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The Radio Society of Great Britain Members' Magazine

RadCom

£3.95 Vol 79 No. 12 December 2003

INSIDE

WATERS & STANTON

GENERAL ENQUIRIES: 01702 206835/204965
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KENWOOD NEW TS-480

HF RIG 160-6m
"HX" model has 200W output!
"SAT" is 100W with built-in ATU
AVAILABLE DECEMBER

Phone for **BEST DEAL.** As UK's largest dealer, we give you best before and after-sales service.

New 2004 Equipment Guide

352 Full Colour Pages Packed with Products, Tips & editorial.

£2.95
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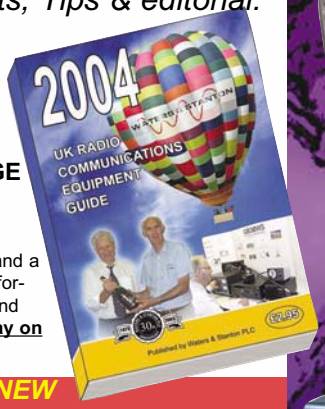

Includes **FREE CARRIAGE** Vouchers worth **over £20!**

Over 4000 products and a wealth of technical information, illustrations and tech info. **Order Today on your "card"**

YAESU VX-2E NEW

Dual Band Ultra Compact FM Handie. The VX-2R is unbelievably small yet provides 1.5W on 144MHz and 1W on 430MHz (3/2W with external supply). General coverage receiver 0.5-999MHz, which includes AM mediumwave & FM broadcast bands plus AM aircraft & UHF TV bands.

IN STOCK £169 B

EVOKE-1 Digital Audio Receiver

Experience "CD" quality!

Tune into the high quality world of digital broadcasting and the many new channels including BBC 7 etc. Experience the highest quality broadcast sound ever available, interference free.

Evoke-1 radio
* 6 memory channels * High quality speaker * AC mains adaptor * Stereo phone socket * Stereo line out for Hi-Fi * Aux speaker socket * Telescopic antenna.

£99.00

HF TRANSCEIVERS

ICOM IC-756 PRO II £1999 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.

SP-20 external speaker + filters. **£164.99**

3 Year Warranty on orders before 1st Jan.

ICOM IC-7400 £1249 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!

3 Year Warranty on orders before 1st Jan.

ICOM IC-703 NEW £599 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.**

Rucksack **LC-156 £62.**

3 Year Warranty on orders before 1st Jan.

ICOM IC-706 IIG DSP £789 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**

3 Year Warranty on orders before 1st Jan.

ICOM IC-718 £499 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.

3 Year Warranty on orders before 1st Jan.

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**

3 Year Warranty on orders before 1st Jan.

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**

3 Year Warranty on orders before 1st Jan.

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**

3 Year Warranty on orders before 1st Jan.

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**

3 Year Warranty on orders before 1st Jan.

Basic Model IC-910H £1129

HF TX / LINEAR AMPLIFIERS

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.

3 Year Warranty on orders before 1st Jan.

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.

3 Year Warranty on orders before 1st Jan.

YAESU FT-920AF £1049 C

100W HFplus 6m transceiver. 100kHz - 30MHz, 48 - 56 MHz Gen coverage Rx, 100 memories, Internal ATU with 100 tuner memories, large backlight LCD, Built-in memory keyer, 13.5V DC. Now includes FM unit and 6kHz AM filter.

LAST FEW

YAESU FT-897 £989 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.

3 Year Warranty on orders before 1st Jan.

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.

3 Year Warranty on orders before 1st Jan.

YAESU FT-857 NEW £799 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.

3 Year Warranty on orders before 1st Jan.

YAESU FT-817 £539 C

bhi NE-DSP1061 Module available!

160m - 70cms. Up to 5W output all modes. ***Ours includes*** **battery and charger.** **Add £110 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 £265.95 C

FT-817 VERSION !

This model has been specifically designed for the FT-817. Enjoy up to 50 Watts output

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THE ONLY THING WE WON'T DISCOUNT • CUSTOMER SERVICE

VHF | UHF TRANSCEIVERS

ICOM IC-E208 NEW £319 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 £309 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 £349 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-8800R £299 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-1500M £179 B

Built like a battleship, this rugged design benefits from Yaesu's commercial product range. 2m 50W and a DTMF microphone. Great value.

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!

VHF|UHF HANDHELDS

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 £115 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-110 £109 B

Combining the ruggedness of the VX-150 with the simplicity of 8-Key operation, the VX-110 is a fully featured 2m handheld ideal for the most demanding of applications. It has a die-cast case, large speaker and illuminated keypad.

ICOM IC-E90 NEW £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 £259 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.

KENWOOD SINGLE BANDERS

Kenwood's **new range** of single band handheld radios for 2m and 70cms with up to 5W output. These are rugged designs and derived from their commercial range, so reliability is unquestionable.

TH-K2E 2m (No key-pad)	**£134.95 B**
TH-K2ET 2m with keypad	**£139.95 B**
TH-K4E 70cm (No key-pad)	**£134.95 B**

QS-112K speaker microphone for Kenwood handhelds **£16.95**

VHF | UHF ANTENNAS

MOBILE ANTENNAS

DIAMOND ANTENNA (PL-259 base type) ***NEW***

CR-8900. Quad bander 6m/10m/2m/70cm. Length 1.26m, max pwr 60W with fold over base. **£72.95 B**

WATSON ANTENNAS (PL-259 base type)

W-2LE	2m quarter wave 2.1dBi 0.45m	**£9.95**	A
W-285S	2m 3.4dB 0.48m (fold over base)	**£14.95**	B
W-77LS	2m/70cm 0/2.5dB 0.42m	**£14.95**	B
W-770HB	2m/79cm 3/5.5dB 1.1m	**£24.95**	B
W-7900	2m/70cm 5.6/7.6dB	**£32.95**	B
W-627	6m/2m/70cm 2.15/4.8/7.2dB 1.6m	**£34.95**	B
WGM-270 ***NEW***	2m/70cm On glass 3.7m coax 50W	**£29.95**	B

HIGH SIERRA SIDEKICK NEW £259 B

80m to 6m 200W Mobile Whip Motorised Tuning, Can Be 'Mag' Mounted*

The large diameter coil offers efficiency higher than any other similar antenna, in a very compact size. Band changing is a button press away!

- 3.5 - 60MHz
- 200 Watts
- 15 in base unit
- High Q Coil
- 3ft whip
- 12V motor
- Control box
- DC cables
- 3/8" stud mount
- Made in USA

* Needs our 3-way magnetic mount

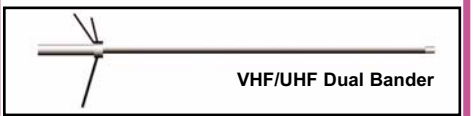
WATSON MOBILE BASES

WM-14B.
Large diameter 14cm magnetic mount SO-239, c/w 5m RG-58 & PL-259

W-3HM	Adjustable hatch mount	**£14.95**	A
WM-08B	8cm mag mount, 5m cable PL-259	**£9.95**	A
WM-14B	14cm hvy duty mag mount+cable	**£12.95**	A
WSM-88V	BNC mag mount plus 3m cable	**£14.95**	A
W-3CK	5m 5D-FB cable assembly+pigtail	**£18.95**	A
W-ECH	5m standard cable kit assembly	**£12.95**	A
W-300T	3/8in" Triple Mag Mount	**£39.95**	A
W-300S	S0-239 Triple Mag Mount	**£39.95**	**A**

BASE STATION ANTENNAS

DIAMOND



VHF/UHF Dual Bander

X-200	2m/70cm colinear 6/8dB 2.5m	**£79.95**	C
X-300	2m/70cm colinear 6.5/9dB 3.1m	**£99.95**	C
V-2000	6m/2m/70cm 2.15/6.2/8.4dB 2.5m	**£89.95**	C

WATSON

W-300.
Very popular dualband base antenna. Supplied with u-bolts for mast fixing.

W-30	2m/70cm colinear 3/6dB 1.15m long	**£39.95**	C
W-50	2m/70cm colinear 4.5/7.2dB 1.8m long	**£49.95**	C
W-300	2m/70cm colinear 6.5/9dB 3.1m long	**£64.95**	C
W-2000	6m/2m/70cm 2.15/6.2/8.4dBi 2.5m	**£69.95**	C

DIAMOND HFV5 NEW

NEW - DIAMOND HFV5 ULTRA COMPACT DIPOLE
40, 20, 15, 10, 6M. 100 WATTS 4M LONG!

This is a superbly engineered rigid dipole for portable or balcony use. Balun fed, it comes with centre mounting plate for up to 2" diameter fixing. Each band is individually adjustable.

NEW

* 40 - 6m
* 150 Watts
* 40m = 40kHz, 20m = 160kHz 15m = 200kHz,
* 10m = 340kHz, 6m = 1.3MHz * SO-239 Balun Fed
* 2" mounting bracket * 4m long / 1.95kg

HFV5 Compact HF Dipole 40-6m **£219.95 C**

WATERS & STANTON

PRICE MATCH

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

HF ANTENNAS

VERTICAL ANTENNAS

Hustler Mobiles

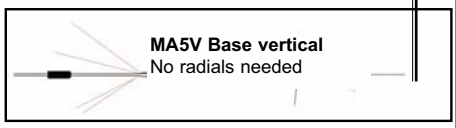
Get top performance when on the move. Purchase the **MO-3 base** (137cm) for **£26.95** or the **MO-4 base** (68cm) for **£22.95**. Then add the resonator of your choice. **RM-10, RM-12, RM-15**, all **£19.95** ea. **RM-17, RM-20 £24.95** ea. **RM-40 £26.95, RM-80 £29.95**

Resonator

Base section → MO-3 or MO-4

CUSHCRAFT BASE ANTENNAS

MA6V *NEW*	20-17-15-12-10-6m 250W PEP	**£289.95**	C
MA5V	20-17-14-12-10m 250W PEP	**£229.95**	C



MA5V Base vertical
No radials needed

R8	40-30-20-17-15-12-10-6m 1.5kW	**£529.95**	C
R6000	20-17-15-12-10-6m 1.5kW PEP	**£349.95**	C

BUTTERNUT BASE ANTENNAS

HF9V-X	80-6m 7.9m 1kW PEP	**£365.00**	C
HF6V-X	80-40-30-20-15-10m 7.9m 2kW	**£315.00**	C
HF2V	80-40m 9.75m (160m opt) 1kW	**£230.00**	C

HY-GAIN BASE ANTENNAS

AV-640	40-6m 1.5kW, 300W 6m (PEP)	**£399.95**	C
AV-620	20-6m 1.5kW, 500W 6m (PEP)	**£299.95**	C
AV-14AVQ	40-20-15-10m 1.5kW PEP	**£179.95**	C
AV-12AVQ	20-15-10m 1.5kW PEP	**£139.95**	C
DX-88	80-10m 1.5kW, 250W 30m	**£395.95**	C

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

High quality German Baluns SO-239
200W 1:1, 4:1 or 6:1 £25.95 ea.
1kw 1:1 £34.95 4:1 or 6:1 £41.95 ea

HORIZONTAL BEAMS & DIPOLES

CUSHCRAFT

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

X-7	20/15/10m 7 el. Yagi 2kW	**£699.95**	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	**£389.95**	C
A4-S	10-15 & 20m 4 el. Yagi 2kW	**£599.95**	D
A3-WS	12 & 17m 3 el. Yagi 2kW	**£399.95**	D
D-3	10-15-20m dipole element 2kW	**£259.95**	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	**£259.95**	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	**£799.95**	C

RADIO WORKS

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

CW-160	160-10m 76.8m long	**£139.95**	C
CWS-160	160-10m 40.5m long	**£134.95**	C
CW-80	80-10m 40.5m long	**£99.95**	C
CWS-80	80-10m 20.1m long	**£119.95**	C
CW-40	40-10m 20.1m long	**£94.95**	C
CW-20	20-10m 10.36m long	**£84.95**	C
CW-620	20-6m 9.7m (32ft) long	**£94.95**	C
G5RV PLUS	80-10m with balun 31m (102ft) long	**£64.95**	B

HF ANTENNAS

Super Antennas USA - Portable HF Ants

MP-1 Portable "Screwdriver"

It beats the competition!

MP-1 Portable whip for 40m to 70cms! Ideal for FT-817 etc. **£159.95**

* Centre variable loading * 40m to 70cms * 150W pep * Total length extended 185cm approx. Packs down to pocket size * Includes universal table/fence bracket and radial wire * SO-239 socket on bracket. **Optional tripod £22.95. 80m coil £29.95**

"I measured up to 10dB gain over another popular whip for the FT-817". **Peter Waters, G3OJV**

PORTABLE ANTENNAS

MIZUHO (FOR FT-817)

ATX-WBN	Walkabout 80-6m Whip 1.5mBNC	**£49.95**	B
ATX-WPL	Walkabout 80-6m Whip1.5mSO-239	**£49.95**	B
ATX-W38	Walkabout 80-6m Whip 1.5m 3/8in	**£49.95**	B

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

AT-80	Single band 80m whip with BNC	**£24.95**	A
AT-40	Single band 40m whip with BNC	**£24.95**	A
AT-30	Single band 30m whip with BNC	**£19.95**	A
AT-20	Single band 20m whip with BNC	**£19.95**	A

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

AT-17	Single band 17m whip with BNC	**£19.95**	A
AT-15	Single band 15m whip with BNC	**£19.95**	A
AT-12	Single band 12m whip with BNC	**£19.95**	A
AT-10	Single band 10m whip with BNC	**£19.95**	A

ANTENNA TUNER UNITS

MFJ Compact Portable Tuners

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

MFJ-902 Travel Tuner

Smallest 150W ATU in the world! 3.5 - 30MHz coax or end fed wires. Real air spaced capacitors! **£69.95 B**

MFJ Power Tuners

MFJ-989C £379.95 C
3kW 1.8 - 30MHz. Wire, balanced and coax feed. Full metering and switching

1.5kW fast differential tuning design. 1.8 - 30MHz. Wire balanced and coax systems. Full metering and switching.

MFJ-971 £349.95 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.

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

MFJ-914 £64.95 B

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

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.

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

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

Buddipole

Direct from the USA

THE KIT: Frequency 40 to 2m Power rating 250W You get the complete dipole with 25' of feeder, balun and BNC termination. Total length approx 4.64m max, fully assembled. Also included is hard carry case. **See November advert for fuller details or our catalogue.**

Buddipole Kit - the complete dipole kit above.	**£199.95**	B
Tele Mast 2.45m fits directly to dipole.	**£49.95**	B
Tripod 58cm. 1.5kg. (Supports Tele Mast)	**£89.95**	B
Rotating Arm Kit (Turns dipole into vertical)	**£32.95**	A
Decorator pole Adaptor (Lets you mount dipole on standard DIY decorator's pole.	**£6.95**	A
Pack of 3 extra coil clips	**£11.95**	A
Antenna carry bag	**£39.95**	A

Buddistick - Effectively half a dipole and configured as a portable vertical system. Includes mini tripod and radial kit.

Buddistick	**£134.95 B**
Buddistick Tripod (comes with Buddistick)	**£32.95 B**
Table Clamp	**£12.95 A**

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

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926.
Limited by guarantee
Member society of the
International Amateur Radio Union
Patron: HRH Prince Philip, Duke of Edinburgh, KG, KT

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the Subscriptions Department from which full details of Society services may also be obtained.

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Details of the Society's volunteer officers can be found in the RSGB Yearbook 2003

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Website: www.rsgb.org
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www.rsgb.org/membersonly Use your callsign in lower case as the user name, and your membership number (see RadCom address label) as the password.

RSGB Matters

Misuse of re-allocated Callsigns

At an RSGB / RA Forum Meeting that took place on 3 November, the Society informed the RA that they had received a number of complaints over the misuse of re-allocated callsigns. At the present time there is a loose arrangement whereby a family member or any other person can be allocated the callsign of a Silent Key if the next of kin of the Silent Key gives his or her approval. This practice is causing ill feeling amongst the amateur community when old and cherished callsigns are re-allocated to persons who have no apparent links with the family but seek the call only for personal gratification. As this practice is not formal policy but a loose arrangement, the Society asked that it be stopped as soon as possible or restricted to immediate family members only. The RA agreed that there had been some problems with these arrangements in the current form and agreed to consider the RSGB request.

QSL BUREAU NEWS

A reminder, again, that if members wish to receive their incoming QSL cards they must make sure that they lodge sufficient stamped self-addressed envelopes with their respective QSL Bureau Sub Manager. If members do not wish to collect cards it would be appreciated if they could let their sub-manager know this and - preferably - make this clear when making the contact.

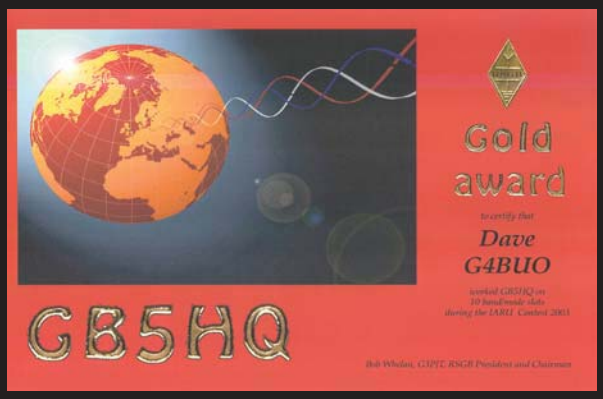
DRRM 94 CONTACT DETAILS

Martin Charman, G4FKK, the Deputy RSGB Regional Manager for District 94 (Surrey and London south of the Thames), is 'Particulars Withheld' in the current *RSGB Yearbook* but wishes it to be known that members in his District are welcome to contact him at the following address: 3 Mount Park, Carshalton, Surrey SM5 4PR or by e-mail to: g4fkk@qsl.net

GB5HQ QSLs AND AWARD

All the GB5HQ QSL cards received direct by QSL manager Nigel Cawthorne, G3TXF, have now been answered. GB5HQ was the callsign used by the RSGB headquarters' station entry in the IARU HF Championship contest in July, which made over 12,000 contacts during the 24-hour operation. Nigel will now be turning his attention to QSL cards received via the bureau.

The GB5HQ award pictured here has already been sent out to around 100 applicants. It's still not too late to apply: the rules can be found on page 58 of the July RadCom and on the GB5HQ website at www.gb5hq.com/awards.html. The awards manager is John Dunnington, G3LZQ (QTHR).



75 YEARS AGO

With reference to the item on page 6 of the November *RadCom*, Rob Micklewright, G3MYM, says that the "Mr Megaw" referred to in the November 1928 *T & R Bulletin* was almost certainly Eric Megaw, G6MU. Rob also points out a printing error in the same piece: the QSO between G6LL and W2JN lasted for 1 hour 45 minutes.

TECHNICAL HELP - A NEW SERVICE FOR MEMBERS

'Technical Help' is a new service to give help to RSGB members who may require technical assistance. Amateur radio encompasses a wide range of technical interests and we can take a certain amount of pride in being able to claim that, within the ranks of our membership, we have a vast pool of knowledge, that we are willing to share with others - particularly with newcomers to the hobby.

35 YEARS AGO ... IN RADIO COMMUNICATION, DECEMBER 1968

New RSGB Headquarters 35 Doughty Street, London, WC1
"Open Weekend" 14 - 15 December, 1968

The new Headquarters of the Radio Society of Great Britain will he open to members and friends over the weekend of 14 - 15 December, 1968. Throughout the weekend there will be talk-in stations operational on 2m, 4m and we hope 160m (aerial space permitting). There will also be a station operating on either 80m or 40m (depending on conditions) to give contact to those not able to visit the new Headquarters. The call-sign to be used on all bands will be GB2HQ. Members of Council and Staff, Honorary Officers and members of the Society's Committees will be at the new headquarters over the weekend to receive visitors and answer queries. The latest RSGB publications will be on show and available for sale. There will also be displays showing the work of the Society. Light refreshments will be provided. . .

Why not come to see the Headquarters that you have helped finance?

Since the introduction of the Foundation Licence, many people have come into the hobby and it is hoped that this new scheme will be of particular help to them.

Whilst, over recent years, we have been able to build up an extremely fast response helpline to aid members with EMC enquiries, we have, for some time, been aware that we need a similar service to help members with other (non-EMC technical questions. Hence, this new Technical Help service. Although, at present, we have limited resources at HQ to help with technical enquiries, there is much help already available throughout the country. We list these below:

Amateur Radio Clubs: All radio amateurs are encouraged to join and regularly support their local club. You can find a list of RSGB affiliated clubs in the *RSGB Yearbook 2004* (see pages 38 - 46). If you join you will find that your fellow members will be a valuable source of help and assistance with almost any technical problem.

Technical Publications: The RSGB produces a number of excellent publications, covering a range of subjects, that are readily available at a reduced price for members. New entrants to the hobby, particularly, are encouraged to improve their pool of technical knowledge by reading these. As a member of RSGB, you will already be receiving *RadCom*, which also covers a whole range of technical subjects. Many of the *RadCom* columnists do offer technical assistance but, in general, can only give a reply via their future printed articles and this may not be much help if you are looking for a speedy response. But some of the *RadCom* columnists list a number of helpful websites in their articles. It may be worth checking these out before going any further.

Technical Committee: The Technical Committee also offers technical advice and can be reached via e-mail or through the RSGB website at www.rsgb.org (Click on Services / RSGB Committees). Alternatively, you can contact Tony Plant, G3NXC, Chairman, Technical Committee, via e-mail at **g3nxc@hotmail.com**

Course Instructors: If you have recently successfully graduated from a course your former instructors may be able to provide assistance.

Amateur Radio Emporiums: Many of these regularly advertise in *RadCom* and are generally very helpful in giving technical advice - particularly if you are a good customer and buy from them regularly. But they cannot be expected to neglect their customers in their shop and talk to you on the telephone to offer technical advice - especially if it is a complicated issue. So please be discriminating if you ever call on any one them for assistance.

Regional Managers: Regional Managers, along with deputies, will be pleased to give assistance. A list is published regularly in *RadCom* (see October 2003 page 12 and in the *Yearbook* (see pages 38 - 46 in the 2004 *Yearbook*).

EMC Co-ordinators and the Technical Help Scheme: We have an excellent team of volunteers who, for many years, have been able to help members with EMC technical problems. Although they tend to specialise in EMC, they also have a very wide range of knowledge in other aspects of the hobby and they may be able to help you.

However, before you contact an EMC Co-ordinator:
1. Make sure that you have done everything possible to solve the problems yourself, including reading the available literature as already suggested.
2. Arm yourself with as much information as possible that will be useful to the co-ordinator.
3. Remember that the co-ordinator is a volunteer, so please ring at sociable times.
4. The scheme only offers telephone advice and our co-ordinators only accept incoming 'phone calls. If the Co-ordinator calls you back on any occasion, please offer to ring off and ring them back. Asking us to call mobile numbers is not kind or helpful! No house visits will be made.

The list of EMC / Technical Advisors who have kindly agreed to help operate the new Technical Help scheme can be found on page 88 of the 2004 *RSGB Yearbook*, on the RSGB 'Technical Help' website at www.qsl.net/rsgb_emc/TechnicalHelp.html or from the scheme's coordinator, Charles Elliott, G4UJW (QTHR); e-mail: celliott@screaming.net

Next year's RSGB President, Jeff Smith, MI0AEX, taken during a recent visit to RSGB HQ.

VHF AWARD NEWS

After several lean months October resulted in a 'bumper harvest' with a total of 35 separate awards being issued. Successful 50MHz claims arrived from friendly rivals Doug Rolph, G0UYC (NR), who gains a sticker for 550 squares, and from David Jarrett, G4DCJ (PE), who gains a sticker at the 525 square level. Grant Wilson, MM5TGW (G61), gains his sticker for 50 countries.

From Guernsey, Mike Johnson, GU6AJE, makes successful claims for both countries (40 - 60) and for squares (125 - 300). He also claimed for his maritime mobile operations in 2001 aboard MV Greenpeace and in 2002 aboard MV Esperanza, which enabled many 6m enthusiasts to work those rare 'wet squares'. Here Mike gained certificates and stickers for 10 and 20 countries and also for 25 and 50 squares. Full details of these activities can be found on Mike's website at www.gu6aje.thersgb.net/gu6aje/mm2001/gu6ajemm.htm (and mm2002).

Regular claimant Frank Howe, G3FIJ (CO), gains a sticker for 175 squares. Frank comments as do many claimants of the slow progress on some of the other VHF / UHF bands.

In the final hours of the month a claim was received from Richard Paul, G7KMZ (BS), which successfully starts him on the first rung of the 50MHz countries ladder with a certificate and sticker for 10 Countries.

Activity has not been confined to 50MHz because from David Hilton-Jones, G4YTL (MK), came a three band claim beginning with 70MHz where David gains a sticker for 55 squares and 10 countries. Derek, G8TOK, gains a sticker for 375 squares and upgrades his 1296MHz square score to 30.

On 144MHz David moves to the 550/60 level with a country total looking somewhat like a 50MHz list! It wasn't quiet on 432MHz either, here David took full advantage of his EME interests with successful claims at 110/15 and 120/18 squares /countries - the first at these levels since 1994 and 1996.

At almost the other end of our spectrum came a bumper claim from John Wood, G4EAT (CM), who sent 50 valid cards for 10GHz contacts. This initial claim from John for the band has enabled him to leapfrog everyone else to take a leading position. Many of these were for contacts during this current year which underlines the excellent conditions there have been on the higher frequencies. John comments that "It took three years to work the squares and then a lot of effort to chase the cards!" A few days later a 1296MHz Distance claim was received from John for a CW contact with SK0UX in JO99, a distance of 1394km.

Details on all VHF, UHF and Microwave Awards can be obtained on receipt of an A4 or A5 SASE from the Awards Manager, Tony Jarvis, G6TTL (QTHR).

RSGB Bookshop

RSGB YEARBOOK 2004

The 2004 edition of the RSGB Yearbook is bigger than ever. with more pages in the information section and more colour pages. Every page has been reviewed and updated from last year. The Yearbook reflects the current state of the hobby, with pages devoted to contesting, awards, satellites and propagation. Plus the mass of information you have come to expect, and the most accurate and comprehensive UK and Eire callsign listings.
All-in-all it adds up to a reference book that no radio amateur should be without. Everything you need at your fingertips, and with 472 pages excellent value.

£14.44
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CALLSEEKER PLUS 2004 CD

Callseeker Plus is the popular CD version of the RSGB Yearbook with a powerful callsign search facility. Plus all the pages of the Yearbook are available in PDF format. A sophisticated yet easy to use Eurocall search program is provided to access the callsigns contained. Callseeker Plus 2004 provides the ideal medium for rapidly searching for all or part of a callsign, postcode, name, town, keyword etc.

DELUXE LOG BOOK 2004

The Deluxe Log Book is back! Designed for those requiring more from their Log Book, we have produced the popular 2004 Deluxe Logbook & Diary. Containing far more than a standard Log book this edition has been thoroughly revised and updated. Amongst its many features is a new style DXCC prefix guide with an extremely useful twelve-band checklist. A 2004 diary section is included along with a brand new repeater listing.

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ADVANCE!

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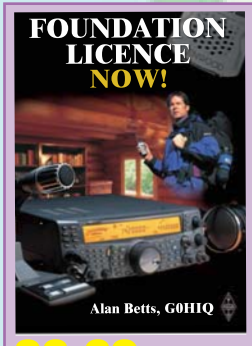

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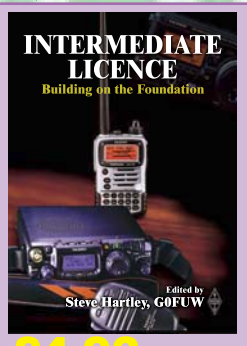

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- MC-60A Desk Microphone
- SP-23 Desk Speaker
- ARCP-2000 Control Software

RRP: £2301.79

ML&S: £2169.00

ZERO DEPOSIT 36 x £78.86

The remote controller RC-2000 is also available at £209.95

New! Kenwood TS-480SAT/SX

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As a go-anywhere HF/50Mz all-mode transceiver, Kenwood's new TS-480HX/TS-480SAT is well ahead of the pack when it comes to advanced electronic engineering, convenient features and ease of operation.

200W output (50MHz: 100W) DC 13.8V operation: The TS480HX is a highly portable rig offering 200W output (50MHz: 100W) - making it ideal for both base station and DX'ing applications. 100W model: The 100W TS-480SAT is additionally equipped with a built-in automatic antenna tuner.

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(TAP £2186.64, 26.9%APR)

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- TS-480SAT 100W version c/w ATU
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RADIO COMMUNICATION

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RadCom is published by the Radio Society of Great Britain as its official journal on the first day of the relevant month and is sent free and post paid to all members of the Society.
Closing date for contributions, unless otherwise notified, is five weeks prior to publication date.

Designed and printed by Space Matters,
60 Borough High Street, London SE1 1XF.

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HamClub (under 18)	£18.50
Affiliated Societies (UK or Overseas)	£42.50

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Special arrangements exist for blind and disabled persons. Details and membership application forms are available from RSGB HQ.

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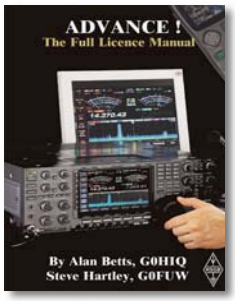

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p32 – Danny Weil, VP2VB/MM. See 'HF' on pages 32-34.

News and Reports

Review

Down To Earth – Amateur Radio From The Ground Up

Technical Features

Regulars

Extreme Solar Activity Disrupts HF Radio Traffic

Giant Sunspots, Solar Flares, CMEs and Auroras

The end of October saw a period of extreme solar activity almost unprecedented at this stage of a solar cycle, about two years *after* the supposed peak in activity. A large sunspot group was joined by an even larger one which rotated into view on 23 October, causing the solar flux to rise dramatically from 135 on 20 October to 298 by the 26th.

