From: John Lawrence, GW3WEZ

I think it is an excellent service that *RadCom* carries this type of ads ('The last word', June). Whilst working abroad (Saudi Arabia, Hong Kong and Thailand), I did look for these ads, in view of investment / UK base. I found only one problem: you had to hunt for them! I respectfully suggest that you encourage potential advertisers to clearly state "QTH for sale", otherwise one has to hunt through all the ads, to find a QTH. For example, "Mast for sale", "Excellent QTH", "Good take-off" etc. In my case I chased details once or twice, and tried a QTH wanted ad, with some responses. However, at that time I had a wife's views to consider so nothing was done.

Historic wireless buildings

From: Martin Snow, GW3PRL

I would question the remark made in 'International Marconi Day 2004' ('Club and regional news', *RadCom* June 2004 p14), which states "Today, the station is the sole surviving historic building in the UK... " This statement is made with reference to the Lizard Radio Station at Bass Point, and is inaccurate. Within the catchment area of the Dragon ARC, Anglesey, stand three very sound buildings from the early days of Marconi's historic experiments. These are the Coast Wireless Station at Holyhead, circa 1901, also the long wave trans-Atlantic transmitting station at Ceunant, near Caernarfon and the associated receiving station at Towyn, near Barmouth, both circa 1912. These buildings are in daily use as dwellings and / or commercial premises, and have had their respective 'special events' in recent years. I suspect there may be others too.

It is a shame we don't preserve more of our heritage radio buildings and equipment. The Swedes have set a wonderful example in maintaining SAQ in working order, while we let Criggion and others, be wrecked!

Congratulations to the Cornish Radio Amateur Club. For many years they have done an excellent job of organising International Marconi Day.

An amazing antenna

From: Mike Lord, G4HXT

I especially enjoyed reading the article in the June issue about Jimmy Porter, G3GGY, reading the RSGB news for 50 years. I am absolutely amazed at the photograph of Jimmy's 16-element HF log periodic antenna and mast towering over his house. It looks as if he has put up an umbrella to keep the house dry! I will show it to family members and friends when they complain about my antennas.

Promoting amateur radio

From: Brian Leathley-Andrew, G8GMU

There is nothing difficult in promoting amateur radio (G1JKE, 'The last word', June 2004), it simply needs doing. I am the PR officer for my Lions Club, I generate awareness for the club many times a month. The same can be done for amateur radio. How many of the special event organisers for June contacted their local newspapers and broadcast radio stations? If not, why not: that could be over 60 opportunities lost. How many clubs engage in the community, giving talks to Rotary, Round Table and Lions clubs (oops, I mentioned Lions again, do you take the point?)

How many radio clubs have a link or a site lodged via their local authority community website? I am not having a pop at anyone, these are simply ideas to promote amateur radio at a local level. Just like GB4FUN - take amateur radio to the people, hold a portable event in your town centre amongst the shoppers. Let us not be seen as that strange guy up the road with the big aerials who sends messages, bit creepy if you ask me; that is one public perception of what we do. To counter this, with GB4BLC I opened my home to the public, primarily for Bedworth Lions awareness month, the spin-off was also to promote amateur radio. This event was covered by all the local newspapers and local BBC radio several times. We must create these opportunities to promote our hobby.

[The RSGB Commercial Manager Mark Allgar, M1MPA, advises that a booklet on how to promote your amateur radio event is available free of charge by contacting sales@rsgb.org.uk - Ed.]

Naked knees

From: Dave Hicks, G6IFA

I was reading my *RadCom* over breakfast this morning, and nearly regurgitated the Manx kippers I had consumed when my gaze alighted on the picture on page 64 of the June issue. People of a nervous disposition should be protected from sights like this. I refer to the 'naked knees'. As editor you could have edited the picture, chopped him off below the fingers as it were, and no harm would have been done, nobody would have been shocked, or upset. By all means show pictures of radio amateurs, but please be good enough to respect the sensitivities of the readers. This is a blot on your otherwise excellent record. The article, which I was able to read when the ambulance had gone, was very informative and I can't wait to see part 2. ♦

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HEIL CLASSIC DESK MICS

PRICES DOWN

The Heil Classic studio quality microphone, exact replica of the 1930's RCA 74B type of broadcast microphone. Inside it has the benefit of modern technology. Two inserts are provided, one for broadcast studio quality and a choice of one other Heil insert. Includes base stand, soft-touch PTT back panel switch and cover for microphone. Requires CC1 adaptor.

HCL5	Classic retro-look HC-5 desk mic	£199.95	B
HCL4	Classic retro-look HC-4 desk mic	£199.95	B
HCLic	Classic retro-look IC desk mic	£199.95	B

CB-1(H) MATCHING DESK STAND

This desk stand has been designed specifically for the Heil Classic & Heritage microphones.

PRICE DOWN £49.95 A

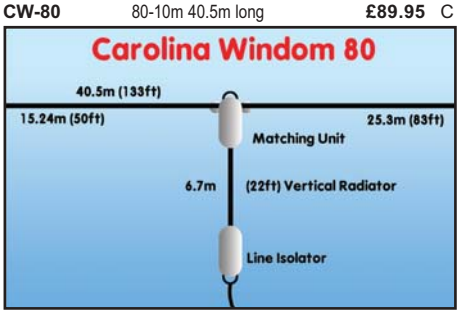
FS-2 PTT FOOT SWITCH

£39.95 B

Ergonomically designed to require less effort to operate. The hinge is under your heel instead of away from your foot. It can control two devices from a single operation.

RADIOWORKS CAROLINA WINDOMS

CW-160	160-10m 76.8m long	£129.95	C
CWS-160	160-10m 40.5m long	£119.95	C
CW-80	80-10m 40.5m long	£89.95	C



CWS-80	80-10m 20.1m long	£109.95	C
CW-40	40-10m 20.1m long	£84.95	C
CW-20	20-10m 10.36m long	£89.95	C
CW-620	20-6m 9.7m (32ft) long	£89.95	C
G5RV PLUS	80-10m with balun 31m (102ft) long	£59.95	B
Baluns and Isolators			
T-4 Plus	Line Isolator1.8 - 54MHz 4kW	£39.95	B
T-4-500	Line Isolator1.8 - 30MHz 500W	£32.95	B
T-4G Plus	Line Isolator 1.8-54MHz + gnd4kW	£39.95	B
REM-BAL	Ladder line 4:1 balun 1.8-30MHz	£45.95	B
B1-2K Plus	1:1 current balun - for inverted V 's	£28.95	B
B4-2K	4:1 voltage balun loops/folded dipoles	£39.95	B
Y1.5K Plus	1:1 current Yagi balun 1.8- 54MHz	£39.95	B
Sundries			
KEVLAR	200ft 400lb strain guy line	£22.95	A
LADDER	450 Ohm ladder line - per metre	£0.90	A

SOTA-3 PORTABLE 2M BEAM & MAST

£44.95 C

With the summer coming, here is the ideal portable Yagi for trekking. Weighing just 200g you get a complete package for "Summits on the Air" operation.

144 - 146MHz
9dBd gain
F/B 12dBd
Weight 200g

V. or horizontal
Fibre glass mast
5m coax
No bolts to drop!

bhi NES10-2 DSP SPEAKER £99.95 B

Combined speaker and programmable DSP unit. Offers dramatic noise reduction, even reduces annoying hetrodynes. 8 Ohms, 8 filter settings, 3.5mm plug, 12-24V DC

bhi NES-5 DSP SPEAKER £79.95 B

Combined speaker and fixed setting DSP unit. Offers same dramatic noise and hetrodyne reduction. (Formally NESCB) 8 Ohms, 3.5mm jack plug, 12-24V DC 500mA

WATSON HP-100 HEADPHONES £19.95 B

Excellent lightweight communication headphones with tailored response ideal for the modern tranceiver or receiver.
**8 Ohms 200-9,000Hz *Adjustable headband *3.5mm stereo plug *1/4" stereo adaptor.*

WATSON HP-200 HEADPHONES £22.95 B

Superb headphones with tailored response for radio comms. Excellent sound proofing, can pull in the weak DX.
**Mono 8 Ohm 200-10,000Hz*
**Padded Ear pieces *3.5mm stereo plug *1/4" stereo adaptor.*

SGC SPECIAL OFFER

Buy an SG-2020 or SG-2020ADSP transceiver with any SGC Coupler (except SG-239) and receive a *FREE* SGC Multimeter (worth £19.99) *PLUS* £30 (inc Vat) *OFF* the price of the pair.

SG-2020 £499.95 C	SG-2020ADSP £589.95 C
1.8-30 MHz 1W-20W	1.8-30 MHz 1W-20W + DSP

PRICES DOWN!

SG-237 Auto ATU

1.8 - 60MHz. 3 - 100W pep (40W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 300mA.

£299.95 c

SG-231 Auto ATU

1 - 60MHz. 3 - 100W pep (50W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 900mA.

£349.95 c

SG-230 Auto ATU

1.6 - 60MHz. 3 - 200W pep (80W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 500mA.