One of the most powerful solar flares ever recorded erupted from the giant sunspot group on 28 October. According to the Space Weather website (http://spaceweather.com), the blast measured X17 and, as a result of the explosion, a severe S4-class solar radiation storm took place. The explosion hurled a coronal mass ejection (CME) towards earth at a speed of nearly 5 million MPH.

The effect on HF radio conditions was of a period of exceptionally good propagation which coincided with the *CQ* World Wide DX phone contest on 25 / 26 October, followed a couple of days later by almost completely dead bands as the CME swept past earth. The CME triggered radio and visual auroras, although due to cloud cover only a lucky few were able to witness the Northern Lights display. BBC Radio 4 news reported that the solar storm forced aircraft flying the North Atlantic route to take a much longer more southerly path in order to maintain radio communications. The severity of the storm was also reported on BBC TV and CNN news.

The photograph of the sun was taken not by NASA using sophisticated satellite equipment, but rather by Steve White, G3ZVW, in his front room! Steve writes, "The technique is not new; it involves using one side of a pair or binoculars (or a telescope) as a projector. Take a sheet of cardboard and cut a hole in it just big enough for one side of the binoculars to see through. Fix it to the binoculars with 'blu tac' or sticky tape. Mount the binoculars on a tripod and adjust to face the sun. As you adjust the tripod you will see the sun shining through the lens. The sun is so bright that particles of dust on the lens allow you to see this quite clearly, even though you are at an angle to the lens and a few feet away (*never* look through binoculars directly at the sun!) Adjust the binoculars so that the sun appears directly in the middle of the lens, then place a sheet of white cardboard a few feet behind the binoculars and focus the image on to it. A darkened room works best and will give a clear and bright image several inches across. The camera used to take the photo was a Fuji S602 Pro (3.3 megapixel digital). The focal distance was about 50cm."

PHOTO: STEVE WHITE, G3ZVW

The sun, showing giant sunspot groups, taken in north London on the morning of 30 October.

Amateur Radio in Rescue Attempt

Richard Pullen, G0OII, who works as a volunteer driver for York District Hospital, recently set out on a routine journey from the hospital with a patient-passenger. On the B1363 near Oswaldkirk they came across a serious road traffic accident. A motorcyclist lay seriously injured beside his bike and partially under a car. Richard's early first-aid training "just came back". After making the unconscious patient comfortable, he sought the co-operation of bystanders to perform traffic-duty at approaches to the junction. There was no mobile phone coverage at the scene from any of the national cellular networks and an ambulance was vital, so Richard put out a call through the GB3YC repeater near Driffield. He was answered by Roger Ingle, G7MZE, who was driving through Hull and who phoned for the ambulance. Within minutes paramedic units arrived, followed by fire service vehicles, the Northern Air Ambulance helicopter and five police cars. Unfortunately, Richard's quick thinking could not save the motorcyclist and, sadly, the man did not survive his ordeal.

PHOTO: R J WALLACE, BRS40536.

GB3YC and G0OII also featured in *RadCom* in July 2001, when the repeater's coverage allowed Richard to alert the fire services to a serious fire on the North Yorkshire Moors.

PHOTO: KEIKO IMAMURA

To the left you can see Satoshi 'Vic' Imamura, JA5VQ, recently spent six months in Edinburgh during which time he sat the RAE and took out the UK call MM0JVQ. He is seen here using his new callsign from the shack of Lothians Radio Society president Toby Sigouin, MM0TSS. Vic's wife Keiko also holds a Japanese amateur radio licence. They returned to Japan in October when their tourist visas expired, but hope to settle in Scotland if they can obtain retirement visas.

Busy Month for Lancashire Raynet Groups

On 1 October Lancashire Emergency Planning called out Fylde Coast Raynet at midnight to attend a rest centre in Blackpool. Central Lancs Raynet was also put on stand-by. About 500 people were being evacuated because a fire at a garage in the town caused the possibility that gas canisters stored there could explode. Between 3 and 9 October, Lancashire Raynet was on stand-by during the Conservative Party Conference at Blackpool.

On 17 October Emergency Planning called Rossendale Raynet out to attend at a rest centre in Nelson, when a suspected explosive device had been found in a house in the town and the occupants of 60 houses nearby were being evacuated. Later, officers from the bomb squad declared that the device had not been active. As Chas Warr, G0AWM, County Controller, Lancashire Raynet says, "Quite an interesting month! We were pleased to find out our callout systems worked as they were designed to."

Telford Rally on Digital Satellite TV

In what is almost certainly a 'first' for any UK radio rally, a short TV programme about this year's Telford Rally will be broadcast to the UK and Europe on SM6CKU's 'Club TV' via digital satellite. The broadcast is on 29 November at 1000UTC. The programme was produced by Wayne, M5WJF, and includes the RSGB President, Bob Whelan, G3PJT, drawing the winning raffle prize, and excerpts from the RSGB Open Meeting, at which visitors to the rally put their questions to a panel from the Society.

In order to receive the broadcast, you will need to tune to the Sirius 2 satellite at 5 degrees east. A 1m dish and universal LNB is required. You should set the digital satellite receiver to: 12.590GHz, vertical polarisation; Symbol Rate: 6667; FEC: 1/2; VPID: 4130; APID: 4131; PCR: 4130. Further details of SM6CKU's Club TV station can be found by visiting his website at www.parabolic.se

NEWS BRIEFS

- At the Radio Amateurs' Emergency Network's AGM on 1 November, the Network's Raynet Trophy was presented to Bill Mahoney, G3TZM. The trophy is presented annually to the individual or group who, in the view of RAEN's National Committee, is considered to have provided services beyond the call of duty in the furtherance and aims of the organisation. Bill is the Public Relations Officer for the Network in the West Midlands and also Deputy Chairman of the RSGB Repeater Management Committee.

- The UK and European distance record for laser communications was broken on 8 October - by the same team that set the previous record! David, G0MRF, at Butser Hill in Hampshire and Allan, G8LSD, in the Ashdown Forest in East Sussex, completed a contact on a wavelength of 670 nanometres over a distance of 76.1km. G8LSD used a 3mW laser diode to a beam expander with a Burr-Brown detector as a replacement eyepiece for a Russian 4.5in reflector telescope as a receiver. G0MRF used a 10mW laser diode without beam expander and, on receive, a wider-bandwidth OPT210 detector. The contact was made more difficult due to poor weather conditions prevailing on the night. The previous record, 49km, was set by David and Allan on 5 April.

Hams in Space

With the arrival of the Expedition 8 crew and a European Space Agency astronaut on 20 October, there were, for eight days, no fewer than five radio amateurs on board the International Space Station. British-born astronaut and Expedition 8 Commander Mike Foale, KB5UAC; Russian cosmonaut Alexander Kaleri, U8MIR; and Spanish astronaut Pedro Duque, KC5RGG, joined the Expedition 7 crew - Yuri Malenchenko, RK3DUP, and Ed Lu, KC5WKJ - after their *Soyuz* transporter rocket docked with the ISS.

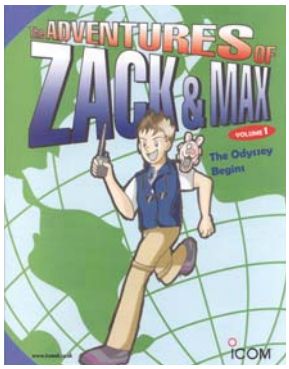
Pedro spent eight days in space before returning to earth with Malenchenko and Lu in the *Soyuz* vehicle. During his week in space he was scheduled to make two amateur radio contacts with schools in Spain using the callsign ED4ISS.

Mike Foale and Alexander Kaleri will spend the next six months on board the ISS.

NASA PHOTO BY BILL INGALLS

Left to right: Expedition 8 Commander Mike Foale, KB5UAC, cosmonaut Alex Kaleri, U8MIR, and European Space Agency astronaut Pedro Duque, KC5RGG, during a pre-flight briefing at the Baikonur Cosmodrome in Kazakhstan.

The Adventures of Zack and Max



Icom (UK) has introduced an amateur radio comic book called *The Adventures of Zack and Max*. The comic follows young Zack, his father, and Zack's introduction to amateur radio. The story provides basic information about amateur radio, gives a glimpse into its history, its applications and its relevance in the world today - in a contemporary and fun way. The comic is illustrated in the popular Japanese comic book style, but is written for a UK audience and includes information on the Foundation Licence and contact details for the RSGB and UK amateur radio dealers.

Ian Lockyer, Marketing Manager at Icom (UK), said, "If you intend to put on a special event station, intend visiting schools or clubs, contact Icom marketing at marketing@icomuk.co.uk and we will send you a quantity of comics to circulate, subject to demand." It is also available on the Icom (UK) website at www.icomuk.co.uk

Settle Down Now!

GB2SCL (Settle-Carlisle Line) was on the air from Ribblehead station platform, 1000ft up in the Pennines, on 11 October. While the rest of the country was basking in sunshine, intrepid operators Jack, G0FQN, and Mark, G1PIE, had to shelter under an umbrella as the clouds came down and enveloped them in misty drizzle. The highlight of the operation was when the *Duchess of Sutherland* passed by, allowing numerous amateurs listening on 40m to witness the nostalgic sound of a steam locomotive 'live'.

Jack, G0FQN, says that although they made 277 contacts, they wished they could have stayed longer because the pile-up was still as big as at the end of the day as it had been at the beginning. However, with a maximum temperature of 7 degrees and sitting in thick cloud, they were "frozen to the marrow and wet through". GB2SCL will be back on the air from Ribblehead station on 29 November.

PHOTO: PAM, 2E1HOY

G0FQN and G1PIE at GB2SCL on Ribblehead station platform. In the background, a fishing pole lashed to the platform railings supported a 40m dipole.

NEWS BRIEFS

- Amateur Radio Emergency Service and Radio Amateur Civil Emergency Service teams in California were activated to assist local authorities and relief organisations as the wind-driven fires caused devastation across the southern half of the state. ARRL San Diego Section Manager, Kent Tiburski, K6FQ, said that around 100 amateurs participated, many supporting relief agencies such as the Red Cross and the Salvation Army. Radio amateurs were also deployed in San Diego-area emergency management offices and hospitals. The majority of support communications was on VHF, although amateurs in San Diego made use of 7233 / 3905kHz because fires compromised or damaged some repeaters.

- The Five Star DXers Association (FSDXA), has announced plans for a very large-scale DXpedition to Rodrigues Island in March / April 2004. The callsign will be 3B9C. A team of nearly 30 will operate no fewer than 15 separate stations on virtually every band and mode imaginable - including SSB, CW, RTTY, PSK31, FM, satellites and possibly even EME - for nearly four weeks. Further details will be published in RadCom closer to the time.

- On 14 October at 2300UTC, Laurie Mayhead, G3AQC, completed a 136kHz to 7010kHz crossband QSO with Peter Dodd, G3LDO, who was operating as CN2PD from Marrakech in Morocco. The CN2PD rig was an IC-706 to a 20m doublet, using a small ATU with two G0MRF 136kHz amplifiers for LF receive. A laptop with ARGO software was used to decode G3AQC's QRSS20 signals. It is believed to be the first time a complete callsign has been received on 136kHz in Africa.

- Papua New Guinea is the latest country (and the first in Oceania) to drop the Morse code requirement for HF band operation. Rick Warnett, P29KFS, the IARU representative of the PNGARS, says the decision was taken by PNG's telecommunications administration, Pangtel, on 6 October. Around 30 - 40 P29 amateurs now have access to the HF bands.

- The next World Radiosport Team Championship (WRTC), will be held in Brazil in 2006. The last such event was in Finland in July last year. WRTC brings together the top HF contesters from all over the world to compete on - as far as is possible - a 'level playing field'. The event is open to all: competitors and spectators alike.

Club & Regional News

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.

Region 1: Scotland West & Western Isles

AYR ARG
3, Digital imaging. 17, Surplus equipment sale. John, MM1JAS, 01292 445599.

PAISLEY (YMCA) ARC
10, Social evening. 24, Christmas break. Jim, GM3UWX.

Region 2: Scotland East & the Highlands

COCKENZIE & PORT SETON ARC
5, Normal club night'. 6, Club Christmas meal. Bob, GM4UYZ, 01875 811723.

LOTHIANS RADIO SOCIETY
8, 'How Antennas Radiate', Brian Flynn, GM8BJF. Toby, MM0TSS, 07739 742367.

Region 3: North West

FYLDE ARS
4, Christmas party. Ken, G3RFH, 01253 823957.

MID-CHESHIRE ARS
3, HF on air. 10, VHF on air. 17, Cheese and wine tasting. Niall, G0VOK, 01606 871413.

SOUTH MANCHESTER R & CC
5, Visit from RSGB Regional Manager Kath Wilson & DRRM Dave Wilson. 12, Discussion on Intermediate Course. 19, Club's Christmas Party. Ed, 0161 969 1964.

STOCKPORT RS
2, AGM. 16, 'Coffee and Cakes', DXpedition video. David, M1ANT, 0161 456 7832.

THORNTON CLEVELEYS ARS
1, On air. 5, Christmas dinner. 8, Video evening. 15, Christmas Party. 22, No meeting. Jack, G4BFH, jack@jduddington.fsnet.co.uk

Region 4: North East

EAST YORKS ARS
12, Pre-Christmas Buffet and social. David, G4EBT, 01482 876702.

EAST YORKS REPEATER GROUP
5, AGM. Andy, G0VRM, 01430 801122 or Richard, G7MFO, 01482 898559.

GREAT LUMLEY AR & ES
10, Christmas meal. Nancy, 0191 447 0036 or 07990 760920; nancybone2001@yahoo.co.uk

HALIFAX & DARS
16, Christmas buffet & quiz, Royal Oak, Clare Road, Halifax. Tom, M0TKA, 01484 715079.

HORNSEA ARC
3, Antenna workshop report. 10, ATV. 17, Christmas Party. 24, 31, No meeting. Richard, G4YTV, 01964 562498,

NORTH WAKEFIELD RC
4, Curry evening, Pete,G0WXG, chef. 11, Visit West Yorkshire Astronomical Society & Pontefract ARC. 18, 'Digital Modes', Conrad, G0RUZ. www.g4nok.org

SHEFFIELD ARC
1, 8, 15, 22, Club nights'. Nick, G4FAL, 0114 255 2893.

WAKEFIELD & DRS
2, Quiz night & Bingo with prizes. 6, Rally meeting. 9, 'Building web pages', G0BQB. 13, Ten-pin bowling. 16, Christmas social evening. 20, On air. 23, No meeting. 27, RSGB video. 30, Meet at *Queen's Arms*, Denby Dale Road. Rick, G4BLT, 01924 255515, www.wdrs.org.uk

Region 5: West Midlands

BROMSGROVE ARS
9, Last meeting of year. Angus, G8DEC, 01527 875573.

CHELTENHAM ARA
5, AGM and social evening. Ivan, G4BGW, 01452 731956, ivan@g4bgw.freeserve.co.uk

GLOUCESTER AR & ES
1, 'Another Man's Hobby'. 8, HF on air & workshop. 15, Christmas buffet. Tony, 01452 618930 office hours.

HILLCREST ARS
4, Anaesthesia for the curious. 18, Christmas party. Stuart, M0SJV, m0sjvstuart@supanet.com

KIDDERMINSTER & DARS
2, Christmas social evening. Tony, G1OZB, 01299 400172.

MID-WARWICKSHIRE ARS
9, Christmas meeting. Bernard, M1AUK, 01926 420913.

SALOP ARS
4, Social: Christmas Cracker Family Quiz. 11, Social: Christmas Party, TBC *Tankerville Arms*. 18, Mince pies. John, G0GTN, 01743 249943.

St LEONARDS ARS
4, 'ATUs: Types and Power Losses', Graeme, G4NVH. 11, Planning meeting. 18, Christmas social evening & festive food. Derek, G0EYX, 01785 604904.

STOURBRIDGE & DRS
15, Christmas gathering, Old Swinford Hospital School, Heath Lane, Oldswinford. John, M1EJG, 01562 700513.

STRATFORD UPON AVON & DRS
8, Surplus sale. 22, 'Festive Natter Night'. 25, Christmas greetings on the air 145.275MHz. Terry, G3MXK, 01789 294387.

TELFORD & DARS
3, Open Evening, on air. 6, RSGB AGM, Priorslee Hall, University Campus, Telford. 10, '2.4GHz Pringles!' - Chairman's mystery project. 17, Christmas dinner. 24, 31, No meetings but members' nets on 144.6MHz / TF 433.2MHz. Mike, G3JKX, 01952 299677.

Region 6: North Wales

CONWY VALLEY ARC
3, Icom 756 ProII, John, GW3VVC. Wynne, GW6PMC, 01745 855068.

DRAGON ARC
1, No meeting, club hosting the RAE. 15, Christmas party. Stewart, GW0ETF, 01248 362229.

MEIRION ARS
4, 'MARS into 2004': the way forward. Martyn, GW4XZJ, 01654 782619.

WREXHAM & DARS
2, Christmas buffet (members only). Mark, MW3MDH, www.qsl.net/wars

Region 7: South Wales

No club details received.

Region 8: Northern Ireland

BANGOR & DARS
3, 'Effects of Solar Weather on Propagation', Prof Brian Gilbody. Mike, GI4XSF, 028 4277 2383.

Region 9: London & Thames Valley

AYLESBURY VALE RS
10, Chairman's mince pies. Roger, G3MEH, 01442 826651, roger@g3meh.fsnet.co.uk

BROMLEY & DARS
16, Mince pies. Alan, G0TLK, 0208 7770420.

COULSDON ATS
8, AGM. Steve, G7SYO, 01737 354271.

DORKING & DRS
5, Annual dinner. 16, Social evening with refreshments. John, G3AEZ, 01306 631236.

MAIDENHEAD & DARC
16, Christmas quiz & construction competition. John, G3TWG, 01628 525275.

RS of HARROW
5, Construction contest. 12, Informal. 19, Christmas social. 26, No meeting. Jim, G0AOT, 01895 476 933 or 020 7278 6421.

READING & DARC
11, AGM, followed by refreshments & beer vouchers! Pete, G8FRC, 0118 969 5697.

STEVENAGE & DARS
2, Members' discussion. 6, 7, Foundation Course. 9, Operating: M3 tuition. 16, Christmas supper. 23 to 30, Club on air, 2m. info@sadars.org

SURREY RCC
1, 'The Good Life', Gareth, G4XAT. Ray, G4FFY, 020 8644 7589.

SUTTON & CHEAM RS
11, Christmas junk sale. John, G0BWV, 020 8644 9945.

WIMBLEDON & DARS
12, Christmas social. Jim, G4WYJ, 01737 356745.

Region 10: South & South East

ANDOVER RAC
2. AGM. 9, Christmas dinner. Terry, G8ALR, 01980 629346.

BASINGSTOKE ARC
1, Families' night, John Carrick-Smith quizmaster. Peter, M1DGQ, 0118 983 6545.

FAREHAM & DARS
3, On air. 17, Mince pies, short talks. Steve, G7HEP, 01329 663673.

FARNBOROUGH & DRS
10, Club dinner. Norman, G0VYR, 01483 835320.

HARWELL ARS
9, AGM. Angus, G0UGO, hars.g3pia@tiscali.co.uk

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HASTINGS E & RC
17, No meeting. R C Gornall, G7DME, 01424 444466.
HORNDEAN & DARC
2, Social evening. Stuart, G0FYX, 023 9247 2846.
ITCHEN VALLEY RC
12, 'Christmas Cheere'. Sheila, G0VNI, 023 8081 3827, sheila.williams@ivarc.org.uk
SOUTHDOWN ARS
1, Christmas social, talk on Christmas by Daphne Burton. John, G3DQY, 01424 424319.
SWINDON & DARC
4, 'An Outline of Power Generation', Dennis, G3LLZ. 11, Christmas dinner. 18, Inter-club fun quiz. Den, M0ACM, 01793 822705.
TROWBRIDGE & DARC
3, Christmas party & presentation night. Ian, G0GRI, 01225 864698 evenings/weekends.
WORTHING & DARC
3, History of ATV in Sussex. 10, Christmas quiz. 17, Christmas party, club awards. Roy, G4GPX, 01903 753893.

Region 11: South West & Channel Islands

APPLEDORE & DARC
15, Christmas party. Brian, M0BRB, brian.jewell@ic24.net
BRISTOL ARC
4, Round table (aerials). 11, Make a 6m J-Pole or 6m net. 18, Club nostalgia, slide show. 25, No meeting. Dave, G7BYN, 01454 883720.
CITY OF BRISTOL RSGB GROUP
8, Grand Christmas party. Martyn, G3RFX, 01225 420442.
CORNISH RAC
4, Christmas party. John, G4LJY, 01872 863849.
EXMOUTH ARC
10, Christmas party. Mike, G1GZG, 01395 274172.
SOUTH BRISTOL ARC
3, Computer clinic. 10, Construction night. 17, Christmas social. Len, G4RZY, 01275 834282.
WEST SOMERSET ARC
2, Quiz night. Jean, G0SZO, 01984 633060.
YEOVIL ARC
4, Another of Bob's valve projects, G7LNJ. 11, Video: British WWII Propaganda. 18, 'Mince pies on the air'. 25, No meeting. Derek, M0WOB, 01935 414 452, m0wob@tiscali.co.uk

Region 12: East & East Anglia

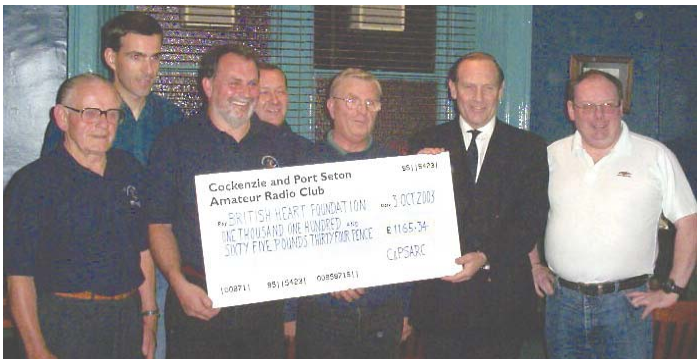
CAMBRIDGE & DARC
5, 'Parachuting', David Lincoln. 12, Christmas party. Ron, G3KBR, 01223 501712.
CHELMSFORD ARS
2, Talk on Raynet, Nigel Hull, G6ZVV (TBC). 19, Christmas dinner, *The Anchor*, Runsell Green. George, G3UTC, 01277 622707, george3utc@btopenworld.com
COLCHESTER RADIO AMATEURS
4, 'Working the rare ones', James, M0ZZO, at St Helena's School. 18, Christmas Inter-Club Convention, at Institute Abbeygate Room. James, M0ZZO, 01255 242748.
FELIXSTOWE & DARS
1, 'Digital Regenerative Nodes'. 15, Christmas noggin, video & mince pies. Paul, G4YQC, paul.whiting@bt.com
HARWICH AR INTEREST GROUP
10, AGM, Christmas party. Eugene, G4FTP, 01206 826633.
LOUGHTON & EPPING FOREST ARS
12, Christmas meal. 26, Meeting at *Robin Hood* pub. Marc, 0208 502 1645 or 07743 456058.
NORFOLK ARC
3, Informal, CW instruction. 10, Christmas dinner. Reg, G0VDO, 01603 429269.

Region 13: East Midlands

EAGLE RADIO GROUP
6, Christmas dinner. 9, AGM and review of year. Terry, G0SWS, 01507 478590.
LINCOLN SW CLUB
10, Annual dinner. 17, Christmas quiz. 31, TBA. John, G1TSL, 01522 793751.
LOUGHBOROUGH & DARC
2, Film can project competition - have you an entry? 9, Fun quiz - another Ian special! 16, Pre-Christmas drink at *Black Swan*, Shepshed. 23, No meeting. Chris, G1ETZ, 01509 504319.
MELTON MOWBRAY ARS
6, Christmas dinner. 19, Mini talks, presentation of trophies, raffle. Phil, G4LWB, Phil@croxtonkerr.fsnet.co.uk
SHEFFORD & DARS
4, 'Oscilloscopes' demonstration. 18, Mince pies evening. David, G8UOD, 01234 742757.
SOUTH NORMANTON, ALFRETON & DARC
1, Christmas party: all family welcome. 8, Construction night: make 2m or 70cm vertical. 15, Santa's junk sale. 22, On air: Christmas greetings. 29, On air: New Year greetings. Russell, 01773 783394 or Mike, 01949 876523.
SOUTH NOTTS RC
3, Open forum, members only. 12, 'Aerial Analyser Construction', John, G4EDX. 17, Sherry & mince pie evening, all welcome. 25, Christmas Day net on 2m, 12.00 noon. Secretary, 01509 569746.

Presentation to British Heart Foundation

The Cockenzie & Port Seton Amateur Radio Club's annual official presentation of the money raised during the year took place on 3 October. Iain Lowis, Director for Scotland for the British Heart Foundation (BHF) accepted a cheque for £1165.34 from the club's chairman, Bob Glasgow, GM4UYZ. Over the past 10 years the club has now raised a total of £9436.51 for the charity. Bob Glasgow, GM4UYZ, said, "It is great to see that something good can be put back into the community from this tremendous hobby. The hobby takes many knocks from people who are not prepared to do anything for it. So to all amateurs: don't knock the hobby, think positive and drive this hobby forward in a positive light."



Left to right: Bill Gordon, MM0BXK; Colin Smith, GM0CLN; Bob Glasgow, GM4UYZ; Cambell Stevenson, MM0DXC; Tom Hood, GM4LRU; Iain Lowis of the BHF; Peter Easton, GM1RCP.The 16 successful candidates at the IOMARS on 21 September.

Farewell to GM3WOJ

Members of the North of Scotland Contest Group, GM7V, and the GMDX Group recently held a farewell dinner to bid *bon voyage* to Chris Tran, GM3WOJ / ZL1CT, prior to his emigration to New Zealand in October. Chris was presented with a gift of a de luxe Morse key to thank him for his friendship and contribution to amateur radio. Chris Tran has been has been an inspirational radio amateur in Scotland with a substantial involvement in the development of 50MHz activity since becoming one of the original permit holders on the band. For many years GM3WOJ was a consistent contest leader on 70MHz during his time as leader of the South of Scotland VHF Contest Group. Following a move to Easter Ross, Chris formed the North of Scotland Contest Group and specialised in organising UK record breaking multi-operator multi-transmitter international contest entries using the GM7V callsign. His location near Tain has also been used on numerous occasions on behalf of the RSGB with entries in the IARU HF Contest using GB5HQ.

17-year old WACRAL member Peter Goodhall, M3PHP, holding his certificate for helping with the presentation on the history of WACRAL.

WACRAL Annual Conference

Members of the World Association Of Christian Radio Amateurs And Listeners (WACRAL) met at the Hayes Conference Centre, Swanwick, Derbyshire over the weekend of 26 - 28 September for the association's annual conference. The Friday evening lecture was given by WACRAL member Rev George Dobbs, G3RJV, the founder of the G-QRP Club, who gave an informative talk on 'minimalist radio'. George later lead the group in evening prayers.

The WACRAL AGM took place on the Saturday morning. Victor Brand, G3JNB, stepped down as publicity officer after many years service and members elected Paul Goodhall, M3JFM, to the role. Paul and his son Peter, M3PHP, also gave a talk and presentation on the history of WACRAL. Other highlights were Harry Bellfield, G3SBV, presiding over the famous WACRAL 'silly price auction', and the conference construction contest for the best-constructed Howes 80m receiver, which was won by Richard Paul, G7KMZ. Alistair McGoff, M3BIB, was awarded a certificate of merit for his very first attempt at construction. The Sunday morning church service was lead by WACRAL President, Rev Phyl Fanning, G6UFI. ▶

New Club Training Materials Website

The Chelmsford Amateur Radio Society will have an additional website available from mid-November. This site will contain all the tuition material, such as Power Point slides, that the club has developed for use in its Foundation and Intermediate courses. This material is being made available for anyone to download to help encourage more clubs to set up courses. The files may be downloaded from http://www.qsl.net/g0mwt Anyone wishing to enrol in one of the club's Foundation or Intermediate courses, which are held on Thursday evenings in Danbury Village Hall, should contact the training officer, Clive Ward, M0SIX, tel: 01245 224577 or 07860 418835; e-mail: training@g0mwt.org.uk

M3s Form New Amateur Radio Club

The RSGB welcome the former Charlie Delta CBers club' (www.cqdx.co.uk) which has been re-born by an enthusiastic group of local amateurs, mostly M3s, as the Charlie Delta ARC' (CDARC), callsign M0DXA. The club meets every Monday at the *New Junction* pub on Forge Road, Darlaston, near Wednesbury in the West Midlands, which is in RSGB District 51. Doors open at 7.00pm. The club has affiliated to the RSGB and will be conducting Foundation courses under the watchful eye of Barry Fox, G0OJR, its Lead Instructor. Plans are also in place to conduct Intermediate courses, as the M3 members are keen to move on to higher things as soon as possible! For further details please contact Dave, M0DCM, tel: 01902 635244, or e-mail m0dcm@blueyonder.co.uk

Just a part of the Norfolk ARC display at the Police Gala Day.