£339.95 c

High Sierra "Sidekick" from USA

As featured in Radcom by S3LDO

New 80m-6m Hi-Q variable tune Mobile antenna.

Mounts on 3-way magnetic mount Handles 200 Watts

Supplied with cables and switch box - can run from cigar lighter.

£239.95 C

This fabulous mobile antenna is superbly constructed and offers extremely high efficiency. It will tune all bands from 80m to 6m, and being variable means the VSWR is always low. Designed to be mounted on our Watson **W-300T** 3-way mag mount (£39.95 B), you simply run the DC cable back to cigar socket and control tuning with the supplied switch. Approx tuning can be achieved by listening to received signals peak, and fine tuning is achieved by minimum VSWR. Works great with QRP as well! Typical VSWR 1.5:1. max height approx 1.37m.

WEB ORDERING
www.wsplc.com

PRICE MATCH

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

WATSON W-10AM PSU £59.95 C

One of our best selling power supplies due to its versatile spec.
*Output 0-15V DC, 10A
*Over current protected
*Dual meters *3 sets of terminals *Front panel fuse
*Supply 230V AC 50Hz.

WATSON W-25SM PSU £79.95 B

Very popular budget switch mode power supply. *Output voltage 13.8V DC *Output current of 22A (25A peak) *Front panel output terminals *Over current & voltage protection *Quiet operation

WATSON W-25AM PSU £89.95 C

DC power supply for the shack & esp. for use with 100W transceivers. Separate voltage and current meters. *Output voltage 0-15V DC *Output current of 25A (30A peak). *3 sets of output terminals *10A cigar socket. *Over current protection

WATSON W-5A PSU £29.95 B

DC power supply for the shack and low power QRP transceivers.
*Output voltage 13.8V DC
*Output current of 5A (7A peak) *Front panel output terminals *Over current protection

MANSON EP-925 PSU £99.95 C

A general purpose 3-15V DC, 25A (30A peak) power supply able to provide the needs of the modern 100W HF transceiver. *Dual analogue meters *Over current protection *Large power terminals for rigs *Quick snap connectors for ancillaries

AVAIR VSWR Meters PRICEMATCH

AV-200 £49.95 B

Ideal for HF and VHF operation. It features high power handling up to 400W * 1.8-180MHz * 5W, 20W, 200W, 400W * Av or PEP

AV-400 £49.95 B

Ideal for VHF and UHF operation. It features high power handling up to 400W * 140-525MHz * 5W, 20W, 200W, 400W * Av or PEP

AV-600 £69.95 B

Two sensors used for HF and VHF/UHF operation. * 1.8-160MHz, 140-525MHz * 5W, 20W, 200W, 400W * Av or PEP

NEW SGC Master Antenna Controller

MAC-200 £339.95 C

* Automatic ATU
* 1.8-60MHz
* 5-Way Selector
* Coax or Balanced
* Long Wire

The MAC-200 will work with any HF transceiver up to 200W output. It has 3 outputs for coax and one each for wire and balanced - all switch selected. 168 revolving memory bins lets it remember for quick QSY. With an impedance range from 2 - 5000 Ohms, and built-in VSWR and power metering, it is all you are ever likely to need! Requires 12V DC.

WEST MOUNTAIN RIGBLASTERS

RIGblaster pro	Data interface 8-pin/mod, Cd & cables	£209.95	B
RIGblaster Plus	Data interface 8-pin/mod, Cd & cables	£119.95	B
RIGblaster M8	Data interface 8-pin, software & cables	£109.95	B
4T8-KIT NEW	Conversion Kit from M8 or Plus to 4pin	£19.95	A
RIGblaster nomic8P	Data interface 8-pin, software & cables	£59.95	B
RIGblaster nomicRJ	Data interface RJ, software & cables	£59.95	B
FT100-CBL	Adapts all units to FT100 input	£12.95	A
RB-CD	Standard RIGblaster program CD	£9.95	A

FREQUENCY COUNTERS

WATSON

The **FC-130** is an ideal frequency counter for the shack, mobile or portable use. Supplied complete with Ni-Cads, charger and telescopic whip.

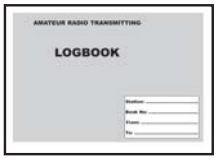
Super Searcher	RF finder & freq. cnter 10MHz-3GHz	£99.95	B
Super Hunter	Frequency counter 10Hz-3GHz	£149.95	B
Hunter	Frequency counter 10MHz-3GHz	£49.95	B
FC-130	Frequency counter 1MHz-3GHz	£59.95	B

OPTOELECTRONICS

Top-of-the-range product from Optoelectronics, the **X-Sweeper** is a fully featured nearfield receiver that displays frequencies analogue signals in spectrum format on a 64x128 graphical display. It has 20 memory banks storing 100 freqs in each.