Norfolk ARC Brings the World to Police Gala Day

Members of the Norfolk Amateur Radio Club (www.norfolkamateurradio.org) put on a giant display for the public at the Police Gala Day held at the Norfolk Showground on 7 September. This annual family day out is the largest event of its kind in the country, with exhibitions, attractions and shows for all ages. The Norfolk club decided to grasp the opportunity for the first time to fill a 30x10m area with a live display of virtually every strand of the amateur radio hobby, including satellite, ATV, construction, packet data and SSTV. The police allowed members to camp on the site over the weekend so that the club could enter the 24-hour SSB Field Day event from its new Mobile Amateur Communications (MAC) vehicle. Using a Kenwood TS-570 rig and an aerial farm of no fewer than five masts up to 15m high over 350 contacts were made, from Ireland to Iraq.

Budding radio enthusiasts had a chance to build their own microchip radio for just £5, while in the marquee a display of very old to very new radios was on display. The RSGB's GB4FUN vehicle was there to show the many aspects of modern amateur radio and satellite. A fully-equipped Raynet Freelander and Gold Wing motorbike were also on active display.

As well as the public displays, the club used the opportunity to test the practical skills of its seven new Foundation licensees. 27 of the club's members took an active part in the gala weekend and nine new members were enrolled, taking the club's membership to over 80.

Pembrokeshire Radio Society Keeps it in the Family

A recent Foundation course at the Pembrokeshire Radio Society resulted in a 100% pass rate for students Stuart Reed (12), Sian Reed (12), Sarah Reed (16), Helen Lee and Jack Lee (9). Stuart, Sian and Sarah are brother and sisters while Helen and Jack are mother and son. All of the candidates are hoping to take the Intermediate level in the near future, and then onwards and upwards to the Full exam.

Impressive IRLP Demo

Recent visitors to the West Manchester Radio Club were Kath, M1CNY, the RSGB Regional Manager for the North West; her husband Dave, M0OBW, Chairman of the UK FM Group (Western), of which Kath is also the Membership Secretary; Ian, G4ZPZ; and Tim, VA3TJS, from London, Ontario. A really excellent presentation and discussion on the Internet Radio Linking Project took place involving an audience of around 60 members. Dave and Kath spoke on the history and problems encountered in the early days using this mode.

Ian, who is NoV holder and Repeater Keeper for GB3PZ - a dedicated Internet-linking repeater and one of the repeaters administered by the UK FM Group (Western), showed slides and explained the system requirements and operating procedures. The talk was accompanied by a practical demonstration, which was highly successful, Tim making contact with several stations, including friends from back home in Ontario, Canada.

The West Manchester Radio Club meets every Thursday evening at the Miners' Welfare Club in Gin Pit Village, Tyldesley, Manchester and new members and visitors are always welcome. Further information from Les, G4HZJ, g4hzj@ntlworld.com

HMS Collingwood Visit for Braintree Club

Seven members of the Braintree and DARC recently paid a visit to the Museum of Communication and Radar which is housed within the HMS Collingwood naval base at Fareham, Hants. The group arrived at 10.00am and spent well over two hours looking over the exhibits before retiring to the Officers Mess for lunch. The afternoon was spent looking round the Historic Dockyard in Portsmouth. The Museum is open to visitors, by arrangement, tel: 01329 286262 for details or see www.recelectronics.demon.co.uk/collingrad.htm

Left to right: Ray, G0JVE, of the Museum; Braintree Club Members Jim, G0DCR; Dave, G0DEC (Chairman); Geoff, G0BYH; Keith, G4MIU; Martin, M0FAQ; Barrie, G6KJR; and front: Ben, M3EUO.

First CW-Only 'Chelmsford Award' is Issued to Foundation Licensee

Since gaining his Foundation licence, Chelmsford Amateur Radio Society member Ron Ingate, M3CAM, has been very active on CW and can now copy Morse at up to 20WPM. He recently submitted the first-ever all-CW claim for the 'Chelmsford Award', which is available to all amateurs / SWLs, the proceeds being donated to the Essex Air Ambulance. For further details contact CARS Awards Manager Martyn Medcalf, G1EFL, tel: 01245 469008 or e-mail: awards@g0mwt.org.uk

500 ATC Cadets Learn About Radio through GB4FUN

GB4FUN AT PETERLEE

For many years the Peterlee Amateur Radio Club has put on a station and display at the town's carnival, the Peterlee Show. The format had been almost unchanged over the years until this year when, on 30 / 31 August GB4FUN was also on show. Thanks to Andrew Pennell, G0NSK, Secretary of the Peterlee club for sending in a report. Norman Ashman, G3NSI, from the club says "We were pleased at the volume of interest shown by old and young alike. The younger ones were surprised to learn that we could talk to other amateurs all over the world without the aid of telephones, computers and the Internet, although we could use these modes if required. I must also mention that as a visual aid the satellite tracking equipment was a great hit. We hope there is as much interest and enjoyment had by future participants as was at the Peterlee Show 2003. Thank you for lending our club GB4FUN and may it travel around the UK for many years to come. Keep up the good work!"

In recent weeks, GB4FUN has been even more busy than usual! Here are just a couple of reports from events that have used GB4FUN to promote amateur radio to the general public (see also the Club News on pages 12 - 14).

On 28 September, the Wales and West ATC Wing held its annual Regional Field Training Day at RAF Cosford in Shopshire. GB4FUN and the West Midlands RSGB regional team, supported by some local clubs, were there to introduce the cadets to amateur radio. There were approximately 500 cadets from Shropshire, Hereford & Worcestershire, parts of Cheshire, the West Midlands, Staffordshire, Merseyside and the three Welsh Wings. The cadets were chosen to represent their Wings in aircraft recognition, band, drill, shooting and first aid.

GB4FUN was stationed about 50m away from the ATC's own HF / VHF field station. Initial concerns by the ATC regarding the possibility of GB4FUN desensing their receivers proved groundless. Several groups of enthusiastic cadets as well as senior ATC officers visited GB4FUN. The cadets asked searching questions, asked for literature and how to go about becoming a radio amateur. All were surprised to learn that amateurs were allowed to use satellites, transmit TV, and were able to talk to astronauts in orbit.

The ATC leadership was very impressed with the professionalism shown, and several useful contacts were made, with squadrons seeking to put their cadets though the Foundation and Intermediate courses. As a direct result of the visit by GB4FUN, the Dudley squadron has asked the Society to organise Foundation courses at their squadron for between 70 and 100 cadets. Courses will be held at its HQ in Dudley in January, March and April 2004, and courses for the Cosford squadron are in the discussion phase. The courses will be run by the local radio clubs, which will help the cadets towards their new Communicator's Badge, as amateur radio is one of the modules leading to the award.

At the presentation parade at the end of the day, special mention was made of the RSGB, and all involved expressed their thanks to the Society. Our thanks go to the ATC, who extended every facility to the GB4FUN team. ◆

Above left: Members of the ATC Dudley Squadron visit GB4FUN at the Wales and West ATC Wing annual Regional Field Training Day at RAF Cosford.

Above: GB4FUN at the Peterlee Show.

The GB4FUN Supporters' Honour Roll

We asked members when renewing their membership to include a donation to help to continue to finance the GB4FUN mobile amateur radio demonstration vehicle. 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 'GB4FUN', c/o RSGB HQ.

GB4FUN 'Big Hitters'		S R Fouracres	G4HVX
Andover RAC	G0ARC	Cheltenham ARA	G5BK
Prof C D Stephens OBE	G3MGS	J D Hayward	G7HOD

T Rodgers	2E1IIL	F Harrop	G3DVL	W N Fenton	G3ZJP	T J Stanley	G4TXK	D B McCutcheon	GI3OAU	J A Chantler	M3CAE
R S Rogers	2M1AHZ	C Tamkin	G3EWT	S V Carpenter	G3ZQF	G J King	G4VFV	Dr W D Hutchinson	GI4FUM	D Baldwin	M3ESB
J P Ketch	EI2GN	G A Bird	G3GDB	J Swanson	G4CBD	H W D Maude	G4YDG	R McAteer	GI4MFM	A Clements	M3HZZ
G Lefebvre	F6AGS	J O Yarker	G3GJY	M W Viner	G4CJJ	G S C Crabbe	G4ZFN	C Ashdown	GM0FHF	J Loader	M3JKL
J A Harrington	G0ERH	M J Marlow	G3IAF	D J Lockwood	G4CLI	R H Alderson	G4ZQC	T H Currie	GM0FRH	C D Small	M3MTS
S G Holt	G0GEU	K S P McFarlane	G3ICG	R H Bold	G4CNW	M H Chace	G6DHU	Mrs I B Birkett	GM0FTX	S M Wilson	M3NOW
L Surgey	G0GMW	A A Chisholm	G3INL	B A Roberts	G4DBQ	S J Stromqvist	G6MPB	C Mackay	GM0KVD	B E Upton	M3RBU
G R Moore	G0IOF	J Pollard	G3IY	B H Slatter	G4DF	P M Yates	G7BZD	R G Henderson	GM0UET	G A Moucka	MI3GAM
J A Wells	G0IWB	E W G Allen	G3JHP	K G Knight	G4DFZ	W J Robe	G7HES	A W Hope	GM3MGT	J R Gorin	MJ1DZJ
B R Rimmer	G0JCQ	R W Peters	G3JXV	Spalding & DARS	G4DSP	D Remnant	G7LXP	A Rose	GM3WED	E D Cameron	MM0BIX
R G E Harvey	G0LLT	J S Bennett	G3KLC	M Small	G4DVI	A E Hogg	G7MWY	J Y Merson	GM4MOA	N D Stewart	MM0BMG
P Spencer	G0LYR	T K Wright	G3KVE	G J Smith	G4EBK	D M Gee	G7NAP	G R Kelly	GM8MST	J Webster	MM0BQN
Rev F G Bligh	G0MTA	D Page	G3KWC	I A Welburn	G4EMA	J D Mendham	G7PEF	B F le Lievre	GU4LJC	D Banks	MM0GGG
G A Nattrass	G0OGD	D Webber	G3LHJ	B F Pearl	G4FCX	R A Hoggard	G7PUL	D Roberts	GW0CSR	L D Thomas	MW0LEW
B J Godfrey	G0OVC	K O Holland	G3MCD	E G Keeler	G4FPM	W D Curtis	G8BGR	B W Parsons	GW0KZK	R J Ramm	RS171477
C Lockwood	G0UER	P Fairnington	G3PLJ	E C M Walton	G4FSN	M A North	G8CGO	J Brace	GW3JBZ	R Nottage	RS185003
J Jeffers	G0UNB	H Williams	G3ROS	C D Appleton	G4GBK	J Renaut	G8DJL	J E Stone	M0AIF	R Singleton	RS25288
B Hillman	G0UXO	F A Robinson	G3TPV	T J Aldridge	G4GJR	D Robbins	G8DKF	878 Squadron		K T Strong	RS39264
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F Mallows	G1GYJ	P R Cragg	G3UGK	M H Parker	G4IUF	D J Keston	G8FMC	D W Kearton	M0BDR	S G W Tomlins	RS95422
A J Gateley	G1NAN	S Tudor Jones	G3UMZ	I L Wadman	G4KDB	Dr K D Brown	G8IRL	J A Chaldecott	M0CZQ	W V Leyland	VE7HBL
L F Acott	G1SEM	A Wang	G3VAA	V A Tomkins	G4KEE	J Hough	G8JQG	J F Loy	M0DHV		
N R Paul	G3AUB	R W S Hewett	G3XLU	D J Froggatt	G4KKE	W A Hoskins	G8LU	J C Finnie	M0KGF		
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R L Knight	G3DPW	S H Bassford	G3YZB	S Mason	G4KNR	A F Jeffery	G8SIG	R Vickerstaff	M1ADT		
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				North Wakefield RC	G4NOK	A Crowther	GD0MWL	R Chick	M1FAK		
				J B Rowlands	G4OJS	S Ferguson	GI0OKQ	A Barron	M3BGZ		

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.

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Antenna Noise Canceller & Diversity Combiner

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FREE SM20 Base Mic & SP21 Speaker

100 Watts HF, 100Watts 6m, 100Watts 2m, All Modes, AutoTuner, DSP Filtering.

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Portable 1.8 - 500Mhz, all modes, built in keyer, includes battery pack, charger etc.

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- **168 strands of 14 AWG Copper Wire.**
- **Ideal for all your antenna projects**

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- 3.5MHz-30MHz (with over 3 metre element)
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Compact - 1kW HF Antenna Tuner

- Covers 1.8 - 30 MHz
- Power 1,000 Watts SSB
- Built in 4:1 Balun
- Ceramic Roller Coaster with Silver Plated Wire
- Differential Tuning Capacitor for "EasyTune"
- Switch 2 antennas plus Balanced Line
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- 3kW or 300W Power Meter Range
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- Vernier Drive for accurate tuning
- Compact Size: 10.5"(w) x 4.5"(h) x 11"(d)

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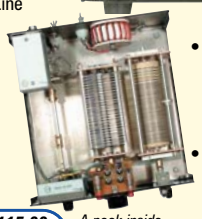

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- ***Matches Long Wires, Doublets, G5RV, Dipoles, Beams, Loops, Verticals***

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10W-100W SWITCHABLE

- TX - all HF + 6mtr, 100W output on HF & 6mtrs
- RX - Gen. coverage 150kHz-30MHz, 50MHz-54MHz
- SSB, CW, AM, FM and digital modes

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ALINCO DX-77E

HF Transceiver 'GREAT VALUE'

10W-100W SWITCHABLE

- 100W HF transceiver
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- All modes, FM, LSB, USB, CW & AM

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ALINCO DR-135E

EXPANDABLE TO RX AM AIRBAND INC 8.33KHZ CHANNELS

- TX: 144-146MHz RX: Expandable 118-174MHz
- 50/10/5W power settings
- 100 memory channels
- Frequency Steps: 5, 8.33, 10, 12.5, 15, 20, 25, 30, 50kHz

•EJ-41U Internal TNC £69.95
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Dual Band Mobile

- Ready for 9600 bps packet
- Extended RX capability 136-174MH, 420-470MHz
- 50W (2m) - 35W (70cms)

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ALINCO DJ-195E
2MTR Handheld with Keypad

- 2 metre (144-146MHz) handheld
- Easy to use, direct entry keypad
- Wide RX possible (typ. 135-173MHz)
- Up to 5W output (0.8W low power)
- 40 memory channels + 1 call channel
- Large range of accessories available

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ALINCO DJ-193E
Great Value 2MTR Handheld

- 2m (144-146MHz)
- Up to 5W VHF
- Wide RX possible (typ. 135-173MHz)
- CTCSS + DCS enc/dec fitted
- 40 memory channels+1 call ch
- DCS, Tone burst and DTMF

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ALINCO DJ-V5
Compact Dual Band Transceiver

- 5W/1W/0.5W output power
- Super wide RX (76-999MHz)
- Includes wide FM mode
- CTCSS Encode+decode, DTMF squelch and 4 different European Tone Bursts
- 200 memory channels+2 call ch

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ALINCO DJ-596
Dual Bander

- 100 memory ch, any mix of VHF/UHF
- Alphanumeric channel labels
- Wide and narrow FM TX/RX
- Direct freq input from keypad
- CTCSS, DCS encode+decode
- DTMF tones and autodial memories

£199.95 P&P £10 | 3 CHEQUES OF **£69.98**
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Raynet 50th Anniversary Convention

On Saturday 25 October, Raynet celebrated the 50th anniversary of its foundation, in the autumn of 1953, by the RSGB Council of the day. The Emergency Communications ('Emercomms') Convention took place at the West Midlands Police Conference and Sports Centre, Birmingham, hosted by the RSGB.

The Convention was open to anyone with an interest in amateur radio emergency and public service communications, and celebrated the efforts and dedication given by its volunteers over the following half century. It featured speakers from Raynet, the RA and User Services and included a special presentation of the Raynet Cup by one of the founder members. The event was sponsored by Kenwood, with Yaesu and Icom (in association with Radio World) also supporting the event with raffle prizes.

Special event station GB50RAEN, in recognition of the original name for Raynet - Radio Amateur Emergency Network - was on the air from 20 October to 3 November, and from the Convention QTH on the day itself, making 968 contacts over the period. The special event station was operated on HF and VHF by the Sandwell Raynet Group, using equipment kindly loaned by Icom (UK).

HISTORY OF RAYNET

Doors opened at 10.30am with lectures starting at 11.00am although, as is often the case, visitors were arriving earlier. They were welcomed by members of the West Midlands Raynet and RSGB regional teams, a cup of tea or coffee, and the opportunity to meet old friends, or visit the RSGB bookstall and Raynet stand, which comprised a display, assembled by David Hicks, G6IFA, of vintage equipment such as the 70MHz, valve-based, Pye Reporter and Pye Westminster VHF mobiles as well as photographs of historic incidents and events in which Raynet was involved.

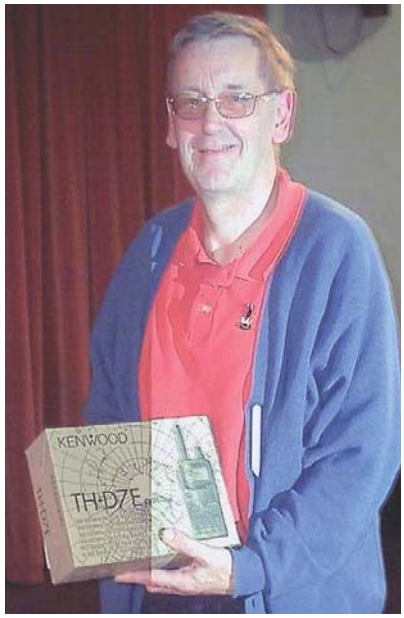
The event was well attended, and notable visitors included Stephen O'Leary, EI6JA, from Cork, representing the Republic of Ireland's counterpart to Raynet - AREN, the Amateur Radio Emergency Network.

The Convention was formally opened, and chaired by RSGB President, Dr Bob Whelan, G3PJT, who outlined the proceedings, and introduced the speakers. Doug Willies, G3HRK, together with Arnold Matthews, G3FZW, opened the series of presentations, speaking about the early history of Raynet. Doug was licensed as G3HRK in 1951. He outlined how RAEN, the forerunner of

Below left: Bob Whelan, G3PJT, formally opening the event.

Below middle: Stephen O'Leary, EI6JA, represented AREN, Ireland's equivalent of Raynet.

Below right: Peter Thomson, GM1XEA, winning the Kenwood TH-D7E.



By Roy Clarke, G8AYD, RSGB Regional Manager, West Midlands,
45 Hawkstone Avenue, Newport, Shropshire TF10 7SE. E-mail: roy@rclarke.com

Raynet, was formed. In 1953 radio amateurs voluntarily provided communications to assist local authorities and the emergency services during the notorious east coast floods. In 1954 he sat on the original RAEN Committee formed by the RSGB, and was one of the first 'Key Station' volunteers and for 30 years was controller of the Norfolk Group. His work has been recognised by the BRCS, SJAB and the police.

In the years that followed, the licensing authorities agreed to allow radio amateurs to pass third party messages in emergency situations. This was qualified as messages passed for 'User Services', which today includes the British Red Cross, St John Ambulance, St Andrews Ambulance Association, Chief Emergency Planning Officers, any United Kingdom Police Force, Fire or Ambulance Service, Health Authority, Government Department, HM Coastguard, Salvation Army, WRVS or Utility Services.

By 1976, RAEN became known as 'RAENET' which later became 'Raynet' and grew into a national network, which was used by Emergency Planning Officers in numerous local authority exercises. These officers now call on Raynet's services when emergencies demand their expertise.

Arnold Matthews, G3FZW, then took over the narrative from Doug. Licensed in 1949, he served as the RSGB area representative. Arnold is still active as the current RSGB Deputy Regional Manager for Shropshire and Staffordshire, manning the RSGB bookstall at the Convention when not required to speak on his topic. In 1953, he joined RAEN and was appointed County Controller. Arnold was made a co-opted member of the RSGB RAEN Committee in 1956 and served until 1967 - latterly as Committee Secretary. He spoke of the difficulties and mistakes made in the early days - there were plenty of both.

Both Doug and Arnold are particularly concerned that the emergency service aspects of amateur radio continue to be kept alive, alert and unified, a view echoed by several other speakers.

PRESENTATION OF THE RAYNET CUP

Following Doug's and Arnold's presentations, Bob Whelan asked Arnold Matthews to present the Raynet Cup to Gordon Bannister, GI8SKR, representing Raynet Northern Ireland. Arnold originally donated the cup to the RSGB's National Raynet Committee in 1962, to be awarded annually to the Raynet group which has done the most for the organisation in the previous year. This year, the Cup was awarded to Raynet Northern Ireland in recognition of the establishment of Raynet in Northern Ireland, and the progress made there during difficult times. It has also co-operated with its counterpart in the Republic of Ireland, the Amateur Radio Emergency Network, on many occasions and has also assisted Scottish Raynet Groups, both in exercises and events.

RAYNET'S SUCCESSES

Bill Mahoney, G3TZM, spoke about the development of Raynet, giving examples of emergency responses, including the Midlands Ambulance strike. He has been a member of Raynet since the early '70s and is currently their Press and Public Relations Officer for the West Midlands, a task for which he has just been awarded the Radio Amateurs' Emergency Network 'Raynet Shield'. He is also Vice Chairman of the RSGB Repeater Management Committee.

Geoff Griffiths, G3STG, described major incidents and events during the 1980s in which amateur radio assisted in providing much-needed communications. As well as Raynet's largest involvement of this decade, the Lockerbie air disaster, these also included the *Herald of Free Enterprise* ferry and *Piper Alpha* oil rig disasters, the Penlee lifeboat disaster in Cornwall, the Mexico and El Salvador earthquakes, and the F1 Birmingham Grand Prix, highlighting the fact that Raynet is not just about communications in times of disaster but also about voluntary community communications. Geoff joined Raynet when the Civil Defence Corps Communications team was disbanded. A former Zone Co-ordinator, and Chairman of Raynet, he can currently be found demonstrating amateur radio to visitors at the National Space Museum in Leicester.

SUPPORT OF USER SERVICES & RA

Lawrie Salvoni focussed on Raynet from the point of view of the User Services. He is well qualified in how to handle emergencies. He manages two crisis management companies, and is a consultant to a training company in the Middle East in the preparation of multi-agency emergency plans. He passed on congratulations to Raynet from Brian Ward, Chairman of the Emergency Planning Society, thanking all Raynet operators for their "crucial support to the nation's emergency planning programme". His lecture ended with a selection of amusing anecdotes on good (or should it be 'bad') communications, including one on the use of aeronautical Q codes related to family planning!

Following the break for lunch, Alan Betts, G0HIQ, who has been licensed for 25 years and is the doyen of the RA's Amateur Radio Department, outlined the view of the regulatory authority towards amateur radio and emergency communications in times of disaster, how this has evolved and is likely to evolve in the future. He stated that the support given by the RA to amateur radio, and its generous allocation of commercially valuable spectrum space is in recognition of the need to provide a skill base in radio and related subjects and emergency communications. He also spoke of the success of the new licence structure in rejuvenating amateur radio, and indicated that of the new M3s which were due for renewal, only 11 had not done so. Alan, in his own inimitable style, fielded a host of questions, many of which were continued after the final lecture and presentation of the raffle prizes.

ALL PHOTOS BY PAUL GASKELL, G4MWO

Left to right: Arnold Matthews, G3FZW; BobWhelan, G3PJT; Gordon Bannister, GI8SKR.

RAYNET'S FUTURE ROLE

John Clifford, GW4BVE, described the use of multiple resources on events, focussing in the use and problems of using HF in mountainous regions where the use of VHF and knife edge diffraction is not possible. He outlined an experimental VHF to HF / 5MHz talk-through repeater, highlighting the problems associated with squelch on SSB, and how this could be overcome by using an alternative squelch system or digital speech encoding. John has been licensed since 1970, and is a founder member of Manchester Scouts Raynet, which specialises in communications in mountainous terrain.

Greg Mossop, G0DUB, outlined the possibilities for the future role, and use of technologies for Raynet. He is Group Controller of West Cheshire Raynet, a corresponding member of the Network Emergency Planning Team, and webmaster of the Raynet HF team website at www.raynet-hf.net

PRIZEWINNERS

Following the lecture programme, Bob Whelan, G3PJT, drew the raffle and closed the proceedings. The principal prize-winners were Peter Thomson, GM1XEA, from Scotland, winning the Kenwood TH-D7E twin-band + TNC hand portable; Celia Willies, G6DFA, who chose the *100 Years of Amateur Radio* book; Peter Blakemore, G7ACR, from Sheffield, choosing the Yaesu FT-1500M 2m mobile, while an Icom R5 went to Steven Lewkowicz, G1CMA, of Stoke-on Trent.

The event was considered a great success, and it is hoped it will become a regular event in the amateur radio calendar. The organisers would like to thank all the sponsors for their generous support, and the volunteers from Raynet and members of the RSGB West Midlands regional team who provided 'bodies' on the day. ◆

VHF NFD 2003

Overall entries for VHF Field Day this year are just a couple down on 2002 levels but activity levels were actually quite comparable with a couple of groups having problems with getting their final entries together. However, there has been an interesting change, with several of the major groups bowing out and being replaced by smaller clubs and groups lower down the table. This increase in real club-based activity was something that the VHF Contest Committee tried to encourage by lowering the equipment and manpower hurdles in the Restricted and Low Power sections two years ago. It's the Restricted section with its straightforward requirements for just 100W and a single antenna which is growing and it's good to see evidence of more clubs entering. You should see the VHFCC more active in promoting the joys of VHF NFD and other club-based contests in particular over the next year or so, and if your club is interested in receiving a talk on contesting, please contact me.

Don't try this at home! Telford's solid fuel rocket blasts off at 1400UTC.

ALL CHANGE AT THE TOP

These changes in the mix of entrants have led to some interesting movements, particularly at the top of the Open section, with groups who have been competing for many years getting a much greater taste of success. It also means that, in order to be competitive - even in the 'Big Boys Section' - you don't need to have so much hardware, and there were very few instances of big multiple antenna systems in use this year. In the Low Power section, it only took a team of two people to win.

Several groups talked about great examples of club spirit rather than outright competitiveness in NFD. Basingstoke ARC said, "The logs steadily began to fill and many people had a go at operating and logging. There were some very good operators and some not very good operators. Some people were adept with the computers and some were a bit slow. If BARC was a contest group then only the experts would have been operating and logging. However, BARC is a radio club and, as such, its priorities are to involve as many members as possible and have an enjoyable time. The bonus would be to achieve this and do well in the contest."

The North Gentleman's Contest Group lived up to their name this year and entertained a visit from members of one of the larger groups. The visitors were suitably impressed with the fellowship, relaxed environment and sense of fun compared with the strict regime of their own group!

Leicester RS used the event as a training session for new and 'rusty' ops, and the energy from their 12-year old operator M3GME kept them all going! The Chippenham DARC staged a return to VHF contests after many years away and felt that for this year the main aim had to be "just taking part". Hopefully next year we'll see them back and moving up the table.

The ultimate example of how it is possible to compete with a small team is that David Dodds, GM4WLL, and Jim Martin, MM0BQI, entered as two teams this year - one in the Restricted section and one in the Low Power section and took the trophies awarded to the leading Scottish entries in each of these sections. Congratulations - it took quite some commitment to do that, and it's taken a few years of trying! Next year we may make some small changes to the rules to make sure that awards are shared around.

Several groups were inspected this year, including many at the top of the tables and all was found to be in perfect order. However, everyone didn't

By Andy Cook, G4PIQ, Chairman, VHF Contest Committee, Knaves Acre, Brantham Hill, Brantham, Manningtree CO11 1TA. E-mail: vhfcc.chairman@rsgb.org.uk

Open Section

Pos	Group Name	Loc	50	70	144	432	1296	Total
1	Windmill CG	01LD	1000	0	903	794	967	3664
2	Reigate ATS & Crawley ARC	010C	707	0	897	369	1000	2973
3	Lothians RS	74WV	672	1000	589	303	0	2563
4	Colchester RA	01PU	0	384	1000	1000	0	2384
5	Aberdeen VHF Group	86RW	907	412	651	248	0	2218
6	Bracknell ARC & Flight Refuelling ARS	80ST	825	533	506	316	0	2180
7	Stevenage & DARS	91TW	713	359	156	0	429	1658
8	Cockenzie & Port Seton ARC	85RU	469	688	317	49	0	1524
9	Harlow & DARS	01BR	832	379	304	0	0	1515
10	MIDCARS	83QE	518	321	289	0	227	1355
11	Wythall ARC	92BJ	543	149	363	169	0	1224
12	Guildford & DARS	91TF	619	318	73	0	0	1009
13	Cambridge & DARC	02CE	0	150	290	64	220	724
14	Newquay & DARS	70KI	211	178	91	0	0	479
15	Edgware & DRS	91VO	307	0	121	0	0	429

Restricted Section

Pos	Group Name	Loc	50	70	144	432	1296	Total
1	De Montfort University ARS	02ST	1000	0	1000	1000	1000	4000
2	Lagan Valley ARS	74AI	599	1000	724	414	0	2738
3	Bristol CG	81KW	927	626	552	614	0	2719
4	South Birmingham RS	82XJ	836	606	0	543	651	2636
5	Newbury & DARS	91GI	642	0	543	310	542	2037
6	Salop ARS	82LN	739	572	486	206	0	2003
7	Basingstoke ARC	91KG	414	0	495	418	491	1819
8	GM4WLL & MM0BQI	85NR	418	702	413	235	0	1767
9	Rochdale & DARS	83VP	837	581	199	34	0	1651
10	Dave Brooking	81PH	703	611	0	0	0	1314
11	CARSCOG Gearboxers 'A'	92HE	493	379	198	191	0	1261
12	Andover ARC	91FH	633	381	180	0	0	1194
13	Leicester RS	92JO	366	400	281	0	0	1047
14	Highland CG	75DH	604	0	329	80	0	1014
15	GM3TAL & G3SHK	75IU	0	811	70	57	0	938
16	Chippenham & DARC	91AJ	180	0	380	3	0	563
17	West Bromwich Central RC 'A'	93XF	79	229	172	17	0	496
18	Moray Firth ARS	87JJ	0	0	153	16	0	168

Low Power Section

Pos	Group Name	Loc	50	70	144	432	1296	Total
1	Warrington CG	93AD	0	0	1000	1000	1000	3000
2	MM0BQI & GM4WLL	85NR	1000	1000	0	335	0	2335
3	Two Counties 'A'	92LJ	489	0	420	431	0	1341
4	Mid Sussex ARS	90WV	405	0	367	237	0	1009
5	Goole R&ES	93PV	0	478	311	201	0	989
6	Torbay ARS 'B'	80DQ	920	0	0	0	0	920
7	Two Counties 'B'	92LJ	0	342	0	0	521	863
8	Sutton Coldfield RS	92FM	458	0	250	0	0	708
9	Herstmonceux Megacycles	00DX	0	0	439	0	0	439
10	Clive O'Hennessy	78WA	0	253	0	8	0	261
11	South Bristol ARC	81QJ	0	0	195	0	0	195
12	CARSCOG Gearboxers 'B'	92HE	0	0	0	0	90	90

Mix & Match Section

Pos	Group Name	Loc	50	70	144	432	1296	Total
1	Telford & DARS	82NN	601	712	685	0	479	2478
2	SRCC Contest Group	91XH	579	0	605	464	392	2040
3	Shefford & DARS	92XA	480	497	586	364	0	1927
4	North Beds Gentleman's CG	92TI	0	462	334	419	711	1926
5	Torbay ARS 'A'	80DQ	0	558	558	290	93	1498
6	Clifton ARS	01DH	373	463	224	0	169	1228
7	Three Clubs CG	01BI	0	363	344	234	0	941
8	Thornton Cleveleys ARS	83NU	563	38	103	0	0	704
9	Farnborough & DARS	91OG	0	0	62	27	0	88

The Harlow & DARS's 2m antenna system.