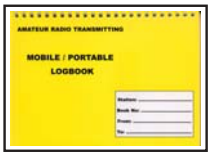
X-Sweeper NEW	Nearfield Receiver 30MHz-3GHz	£1399.95	C
Xplorer	Freq. cnter / CTCSS/DTMF decode	£659.95	B
Digital-Scout	Digital Freq. counter 60MHz-2.6GHz	£429.95	C
Scout	Freq. finder 10MHz-1.4GHz	£299.95	B
M1	Freq. cntr 50Hz - 40MHz	£229.95	B
M1-TCX0	M1 + temp controlled crystal oscillator	£249.95	B
Cub	Mini counter 1-2.8GHz	£129.95	B

TRANSMITTING LOGBOOK £4.99 A



Traditional Logbook for Radio Amateurs, A4 spiral bound for ease of use plus updated Prefix List and room for extra notes. A logbook is a legal requirement for any radio station.

MOBILE LOGBOOK £4.99 A



You've asked for one so here it is - the Radio Amateurs Mobile/Portable Logbook. A5 size, it also contains relevant repeater information. A mobile logbook is not a legal requirement.

Coax Switches

CS-600 2-way coax switch rated over 1kw (HF) and up to 600MHz @100W. Fitted SO-239 sockets. **£12.95 A**

MFJ-1704 4-way coax switch rated over 1kw (HF) and up to 600MHz @100W. Fitted SO-239 sockets. **£69.95 A**

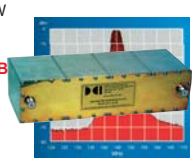
DCI High Performance Bandpass Filters

Razor sharp VHF & UHF filters

Simply place in antenna feed and clear up reception problems related to strong out of band signals. These are commercial grade filters with up to 68dB rejection.

DCI-145 2M Band Pass Filter. 200W handling. -68dB @ 136MHz, -55dB @ 155MHz. SO-239 **£99.95 B**
DCI-145-2HN "N" sockets **£109.95 B**

DCI-435 70cm Band Pass Filter. 200W. -47dB @ 415MHz, -50dB @ 455MHz. "N" sockets. **£119.95 B**



WATSON NEW W-25XM £99.95

Carriage £10

New compact, variable voltage, switch-mode power supply. About the size of an IC-706, this hunky low-noise supply will power any 100 Watt transceiver. Weighing just 1.65kg it operates from either 230V or 115V AC.

*9.7 - 17V DC (13.8v notch)
*Input 230V or 115 AC
*25 Amps peak
*22 Amps continuous
*Fan cooled
*Dual output terminals

*Dual metering volts & current
*Over voltage & current protect
*Removable AC lead
*Illuminated metering
*Protection warning light
*1.65kg 170w x 180d x 65h mm

NEW New Tailored Audio Base-Station Speaker

Designed for radio communications and speech. This heavy duty unit is built into a black cast alloy case and has a tailored frequency response which is ideal for SSB. It matches the colour of branded HF transceivers and is supplied with 3.5mm lead.
Size 12W x 18H x 11D cm.
Weight 0.85kg.

SP-2B £29.95 C

New Graphic Equaliser & Mixer UB-802a

Dual Mic graphic equaliser with dual **variable 60dB preamps** plus 2 x mon/stereo line inputs.Configure to adjust adust both tx & rx audio and monitor both through phones. Professional quality features low-mid-hi, tape in/out, 1/4" jack and XLR sockets, 48V for condenser mics etc. **Plus FREE AC adaptor.**

£54.95 C

In/out adaptor sets for 8-pin mics: K-802, Y-802, I802 £16.95

The World's First HF/VHF/UHF Multimode Portable/Base Station!

FT-897

Multi-Band:	HF/6m/2m/70cm
All Mode:	CW/SSB/AM/FMN/FMW/PACKET/DIGITAL
Ultra Compact size:	7.87" x 3.15" x 10.3" W.H.D.
High Power Output:	HF/6m 100W, 2m 50W, 70cms 20W w/AC or 13.8VDC or 20W, (10W on 70cms) w/optional Ni-MH Battery

Optional Accessories include

FNB-78 Internal Ni-MH Battery Pack

FP-30 Internal AC Power Supply

FC-30 External Automatic Antenna Tuner

YAESU
Choice of the World's top DX'ers

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