6m Open Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3GRS/P	01LD	175	106138	400	7+7Y+5Y	SV8CRI	2369
2	GM3WOJ/P	86RW	112	96260	400	6Y	IH9/I2ADN	2483
3	G6BUT/P	01BR	155	88308	400	5Y	9H1YZ	2102
4	G4BRA/P	80ST	164	87544	300	8Y	9H1DE	2140
5	G8SAD/P	91TW	177	75651	400	7Y	LZ1KCO	2278
6	G5LK/P	010C	94	75062	100	2x5Y	LZ1KCO	2143
7	GM3HAM/P	74WV	123	71297	400	9Y	YT1Z	2311
8	G5RS/P	91TF	153	65680	400	6Y	LZ1KCO	2252
9	G3ZME/P	82NN	137	63818	400	5Y	LZ1KCO	2461
10	G0WRC/P	92BJ	126	57658	400	5Y	5B/G1JJE	3342
11	G6ZTT/P	83QE	144	54988	100	7Y	Z36W	2242
12	MM0CPS/P	85RU	96	49794	200	6Y	IZ8DWL	2352
13	G3ASR/P	91VO	55	32597	100	5Y	LZ1KCO	2254
14	M0BFB/P	70KI	33	22400	100	4Y	ZA1B	2148

6m Restricted Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3SDC/P	02ST	80	70117	90	6Y	UT5JDS	2491
2	GW6YB/P	81KW	147	65010	100	8Y	9H1DE	2260
3	G0ROC/P	83VP	107	58676	100	5Y	IH9/I2ADN	2167
4	G4OHM/P	82XJ	153	58608	100	6Y	IH9/I2ADN	2048
5	MC1AXW/P	82LN	169	51827	100	7Y	YT1Z	2155
6	G1KHX/P	81PH	122	49314	90	3Y	4N1N	2046
7	G5XV/P	91GI	97	45022	100	6Y	4N1N	2093
8	G6ARC/P	91FH	74	44357	100	5Y	LZ2CC	2163
9	GM0FRG/P	75FI	40	42381	100	5Y	YU1CF	2182
10	GI3PDN/P	74AI	64	42035	100	5Y	IH9/I2ADN	2383
11	G4ATH/P	83NU	61	39460	100	4Y	4N1N	2162
12	G3SRC/P	91XH	94	40588	100	5Y	UT7CR	2215
13	G4GEE/P	92HE	159	34593	100	T/Stile	YU1ADN	1905
14	G3FJE/P	92XA	81	33662	100	7Y	YT1Z	1942
15	GM4WLL/P	85NR	42	29279	100	5Y	IH9/I2ADN	2381
16	G3TCR/P	91KG	74	29050	100	5Y	YT1Z	1989
17	M0BPQ/P	01DH	58	26126	100	5Y	LZ1LCO	2239
18	G5UM/P	92JO	57	25663	100	6Y	IZ8DWL	2037
19	G3VRE/P	91AJ	52	12597	100	3Y	9H1YZ	2169
20	G4WBC/P	93XF	10	5522	20	6Y	IZ8DWL	195

6m Low Power Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	MM0BQI/P	85NR	78	53220	25	6Y	IH9/I2ADN	2381
2	G0UWS/P	80DQ	77	48974	25	5Y	YO3JR	2322
3	G3BXF/P	92LJ	64	26046	25	5Y	YT0A	1909
4	G3RSC/P	92FM	65	24377	25	3Y	Z36W	2145
5	G4VTQ/P	90WV	46	21545	25	3Y	9H1YZ	2042

4m Open Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	GM3HAM/P	IO74WW	93	33396	160	11	S51DI	1677
2	MM0CPS/P	IO85RU	59	22979	50	8	S51DI	1641
3	G4RFR/P	IO80ST	84	17800	130	2x12	S51DI	1420
4	GM3WOJ/P	IO86RW	34	13763	150	7	G3LHJ/P	699
5	G0VHF/P	JO01PU	48	12811	90	8	S51DI	1209
6	G6BUT/P	JO01BR	71	12655	150	6	GM3TAL/P	580
7	G8SAD/P	IO91TW	65	12004	150	8	S51DI	1318
8	G4ZTT/P	IO83QE	66	10727	20	6	GM3TAL/P	343
9	G3PJX/P	IO91TF	61	10620	160	8	GM3WOJ/P	650
10	G3TDM/P	IO70KI	22	5928	50	7	GM3HAM/P	510
11	G0GKP/P	JO02CE	27	4998	10	5	GM3WOJ/P	557
12	G4WAC/P	IO92BJ	24	4964	160	7	S51DI	1432

4m Restricted Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	GI3PDN/P	IO74AI	54	18581	100	6	M0BPQ/P	539
2	GM3TAL/P	IO75IU	36	15078	50	9	S51DI	1791
3	G3UKV/P	IO82NN	71	13227	85	8	S51DI	1502
4	GM4WLL/P	IO85NR	36	13043	45	6	S51DI	1651
5	GW6YB/P	IO81KW	57	11632	70	7	S51DI	1497
6	G1KHX/P	IO81PH	57	11344	90	4	S51DI	1450
7	G4OHM/P	IO82XJ	63	11258	40	6	S51DI	1442
8	G0ROC/P	IO83VP	67	10800	100	5	G3TDM/P	417
9	MC1AXW/P	IO82LN	59	10632	80	5	S51DI	1512
10	M0BPQ/P	JO01DH	48	8608	50	5	GM3WOJ/P	652
11	G4FOH/P	IO92TI	51	8577	50	6	S51DI	1335
12	G5UM/P	IO92JO	44	7429	100	4	GM3TAL/P	448
13	G6ARC/P	IO91FH	36	7081	25	4	S51DI	1372
14	G4GEE/P	IO92HE	53	7036	25	T/Stile	GM3TAL/P	481
15	G4CW/P	JO01BI	44	6742	19	6	GI3PDN/P	527
16	G4WBC/P	IO93XF	22	4247	10	5	GM3WOJ/P	442
17	G4ATH/P	IO83NU	5	702	25	6	G4GEE/P	211

4m Low Power Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	MM0BQI/P	IO85NR	59	22045	25	6	S51DI	1651
2	G3LHJ/P	IO80DQ	46	12293	10	5	S51DI	1504
3	G3FJE/P	IO92XA	57	10967	10	10	S51DI	1300
4	G0OLE/P	IO93PV	46	10531	10	6	S51DI	1430
5	G3BXF/P	IO92LJ	43	7530	15	8	GM3WOJ/P	510
6	GM4VVX/P	IO78WA	10	5583	10	6	S51DI	1854

2m Open Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G0VHF/P	JO01PU	657	242249	400	4x9Y	YO3JW	2011
2	G0FBB/P	JO01LD	608	218685	400	2x17Y	YO3JW	2016
3	G5LK/P	JO01OC	602	217246	400	4x10Y,18Y	YO3DMU	1995
4	GM4ZUK/P	IO86RW	393	157691	400	4x13Y	EA1EF/P	1552
5	GM3HAM/P	IO74WV	427	142577	400	17Y	9A3PZ	1914
6	G4RFR/P	IO80ST	484	122606	400	2x19Y, 19Y	F5KSE/P	959
7	G1WAC/P	IO92BJ	362	88053	400	2x17Y	YO3JW	2236
8	MM0CPS/P	IO85RU	261	76877	400	2x17Y	F6JOR	1000
9	G6BUT/P	JO01BR	298	73541	250	2x13Y	DL0GTH	752
10	G2XV/P	JO02CE	281	70132	180	2x17Y	YO3FFF/P	2039
11	G3ZTT/P	IO83QE	369	69935	400	2x17Y	F5KSE/P	1211
12	G3GHN/P	JO01DH	267	54196	200	9Y	HB9BSL/P	677
13	G8SAD/P	IO91TW	200	37845	400	4x6Y	DF0CI	733
14	G3ASR/P	IO91VO	151	29422	90	5Y	GM4ZUK/P	612
15	G6GMW/P	IO83NU	132	24971	200	19Y	F6HPP/P	664
16	G4ADV/P	IO70KI	84	22008	400	2x9Y	F/G4IDG/P	1581
17	G6GS/P	IO91TF	107	17606	50	17Y	GM0FRG/P	573

2m Restricted Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3SDC/P	JO02ST	313	109869	100	17Y	LZ9X	2074
2	GI4GTY/P	IO74AI	269	79541	100	18Y	EA2URE	1305
3	G3ZME/P	IO82NN	343	75304	100	17Y	F5KSE/P	1151
4	G3WIM/P	IO91XH	344	66432	100	18Y	GM4ZUK/P	646
5	G3FJE/P	IO92XA	247	64349	100	12Y	YO3JW	2105
6	GW6YB/P	IO81KW	253	60636	100	17Y	LZ2SQ	2387
7	G5XV/P	IO91GI	307	59703	100	17Y	G4MCL	963
8	G3TCR/P	IO91KG	245	54407	100	17Y	YO3JW	2161
9	MC1AXW/P	IO82LN	294	53405	100	10Y	YO2KBK/P	1910
10	GM4WLL/P	IO85NR	164	45359	50	8/8 slot	PI4GN	672
11	G3VRE/P	IO91AJ	301	41795	50	12Y	F5KSE/P	1008
12	G0KDV/P	JO01BI	202	37778	100	10Y	DJ0QZ	658
13	G4VMX/P	IO92TI	187	36709	50	16Y	YO3FFF/P	2082
14	GM0FRG/P	IO75FI	152	36193	100	17Y	ON4PRA/P	814
15	G3LRS/P	IO92JO	157	30882	100	13Y	DK0BN	690
16	G0ROC/P	IO83VP	139	21879	100	10Y	EA1EF/P	1190
17	G2ASF/P	IO92HE	177	21759	100	T/Stile	EI5FK	492
18	G0ARC/P	IO91FH	123	19795	100	9Y	EA2URE	922
19	G4WBC/P	IO93XF	88	18924	50	9Y	DK5DQ	544
20	GM3TKV/P	IO87JJ	85	16756	50	17Y	G4RRA	738
21	GM3SHK/P	IO75IU	22	7687	50	10Y	G3WIM/P	612

2m Low Power Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3CKR/P	IO93AD	324	84618	25	17Y	YO4RFV/P	2304
2	G8NJA/P	IO80DQ	175	47190	25	17Y	F5KSE/P	984
3	G3YNN/P	JO00DX	162	37107	25	12Y	F5KSE/P	926
4	G7APD/P	IO92LJ	210	35535	25	17Y	DF2VJ	655
5	G3ZMS/P	IO90WV	155	31067	25	11Y	F5KSE/P	922
6	G0OLE/P	IO93PV	100	26278	25	17Y	F4CQY/P	744
7	G3RSC/P	IO92FM	128	21146	25	10Y	DK0BN	708
8	G4WAW/P	IO81QJ	91	16461	25	14Y	EA1EF/P	938
9	G6FRS/P	IO91PF	45	5226	25	6Y	GI4GTY/P	495

70cm Open Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G0VHF/P	JO01PU	266	94377	400	4x21Y	F6KBR/P	1044
2	G0HSS/P	JO01LD	227	74929	250	4x21Y	F5BUT	987
3	G5LK/P	JO01OC	103	34806	400	4x28Y	EA1EF/P	985
4	G4BRA/P	IO80ST	122	29815	400	4x21Y	DG7NBE/P	877
5	GM3HAM/P	IO74WV	88	28554	400	2x27Y	F5KSE/P	1423
6	GM0ONN/P	IO86RW	63	23362	400	4x21Y	ON4IQ	814
7	G7WAC/P	IO92BJ	79	15936	400	21Y	DF2VJ	705
8	G8EVY/P	JO02CE	30	6059	35	23Y	MI0BOT/P	475
9	MM0CPS/P	IO85RU	31	4643	50	24Y	G5XV/P	505

70cm Restricted Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3SDC/P	JO02ST	126	44228	100	38Y	OK1ORA	865
2	GW6YB/P	IO81KW	117	27159	50	38Y	DF2VJ	766
3	G8OHM/P	IO82XJ	116	24006	100	24Y	EA1EF/P	1054
4	G3ZPB/P	IO91XH	103	20517	30	27QLY	DG7NBE/P	710
5	G8BNE/P	IO92TI	85	18550	50	21Y	DF2VJ	613
6	G3TCR/P	IO91KG	104	18488	50	21Y	GM0ONN/P	637
7	MI0BOT/P	IO74AI	58	18324	100	21Y	PA6NL	721
8	G3FJE/P	IO92XA	70	16107	100	28Y	DF2VJ	575
9	G5XV/P	IO91GI	83	13698	100	22Y	DF1JM	558
10	G3NJA/P	IO80DQ	49	12806	50	19Y	GM0ONN/P	699
11	MM0BQI/P	IO85NR	30	10373	50	21Y	PA6NL	620
12	G1RCV/P	JO01BI	62	10369	50	19Y	PI4GN	499
13	MC1AXW/P	IO82LN	51	9099	80	18Y	GM0ONN/P	488
14	G0PPO/P	JO01DH	58	8670	100	21Y	GM3HAM/P	495
15	G7ASF/P	IO92HE	53	8444	50	T/Stile	EI5FK	492
16	GM0FRG/P	IO75FI	13	3541	50	21Y	G3NJA/P	533
17	GM3SHK/P	IO75IU	6	2511	50	18Y	G0VHF/P	619
18	G0ROC/P	IO83VP	10	1498	50	18Y	GM0ONN/P	367
19	M0FRS/P	IO91PF	9	1174	50	13Y	PA0NL	340
20	G4WBC/P	IO93XF	3	733	25	19Y	PA6NL	314
21	GM3TKV/P	IO87JJ	13	699	50	17Y	MM0CPS/P	176
22	G3VRE/P	IO91AJ	2	136	20	17Y	GW6YB/P	101

70cm Low Power Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3CKR/P	IO93AD	135	30194	20	30Y	F5KSE/P	1194
2	G8LED/P	IO92LJ	74	13026	25	18Y	DF1JM	552
3	GM4WLL/P	IO85NR	31	10105	25	21Y	PA6NL	620
4	G1ZMS/P	IO90WV	31	7144	25	17Y	F6DVC	631
5	G0OLE/P	IO93PV	26	6067	25	13Y	PE1GRJ	407
6	GM4VVX/P	IO78WA	2	239	25	19Y	GM0ONN/P	153

23cm Open Section

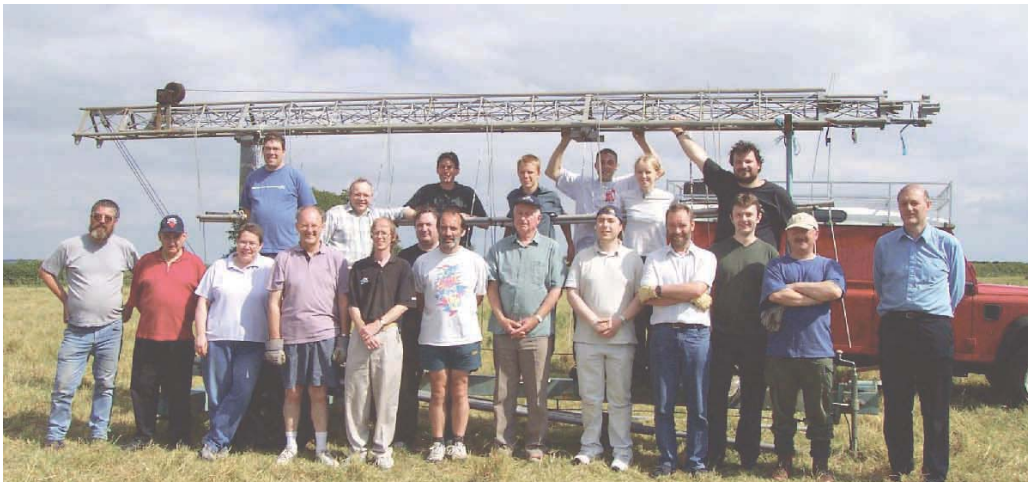
Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G5LK/P	JO01OC	68	17437	60	2x35Y	DL0GTH	674
2	G0FDZ/P	JO01LD	67	16867	220	1.5m dish, 2x55Y	F6KBR/P	968
3	G8SAD/P	IO91TW	39	7483	15	4x23Y	DJ5BV	535
4	G8ZTT/P	IO83QE	24	3957	50	4x55Y	G3SDC/P	282
5	G6KWA/P	JO02CE	25	3842	15	-	PA0WMX	406

23cm Restricted Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3SDC/P	JO02ST	65	18322	65	40Y	DL0GTH	681
2	G3OHM/P	IO82XJ	58	11932	100	70Y	DG9KAF/P	610
3	G5XV/P	IO91GI	53	9922	100	2m dish	DK2MN	608
4	G3TCR/P	IO91KG	55	9004	40	55Y	DF0OL	651
5	G3ZME/P	IO82NN	45	8780	100	55QLY	PA0WMX	620

23cm Low Power Section

Pos	Callsign	Loc	QSO	Score	Pwr	Ant	Best DX	km
1	G3CKR/P	IO93AD	40	7789	25	1m dish	F6CBH	512
2	G4JTJ/P	IO92TI	25	5540	20	6ft dish	ON4CDU/P	496
3	G4APD/P	IO92LJ	28	4061	10	35Y	PA0EZ	425
4	G8MNY/P	IO91XH	31	3055	15	55Y	EI9E/P	466
5	M0BPQ/P	JO01DH	14	1315	8	35Y	G3CKR/P	255
6	G3NJA/P	IO80DQ	4	728	10	57Y	G3CKR/P	299
7	G8SEQ/P	IO92HE	7	702	10	Omni	G3SDC/P	209



The Flight Refuelleing ARS & Bracknell ARC combined team.

PHOTO: WWW.FRARS.ORG.UK

Below left: GM4ZUK/P's 2m station

Below right: G8APZ operating the Colchester RA 70cm station.

PHOTO BY M0SPS

have straightforward contests. The Colchester group never got on 6m due to antenna problems, making a big dent in their potential score. Crawley and Reigate wrestled with the vagaries of bad connections to H100 coax on 70cm, and also on 70cm, the Open Section winners, Windmill CG lost three hours due to a pre-amp failure. MIDCARS struggled with some problems on 23cm and finally had to drop the mast and test antennas at 1.00am. They described this as "interesting"!

However, 4m was clearly the problem band. The Aberdeen VHF Group only made it on for the last 90 minutes, having had a failure of their transverter and had to drive to Aberdeen and back to gather up a replacement. Nevertheless they still managed to come fourth on the band. Last year's Restricted Section winners, Bristol Contest Group, had a much harder time this year and found conditions pretty poor. They also discovered a few days before the contest that they had lost part of their 4m antenna and Salop ARS lost their 4m antenna as the mast failed on tear down.

ALTERNATIVE ENERGY

Last year CARSCOG Gearboxers staged a full station using solar and wind power and they repeated that feat this year. Thankfully they had three times the solar generating capacity available this year because the sun shone, but the winds were so light that the wind generator only turned for five minutes. Also in the alternative energy camp were GM3TAL and G3SHK operating from Scotland. They used wind power to charge their pair of 90Ah batteries, which they had to hand carry up the hill - lots of exercise there.

CONDITIONS

On 6m, good Sporadic E conditions made the band popular and interesting. As one group said, "We worked a ZA and it wasn't even our best DX". On 4m, the Sporadic E gave rise to a mixture of headaches from broadcast FM QRM and cheers for providing many people's best DX into Slovenia. S51DI provided those QSOs and is an RSGB member - thanks Ivan!

What always makes Field Day exciting is when that Sporadic E reaches the heady heights of 2m - and it did just that this year with superb DX and signals down to the far South East of Europe on Sunday morning. It wasn't just the Sporadic E which made 2m exciting though, since there was also decent tropo down to the South of France and Spain. 70cm also benefited from the good tropo with an outstanding 1400km QSO between the Lothians RS and F5KSE/P in JN02 the Pyrenees. Some of these signals were very strong and the South Birmingham Club had a Spanish station call them off the back of the antenna on 70cm.

WINNERS

The Open section was won the Windmill Contest Group, giving them their first award of the Surrey Trophy and pushing the Reigate & Crawley clubs into second place. The Lothians Radio Society took third place overall which is good for a team that far north, and once again they take the Tartan Trophy as the leading resident Scottish group.

The Restricted Section was where the action was this year. Last year's winners, the Bristol Contest Group, were pushed down into third place by a comprehensive win from first-time section entrants De Montfort University ARS and a very creditable second place from Lagan Valley in Northern Ireland. The two-man team of GM4WLL and MM0BQI were the leading Scottish group and win the Cockenzie Quaich.

The Low Power section was dominated by the same pair of two man teams as last year with the Warrington Contest Group winning the section and taking the Arthur Watts Trophy, and MM0BQI and GM4WLL in their second guise taking second place and the Scottish Trophy.

Once again the Mix and Match section was the most closely fought, with the Telford & DARS again grabbing the G5BY Trophy for winning the section, with the SRCC Contest team in the runner-up position. The Telford team started the contest with a bang (or a whoosh at least) by launching a solid-fuel rocket on the gong of 1400. Perhaps this was the inspiration for them to soar to the top of section again!

Thanks to G3MEH, YO3DMU, M1GXL, IW0BET, G4DEZ, YO3FFF, HB9DDZ, G8ZK, GW0ARA and S51DI for checklogs. G4FRE planned to send a checklog, having operated from a wedding, but the log got too smudged by having champagne spilt on it - now that sounds like a civilized way to operate NFD! ◆

RSGB MEMBERS ONLY CHRISTMAS OFFER

Ramsey FR-1 FM Broadcast radio receiver kit

The RSGB has negotiated a special purchase of this popular Ramsey Kit with their UK distributor Waters & Stanton. RSGB members can make a 20% or £9.00 saving on the normal advertised price of this excellent kit.

The kit contains everything to get you started including the case, front panel, control knobs, telescopic antenna and even the battery. A comprehensive instruction sheet is supplied and only the most basic home construction items such as a soldering iron are required to build the set. Once built, the radio covers 88 - 108MHz FM (10.7MHz IF) with 1µV sensitivity and provides 250mW audio output that will drive any 4 - 45 ohm speaker or headphones (not supplied).

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bhi DSP Noise Reduction Module for Yaesu FT-817

Yaesu's FT-817 is already a remarkable all-mode self-contained transceiver, covering HF, 6m, 2m and 70cm in a carry-around size, complete with its own internal battery pack. Now it's been given even more of a boost on receive with the availability of an add-on audio DSP unit from the UK firm of bhi in East Sussex.

For more information on the transceiver itself, take a look at Peter Hart's, G3SJX, technical review of the FT-817, as the present review deals solely with the add-on DSP facility. The FT-817 review was published in the June 2001 *RadCom*, and is also available on the RSGB's members-only website (see 'Websearch' below).

AN INTEGRAL SOLUTION

The ready-wired NEDSP1061 unit is described as "a fully integral solution for noise reduction for the FT-817". Even though the transceiver itself is small and compact, there is, somehow, a bit of room to squeeze this tiny unit in as well! Fitting completely within the FT-817's case it can be supplied either as a 'fit it yourself' version, or as a dealer-installed unit in a special 'DSP' version of the FT-817. However, before you think about fitting it yourself I would suggest you take a look at the 10-page fitting instructions. The installation involves the removal of small surface mount components as well as drilling the FT-817 top lid. bhi says that this should only be carried out by a qualified engineer, and that they accept no responsibility for the fitting or installation, nor are they liable for any damage to equipment caused by its fitting. The fitting instructions are available on bhi's website. You've been warned!

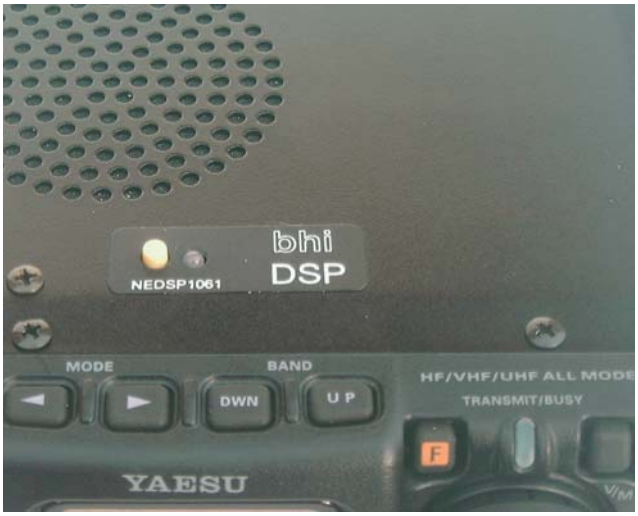
FEATURES

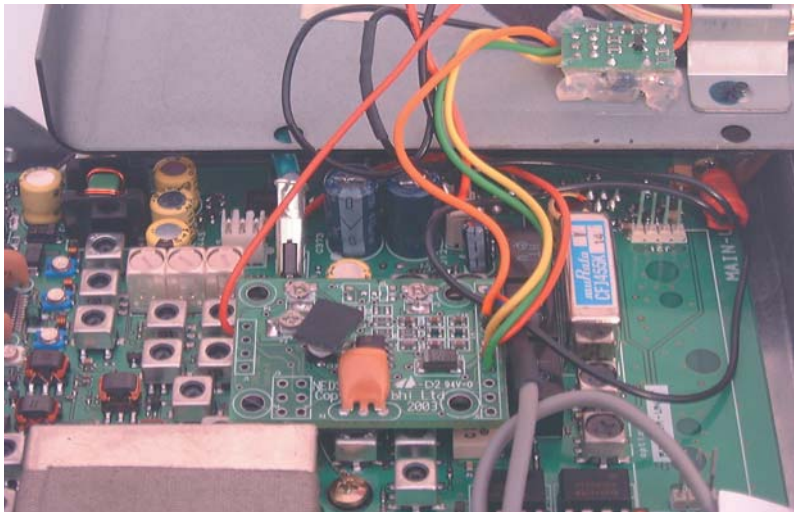
The DSP unit gives four switchable noise reduction levels to the FT-817; Level 1 gives 11dB white noise reduction, level 2 gives 13dB, level 3 gives 19dB and level 4 gives 35dB. Automatic tone reduction is also a built-in feature, reducing the audio level of constant-one heterodynes. This is automatically switched in when the DSP noise reduction is enabled, with level 1 giving 5dB tone reduction, level 2 giving 8dB, level 3 giving 21dB and level 4 giving 65dB reduction.

The PCB itself is a small 37 x 27mm in size, and draws around 45mA from the radio's DC supply. With the FT-817 drawing typically around 450mA on receive, this means the DSP facility adds only a little to the overall battery drain. The top lid of the FT-817's case is used to mount the small control panel for the internal unit. Here, a single push-button is used to switch the DSP filter on or off and to set the filtering level, with an adjacent two-colour (red / green) LED giving a visual indication of the DSP on / off state and level setting.

IN USE

Each time you switch the FT-817 on, the DSP indication LED initially illuminates a constant red to show that the DSP filtering isn't on. The radio also gives a number of short bleeps from its speaker, between one and four, to indicate to you which DSP noise reduction level the unit is currently set to (it remembers the level it was switched to just before the transceiver was last switched off). Briefly pressing the small adjacent button to the LED switches the DSP unit on, with the LED extinguishing to show it's enabled. To change the DSP level, you need to press and hold the button for a second or so. The DSP unit will then switch to the next higher level, indicating this with a number of green LED flashes to show you which level it's now set to, with again a set of bleeps which coincide with the LED flashes. If the button is continuously held it will step through all the levels; you release the button when it reaches the level you want. To switch the DSP off, a short press of the button is all that's needed, the LED then again glowing red to





Below left: Close-up of control button/LED.

Below, right: The bhi DSP unit (centre) installed inside the FT-817.

show the noise filtering is off.

As well as manual control, there are two 'demonstration modes' available which you can initiate by keeping the DSP button pressed for varying lengths of time when you switch the transceiver on. The first demonstration mode switches on the noise cancellation for one and a half seconds, then off for one and a half seconds. It'll then move on to the next DSP noise reduction level, and continuously repeat this cycle through all four levels. The second demonstration mode sets the DSP filter to level three and switches the DSP on for three seconds, then off for three seconds, repeating this continuously. This can be used to give an idea of how the unit performs in various receive situations.

ON THE AIR

I've used a number of add-on audio DSP units in the past, but never one that was built into such a versatile transceiver as small as this! Using the FT-817 from home with it connected to my HF antenna system very quickly showed me the DSP system was a worthwhile addition. Using the transceiver in mobile use, and from temporary portable locations with a 'throw it out of the window' HF dipole typically surrounded by TV line time-base noise, fluorescent light interference and the like, showed me it was a *very* worthwhile addition!

I used the FT-817 from several hotel rooms around the UK, as well as portable from locations ranging from inland moors to a couple of ocean-side shipping ports (ie with a good salt-water ground plane but combined with 'noisy' RF locations). In virtually every operation mode and location, I found the DSP filter worked impeccably, always improving the readability of incoming signals to at least some extent. Occasionally, it made otherwise barely readable SSB signals quite understandable. Even on 6m, 2m and 70cm FM, it cleaned up received audio very nicely; I had a quick but pleasant contact through the Hastings 6m repeater using the transceiver in portable mode in Kent with its set-top antenna in what was a very electrically noisy location.

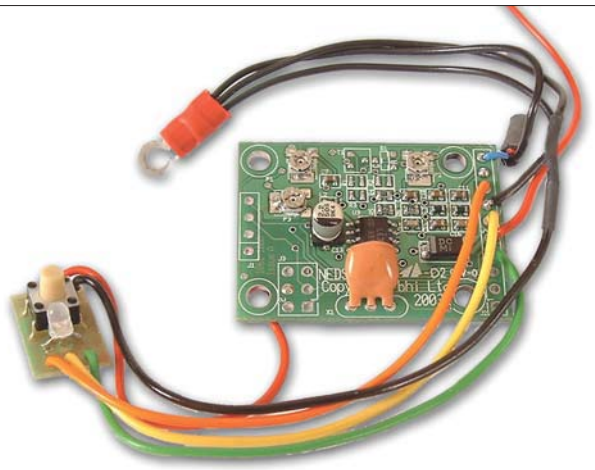
With little or no background receive noise, the DSP filtering had virtually no effect on the received audio quality. As the background noise level increased, with the DSP unit having to 'work harder' as a result, I found the audio was always degraded to some extent, typically with a 'watery' sound. I found I usually couldn't use the highest filtering level, No 4, at all on speech modes if there was more than a moderate level of background noise, as it caused the audio to be severely degraded. But then, with the DSP switched off, I usually couldn't even tell there was audio there in the first place!

On CW, the filtering worked excellently, with the background noise often virtually disappearing to give 'clean' CW copy; I was most impressed. I only wished there was a DSP audio bandwidth filter included as well to separate multiple close-spaced CW signals. The tone reduction gave a useful, if not 'complete', tone notch on level three, and some, but in my mind not very much, tone reduction on levels one and two. But this is in accordance with the specifications, so I mustn't complain too much!

CONCLUSIONS

Once I'd used the bhi Noise Reduction module fitted to the FT-817 for a while, I must say that I feel the combination is a winner. Not only on HF, but also on VHF and UHF, the system works well in improving receive signals that little bit more, often making the difference between a very noisy signal and one that's 'readable with little or no difficulty'. It obviously won't get rid of adjacent frequency interference or strong-signal overload problems, that's up to the IF filters and other performance aspects in your receiver. But when you're using this QRP FT-817 transceiver to communicate with other, typically weak and noisy QRP stations, the bhi add-on DSP filter system could be worth its weight in gold.

Our thanks go to Martin Lynch and Sons for the loan of the bhi DSP-equipped FT-817 for this review. The NEDSP1061 is available from ML&S, Waters & Stanton and Radio World and costs £89.95 plus fitting charge, or you can contact bhi directly on 0870 2407258. ◆



The bhi FT-817 DSP module before fitting.

WEB SEARCH

RadCom FT-817 review:	www.rsgb.org/membersonly/reviews/ft817/817.pdf
bhi:	www.radio.bhinstrumentation.co.uk
DSP module fitting instructions:	www.radio.bhinstrumentation.co.uk/html/ft817_dsp.html

The modified Yaesu FT-817 with the bhi DSP unit installed.

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HF/VHF 100W Transceiver.
Built in Auto ATU.

Icom IC-910H
£1090.00
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Optional 23cms Board.

Icom IC-718
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Icom IC-706mkIIG **£779.00**
HF/6m/2m/70cms mobile Transceiver

Icom IC-703 **£589.00**
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Icom IC-2725E **£299.00**
2m/70cms Mobile Transceiver

Icom IC-E90 **£269.00**
2m/6m/70cms, 5W Handheld Transceiver

Alinco DX-70TH
£599.00
HF/6m Mobile Transceiver.
100W HF & 6m.

Alinco DX-77E
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HF Transceiver.
Upto 100W Output Power.

bhi NES10-2 **£99.95**
Noise eliminating speaker with built in DSP Filters

bhi NEIM1031 **£129.95**
Noise eliminating in-line module

MFJ MFJ-969 **£199.95**
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MFJ MFJ-949E **£159.95**
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MFJ MFJ-941E **£129.95**
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VR-5000
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40m - 70cms.
Max input 120W.
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FT-8900R £339.00
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MAKE	MODEL	DESCRIPTION	PRICE
Adonis	AM-805G	Desk Mic Built In Compressor, VU Meter	£70.00
AEA	PK-232MBX	TNC	£125.00
AEA	PK-900	TNC	£200.00
AEA	PK-96	TNC	£90.00
AKD	6001	6m FM Transceiver	£135.00
Alinco	DJ-G5EY	Dual Band Handheld	£199.00
Alinco	DJ-X10	Wide Band Receiver	£200.00
Alinco	DR-150	2m Transceiver with Air-and Receive	£150.00
Alinco	DX-70	HF & 6m Transceiver	£399.00
Alinco	DX-70TH	HF & 6m Transceiver (100W Output)	£475.00
Alinco	DX-77E	HF Base Station	£399.00
Ameritron	QSK-5	Amplifier Switch / Pre Heat	£200.00
Ameritron	RCS-4X	4 Way Switch	£99.00
AOR	AR-3000A	Wide Band Receiver	£450.00
AOR	AR-3030	HF Receiver, Including PSU	£350.00
AOR	AR-7030	Top Receiver	£550.00
AOR	AR-7030+	HF Receiver	£625.00
AOR	AR-8600	Base Scanner / Receiver	£425.00
AOR	AR-8600mkII	Base Scanner / Receiver	£499.00
AOR	AR-950	Communications Receiver	£89.00
AOR	ARD-2	Decoder	£200.00
Cubic	CDR-3550	Top Class 20-1300MHz Digital Receiver	£4,999.00
Datong	ASP	Auto Speech Processor (FT-817, FT-77)	£70.00
Global	AT-1000	Manual Short Wave Tuner	£50.00
Hunter	750	Linear Amplifier	£599.00
Icom	IC-2100H	2m FM Mobile Transceiver	£150.00
Icom	IC-2710H	Dual Band Mobile	£225.00
Icom	IC-271E	2m Multimode Transceiver - 25W	£299.00
Icom	IC-32E	2m / 70cms Handheld Transceiver	£99.00
Icom	IC-471E	70cms Multimode Transceiver	£299.00
Icom	IC-490E	70cms Mobile Transceiver	£250.00
Icom	IC-575A	50 MHz Multimode Transceiver	£450.00
Icom	IC-7100	25 - 2000 RECEIVER	£575.00
Icom	IC-720A	HF & FM Transceiver	£400.00
Icom	IC-735	Base Or Mobile Transceiver	£399.00
Icom	IC-7400	HF / 6m / 2m Built In ATU	£999.00
Icom	IC-746	HF / 6m / 2m Built In ATU	£875.00
Icom	IC-756	HF / 6M All Band Transceiver	£950.00
Icom	IC-910	2m / 70cms Base Transceiver	£999.00
Icom	IC-E90	Tri-Band Handheld	£220.00
Icom	IC-R5	Handheld Scanner	£125.00
Icom	IC-R10	Handheld Scanner	£229.00
Icom	IC-R70	HF Receiver	£299.00
Icom	IC-R7000	MINT CONDITION!!! Receiver	£550.00
Icom	IC-R71E	Receiver	£325.00
Icom	IC-R72	Receiver	£350.00
Icom	IC-R75	Receiver (With DSP Unit)	£499.00
Icom	IC-W2E	2m / 70cms Handheld Transceiver	£140.00
Icom	PS-55	Power Supply Matching IC-735	£100.00
Icom	SP-20	External Speaker	£99.00
JRC	JST-245	HF 50MHz 1500w AC Base Transceiver	£1,295.00
JRC	NRD-525	HF Receiver	£375.00
JRC	NRD-545	DSP Receiver	£899.00
JRC	NRD-L2000	1kW Linear Amp Solid State	£1,600.00
Kamtronics	KAM	Multimode TNC	£140.00
Kenwood	23cms	23cms Module for Kenwood TS-790E	£299.00
Kenwood	PS-31	Power Supply (TS-870, TS-850, etc)	£135.00
Kenwood	PS-430	Power Supply	£100.00
Kenwood	R-2000	Receiver Including Converter	£275.00
Kenwood	R-5000	Receiver	£499.00
Kenwood	R-5000	Receiver With VHF Converter	£600.00
Kenwood	TH-215E	2m Handheld Transceiver	£99.00
Kenwood	TH-235	2m Handheld Transceiver	£85.00
Kenwood	TH-47E	70cms Handheld Transceiver	£80.00
Kenwood	TH-79E	2m / 70cms Handheld Transceiver	£175.00
Kenwood	TH-F7E	Dual Band Handheld	£199.00
Kenwood	TL-120	Low Drive Linear Amplifier 100W HF	£150.00
Kenwood	TM-255E	2m Multimode Transceiver (MINT)	£395.00
Kenwood	TM-451E	70cms Mobile Transceiver Data Ready	£175.00
Kenwood	TR-751E	2m Multimode Transceiver	£250.00
Kenwood	TS-450S	HF Base / Mobile	£499.00
Kenwood	TS-50S	HF Mobile / Base Variable Power	£425.00
Kenwood	TS-570DGE	Mobile / Base HF Transceiver	£675.00
Kenwood	TS-790E	Dual Band Base - All Mode	£750.00
Kenwood	TS-850SAT	HF Base Station with Built In ATU	£699.00
Kenwood	TS-950SD	HF 150W DSP Base Station	£1,200.00
Kenwood	TS-950SDX	Kenwood's Flag Ship	£1,650.00
Kenwood	YG-455CN-1	270Hz CW Crystal Filer	£100.00
Kenwood	YK-88C-1	500Hz CW Narrow Filter	£40.00
Kenwood	YK-88CN1	270Hz CW Filter 8.83MHz	£40.00
Kenwood	YK-88S-1	2.4KHz SSB Narrow Filer 8.83MHz	£40.00
Kenwood	YK-88SN	1.8K SSB Filter	£40.00
Kenwood	YK-88SN-1	1.8KHz SSB Narrow Filter 8.83MHz	£40.00
Lowe	HF-350	HF Receiver	£295.00
MFJ	MFJ-1278	TNC All Mode	£175.00
MFJ	MFJ-784DSP	DSP Tunable Filter	£140.00
OptoElectronics	MiniScout	Frequency Counter	£129.00
PacCom	TNC-320	TNC	£90.00
Pres. Lincoln	10 METRE	10 Metre Multimode	£175.00
RadioShack	Pro-60	Scanner (30MHz - 999MHz, Gaps)	£99.00
RevCo	RS-2000	60 - 519 MHz Home Base Scanner	£79.00
Sommerkamp	FT-290R	2m Multimode Transceiver	£150.00
Sony	SW-100E	FM/SW/MW/LW Portable Receiver	£90.00
Standard	C-156E	2m Handheld Transceiver	£125.00
TenTec	RX-350	HF Receiver	£999.00
Tokyo	HL-30V	2m - 25W Amplifier	£75.00
Tokyo	HL-35V	2m Power Amplifier with Pre-Amp	£89.00
Tokyo	HL-37V	Linear Amplifier	£60.00
Tono	T-777	Communications Terminal	£120.00
Transverter	QM-70	28/144 Transverter	£100.00
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Uniden	UBC-9000XLT	Base Scanner	£199.00
WinRadio	WR-1550E	Trunking Software	£450.00
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Yaesu	FP-707	Power Supply Unit	£80.00
Yaesu	FP-757GX	Power Unit for FT-757	£300.00
Yaesu	FR-101	HF, 2m, 6m Base Transceiver	£399.00
Yaesu	FRG-8800	Receiver Including Converter	£399.00
Yaesu	FRT-7700	Antenna Tuner for FRG-7700	£60.00
Yaesu	FRV-7700	Converter for FRG-7700	£60.00
Yaesu	FT-100	HF/6m/2m/70cms Mobile Transceiver	£499.00
Yaesu	FT-1000MP	HF Base Station, Built In ATU, DSP	£1,199.00
Yaesu	FT-1000mkV	200W DSP HF Transceiver	£1,800.00
Yaesu	FT-1000mkV-Field	Top HF Radio - AC	£1,500.00
Yaesu	FT-1500M	2m 50W Mobile w/ DTMF Mic	£129.00
Yaesu	FT-221R	2m Multimode Base Station	£200.00
Yaesu	FT-2600M	Mobile VHF / FM Transceiver	£120.00
Yaesu	FT-290RmkII	2m Multimode Mobile Transceiver	£225.00
Yaesu	FT-41R	Handheld Transceiver	£120.00
Yaesu	FT-50R	Dual Band Handheld	£150.00
Yaesu	FT-51R	2m / 70cms Handheld Transceiver	£199.00
Yaesu	FT-690R	6m Multimode Mobile Transceiver	£199.00
Yaesu	FT-7100M	2m / 70cms Mobile Transceiver	£220.00
Yaesu	FT-726R	6m / 2m / 70cms / HF Transceiver	£575.00
Yaesu	FT-790R	70cms Multimode Transceiver	£175.00
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Yaesu	FT-8100R	2m / 70cms Mobile Transceiver	£220.00
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Yaesu	FTV-430MHZ	Module for Transverter	£99.00
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Yaesu	System 600	HF Commercial Radio	£600.00
Yaesu	VR-120	FM / WFM / AM Receiver	£99.00
Yaesu	VR-500	Yaesu Handheld Scanner	£149.00
Yaesu	VR-5000	Top Class Base Scanner	£450.00
Yaesu	VX-1R	Handheld Transceiver	£120.00
Yaesu	VX-5R	Triband Handheld	£220.00
Yaesu	VX-7R	Triband Handheld	£240.00
Yaesu	XF-114SN	2KHz SSB Filter	£60.00
Yupiteru	MVT-3300	Handheld Scanner	£99.00

Reviewed by Mark Marsden, G4AXX, 38 Lambert Cross, Saffron Walden, Essex CB10 2DP. E-mail: g4axx@ntlworld.com

The Heil Pro-Set + Headset

The author, Mark, G4AXX, models the Heil Pro-Set+.

The Pro-Set+ headset is the latest addition to the Heil Sound range. It follows on from the successful and very popular Heil Pro-Set headset which has been the headset of choice for DXers, contesters and special event station operators for several years. Major improvements have been made with the Pro-Set+.

The Pro-Set+ weighs 480g, which is heavier than the Pro-Set at 285g. Despite this, the Pro-Set+ is very comfortable to wear for extended periods. It has been used by the members of the Granta Contest Group with Yaesu FT-1000MPs in three contests recently, as well as with Kenwood and Icom transceivers, and has performed very well.

TWO MICROPHONES

There are now two microphone inserts built in, the HC-4 ('DX') and HC-5 ('full-range'). There's also a version with the HC-4 and special Icom electret inserts. Choosing which microphone to use is now as simple as flicking a switch on the mic boom (see photograph).

The HC-4 is designed for DX use, and the HC-5 for more casual operation. The HC-4 has a 10dB peak in the audio response at around 2kHz to help articulate speech in poor signal to noise ratio conditions (see **Fig 1**).

The output levels of the HC-4 and HC-5 inserts have recently been reduced by 10dB in a move to improve transmitter gain distribution and increase the signal-to-noise ratio of voice to background noise. This means turning up the microphone gain by 10dB to regain the correct levels of modulation and, if used, RF compression.

SOUND QUALITY

There are studio recordings, made using the various Heil microphones, available for comparison on the Heil Sound website (see 'Websearch' below).

The headset was also tested by John Crabbe, G3WFM, at the GB3RS club station using a Kenwood TS-950SDX transceiver. John asked for comparative reports on the two microphones. Several stations were worked on 40m, with reports varying from 56 to 59+. The 'Full range' microphone was described as: "More low and high frequencies", "Better – prefer this", "Best – fuller sound", "Better all round". The comments on the 'DX' microphone were: "It sounds like a telephone – cuts off lows and highs", "No top, no base", "Sharper", "Very 'narrow' – OK for DX, very sharp".

It would certainly appear that the two microphones do what is intended. It is also interesting to note that off-air reports are quite different from conclusions drawn by monitoring one's own voice using the 'monitor' facility on many transceivers, where little difference was evident when switching between the two microphones.

PHASE SWITCH

The headphones are 200Ω earpieces with the HF roll off -3dB point at 8kHz. Being stereo, they are ideal for dual receiver and split-frequency operation.

A phase reversal switch is provided which reverses the phase of one of the earpieces (see photo). Bob Heil of Heil Sound comments, "This unique feature repositions the sound field and is most useful on CW, allowing you to 'move' a wanted signal from the front to the back of your head." An interesting feature with SSB use has been observed. *RadCom* editor Steve Telenius-Lowe, G4JVG, used the Heil Pro-Set+ with an Icom IC-781 transceiver, also during a contest. He comments: "At first I thought the phase switch was of little or no use on SSB. However, after several consecutive hours of operation, I found that my brain was getting tired and I was finding it difficult to pick out callsigns from the 'mush'. Switching the phase switch to the 'other' position immediately helped to re-focus the brain and signals somehow sounded 'crisper' and easier to copy. Later, when the brain became tired again, moving the switch back to its original position again brought about an improvement in readability. It did not seem to matter which position the switch was in, it was the reversal of the phase that seemed to help. Eventually you will be tired no matter how often the switch is flipped, but I did find it made a real difference on at least two or three occasions."

Below left: "Choosing which microphone to use is now as simple as flicking a switch on the mic boom."

Below right: The phase reversal switch which reverses the phase of one of the earpieces.

CONSTRUCTION QUALITY

The headset has removable and washable foam microphone windscreen and cotton earpad covers. The headphones cover the ear and provide excellent sound insulation against outside noises.

The microphone boom can be swung through 180° enabling the headset to be worn with the microphone boom (and cable) on either the left or right hand side.

The overall feel of the construction is solid. The earpiece swivel mounting is described as "strong 1/4in stud speaker-mounting swivels" and feels substantial. Also, the swivel point of the microphone boom is a large circular plastic ring which feels a lot more robust than the swivel on the Pro-Set.

The cable is a generous 2.5m long and the strain reliefs are very rugged. The microphone and headphone connectors are 3.5mm mono and 6.35mm stereo plugs, and adapters are available for Kenwood/Alinco, Kachina, Icom, Drake, Yaesu, Ten-Tec and Collins radios.

CONCLUSION

The Heil Pro-Set+ is a worthy addition to the Heil Sound range, the construction quality is excellent and it can be expected to give many years of service. Is the standard Pro-Set still going to be available in future? It looks like it from the website, so the choice is yours.

The Pro Set+ is currently available at around £185, and our thanks go to Waters & Stanton plc for the loan of the headset for review. ◆

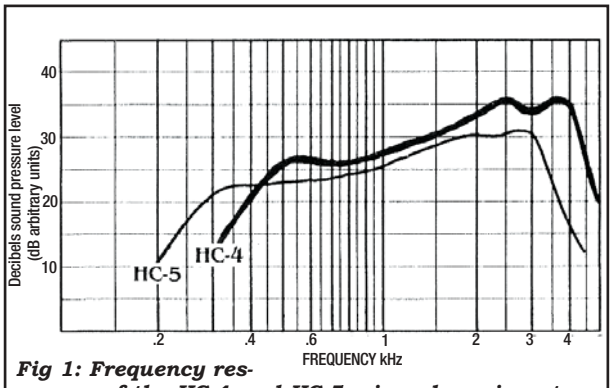


Fig 1: Frequency responses of the HC-4 and HC-5 microphone inserts.

WEBSEARCH

Heil Sound	www.heilsound.com
Microphone comparisons (studio recordings)	www.heilsound.com/sound_comparisons.htm

By Richard Constantine, G3UGF, The Old Exchange, Burnley Road, Mytholmroyd, Hebden Bridge, West Yorkshire HX7 5PD. E-mail: g3ugf@nocomm.co.uk

'Train the Trainers': the RSGB Full Licence Tutors' Weekend

The weekend of 18 / 19 October saw a unique gathering of amateurs at the Telford campus of the University of Wolverhampton. Chaired by Ed Taylor, G3SQX, RSGB Director responsible for Amateur Radio Development, and ably assisted by Dave Wilson, M0OBW, and Brian Reay, G8OSN, it brought together a team of around 35 tutors representing between them some 30 radio societies across the UK and Channel Isles. This was in addition to a leader's team of six, plus RSGB HQ staff and the Radiocommunications Agency.

With the next stage of the three-stage licence process now well under way and the new Full licence syllabus due to be introduced early in 2004, it was considered vital that experienced tutors got together to evaluate the changes and to share ideas and experiences.

OPENING DAY

Peter Kirby, General Manager of the RSGB, set the tone of the two-day session with an insight into the history of the RAE since its inception in 1948. He also gave an outline of how and why, just over three years ago, there had been an urgent need to update the established City & Guilds route to licensing. Peter said that "the Society's aim was to serve the UK amateur population as a whole, by providing education and training and that it was vital to find and use the best ideas to achieve this".

Alan Betts, G0HIQ, representing the Radiocommunications Agency, spoke about licensing standards, the position of OFCOM - the new regulatory body - and answered questions on the commercial value of the spectrum, the reasoning and methodology of the new licence structure, together with the international dimension.

Richard Constantine, G3UGF, the RSGB's Director of Education and Training, outlined 'the big picture', giving an overview of the Society's progress and long-term goals, liaising with other organisations and professional bodies. He said that by working with other agencies, including those in government and education, the aim was to raise the profile of amateur radio once again, to re-establish its value as an educational tool and to improve its standing at all levels and in the world of work. To achieve this, Richard added, "it is vital that whilst we value and appreciate the differences in teaching styles and methods, in order to gain credibility for what we do in mainstream circles, we must foster a climate for high standards of learning through consistently good and repeatable teaching methods."

On the first day of the conference, Anthony Vinters, G0WFG, chair of STELAR (Science & Technology through Educational Links with Amateur Radio), gave an animated and 'energising' lecture on teaching and classroom methods for effective learning, particularly geared to how people do, or indeed do not, learn! Using two 'Slinky' coils to form a dipole, he demonstrated simple and effective teaching methods and stressed the need for consistent terminology in the learning process under the heading 'Energy not Voltage!'

DAY TWO

On the Sunday, Brian Reay, G8OSN, gave an excellent presentation entitled 'Lesson Planning and Instructional Techniques' on thinking processes, learning retention and overcoming disruptive classroom behaviour. Due to a last-minute change of speakers, Brian stayed up well into the early hours generating an effective and most thought-provoking *PowerPoint* presentation, which was well-received by all.

On both days workshop groups considered various topics from the revised Full licence syllabus, including:

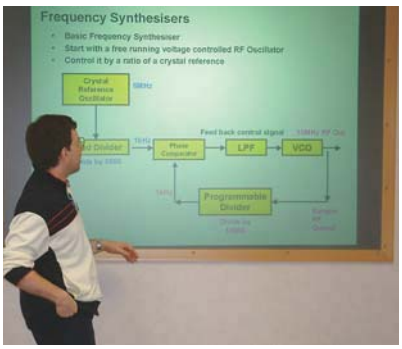
- EMC and Licence conditions
- EMF, Potential Difference and Mathematics
- Propagation, Feeders and Antennas
- Transmitters and Receivers.

Each group made presentations to the whole seminar. This revealed some superb thought-provoking and innovative ideas, highlighting the wealth of talent and experience available from within our ranks. These ranged from cardboard models, simple diagrams and memory aids to complete 3D animated *PowerPoint* slides, many covering complex subjects in an interesting, easy-to-understand and informative way.

In the feedback sessions it became clear that there is much to be gained by working together and those assembled were enthusiastic about developing shared resources for tutors.

As a result of this first weekend, work is now in hand to make the interchange of ideas between tutors easier. During 2004 it is hoped to develop a simple lesson planning scheme, in partnership for accredited tutors to follow, together with material and links to other sources.

As soon as the new and last link in the licence scheme is in place early in 2004, Ed Taylor, G3SQX, and the ARDC will be looking at ways to make the tutors' accreditation scheme more widely available, based on the outstanding success of this first weekend. ◆



Far right: Brilliantly simple frequency explanation by Murray, G6JYF.

Below left: Anthony, G0WFG, 'energising' the tutors with his 'Slinky dipole'.

Below middle: Working group on Transmitters and Receivers in session.

Below right: Brian's, G8OSN, humorous lecture 'Tell them what you're going to tell them', also known as 'Joining up the dots'.

Book Review

ADVANCE! THE FULL LICENCE MANUAL

by Alan Betts, G0HIQ, and Steve Hartley, G0FUW
Reviewed by RSGB Staff

This is the final book of the RSGB licensing trilogy, which now comprises *Foundation Licence - Now!*, *Intermediate Licence - Building on the Foundation* and *Advance! The Full Licence Manual*. It covers the syllabus for the final examination in the progressive licensing structure which is now in place.

The changes from the old syllabus are significant, and the book is highly recommended for anyone taking the full licence course.

The book begins with an introduction almost entirely devoted to 'How to Use this Book', but the most useful information appears before this section. It emphasises that this part of the course has no practical aspect, unlike the previous parts. You do not need to have a Foundation or Intermediate Licence, but you must have passed both exams and the assessments before sitting this exam.

After initial chapters on basic electronics, semiconductors and valves, the book dives straight into receivers and transmitters. The basic modes of modulation (AM, SSB and FM) are described, followed by the constituent parts of receivers and transmitters, with brief explanations of how they are used and why. The transmitter section introduces RTTY as a basic data mode and covers the design principles through to the PA stages, also accounting for filtering, efficiency and ALC. The chapter on transmitter interference catalogues all the nasty things your transmitter will do, given half a chance, and suggests (in some cases) how they may be avoided.

The chapter on feeders and antennas covers the usual theory and practice, with information and polar diagrams for ground planes, whips, dipoles and folded dipoles, Yagis and quads, with trap dipoles and end-fed wires bringing up the rear.

Four pages on propagation are sufficient to cover the syllabus, and are followed by 14 pages on EMC, always a difficult subject for the fledgling Full licensee, as such problems are encountered *almost* exclusively when higher powers are used. At least the new operator knows where to come for basic information when his/her first case of electromagnetic *in*compatibility occurs!

A chapter on measurements follows, with details of the voltmeter and ammeter, a diode RF probe, an SWR meter, an absorption wavemeter, and an oscilloscope.

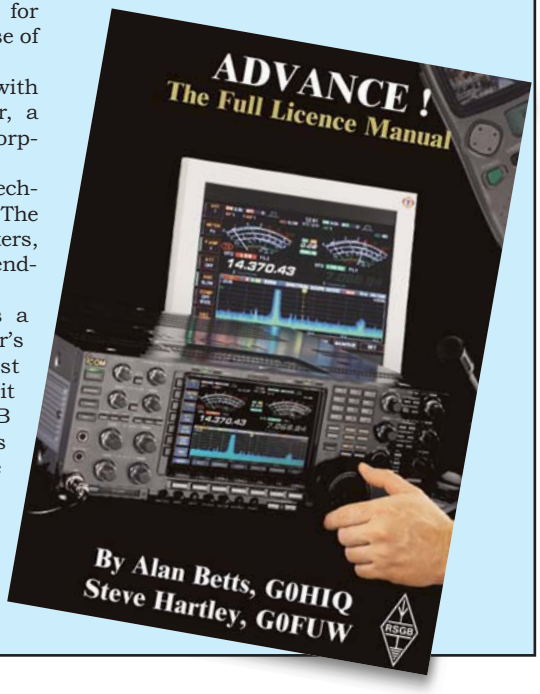
Next comes a chapter on operating techniques, or so the chapter heading says. The subjects covered are packet radio, repeaters, setting up a special event station, and ending with notes about the band plans.

Tucked away almost at the end is a chapter on safety. From an operator's point of view, this is probably the most important chapter in the book - ignore it at your peril. A full copy of the RSGB EMC Committee Leaflet EMC 07 is included. This covers Protective Multiple Earthing in detail.

The book ends with a short chapter on licence conditions, which contains the answers to many questions which keep cropping up once the new licence has been received.

In short, anyone planning to sit the Full RAE, or to enrol for a course, should have a copy of this book. It contains all you need to know.

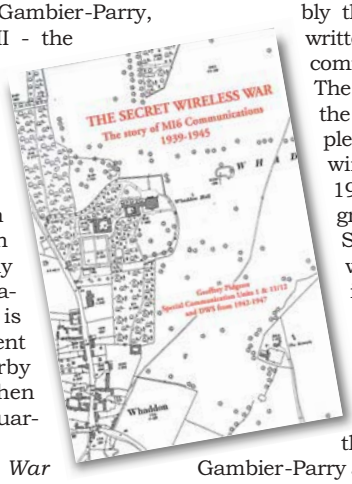
ADVANCE! THE FULL LICENCE MANUAL
By Alan Betts, G0HIQ, and Steve Hartley, G0FUW
RSGB Books
A4, 104 pages, soft covers.
ISBN 1-872309-95-X
Members' price: £8.49 (non-members £9.99).
Available from the RSGB shop.



THE SECRET WIRELESS WAR: The Story of MI6 Communications 1939-1945

By Geoffrey Pidgeon
Reviewed by RSGB HQ Staff

Possibly the most important UK wireless traffic in WWII was handled by a unit formed in 1938 by Brigadier Richard Gambier-Parry, the head of MI6 Section VIII - the communications division of SIS. *The Secret Wireless War* tells of the early days of the original SIS wireless 'Station X' based in Barnes in south-west London, and the building of its second station in a bungalow in Surrey with the strange name of 'Funny Neuk'. The unit's wireless station at Bletchley Park is described and its replacement by the stations at nearby Whaddon Hall which then became the wartime headquarters of Section VIII.



The Secret Wireless War includes the story of Churchill's personal wireless operator, there is a description by a German serving in Rommel's Afrika Corps of how he operated an Enigma machine at Rommel's headquarters in the desert, it documents the work of British agents in embassies abroad and of those in German-occupied territories, and the curious story of 'Black Propaganda' is told.

So far, so good. But that brief description barely scratches the surface of what is contained in *The Secret Wireless War*. It is hard to convey the vast scope of this book in a short review such as this. Suffice to say it is probably the most complete book yet written on Britain's secret radio communications during WWII. The author says, "I believe this is the first book to give the complete story of the SIS secret wireless war from 1939 to 1945. It also gives a background history of our Secret Service, its growing use of wireless in the 1930s, and its involvement in the dissemination of Enigma (Ultra) intelligence."

The book is in three parts: Part 1 covers the historical background to the SIS, introduces Richard Gambier-Parry and discusses the early days of Barnes Station X and 'Funny Neuk'. Part 2, entitled 'War Comes to Whaddon Village', is a detailed account of life and work at Whaddon Hall, Bletchley Park, Windy Ridge, Hanslope - and much more besides. The largest section of the book, Part 3, is a series of 18 chapters and eight appendices called 'Their Story', which consists of first-hand accounts by some of those personally involved in the secret wireless war. One of these chapters is in effect a brief autobiography of Pat Hawker, G3VA (although written in the third person). Pat was a war-time colleague of the author, and is acknowledged as being one of several individuals who supplied vital information for the book as a whole. Another chapter was contributed by Bob King, G3ASE, who also helped to provide information on the Volunteer Interceptors for the book.

This is a big book - 416 pages of high-quality paper, hard bound, containing 185,000 words and 194 illustrations - covering a big subject. It contains details of places and events that have never before been reported and will become essential reading for anyone interested in this fascinating part of Britain's history. In short, *The Secret Wireless War* is an important record of people and events that - it is no exaggeration to say - helped to win WWII. (Note that this book is not connected to the video of the same name, although some of the same individuals contribute to both.)

THE SECRET WIRELESS WAR: The Story of MI6 Communications 1939-1945
By Geoffrey Pidgeon
UPSO Limited, 2003
416 pages, A4, hardback
ISBN 1-84375-252-2
Members' price: £25.49 (non-members £29.99)

There have been a few recent instances which once again remind us that DXpeditions don't always go to plan. 3C0V, active from Pagalu (previously known as Annobon Island), had been going strong and then disappeared suddenly from the bands. It later transpired that they had been closed down at short notice by the authorities on the island. At the time of writing, it is not clear exactly why this happened, as they believed they had all the necessary documentation and permissions before travelling to the island. Sadly, when they became absent from the bands, instead of expressions of concern for their well-being and safety, the *DXCluster* carried several offensive messages, slating them for not being on the bands for the weekend DX chasers.

The Italian team heading for a new IOTA group in French Polynesia (FO) were delayed in their arrival by 24 hours or so, due to a drop in the wind (they were sailing by catamaran), and then, during the landing, they lost two transceivers and one antenna in the sea. Finally, their generator failed to start and they had to rely on battery power. Lastly, the BV9P Pratas Island DXpedition was delayed by a day due to typhoon warnings in the area. Too often, as highlighted above, when DXpeditions fail to appear or are less active than perhaps hoped for, the fireside DXers (most of whom have never been on such a trip and never will) start complaining which, in these days of the Internet, is all too easy to do. Whereas, when the story emerges, it's often one of triumphing in the face of adversity. (Incidentally, the CDXC – Chiltern DX Club - newsletter, *CDXC Digest*, carries many such expedition stories every other month. Having just stood down after five years as editor, perhaps I might be forgiven for giving it a plug. Details of CDXC membership can be obtained from treasurer Shaun Jarvis, M0BJL). The good news is that there is another group of amateurs who rise to the occasion in true amateur spirit to help out; the Italians, for example, have already received several offers of help towards replacing the lost equipment.

DX NEWS

Firstly, news of a major operation due to take place next March/April. The UK-based Five Star DXers Association (FSDXA, closely linked to the Chiltern DX Club) announced at the RSGB HF Convention that it will mount a major operation to **Rodrigues Island**, with the callsign 3B9C, as a follow-on to the extremely successful 2001 D68C expedition. More information to follow, but you can also find full details on the extensive web page, or contact the publicity officer (none other than yours truly).

ON4JM was due to leave for **Benin** on 2 November, where he was due to stay until 23 December. He plans to operate in his spare time (during local evenings and on Sundays), probably as TY4JM. QSL via ON4JM, preferably via the bureau.

Jose, ON4LAC, should have been active as 3B8/ON4LAC from **Mauritius** until 23 November, moving from there to **Reunion Island** (FR5) to be active as FR5/ON4LAC during the period 26 November to 15 December. Find him mainly on 20 and 15m on SSB and PSK, plus some RTTY. He will then be back in 3B8 from 17 to 27 December before heading home. QSL via his home callsign.

The Clipperton DX Club expedition to **Europa Island**, which I mentioned last month, has been extended through to 15 December. The callsign will be TO4E for the DXpedition and TO4WW for the CQWW CW Contest.

Members of the IARV (an NGO) led by Yoshi, JA1UT, are once again planning an aid trip to the Sahara desert. They will be in **Mauritania** from 4 to 17 December. Look for 5T5AFF (JA1AFF), 5T5CPS (JA1CPS), 5T5GDR (JR1GDR), 5T5HC (JA1HC), 5T5RQ (JA6RQ) and 5T5TY (JA1TY), to be active in their spare time. QSL via their home calls.

Richard, F8LPX (ex-TR8DR, FB1LPX, PT2ZDR, YS1DRF, 9J2DR), is heading to Bujumbura, **Burundi**, where he will be working in the French Embassy for the next three years. He hopes to have a licence soon. Fingers crossed for this one, as several operations in recent years were disallowed by ARRL due to irregularities in the licences (it's often unclear in some emerging countries just who the true licensing authority is, perhaps not surprisingly as amateur radio is unlikely to figure highly in the local order of priorities).

Cliff, G0MMI, reports that he has taken up QSLing duties for YI1BGD/5 (**Iraq**), but that cards for YI1BGD itself should go to Diya, YI1DZ, unless told otherwise by the operator. I am very conscious that I haven't provided much QSL information in recent months; I will try to compile a bumper 'QTH Corner', covering many of the recent DX operations, in time for next month's issue (and will post it on my web page as soon as it is ready).

Johan, PA3EXX / VK4WWI, will operate as VK4WWI/9 from **Cato Reef** (new IOTA) on 2 - 6 December. He will be active on 10 - 80m SSB and CW. QSL via home call. A planned trip to Marion Reef (Coral

COUNTRIES WORKED, 2003

(sorted this month by Mixed totals)

CALL	CW	SSB	DATA	MIXED
W1JR	248	222	147	282
G3YVH	219	172	0	246
G3XTT	229	164	129	245
G3SXW	237	0	0	237
M0AWX	0	233	81	237
G3TBK	227	107	0	233
G4WFQ	213	70	100	232
G3TXF	231	16	0	231
GM0TGE	149	172	0	219
G4WXZ	166	169	0	218
G4KFT	206	0	0	206
G4KIV	158	165	2	202
GU4YOX	149	138	0	188
G3LHJ	171	65	100	186
G3VDL	185	0	0	185
G4EDG (QRP)	180	0	0	180
MU0FAL	154	133	0	173
G0ARF	0	0	169	169
G4OBK	149	24	69	160
G3ZRJ	156	0	0	156
M0CNP	12	149	43	152
M3CLY	0	152	0	152
M0BKV	1	141	66	148
G3YMC (QRP)	134	0	0	134
ZC4VG	131	34	57	134
GU0SUP	0	0	132	132
M0BVE	132	0	0	132
MM0BQI	92	74	101	132
M5PLY	-	-	71	131
G0GFQ	0	128	2	129
M5GUS	0	127	0	127
G4UCJ	124	10	24	126
G3JFS (QRP)	93	57	55	117
G4IFB	115	0	0	115
G4IDL	103	14	0	114
G4FVK	60	99	0	112
G0LGJ/M	0	103	0	103
GI0NQC	1	70	69	102
G4YWY/M	0	95	0	95
GU7DHI	6	84	0	84
GM6MEN	1	76	0	77
G6FCI	0	70	18	74
GW4ALG (QRP)	74	0	0	74
G3URA	0	0	71	71
G4DDL	68	17	21	70
G7FSI	0	63	0	63
G3WP	59	0	0	59
G1UGH	0	56	0	56
M3NPB	46	21	0	56

By Don Field, G3XTT, 105 Shiplake Bottom,
Peppard Common, Henley on Thames RG9 5HJ. E-mail: hf.radcom@rsgb.org.uk

Sea Islands Territory North Group) has been cancelled for this year.

Dave, G3TBK, will be active again this month from **St Vincent** as J88DR. He will be mainly on CW but says he will listen for UK Foundation and Intermediate Licence holders on SSB around 14140kHz from 2215 to 2300 each night. QSLs to G3TBK as normal.

Kay, K6KO, and Ken,K6TA, will be active from **Aruba** as P40K and P40TA respectively from 26 November until 17 December. They will operate the main contests during that period and outside of contest activity they will concentrate on the 12, 17 and 30m bands and RTTY. QSL both calls via WM6A.

Mike, G4IUF, will be back in the **Galapagos Islands** from 15 December until 11 January. He will be using the callsign G4IUF/HC8 with a better LF antenna, providing he can get the traps. Mike is hoping to make some 160m QSOs this year.

9 BAND TABLES No 48

MIXED MODE

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
G3KMA	255	302	329	322	334	329	335	323	332	2861
G4BWP	250	305	333	321	335	328	335	316	325	2848
G3XTT	235	281	319	286	334	316	333	299	314	2717
GW3JXN	192	260	299	288	328	319	321	297	305	2609
G3GIQ	152	246	303	264	334	318	333	307	328	2585
G4OBK	186	234	285	289	330	309	319	303	302	2557
G3SED	234	263	296	280	314	295	302	275	287	2546
G3TXF	140	241	301	298	329	302	325	285	305	2526
G3SNN	174	238	288	234	333	292	325	280	305	2469
G3TBK	143	241	281	264	330	302	318	287	293	2459
G3LAS	120	209	262	272	319	306	317	300	301	2406
G3YVH	139	170	264	287	325	313	313	279	286	2376
G3IFB	63	226	288	249	327	253	307	253	287	2253
GM3PPE	148	210	254	264	320	268	278	241	228	2211
G4PTJ	49	192	254	214	326	279	322	271	304	2211
G3VJP	107	187	260	190	329	277	316	248	286	2200
G3AKU	115	170	242	253	302	268	276	266	276	2168
G3KMQ	60	214	267	214	325	251	282	259	249	2121
G0JHC	1	71	232	280	288	307	315	300	309	2103
G5LP	75	228	283	227	312	246	286	187	253	2097
G3VKW	49	173	236	146	328	247	324	262	309	2074
G3IGW	129	198	318	242	289	246	264	137	238	2061
M0BEW	74	131	227	204	289	246	278	232	267	1948
G4NXG/M	26	57	140	0	295	231	290	202	254	1495
G4WFQ	29	115	195	174	241	194	217	155	174	1494
G4OWT	42	87	181	94	307	112	296	97	268	1484
G0LRX	4	105	127	0	241	66	260	82	234	1119
G4FVK	42	79	107	63	191	108	194	85	176	1045
M0CNP	10	87	132	9	312	95	182	79	131	1037
MM0BQI	39	77	136	54	201	86	186	66	175	1020
AVERAGE	109	187	248	209	306	250	292	232	270	2103
CW ONLY										
G3KMA	249	283	326	322	334	323	332	311	322	2802
G4BWP	230	237	307	320	308	309	311	285	267	2574
G3XTT	225	255	307	286	308	297	309	278	289	2554
G3TXF	140	238	299	298	324	300	320	284	295	2498
GW3JXN	189	236	286	288	315	305	310	275	278	2482
G4OBK	178	218	277	289	313	297	299	286	286	2443
G0NXX	177	239	282	294	300	292	278	269	270	2401
GM3POI	211	237	289	266	306	258	284	238	254	2343
G3SED	233	249	291	280	288	264	267	230	226	2328
G3YVH	137	170	259	287	316	300	298	264	270	2301
G3SXW	96	209	266	269	318	290	303	260	286	2297
G3LAS	119	153	243	272	283	288	289	265	267	2179
G3AKU	115	170	242	253	293	258	264	248	260	2103
G5LP	75	224	283	227	301	246	276	187	246	2065
G3VJP	106	150	249	190	301	254	287	222	254	2013
G4PTJ	47	146	224	214	278	260	288	251	263	1971
G3VKW	43	111	189	144	252	189	273	206	216	1623
G4WFQ	29	111	182	173	172	149	160	123	105	1204
G4OWT	34	81	154	94	239	75	238	71	209	1195
MM0BQI	26	57	100	54	121	54	119	34	117	682
AVERAGE	133	189	253	241	284	250	275	229	249	2103

NEXT DEADLINE 8 January 2004. PREPARED BY G3GIQ henry@topdx.com

CORRESPONDENCE AND TABLES

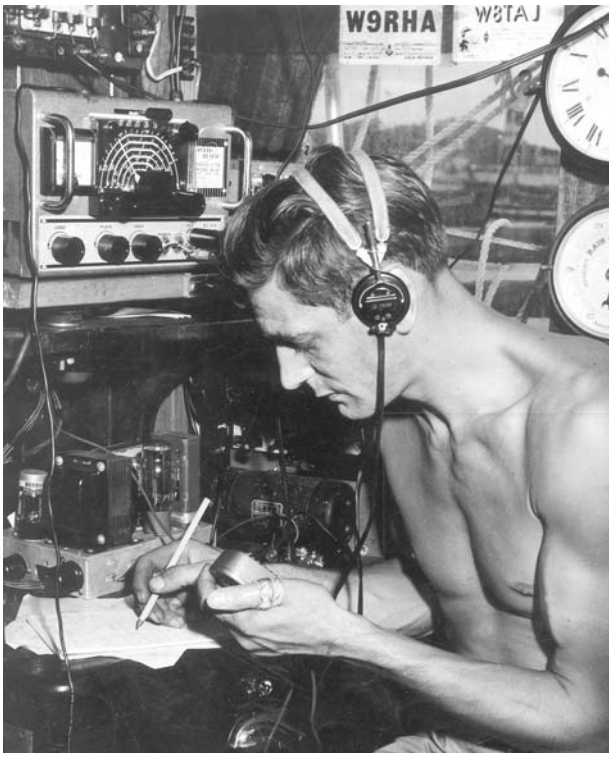
There have been several new table entrants this month; welcome one and all. Damian, M0BKV, writes that he thoroughly enjoyed some casual participation in the CQWW Phone Contest, and can't understand why some folk are so against contests. As he says, "they teach you so much about yourself and radio wave propagation, improve your operating skills, give you so much DX and get people on the air, quite apart from the competition and having fun aspect." With a small triband Yagi at 45ft, and 100 watts from an FT900AT, he worked 518 stations in 86 countries, despite taking time out to do some maintenance on the house (incidentally, he thanks the RSGB for its support in helping him to get planning permission for his mast and beam).

Terry, G1UGH (our first G1 participant), has worked 56 countries since 24 August, including (on 20m) HS0/IK4MRH (Thailand), BV2B (Taiwan) and (on 15m) 5N0NHD (Nigeria). Dave, M0BVE, mentions CW contacts with 3B9 (Rodrigues Island), 5R8 (Madagascar) etc, but doesn't mention the band. Mark, G0LGJ/M, reports that his mobile activities netted him a ZL (New Zealand) station on 40m, quite a feat. He has now applied for DXCC with 136 confirmed through his mobile activities, though he notes that the ARRL does not offer a /M endorsement. Mick, G2HDU, picks up on the topic of channelised SSB (see October 'HF') and says he wrote to the then *RSGB Bulletin* about exactly this subject in January 1960! I guess there's nothing new under the sun, though the difference is of course that rigs have become much more stable during that time, with better filtering, so the basis for today's discussion is likely to be somewhat different.

Paul, GM6MEN, reports a cross-mode contact with TG9NX (Guatemala) on 12m SSB which merits a mention. Paul responded to TG9NX's CQ call, but apparently wasn't being heard well enough for a contact to take place. So, throwing caution to the wind, he reached for his Morse key and, despite some rusty sending, managed a solid contact. He urges other ex-Class B licensees to give CW a try, using the TG9NX QSO as a fine example of how CW can often get through when SSB can't. Paul also enters the fray on

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 **February** issue by **20 December**.



Danny Weil operating as VP2VB/MM from the YASME, ca 1959.

channelised HF operation. He feels that 40m is the only band so congested that channelisation may offer some help. However, this would require a degree of discipline which he suspects many operators may be lacking! And, talking about the effectiveness of CW, Robin, M1DUD (who I had a very pleasant chat with at the HF Convention), reports a CW QSO with RX3BO in Moscow with just one watt on 18075kHz. Perhaps not so remarkable except that, at the time, Robin had no antenna connected, but was re-calibrating his FT-757 using a low-reading power meter with a dummy load connected! The antenna was connected to another transceiver entirely. They exchanged 559 reports. A few minutes later, with the antenna reconnected, the signal reports went up just two S points to 579 each way!

My thanks as ever to Henry, G3GIQ, for compiling the nine-band table. Henry asks that all submissions be in plain ASCII text as this makes his life a lot easier, but do please include totals as well as individual band scores, as it acts as a check on his typing! Henry also gets a little confused when he sees huge changes in score from time to time (one entrant appeared to have jumped from 252 to 312 on 20m in just three months!) Please check your scores before you send them. If something unusual has happened (like you find you had previously made an error) then please let Henry have a word of explanation.

SILENT KEYS

Legendary DXpeditioner Danny Weil, ex-VP2VB, of *YASME* fame died on 3 October. He was 85. British-born, Danny was active under a variety of callsigns in the 1950s and early 1960s while sailing around the world. Late last year, he suffered a stroke and had been living in an extended-care facility in San Antonio, Texas. Danny was a watch and clock maker by trade and had also served in the RAF, but was inspired by Thor Heyerdahl's *Kon-Tiki* voyages of the late 1940s, as a result of which he took up sailing and completed his first solo crossing of the Atlantic in 1954, landing in Antigua. Like Heyerdahl, Danny came to appreciate the potential value of amateur radio as a means of communication on future voyages. Those voyages (in three different *YASME* yachts), which led to him operating from around 30 rare DXCC countries, were an inspiration to many amateurs, and the name of his yacht was adopted in due course by the YASME Foundation, which went on to sponsor many other expeditions and to act as QSL route for Lloyd and Iris Colvin and others. The full story is told by Jim Cain, K1TN, in the recently-published book *YASME* (available from RSGB Sales). Danny was only the fifth person to be inducted into the *CQ* DX Hall of Fame, in 1969.

Ian Anderson, T20AA (ex-GM4JAB, ZD9BT, VP8GZ, J87BD and T2ITA), also passed away on 3 October, reports Jack, VK2GJH. Ian had been active from Tuvalu for over 20 years, and made it into many UK logbooks. ◆

WEB SEARCH

CDXC:	www.cdxc.org.uk
BARTG:	www.bartg.demon.co.uk
3B9C:	www.fsdxa.com/3b9c
Europa Island Expedition:	http://europa2003.free.fr
Clipperton DX Club:	http://cdxc.free.fr

HF F-Layer, Propagation Predictions for December 2003

	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	7471..177677	..231147....	...55577....	...9999.....	...7999.....	....77......	....33......
*** Asia							
Yakutsk	311...135444	...651.54...	...72.......	....	....	....	....
Tokyo	...1...1111.	...2...1....	...1........	....	....	....	....
Singapore	......121...	.......331...	......42....	.....261....	.....24.....	....133.....	....111.....
Hyderabad	....	2......2211.	......23....	...1.277....	...33573....	...7778.....	...4787.....
Tel Aviv	626....67647	...2..284..8	...64367....	...3556.....	....663.....	....4.......	....
*** Oceania							
Wellington	....34651...	...177761...	...17883....	....463.....	....242.....	....24......	.....2......
Well (NZ) (LP)	....	....	1.........1	...2....12..	...41...2...	....	....
Perth	....	......11....	......31....	.....373....	.....461....	...2367.....	...1355.....
Sydney	......1.....	.....131....	.....55.....	....687.....	....686.....	...1785.....	....67......
Melbourne (LP)	...22.......	....57......	...38.......	....81......	....82......	....6.......	....
Honolulu	.......1....	...1.112....	....	....	....	....	....
Honolulu (LP)	....	....	....	........1...	........2...	...111......	...22.......
W. Samoa	.......1....	....4454....	....4652....	....242.....	.....2......	....	....
*** Africa							
Mauritius	1..........	....	.......1....	.......1....	....	....	....
Johannesburg	76......2677	62......5655	2......25411	.......31...	.....113....	...35666....	...24564....
Ibadan	233.....1222	617.....4453	...5...151..	...876678...	...887885...	...99899....	...89798....
Nairobi	11..........	22......1111	1.2....133.1	..1111142...	...32235....	...54453....	...5555.....
Canary Isles	7763....6667	66.4...15666	...1311255..	...866637...	...426714...	.....56.....	.....56.....
*** S. America							
Buenos Aires	3317.......2	.1.6........	...4........	...51........	...221.1....	....2111....	.....111....
Rio de Janeiro	...3........	...4........	...3........	...63..11...	...341121...	....4112....	....31.2....
Lima	...1........	...1........	....	.....21.....	.....321....	.....432....	.....331....
Caracas	.111........	.1.2........	....1.......	....	.....111....	.....655....	.....663....
*** N. America							
Guatemala	...1........	...1........	....	....	....	......21....	......1.....
New Orleans	1..1.......1	...2........	....	......552...	......66....	......77....	......64....
Washington	4424......54	14.62....211	.....2..1...	.....3336...	......562...	......46....	......52....
Quebec	66.71....575	...12....3..	.....2113...	.....7786...	......88....	......88....	......87....
Anchorage	54.31..24323	....11..2...	....	....	....	....	....
Vancouver	11..........	....	....	.......2....	....	....	....
San Francisco	....	....	....	.......3....	.......1....	....	....
San Fran (LP)	....	....	.......3....	.......6....	.......6....	.......5....	....

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 October 2003 issued by the Sunspot Data Centre, Brussels, was 65.6. The daily maximum / minimum numbers were 167 and 13 on 29 / 30 October and 13 / 14 / 15 October respectively. The predicted smoothed sunspot numbers for December, January and February are respectively: (SIDC classical method - Waldmeier's standard) 58, 57, 55 (combined method) 56, 53, 51. 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.

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Contest

Jurij Phunkner, MM0DFV writes on behalf of the Scottish-Russian ARS, which is promoting the UK DX Contest. The dates for 2004 are 10/11 January for the SSB leg, 26/27 June for the CW leg and 17/18 July for the RTTY leg. The contest covers 1.8MHz to 28MHz (except for the RTTY leg, presumably) and the objective is for amateurs around the world to contact UK amateurs in as many UK areas as possible. For UK stations, the exchange is signal report and UK area code (eg OX for Oxford).

STEW PERRY DISTANCE CHALLENGE

Run by the 'Boring Amateur Radio Club', and according to their website, "The Stew Perry Topband Distance Challenge is a unique contest - held on 160 metres - which occurs near the solstice in December. This contest uses grid squares for the exchange and a QSO point system which awards points in proportion to the distance between the stations making the QSO. There is also a generous power multiplier (x2 for 100 watts and x4 for 5 watts) and a multi-operator category. There is even a multiplier for those who work QRP stations - making it worth the extra effort to pull them out of the noise". This makes for a really interesting test of operator skill. It's pleasing to see some UK stations featuring strongly in the results of the 2002 event. Clive, GM3POI, makes third place in the Single-Operator High Power Category. In the Single-Operator, Low-Power Category, Bob, GU4YOX, takes World First place. Bob says that he's delighted with this result and plans to do even better this year. He has approx 4300ft of radials under the tower now and is proposing to remove the beam this winter and increase the vertical height with a pole to around 87ft.

Another Bob, G4VGO, took third place in the Low Power section, which once again is a very creditable achievement. Congratulations to both Bobs and Clive on excellent results. If you're around on 27 and 28 December remember to take a look on topband as the participants in this rather unusual contest will be delighted to hear from you, I am sure.

CONTESTS THIS MONTH

One of my favourite contests has always been the ARRL 10 metre Contest. With declining propagation, it may not be a hotbed of activity this year, but there is almost always something to work, and usually something quite interesting! The contest takes in both CW and SSB so there should be something for everyone. It would be great to see some new entrants from

Moonrise over the M0B - the Hadley Wood Contest Group's station in the 2m Trophy Contest, September 2003.

PHOTO BY G3ZVW

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest	Bands	Exchange
5-7 Dec	2200-1600	CW	ARRL 160m Contest	1.8	RST
13-14 Dec	0000-2359	CW/SSB	ARRL 10m Contest	28	RST+SN
20 Dec	0000-2359	RTTY	OK RTTY DX	3.5-28	RST+CQ Z (14)
27 Dec	0000-2359	CW/SSB	RAC Canada Winter Contest	1.8-144	RST+SN
27-28 Dec	1500-1500	CW	Stew Perry Distance Challenge	1.8	Grid (IO91)
VHF Contests					
2 Dec	1900-2130	ALL	RSGB 144MHz Activity	144	RST+SN+Loc
7 Dec	0900-1700	ALL	RSGB 144MHz AFS	144	RST+SN+Loc
9 Dec	1900-2130	ALL	RSGB 432MHz Activity	432	RST+SN+Loc
16 Dec	1900-2130	ALL	RSGB 1.3GHz - 24GHz Activity	1.3G - 24G	RST+SN+Loc
23 Dec	1900-2130	ALL	RSGB 50MHz Activity	50	RST+SN+Loc
26 Dec	1400-1600	ALL	RSGB Christmas Cumulative	50-432	RST+SN+Loc
27 Dec	1400-1600	ALL	RSGB Christmas Cumulative	50-432	RST+SN+Loc
28 Dec	1400-1600	ALL	RSGB Christmas Cumulative	50-432	RST+SN+Loc
29 Dec	1400-1600	ALL	RSGB Christmas Cumulative	50-432	RST+SN+Loc

432MHz ACTIVITY CONTEST 2002

The first year of these contests started with an event with good conditions, with many entrants able to take advantage of the co-ordination of these contests with the Nordic Activity Contests. This co-ordination of dates gives a much better chance of good contacts into Scandinavia, and also with the higher level of European activity that the Nordic events have traditionally brought to the band. In the January session, several stations made contacts into Scandinavia, with best DX distances in excess of 1000km. Unfortunately, the other sessions seemed to coincide with much poorer conditions, and these levels of DX weren't repeated. Activity for the events started off well, but dropped off during the year, with the final few events being really poorly supported. High levels of activity breed more activity and so declining activity is a vicious circle. The VHFCC will be doing its best to encourage more activity into these series of contests during 2003, and we'd like to encourage everyone at home on a Tuesday evening to just take a little time to wander over to the station and see what's happening on the band. Openings which don't even touch 2m can be intense on 70cm and higher and can occur with surprising regularity, so if you don't check the bands, you have no idea what DX you may be missing.

In the Single Operator section, Roger Piper, G3MEH, turned out for every session bar one and wins this section from Bryn Llewellyn, G4DEZ. Pete Lindsay, G4CLA, takes the award for leading station with low power and one antenna. The Open section was conclusively won by The South Birmingham Radio Society, G8OHM, who supported every one of the 12 events, with Tim Boon, M0AFC/P, taking second place.

Andy Cook, G4PIQ

SINGLE OPERATOR FIXED SECTION

Pos	Callsign	Total	Pwr	Ant
1*	G3MEH	5924	250	2 x 23Y
2*	G4DEZ	4405	400	2 x 28Y
3	G4BRK	4310	60	21Y
4*	PE1EWR	3454	130	2 x 21Y
5	M0GHZ	2234	400	2 x 21Y
6*	G4CLA	1660	25	28Y
7	G8VHI	1000	100	2 x 23Y
8	G3YDY	671	50	19Y
9	G8HGN	565	50	2 x 21Y
10	G7ULL	246	50	15Y
11	G3YJR	172	10	19Y
12	G4APJ	161	25	19Y
13	GW8ASA	130	50	23Y
14	G0DVJ	62	50	5Y
15	G8VYK	36	29	19Y
16	G0DTI	2	20	19Y
17	M5ADF	1	5	Vert

OPEN SECTION

Pos	Callsign	Total	Pwr	Ant
1*	G8OHM	6000	400	26Y
2*	M0AFC/P	1489	25	19Y
3	GW8ASA/P	895	50	23Y
4	G4APJ/P	279	5	19Y
5	M0BPQ/P	137	100	19Y

ROPOCO 2, 2002

Where commented upon, most contestants found conditions to be average, which in the writer's experience at such an early hour in summer is not good! Many also commented that the going particularly in the second hour was slow, and that if anything the contest is too long, which is an understandable comment. However, realistically it could hardly be shorter and perhaps a more operator-friendly time slot would address both these issues: AFS may well be a pointer in this regard.

Fraser Robertson, G4BJM, once again combined the attributes of a strong signal, slick operating and high accuracy to top the table. G3RSD using only 100 watts output and an antenna at modest height achieved second place, beating a clutch of stations with 6dB greater output. Antenna heights ranged from below 20ft to greater than 80ft, with a remarkable number in the former category, which makes the author's antenna seem less modest than he had previously thought!

The very obvious mangling of postcodes, which clearly are then repeated ad infinitum, belies the fact that overall accuracy is high, with a mean deduction of less than 1%, with the median below 2%, the range being zero to 27% with four perfect logs, a very commendable performance. The latter figure is less than in recent events but there is no truth in the rumour that the adjudicator is heavy handed!

Over a third of logs received were still paper based, which is disappointing. The author, although not computer illiterate, came late to computer logging and found keyboarding to be the major problem. However, it revolutionised his contest approach and activity, so advancing years should not be a barrier. It is clear that accuracy in the computer based logs is very much higher than the paper based equivalents, which should provide further motivation. ***Clive Whelan, GW3NJW***

POS	CALLSIGN	SCORE	EQUIPMENT CODE
1	G0CKP	690	4C1
2	G4BJM	680	4C17
3	G4BWP	650	-
4	G3BJ	640	4C18
4*	G3TXF	640	4C15
6	GW3WWN	590	3C12
7	G0MTN	570	3C12
8*	G3RSD	550	3C13
9	G4RCG	530	4C16
9	G4OGB	530	3C13
9	G4CXT	530	3C13
9	G3LIK	530	3C13
13	G3TJE	520	3Q13
14	GW0GEI	510	4C13
15	G3ZGC	500	4W13
15	G4IIY	470	4C13
17	G2HLU	470	4C12
18	G4CZB	450	4C13
18	G0IVZ	450	-
18	G3JJZ	450	3W1
21	G4CWH	420	4W14
21	G4EBK	420	3C13
23	G0WHO	410	3C13
23	G4ARI	410	1C14
25	G3GC	380	3C13
25*	G4XPE	380	3C11
27	G3MA	370	2C1
27	GW3NJW	370	4C13
27	G3RFH	370	3C1
30*	G3ZDD	330	-
31*	G3LHJ	320	3W1
32	G0DHZ	300	3C1
33	G0WBC	280	3C13
33	G3GMM	280	3C1
35	G3VQO	270	3W1
36	G4PTE	250	3G1
36	G3VDF	250	3C1
36	G4BUO	250	3W1
36*	G0RDO	250	3W1
40	GW3SB	240	3W1
41	G3CQR	220	3C13
41*	G3IZD	220	3W12
43*	G3YMC	200	1W12
44	G3GMS	180	3G12
45	G3XTT	160	4C14
46*	M0AJT	150	3C14
47	GW4KVJ	140	3C1

* indicates a perfect log. Check logs gratefully acknowledged from GM3UM and GW0KZW.

By Tim Kirby, G4VXE, Willowside, Bow Bank, Longworth, Abingdon, Oxfordshire OX13 5ER. E–mail: tim@g4vxe.com

the UK in this event this year.

Quite a busy month on VHF. There's the 144MHz AFS contest on 7 December which normally sees excellent activity across the country. From 26 to 29 December there are the Christmas cumulative contests on 50, 70, 144 and 432MHz. The contests are held each day between 1400 and 1600 so might well make an excellent way to recover from the Christmas excesses!

CQWW RESULTS

The results for the 2002 CQ WW CW and SSB results have been published. You can view them on the web at http://www.cq-amateur-radio.com/cqwwhome.html and then click on Expanded Results for the appropriate contest. Congratulations and thanks to everyone who sent in a log. We'll just highlight the UK stations who appeared in the 'top scores' boxes.

On SSB; G3UEG 6th in the World Low Power, 1.8MHz section; 3rd GI5W (M0SDX) in the World Assisted All Band Section; GD6IA (GM3WOJ) 1st place Europe all band; GM7V 2nd place Europe all band, GW4BLE 4th place Europe all band; GW3JXN 10th place Europe QRP, All Band; MU0C 5th place Europe Multi-Two and GM5A 5th place Europe Multi-Multi.

On CW; G0IVZ World 5th on 14MHz Single Operator; GM3YOR World 3rd on 3.5MHz Single Operator; G4VGO World 5th on 1.8MHz Single Operator; GW3JXN Europe 8th on QRP All Band; GI5W 3rd place Europe on MultiTwo; GM7V 3rd place Europe on Multi-Multi.

Again, many congratulations to all concerned. It was also good to note some UK stations participating in some leading scores from outside these shores: Don, G3XTT, and the 'VooDudes' to name a couple!

MERRY CHRISTMAS

The column wouldn't be complete without me wishing all readers a very Merry Christmas and all good wishes for the New Year. I hope to see you on the bands, HF or VHF, in 2004. ◆

144MHz ACTIVITY CONTESTS 2002

These weekday activity contests continue to be appealing, with the number of entries in both the Single Operator Fixed and Open sections both increasing for the 2002 events on 144MHz. Over 900 callsigns are recorded in the adjudication database, including 300 overseas ones, demonstrating the level of activity, and the amount of DX that is available. Entrants observed only average conditions for most of the sessions, although several were pleased with the opportunity to test antenna systems, portable set-ups, and occasionally work a few new squares.

Andy Cook, G4PIQ, repeats his 2001 performance to win the Single Operator fixed section, despite having antennas in need of some repair. Roger Piper, G3MEH, is in second place with strong scores throughout the year. Just behind in third place is Bryn Llewellyn, G4DEZ, with some session-winning performances during the last few months of the year. Dave Hewitt, G8ZRE, was very successful, firstly by being the leading single-op station with 25W and a single antenna, notching up this result from home during the winter months before going out portable, where he comfortably won the Open section. There was a close-run battle for the Open section second place between Roger Ward, GW5NF/P, and Steve Bunting, M0BPQ/P, although they never operated together in the same session. Once again, Frank Laanen, PE1EWR, wins the leading overseas station award. *Lee Volante, G0MTN*

SINGLE OPERATOR FIXED SECTION

Pos	Call	Score	QSO	Best DX	km
1*	G4PIQ	5108	552	SK7JM	922
2*	G3MEH	4373	504	DL2MK	648
3	G4DEZ	4291	435	DG5YX	1060
4	G4ZTR	2899	233	DL4NAC	781
5	M5FUN	2225	520	GM1CMF	650
6	G1ZJP	1709	110	GM4ODA/P	634
7*	G8ZRE	1506	182	F6CBH	554
8	G0DVJ	940	197	DF0HF	758
9	G8HGN	926	97	DK5DQ	475
10	G8VHI	621	48	GM4ODA/P	676
11	G3YDY	373	107	OZ9KY	775
12	G4BRK	345	32	ON1AEN	390
13*	PE1EWR	329	87	G4RRA	523
14	G(Q)4XPE	303	74	GM4CCC/P	434
15	G0AFH	220	43	GM4PPT	555
16	GM3POI	201	28	SK0UX	1187
17	G3YJR	178	58	GM4CCC/P	389
18	M1PIA	148	39	GM1XOI	504
19	G7DWY	119	17	G4RRA	352
20	M0CGE	82	32	PI4FRG	347
21	GW8ASA	81	17	PE1EWR	496
22	GM4VVX	67	30	DJ8MS	1131
23	GW0GEI	55	22	M5FUN	408
24	GM0HTT	16	12	MI0AYR	524
25	G0VQR	9	7	G4RRA	222

OPEN SECTION

Pos	Call	Score	QSO	Best DX	km
1*	G(Q)8ZRE/P	4039	199	ON4YZ	597
2*	GW5NF/P	2426	154	F4CKV	759
3	M0BPQ/P	2231	133	DL9NEF	819
4	G0WLY	1602	134	DL0NR	696
5	M0AFC/P	1589	112	DK5DQ	725
6	G4VRS	1000	70	DK1YY	626
7	GW8ASA/P	791	60	ON4PS/P	596
8	M1BCG/P	449	35	DK5DQ	665
9	G8XQS/P	135	18	EI3GE	362
10	G8WYR	95	15	G3YVR	318
11	G4APJ/P	93	14	M5FUN	344

Checklog received with thanks from G0DTI.

FIRST 70MHz CONTEST, 2003

Activity levels were high for this event with 77 stations appearing in the logs. Stations were active from G, GD, GI, GM and GW. One contact with Slovenia was completed. A number of stations that achieved reasonable numbers of contacts did not submit entries.

Conditions were reported as average to above average with deep slow QSB. A number of long distance QSOs took place, helped by the presence of three Scottish portables. Nineteen QSOs in excess of 500km were recorded.

A number of stations commented that activity dramatically reduced as the event progressed and suggested that the event should be shortened in the future. It is worthy of note that 10% of all contacts took place in the final hour demonstrating that there were still stations to be worked until the end.

A useful check log was received from G0WJR/M who spent the event driving from Norfolk to Birmingham and relied on a GPS to determine his locator!

Congratulations go to: the Northern Lights, GD0EMG, who retain their stranglehold on this event; Roger, G3MEH, for his win in the fixed single operator section; David, GM4WLL/P, for his win in the single-operator other section; Ian, G3YBY, who was the leading low-power fixed station in his first-ever entry in a 70MHz contest; the Colchester Contest Group, G0VHF/P; Bryn, G4DEZ, and Stuart, G4AFF, who were runners-up in their sections. All of these stations will receive certificates. *Roger Dixon, G4BVY*

MULTI OPERATOR

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	GD0EMG	53	15513	S51DI	1673	160	2x8ele
2 *	G0VHF/P	50	9238	GM4ZUK/P	630	90	8ele

SINGLE OPERATOR FIXED

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G3MEH	46	6144	GM4WLL/P	464	160	2x5ele
2 *	G4DEZ	28	5313	GM4WLL/P	340	150	5ele
3	G3TCU	38	4755	GM4WLL/P	526	150	6ele
4	G0ODQ	40	4690	GM4WLL/P	468	75	5ele
5	G8SRL	26	4672	GM4WLL/P	553	100	7ele
6	G3IKR	31	4207	GM4ZUK/P	525	140	4ele
7 *	G3YBY	30	4171	GM4WLL/P	463	10	HB9CV
8	G3JYP	19	3729	G4RFR	423	10	8ele Quagi
9	G3LVP	23	3248	GM4ZUK/P	561	150	4ele
10	G4SJH	23	2717	GM4WLL/P	507	60	5ele
11	G3XPU	23	2712	GM4WLL/P	370	50	3ele
12	G6UBM	10	340	G4RFR	159	15	5ele
13	M0WYE	4	269	G3MEH	127	10	Dipole

SINGLE OPERATOR OTHER

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	GM4WLL/P	29	9806	G4RFR	555	20	6ele
2 *	G4AFF/P	47	6402	GM4ZUK/P	427	70	8ele
3	GM4ZUK/P	13	4207	G4RFR	687	60	5ele
4	G4XRV/P	25	2774	GM4WLL/P	452	10	5ele
5	GM4VVX/P	4	1032	G4AFF/P	560	9	6ele

MARCH 144/432MHz 2003

The first major event of the year has always tested the resolve, stamina and equipment of operators. Unfortunately there has been a growing trend over the last few years of a reduction in the numbers willing to go out portable this early in the year. This event saw a near collapse in the level of portable activity together with a general reduction in the levels of activity and numbers of entrants. Conditions were rated as 'mediocre' and 'poor' and several stations suffered from high static levels.

While the weather was gentle in the south, there was rain and thunder in the north and impassable tracks to portable sites in Scotland.

Even the big groups suffer from equipment problems. G5B had problems with a new EHT supply which had not been soak tested. GD0EMG had a total failure of their 70cm amplifier before the event and lost their 144MHz amplifier early in the event which caused them to enter the six-hour event instead.

The majority of logs were received in electronic form easing the load on the adjudicator. While standards were generally high, the poor conditions caused a number of logging errors on weak long distance contacts. Congratulations go to the Five Bells, G5B, who continue to dominate this event and won both bands; Roger, G3MEH, who repeated his overall win in the single operator section; Bryn, G4DEZ, for his win in the six-hour single-operator fixed section; the Northern Lights, GD0EMG, who won the six-hour open section; and all other band winners and runners up who together with stations marked (*) will receive certificates. Many thanks for a useful check log from the Mudhoppers Contest Group, G4ZDA. *Roger Dixon, G4BVY*

OVERALL RESULTS

MULTI OP

Pos	Call	Group	144MHz	432MHz	Total
1 *	G5B	The Five Bells	1000	1000	2000
2 *	G3YNN	Herstmonceux Megacycles	253	15	268
3	G1ORC/P	Oldham Radio Club	6	1	7

SINGLE OP FIXED

Pos	Call	Group	144MHz	432MHz	Total
1 *	G3MEH	-	1000	1000	2000
2 *	G8HGN	-	204	205	409
3	2E1GUA	-	40	257	296
4	M0ZZO	-	231	0	231
5	G3YDY	-	76	128	204

6 HR SINGLE OP

Pos	Call	Group	144MHz	432MHz	Total
1 *	G4DEZ	-	1000	102	1102
2 *	G3XDY	-	0	1000	1000
3	G4ZTR	-	635	0	635
4	M0DDT	-	0	374	374
5	G8VYK	-	135	86	221
6	G4APJ	-	27	145	173
7	G0TXL	-	165	0	165
8	G8ZRE	-	162	0	162
9	G3YJR	-	33	83	116
10	G3JJZ	-	12	80	92
11	M0COP	-	40	0	40

6 HR OTHER

Pos	Call	Group	144MHz	432MHz	Total
1 *	GD0EMG	The Northern Lights	1000	1000	2000
2 *	M0BPQ/P	-	686	677	1363
3	G0WJR/P	-	88	836	924
4	GM4VVX/P	-	556	0	556
5	G3VQO/P	-	10	0	10

144MHZ

MULTI-OP

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G5B	342	121213	DK0ES	830	400	6x12ele
2 *	G3YNN	115	30710	DF0CI	688	100	12ele
3 *	G1ORC/P	10	750	GM1XOI	277	2.5	9ele

SINGLE OP FIXED

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G3MEH	175	39385	DJ2IE	724	400	2x10ele
2 *	M0ZZO	36	9102	DL0PVD	546	50	8ele
3	G8HGN	17	8043	DK0ES	736	50	2x15ele
4	G3YDY	11	2984	DK0BN	549	50	9ele
5 *	2E1GUA	15	1562	DK0VH	434	10	13ele

6 HR SINGLE OP

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G4DEZ	139	49699	F5MKD	737	400	2x12ele
2 *	G4ZTR	112	31535	DK0ES	726	400	12ele
3 *	G0TXL	38	8220	DK0BN	578	20	9ele
4 *	G8ZRE	56	8039	F5KEU/P	510	25	8ele XY
5	G8VYK	36	6686	DJ0QZ	643	25	17ele
6	M0COP	17	1976	ON4WY	364	100	8/8
7	G3YJR	15	1644	F6FLB	356	2	5ele
8	G4APJ	6	1351	F6FLB	410	5	9ele
9	G3JJZ	6	614	G4PBP	200	25	8ele

6 HR OTHERS

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	GD0EMG	54	18126	F1CXX	751	400	8x9ele
2 *	M0BPQ/P	53	12434	DA0SAX	677	180	9ele
3	GM4VVX/P	30	10079	G4RRA	806	300	17ele
4	G0WJR/P	10	1601	ON4WY	395	40	HB9CV
5	G3VQO/P	5	182	F6FLB	123	50	whip

432MHZ

MULTI OP

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G5B	120	39336	DK6AS	738	400	8x28ele
2 *	G3YNN	6	591	M0DDT	147	25	25ele
3 *	G1ORC/P	4	39	G0CDA	29	2.5	15ele

SINGLE OP FIXED

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G3MEH	54	5838	PA1TK	371	250	2x23ele
2 *	2E1GUA	9	1499	PA6C	433	10	19ele
3	G8HGN	3	1194	DL0PVD	585	50	2x21ele
4	G3YDY	6	749	PA6NL	254	50	19ele

6 HR SINGLE OP

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G3XDY	24	9604	DL0GTH/P	735	250	28ele
2 *	M0DDT	30	3588	PA6NL	367	100	21ele
3 *	G4APJ	6	1397	PA6NL	469	25	19ele
4	G4DEZ	5	981	PA1TK	326	400	2x28ele
5 *	G8VYK	12	830	PA6NL	256	25	-
6	G3YJR	7	800	PA6NL	413	10	19ele
7	G3JJZ	5	768	PA6NL	289	10	19ele

6 HR OTHERS

Pos	Callsign	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	GD0EMG	7	1277	G4RRA	379	10	4x26ele
2 *	G0WJR/P	8	1067	PA6NL	477	5	7ele
3	M0BPQ/P	10	865	PA6NL	275	60	21ele

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MD-24N same spec as MD-24 but "N-type" fittings £24.95
MD-25 HF or VHF/UHF internal/external duplexer (1.3-225MHz) (350-540MHz) SO239 fittings £24.95
MX2000 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz) £49.95
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 1inch 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) £9.95
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 £129.95

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)

TMA3 3" to 1 1/4" heavy duty aluminium telescopic mast set, approx 40ft when erect, 6ft collapsed £199.95
TMA2 2 1/4" to 1 1/4" heavy duty telescopic mast set, approx 40ft when erect, 9ft collapsed £149.95
TMA1 2" to 1 1/4" heavy duty aluminium telescopic mast set, approx 20ft when erect, 6ft collapsed £99.95
TMAF-1 2" to 1 1/4" heavy duty fibreglass telescopic mast set, approx 20ft when erect, 6ft collapsed £99.95
TMAF-2 2 1/4" to 1 1/4" heavy duty telescopic fibreglass mast set, approx 40ft when 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 £329.95

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 £269.95

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 £499.95
40 Mtr RADIAL KIT FOR ABOVE £99.00

HF VERTICALS

VR3000 3 BAND VERTICAL
FREQ: 10-15-20 Mtrs
GAIN: 3.8 dBd HEIGHT:3.80m POWER:2000 Watts (without radials)
POWER: 500 Watts (with optional radials) £89.95
OPTIONAL 10-15-20mtr radial kit £34.95

VR5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN:3.5 dBd HEIGHT:4.00m RADIAL LENGTH:2.30m (included). POWER: 500 Watts £169.95

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN:3.5 dBd HEIGHT:6.50m POWER:2000 Watts (without radials) POWER:500 Watts (with optional radials) £99.95
OPTIONAL 10-15-20mtr radial kit £34.95
OPTIONAL 40mtr radial kit £12.95

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN:3.5 dBd HEIGHT:7.30m POWER:2000 Watts (without radials) POWER:500 Watts (with optional radials) £139.95
OPTIONAL 10-15-20mtr radial kit £34.95
OPTIONAL 40mtr radial kit £12.95
OPTIONAL 80mtr radial kit £14.95

EVX6000 6 BAND VERTICAL FREQ:10-15-20-30-40-80 Mtrs HEIGHT:5.00m RADIAL LENGTH:1.70m(included) POWER:800 Watts £249.95

EVX8000 8 BAND VERTICAL FREQ:10-12-15-17-20-30-40 Mtrs (80m optional) HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included) POWER: 2000 Watts £269.95
80 MTR RADIAL KIT FOR ABOVE £79.00

(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 £44.95
MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts £39.95
MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts £44.95
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

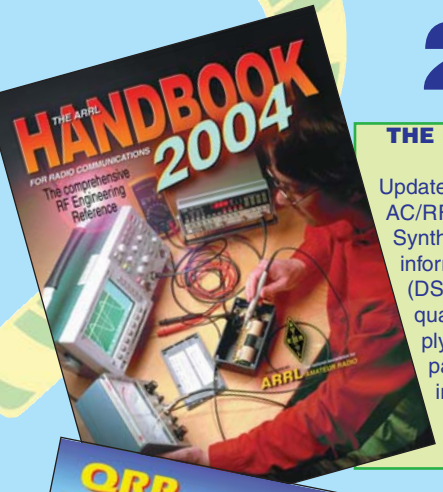
STANDARD LEADS
1mtr RG58 PL259 to PL259 lead £3.95
10mtr RG58 PL259 to PL259 lead £7.95
30mtr RG58 PL259 to PL259 lead £14.95

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)

COAX SWITCH SALE

CS201 Two-way 3 X SO239 £18.95 .....this month just **£12.95**
CS201N Two-way 3 X N-type £28.95 .....this month just **£18.95**
CS401 Four-way 5 X SO239 £49.95 .....this month just **£39.95**
Plus £6.00 P&P

2003 TOP TEN



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Updated and comprehensive information on AC/RF Sources (Oscillators and Synthesizers) Revised and comprehensive information on Digital Signal Processing (DSP) technology. A new commercial-quality, high-voltage power (plate) supply. A high-performance easy-to-build passive CW filter. Revised and updated information on cellular technology.

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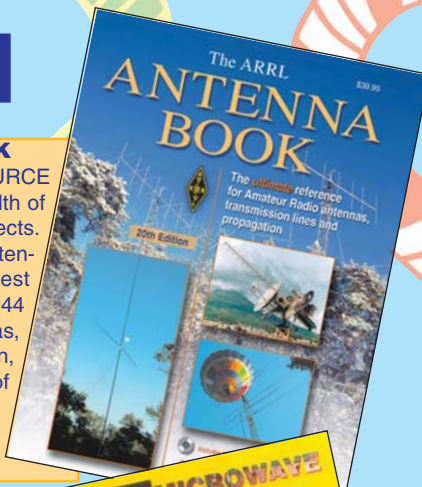

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The ARRL Antenna Book is THE SOURCE for current antenna theory and a wealth of practical, how-to construction projects. Extensively revised, and featuring antenna designs enhanced by the latest advances in computer modeling. 944 pages! In depth coverage of antennas, feed lines, and propagation. Design, build and install any imaginable type of antenna!

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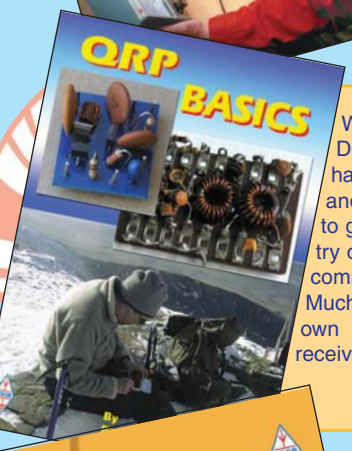

QRP BASICS

Written by the UK's QRP supremo Rev George Dobbs, G3RJV, QRP Basics tells of the fun to be had by operating with low power, both from home and in the great outdoors. Advice is given on how to get the best results from a QRP station, how to try out QRP if you haven't before. A large range of commercial QRP equipment and kits are described. Much of the book explains how to construct your own station, including complete transmitters and receivers, and accessories.

£12.74

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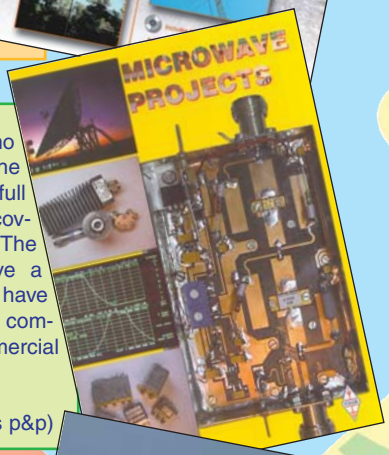
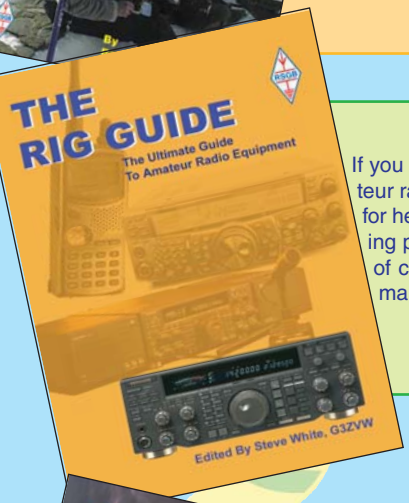


MICROWAVE PROJECTS

Microwave Projects is aimed at those who are interested in building equipment for the amateur radio microwave bands. Packed full of ideas from around the world this book covers the subject with a variety of projects. The book has many contributors who have a wealth of experience in this area and they have produced many projects, design ideas, complete designs and modifications of commercial equipment, for the book.

£12.74

Non-members £14.99 (plus p&p)



THE RIG GUIDE

If you are thinking of buying new or used amateur radio equipment the "RSGB Rig Guide" is for here to help. The guide is packed with buying prices and specifications on a vast range of current and older rigs covering the major manufacturers.

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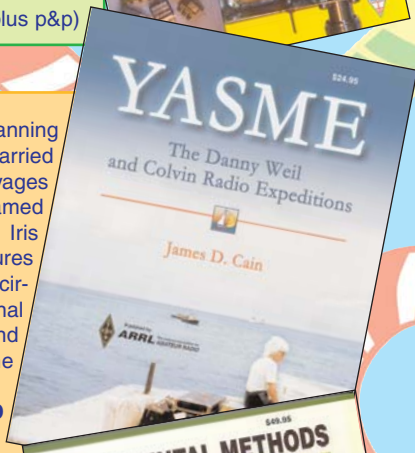
(inc. p&p)



YASME

This is the history of three travelers spanning the birth of YASME--the boat that carried young sailor Danny Weil on his first voyages beginning in 1954--and the lives of famed ham radio DXpeditioners Lloyd and Iris Colvin. The Colvins' worldwide adventures continue to be recounted in ham radio circles, epitomizing the spirit of international friendship through Amateur Radio and their 30-year association with the YASME Foundation.

£16.99

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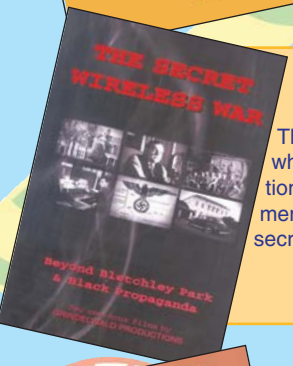

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This 120 minute video tells the the tale of those men who were specially enlisted for wireless communications during WW2 and their shared experiences. The men have pieced together their part in what was a very secret operation only revealed in recent years .

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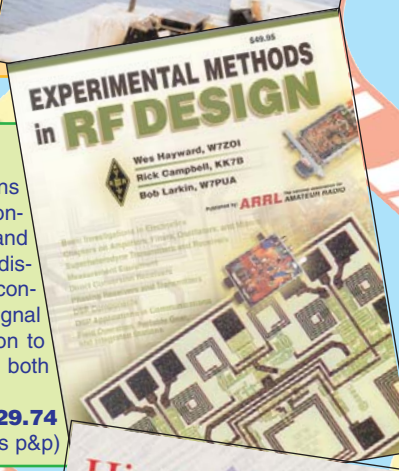

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Immerse yourself in the communications experience by building equipment that contributes to understanding basic concepts and circuits. Explore wide dynamic range, low distortion radio equipment, the use of direct conversion and phasing methods, and digital signal processing. Use the models and discussion to design, build and measure equipment at both the circuit and the system level.

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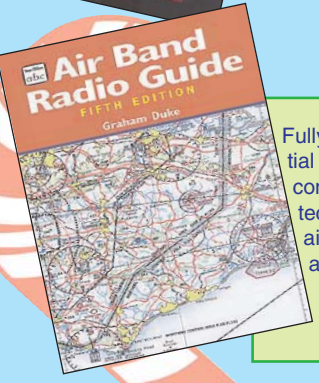

AIR BAND RADIO GUIDE

Fully updated the "ABC Air Band Guide" is an essential guide for the well-informed aviation enthusiast. It contains a wealth of information, both from the technical radio experts and those experienced in airband listening with advice on how to choose and set up a suitable receiver.

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By Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ. E-mail: brs32525@compuserve.com

UBA - SWARL 365 DAYS CONTEST 2004

The aim of this contest is to hear or work as many DXCC countries as possible, on the HF bands, during a period of one year starting on 1 January 2004 at 0000UTC, and without the necessity of confirmation by QSL card. The following are the *brief* rules.

1 **Duration.** 0000UTC on 1 January 2004 to 2400UTC on 31 December 2004.
2 **Participants.** All licensed radio amateurs and short wave listeners, including those without a short wave listener's number.
3 **Categories.** There is only one category: Mixed mode (SSB, CW, RTTY and all new digital modes such as PSK, Throb, MT63, HELL, PacTOR, MFSK etc.)
4 **Bands.** 160, 80, 40, 30, 20, 17, 15, 12 and 10 metre bands. Respect the IARU band-planning recommendations, ie that SSB QSOs may not be logged on 10MHz.
5 **Logs.** Logs should be in alphabetical order according to the normal country prefix. The logs should comprise the following information: 1 DXCC country, 2 Callsign of the station heard, 3 Frequency, 4 Mode, 5 Date, 6 Time (UTC), 7 RS(T) (QTH SWL or licensed amateur, 8 Callsign of the QSO partner (for licensed hams, his own callsign).
6 **Summary sheet.** All logs (final and intermediate, see rule 10) shall be accompanied by a summary sheet including your callsign or SWL number, the category of participation, your name, address and e-Mail, the number of DXCC countries per band, station description, and the following signed declaration: "I hereby declare that I operated my station in accordance with the contest rules. I accept the decision of the contest committee."
7 **Scores.** Each DXCC country counts only once per band and counts for one point.
8 **Multipliers.** There are no multipliers.
9 **Winner.** The winner is the participant with the highest number of logged DXCC lands on all bands together.
10 **Submission of log and summary sheet.** Intermediate summary sheets *must* be submitted three times per year, these sheets must contain the information outlined in rule 6 above. These must reach the contest manager by the end of the month following the closing date. Closing date 1st period = 31 March; Closing date 2nd period 30 June; Closing date 3rd period = 30 September. The final log and final summary sheet must reach the contest manager by the end of the month following the final closing date.
11 **Results.** Both the interim and final results will be published on the UBA website at http://www.UBA.be, in the ONL/SWL section, on the SWARL reflector at http://groups.yahoo.com/group/SWARL, and on the website of Patrick De Wever, ONL04299, at http://users.skynet.be/ONL4299/Contest/1Contestinfo.htm
12 **Address.** Logs and summary sheets should be sent to the contest manager only by e-mail to onl4299@skynet.be
13 **Awards and plaques.** First and second in both the ham and SWL categories will receive a plaque sponsored by the UBA. The first 10 will receive an e-certificate sponsored by SWARL.

The *full* rules can be found on the Internet at http://users.skynet.be/ONL4299/Contest/365/365%20EN%202004.htm

Good to hear from well-known DXer Mike Bazley, VK6HD (ex-BRS17197). However, he was prompted to write because he wanted to make SWLs aware that he no longer QSLs every SWL report that he receives. He used to reply to all cards received provided they checked with his log, but over the past couple of years he has received 'reports' from SWLs that just cannot be honest and true. Mike assumes that they must have been taken from the DX Clusters. I have covered this very seedy practice before, but it must still go on. It does absolutely nothing for the SWL movement and clearly penalises the vast majority of SWLs who sent accurate and honest reports. Just like in other arenas, the few spoil it for the majority.

Mike gives a clear case of where the SWL could not have heard his signals - a report from a European SWL reporting that he was 599 on 160 metres at 1100UTC, when there was a Cluster 'spot' from the USA station that Mike was working saying that he was 599. Any SWL who knows anything about 160 metre propagation will know that it is just not possible to hear VK6s in Europe at 1100UTC working USA. Indeed, it is something of a rarity to hear VK6s at all on 160m!

Mike will QSL all genuine reports. However, quite rightly, he expects to see some proof that his signals were heard. For example, the report given to the station worked or the callsigns of three consecutive QSOs made. These will show Mike - and any other operator for that matter - that the SWL did hear him.

BAND REPORTS

September seemed to come and go very quickly, with not much interesting DX in between! Your reports suggest a poor month SWL DX-wise.

Reports have become rather thin on the ground; surely there must still be some listeners out there who spend time listening on the bands? Your reports really are appreciated and help the column to provide a good feel for recent band conditions.

The majority of this month's report comes, once again, from Robert Small, BRS8841. But even he did not really have too much to report, as he had been away on holiday. There was little of any note in the HF high-band pickings this month apart from VK9XW, so we shall note the following on 40m: YI9T, ZS4PJM, FH/G4IRN, OJ0LA and XZ7A.

Other reports suggest that 17m had been lively without producing anything of real note, although ST2M, 3C0V and DS0DX/2 (AS-168) are all worthy of a mention. 15m seemed to be improving with VR2IG, 9M6A, YI1BGD/5, AL5A/NH0 and A52SM heard. SU9NC and 5U7JB were also notable callsigns.

INITIAL CQWW THOUGHTS

Having just spent a large chunk of the weekend listening in the *CQ* World Wide DX phone contest, it is worth noting how good - surprisingly - 10 metres was. This contest always defies conditions, although we were treated to exceptional conditions with the SFI in the 200s. In fact, all the bands provided something of note, but perhaps the lasting memory this year was some extremely wide signals on both 20m and 40m. Indeed, listening on the latter band was actually quite difficult, with the DX covered up by 'splattering' Europeans. It was amazing to compare the difference in 80-metre activity a few minutes before midnight on Sunday: bedlam at 2358 and absolute silence at 0000UTC! I look forward to further impressions of the weekend to include in future columns.

BELGIAN CONTEST

We have received details of a new contest organised by Belgian SWL Patrick De Wever, ONL04299, the UBA (Belgian national amateur radio society) SWL Contest manager and SWARL (Short Wave Amateur Radio Listening) co-moderator. It is being run for only the second time in 2004. In fact, the contest is open to both SWLs and licensed amateurs. Brief rules appear in the box and the full rules can be found on the Internet at http://users.skynet.be/ONL4299/Contest/365/365%20EN%202004.htm ◆

SWL

VHF/UHF

With the 6m band now in the doldrums activity has declined markedly over the past few weeks. Nevertheless, there were some productive tropospheric openings on VHF and UHF for those who were prepared to come on the bands. Until fairly recently, in 'flat' conditions, only stations up to a few hundred kilometres could be worked by tropo on CW and SSB. The better-equipped stations could work DX via prearranged skeds or random meteor scatter or by moonbounce, although the latter required high power, a good antenna array and an above average receiver.

But things are rather different now, mainly thanks to the remarkable WSJT family of software pioneered by Joe Taylor, K1JT. This has enabled many average stations to extend their DX capabilities to an extent unimaginable a decade ago. An encouraging example of just what can be achieved with JT44 over a considerable distance on 2m with very low power is described by Mike Johnson, M5MUF (IO92) - see his report in the Band Reports section.

LOCATOR SQUARES TABLE

Starting date: 1 1 1979

Callsign	50MHz	70MHz	144MHz	430MHz	1296MHz	Total
G0JHC	1040	26	48	4	-	1118
G3IMV	846	20	619	125	53	1663
G0FYD	717	9	294	48	17	1067
GW7SMV	664	-	216	-	-	880
G4DEZ	661	28	182	82	41	994
G8BCG	661	-	-	-	-	661
G7KHF	510	-	18	-	-	528
MU0FAL	503	-	28	9	3	543
G1SWH	448	42	242	81	30	843
G4OBK	435	25	64	7	-	531
M5BXB	423	15	177	57	-	672
G8TOK	419	39	145	57	29	689
G6TTL	381	-	133	90	27	631
GM4VVX	349	16	152	2	-	519
G8HGN	346	-	192	73	-	617
GW3EJR	313	-	-	-	-	313
G1UGH	280	-	130	18	-	428
G3FIJ	278	29	108	51	23	489
M1DUD	269	1	49	9	-	328
M3CLY	262	-	285	20	-	567
G1EFL	231	-	67	2	-	300
G0ISW	224	6	88	22	-	340
GM4JJJ	206	3	430	46	-	685
GM6MEN	186	-	-	-	-	186
G4APJ	184	-	61	29	-	274
M5MUF	145	23	48	-	6	222
G4FUJ	111	20	28	6	5	170
G4ZHI	107	17	280	33	-	437
EA7IT	67	-	108	-	-	175
MM1FEO	54	-	13	-	-	67
G3FPK	30	-	246	-	-	276
M3VAM	17	-	18	6	-	41
G4YTL	11	56	555	136	13	771
G3XDY	-	34	251	175	123	583
G8VHI	-	-	217	76	40	333
G8RWG	-	-	108	-	-	108

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Band of the month 50MHz. Next deadline is Friday 5 December.

SOLAR AND GEOMAGNETIC DATA

The average daily 10.7cm radio flux in the 30 days to 16 October rose a little compared with the previous period to 116.4 units. It was below 100 on only five days. On 28 September and 1 October it peaked at 137, while the minimum of 92 was on 14 October. The maximum SESC sunspot number was 137 on 27 September and the lowest figure was just 24 on 14 October. Only 18 new sunspot regions were recorded.

Between 18 September and 16 October the middle latitude A-index at Fredericksburg was in the 1-10 quiet range on 14 days, in the 11-20 unsettled range on seven days and in the sub-storm 21-50 range in the remainder. The peak values were 34 on 20 September and 33 on 14 October.

METEOR SCATTER

After a few days of steady build up the Geminids meteor shower should peak around 1600 on 14 December with a zenithal hourly rate of 120. For mid-UK stations the radiant is above the horizon for about 20 hours from around 1630, just missing the predicted peak. However, this is not too much of a problem, as the ZHR will still be very good; in fact the reflection efficiency is 50% above the average for about 30 hours in this shower.

Around 0100 on 23 December the Ursids shower should peak but the ZHR is low at 10. The radiant does not set and reflection efficiencies are 50% above average for about 12 hours but the north/south path is not very good. M5MUF has tried FSK441 mode for the first time and has completed with EA3AXV (JN01), OK1DFC (JN79) and DL3LST (JO61).

DX NOTE

Steve Burrows, M5BXB, writes, "I will be QRV in the last two weeks in December as OK8XB from Frydlant-nad-Ostravici, JN99FE. Operating will be mainly HF, but I intend to visit Josef, OK2BLE, who has his QTH on top of Lysa Hora, JN99FN (1323m ASL). This is the same site as the OK beacon. I plan on operating 2m as OK8XB/P for at least four days during my stay, but that will depend on weather conditions as Lysa Hora will be covered in snow! QSL is via M5BXB. Details also on QRZ.com I will supply a bottle of slivovice (plum brandy) to the first UK station worked!" Steve has a website - see the panel.

BAND REPORTS

50MHz

Now that the Es has gone, 6m activity is very low. Bryn Llewellyn, G4DEZ (JO03), heard the CN8MC beacon on 50.026MHz at S7 for a couple of hours on 8 October at 0100. On the 12th he heard a very weak ZS station for about 30s on 50.110MHz. Ted Collins's, G4UPS (IO80), report for the second half of September reveals no activity until the 28th when he heard CN8BC at S7 at 1500. The CT0SIX beacon was copied at up to S9 by 1610. Later he worked EH5FKX and EH5YV (IM98) and heard the EA3VHF beacon in JN01. On the 29th, the CN8BC beacon was copied at times in the afternoon and evening and EH7BYM (IM53) was worked at 1939.

Coming to October, Ted copied CT0SIX peaking to S7 for nearly an hour from 1557 on the 6th but no CT stations were heard. During the following morning very strong in-band Russian TV was heard and at 1034 he worked SP9MRK (JO90) and later, in patchy openings till 1410, DL5WF* (JO60), YO2BP* (KN05), HB9LBC (JN47) a new station on the band, S57MTA (JN76), S51DI* (JN76), IN3KLQ* (JN56), 9A8A* (JN86) and I3BHE* (JN65). On the 8th at 1827 he contacted IK0FTA* then IW0GXY* both in JN61. Beacon CN8MC was S4 at 1327 on the 9th soon peaking to S6 and remaining at that strength till 1450, but CQ calls brought no replies. Up to the 17th, nothing was heard on the band.

70MHz

More good news for 4m enthusiasts from Bo Christensen, OZ1DJJ, via the 4m website who writes, "Friday 19 September I was told in mail from the Greenland authorities that 4m is now a legal ham band for all OX, we can use 70.0-70.5MHz. Power is not mentioned in mail but when it is a general ham band it will be 500-1000W." His callsign in Greenland is OX3LX.

M5MUF now uses a 2-ele phased delta-loop quad antenna - essentially a quad version of the HB9CV design.

By Norman Fitch, G3FPK, 40 Eskdale Gardens,
Purley, Surrey CR8 1EZ. E-mail: g3fpk@compuserve.com

Mike was QRV in the second RSGB 4m contest on 21 September and completed 21 QSOs, ODX being G4ADV (IO70) at 361km. During the contests he took the chance to work GM6VXB (IO97) at 542+km on MS using JT6m mode, after which he completed with GW3HWR (IO71) using JT44. He made his second QSO on FM with M3AOM in Birmingham, helped by pronounced aircraft scatter.

144MHz

Robin Burrows-Ellis, M1DUD (JO02), now has an FT-817 transceiver and 5-ele Yagi on 2m. He was QRV in the RSGB Trophy Contest on 6/7 September completing 49 contacts with DL, ON and PA stations, though deep QSB reduced the number of UK QSOs. ODX was TM9R (JN27) at 577km which was a new grid. In the good tropo conditions in the 14-16 September period he completed over 30 QSOs with Scandinavian stations including his first ever contacts with LA and SM, all-time ODX being SK6HD (JO68) at 1068km. Openings were long with good signal strengths. All the above were achieved with just 5W.

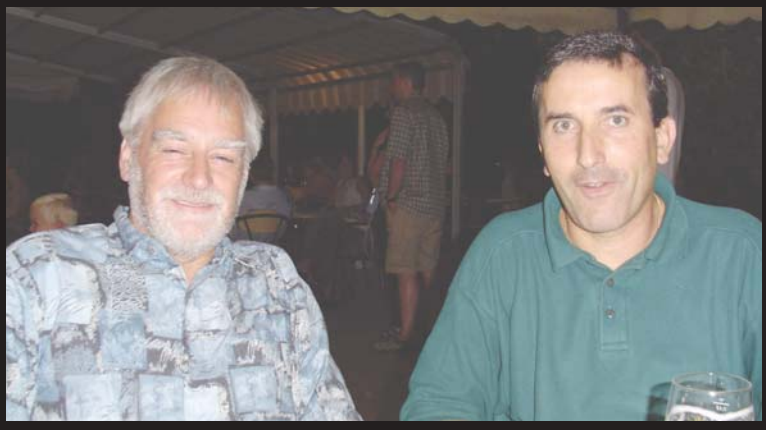
Ken Punshon, G4APJ (IO83), noticed some interesting activity reported on the DX Summit website - see the panel - on 18 September so took a listen and from 1830 worked EB1CTQ and EA1DDU both in IN73. Both remained good signals for a couple of hours but nothing else was heard till 2006 when F6AQI came in at S7 from IN96.

In the opening on 12 October, G4DEZ worked six HB9s, OE, OK and about 50 DLs at up to 1068km. Next day at 1500 Bryn worked into JN47 and JO40 with S9 reports both ways but once again G activity was low. But Richard Staples, G4HGI (IO83), was QRV on the 12th and in the 1518-1900 period lists nine QSOs with DL, HB9 and PE stations in JN47, 49, 57, JO21, 31, 50, 51 and 60. Then from 1630 on the 17th he worked DF0CI (JO51), OZ0JD and OZ1MES (JO47) in another good tropo opening.

Paul Pasquet, G4RRA (IO80), found excellent conditions on 14 September and worked eight SMs in JO78, 88, 89 and 99 from 0711. Next morning from 0655 he contacted SM1MUT, SM1WXC and SM1EXE, who was only running 10W to a 6-ele Yagi, all in JO79.

M5MUF took advantage of the good tropo across the Bay of Biscay on 18 September to work EAs in IN53 and 73 and Fs in IN78, 86 and 96. Mike has spent a lot of time exploring the possibilities of JT44 mode on tropo and has been running a series of tests with PE1AHX (JO21). Over the 450km path they can usually make contact using a few hundred milliwatts on a flat band and he has heard Catharinus down to *one milliwatt*. They have developed a reporting system details of which are on Mike's website - see the panel. Other JT44 tropo QSOs were with G3UTS (IO94), GW0GEI (IO73), GW8ASA (IO81), PA1BVM (JO21), DK7BY (JO44) and DL5GAC (JN47). He lists 19 SSB and CW QSOs in the 18 September to 14 October period, ODX being EA1TA (IN53) at 1164km.

Dave Hewitt, G8ZRE, visited Gran Canaria Playa de Ingles in September taking a handheld transceiver with him with the idea of operating as EA8/G8ZRE/P. However, he was dismayed to discover that the band seems to have been reassigned to the local red roof Mercedes taxis. They were all over the band, 144.200-144.500, 145.375, 145.575, 144.625 and 145.925MHz. In one taxi each side of the rear view mirror were two digital readouts showing 144.125 and 144.800MHz Selcall, a PMR shared repeater system. The drivers sing and play music as well. We all thought that in Region 1 the 2m band was an exclusive amateur allocation with us as primary users. He suggests, "Perhaps any Spanish readers of *RadCom* could explain why taxis are on the 2m band."There are quite a few EA8 on the band so perhaps they



MOONBOUNCE

Until recently, moonbounce operation was pretty well the sole prerogative of stations running high power to large Yagi antenna arrays or big dishes. The average operator in urban or suburban areas was likely to be at a disadvantage facing opposition from neighbours objecting to large antennas and perhaps suffering from RF interference. This is no longer the case now that we are able to detect signals inaudible to the human ear using computer programs to decode below-noise data.

M5MUF writes, "My success and astonishment with JT44 tropo, and a few prods from PA1BVM, persuaded me to listen for 2m EME signals at moonset. Using my 10-ele Cushcraft Yagi (approx 11dBd) and BF981 preamplifier I have heard W5UN, KB8RQ, I2FAK, RN6BN and UA4AQL and have had my signals partially decoded by most of them. These tantalising results prompted me to build a bigger antenna and for EME use I now have a 6-wavelength (12.1m) 17-ele DK7ZB Yagi in 'rope' technology yielding 15.8dBd gain. With this I have managed to work S52LM off the Moon using my very QRP 30W. Using fishing line and lightweight aluminium tubing, the antenna weighs only 1.1kg and rolls up for storage and carriage."

Mike is trying it out in various positions in the garden and, with the antenna attached to the main mast by a halyard, a maximum elevation of about 40° can be achieved. This approach to EME operation sounds quite novel and illustrates what can be achieved with modest equipment and a little ingenuity. Pictures of his antenna are on his website - see the panel.

Congratulations to Roy Reed, G3ZIG (JO02), who came first in his class in the ARI EME 2m contest in May. Another participant was IK2DDR; see the photo of them.

The following notes are compiled from the October *432 and Above EME News* edited by Al Katz, K2UYH. There is a picture of the JW/SM2BYA DXpedition site and the station was due to be QRV in the first weekend of the ARRL EME Contest over the 18/19 October weekend. On 23cm DL3OCH made a successful 'small station' DXpedition to Corsica (JN42) and Sardinia (JN40 and 41) in September and Bodo completed all his skeds. All QSOs were made using JT44 running 82W output to DJ9YW's home built 59-el Yagi (19.7dBd gain) with 0.28dB noise figure preamp at the feed.

Peter Blair, G3LTF (IO91), was only QRV on 23cm in September on the 20th completing with LA8LF, ZS6AXT, IK2MMB, GW3XYW and WA6PY but never quite made it with OM6AA. He has now fitted professional connectors to the 50m of $1^{5/8}$ inch coaxial cable feeding his dish resulting in an improved VSWR and slightly reduced loss on 13cm.

The technical section is devoted to the remainder of Graham Daubney's, F5VHX (JO04), article on his Zero-IF Radiometer project, the first parts of which were published in the June issue; see p45 in the August *RadCom*. He writes that, ". . . this is not a simple project, many of the components used are not only SMT, but also very small package SMT parts. A steady hand and at least some magnification equipment is essential." He can be e-mailed at fg8mbi@rfham.com for enquiries.

The monthly *432 and Above EME News* is now available in a very colourful .pdf format from the website - see the panel - but be patient as it might take a little while to download if you don't have broadband.

Above: Roy Reed, G3ZIG, and Francesco Cominelli, IK2DDR, who is located in JN55GN. They met up this summer when Roy was on holiday at Lake Garda in Italy. Both are keen EME operators.

can enlighten us as to how this has been allowed to happen.

Bob Harrison, G8HGN (JO01), was QRV in the Trophy Contest and completed 17 contacts with DL, F, G, HB, ON and PA stations in 15 grids. ODX was TM8MB (JN35) at 790km in just above average conditions. After returning from Germany, he caught the tail end of the tropo lift on 17 September working a couple of EAs in IN53. Next day beacon EA1VHF was S9 at times and in the evening he contacted EA1TA and EA1DDO (IN53). At 0834 on the 20th he worked DF0CI (JO51). Jamie Ashford, GW7SMV (IO81), lists 11 tropo SSB QSOs made in the 17 September to 17 October period and ODX was EA8BPX (IL18) at 2803km on 17 September.

430MHz UP

M1DUD now has a 13-ele Yagi for 70cm and in the excellent tropo opening in mid-September on 2m was able to set up some skeds for 70cm. One was a 2-way QRP QSO with OZ1SKY (JO56) at 743km worked with 5W at 2028 on the 15th with RS51 reports each way. Following their QSO on 2m in this period, G4APJ and EA1DDU QSYd to 70cm where Domingo was S8. Ken's 25W got an S2 report and was his all-time ODX at 1151km. G4RRA is hoping to get some more power on 70cm since, although Paul can hear the DX, it can't seem to hear him. From 0638 on 14 September he worked SK7MW (JO65), OZ1BNN (JO55), OZ2LD (JO54), SM6NZV (JO57) and SM6SKH (JO66). He heard stations working YL3AG the next morning but nil heard his end. On the 18th he worked a number of EAs in IN53, 73 and 83.

G8HGN was QRV in the IARU UHF Contest and on 5 October made 17 QSOs with stations in DL, F, G and PA in 12 grids for a claimed score of 6219 points. ODX was DL0PVD (JN49) at 585km. Bob was QRV in the 70cm RSGB UK Activity Contest on 14 October completing 24 QSOs with stations in DL, F, G, GW, ON and PA in 11 grids for a claimed score of 55,000 points. ODX was DF2VJ (JN39) at 524km. Conditions were dire at first but livened up later till 2100 when it all went quiet. Paul Higginson, GW8IZR (IO73), runs 250W at the feed to two 21-ele Yagis on 70cm. He was QRV in the 4/5 October contest but found conditions quite poor with no tropo to speak of. He completed 13 SSB contacts with EI, G, GW and PA stations, ODX was PI4ZLD (JO11) at 595km.

Paul also operated on 23cm, again making 13 QSOs, three on CW, the rest on SSB, ODX being PA6NL (JO21) at 593km. It was a race against time to get the station running using a water-cooled 250W PA to a 2m dish antenna with a home brew 'junk box', GasFet preamp delivering a few dB of Sun noise. Conditions were quite poor and it was disappointing that the 70cm operators of the bigger stations seemed either unwilling or unable to get their 23cm stations to keep requests for QSOs. A notable exception was G8P.

M5MUF's 23cm activity is sporadic due to a shortage of decent feeders and a self-dismantling N-type connector. After a QSY from 2m, his first QSO was on 18 September with F6CCH (IN96) at 646km. Mike is now running 35W to a 44-ele Yagi but still needs a masthead preamp.

SIGN OFF

That wraps it up for another month. The deadline for the February issue is very early, **Friday 5 December** and for March, when I'll need your final 2003 Annual Table scores, it's **13 January 2004**. My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk Here's wishing you all a Very Happy Christmas. ◆

WEB SEARCH

M5MUF EME antenna	http://www.gu6aje.thersgb.net/m5muf/144mhz17el.htm
K2UYH EME News	http://www.nitehawk.com/rasmit/em70cm.html
M5BXB	http://www.qsl.net/m5bxb
DX Summit	http://oh2aq.kolumbus.com/dxs/
M5MUF JT44 info	http://www.gu6aje.thersgb.net/m5muf/jt44test.htm

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.

- Geoff, M1DCU, is searching for a wiring diagram for the **Airlite 62 aviation headset** manufactured by Clement Clarke. Any advice on how this headset might be modified or rewired for amateur radio use on a Yaesu FT-847 would be greatly appreciated. M1DCU, tel: 01761 414 312, or e-mail ghallett@globalnet.co.uk

- Pat, G3MA, is looking for a Startup/Setting Up disc for an **IBM computer, model PS/2 8555**, on behalf of a mentally-retarded lady. G3MA, QTHR. Tel: 01452 539 519.

- Dick, G0DIC, is looking for a source for the following battery type – **Varta Photo Special V741PX 15V**. It measures 14.3 x 35mm. The Maplin code was FM09K (type BLR154/504) but is now discontinued. The battery is for use in a GPO multi-range analogue meter No 12D (made by AVO). G0DIC, e-mail: rafixter@lineone.net

- Don, ZL4GX, is looking for the circuit diagram or service manual of the **Black Star Nova 2400 10Hz to 2.4GHz Counter/Timer**. Paper or electronic versions would be equally welcome. ZL4GZ, e-mail: donmer@slingshot.co.nz

- Ted, G8HLJ, needs information and an EPROM supplier for the conversion of the **Pye MX293 PMR** to the 2m band. All expenses will be refunded. G8HLJ, QTHR. Tel: 0151 632 0614.

- John, GM0WRR, needs a transformer for a **KW1000 linear amplifier** for the repair of equipment belonging to the West of Scotland Amateur Radio Club, GM4AGG. GM0WRR, QTHR. E-mail: johngm0wrr@ntlworld.com

- Mr A Moon, G3RGB, needs information or a circuit diagram of the IQD microphone with the DTMF keypad, as used with the **Pye MX294 PMR transceiver**. G3RGB, QTHR. E-mail: a.moon1@ntlworld.com

- Brian, G3UNT, would like to hear from anyone who can suggest a suitable route for a heavy duty power cable from the battery to the interior of a 1998-style **Toyota RAV4**. G3UNT, QTHR. E-mail: g3unt@tinyworld.co.uk

- Ivan, G4WIA, seeks a VS-1 Voice Synthesiser Unit for a **Trio 811E** on behalf of a blind operator. G4WIA, QTHR. Tel: 01480 461 331, or e-mail: ivan.whitmore@ntlworld.com

- G3PNF has recently been given a **GEC BRT400 receiver** and would like to obtain a circuit diagram, a manual, or both. He is willing to borrow a document for copying, all expenses being reimbursed. G3PNF, QTHR. Tel: 01903 746 959, or e-mail: a.wadsworth@testco.net

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Woolston, Church Stretton, Shropshire SY6 6QD.

IARU

In this 'IARU' column Don Beattie discusses the recent IARU Administrative Council meeting, and an important presentation made recently by IARU Region 1

Each IARU Region holds a conference every three years, on a schedule that results in one conference being held each year. The IARU is coordinated on a global basis by its Administrative Council (AC), which meets once a year, normally at the relevant Region's triennial conference. For 2003, the AC meeting was scheduled to be held after the planned Region 3 Conference in Taiwan in September 2003. Unfortunately the Conference was postponed because of the SARS epidemic, and so the AC meeting was held on a free-standing basis in Amsterdam. The AC comprises two nominees from each of the regional Executive Committees, together with the President, Vice President and International Secretary of the IARU.

The agenda for the meeting covered a range of issues of importance to international amateur radio at the present. Perhaps most importantly there was a lengthy session on the longer-term issues facing amateur radio, which will contribute to development of IARU future strategies. The AC also reviewed the outcome of the World Radio Conference 2003, and the positive changes for the Amateur Service. IARU will be urging national societies to work with their administrations to adopt into their national regulations the decisions taken at WRC03. In this respect, the existing AC Resolution on Morse code was reviewed and revised to make clear that IARU policy is to support the removal of Morse testing at national level.

The agenda also extended to budgetary planning, preparations for the IARU exhibit at ITU Telecom World 2003, a review of reports from volunteer IARU international coordinators, and issues relating to the IARU HF Championship.

Finally, the AC considered the nomination of President and Vice President for the five years commencing May 2004. The current President, Larry Price, W4RA, was proposed for reappointment for a further term. The current Vice President, David Wardlaw, VK3ADW, had decided not to stand for a further term, and the AC determined that, from the candidates proposed by the various Regions, Tim Ellam, G4HUA / VE6SH, should be proposed for appointment as Vice President. Individual member societies of IARU will now be asked to ratify these two appointments.

IARU REGION 1 MEDAL

Region 1 recognises significant contributions to the world of amateur radio (and IARU in particular) by the award of the IARU Region 1 Medal. The Region 1 EC decided after WRC03 the medal should be awarded to Jan Verduijn of the Radiocommunication Agency Netherlands. Jan was CEPT coordinator and spokesman for Agenda item 1.23 (the 7MHz issue) at WRC03, and was awarded the medal in recognition of his outstanding work in preparation for, and also during WRC03. Jan was totally committed to finding a solution, not only for radio amateurs but also for broadcasters and fixed and mobile services. His dedication, extreme hard work and outstanding diplomatic skills were a major contribution to the successful outcome of WRC03 Agenda item 1.23 for the amateur radio community. Ole Garpestad, LA2RR, presented the medal to Jan at the VERON 'Day of the Amateur' event in October 2003.

Left, top: Left to right: outgoing IARU Vice President, David Wardlaw, VK3ADW; President Larry Price, W4RA; and Tim Ellam, G4HUA / VE6SH, nominee for Vice President, IARU.

Left, bottom: Ole Garpestad, LA2RR, Chairman of IARU Region 1 (left) presents the IARU Region 1 medal to Jan Verduijn.

ARDF CHAMPIONSHIPS

The 14th Region 1 ARDF Championships were held recently in Poland. IARU Region 1 promotes ARDF Championships as a way of encouraging this competitive radio sport. The championships this year were organised by PZK, the Polish Amateur Radio Union, and KRS, the Polish ARDF Club. Some 235 competitors from 20 national societies took part in an outstandingly well-organised event held at the Polish resort of Cetniewo. The Executive Committee was represented at the event by Panayot Danev, LZ1US, who not only presented some of the prizes, but also managed to take part in the championships himself, achieving a creditable position in the middle of the field. An illustrated and quite inspirational write-up of the event is on the Region 1 website.

In the next 'IARU' column I will return to the activities of the Region 1 Committees in supporting amateur radio and safeguarding its privileges. ◆

WEBSEARCH

IARU Region 1: www.iaru-r1.org

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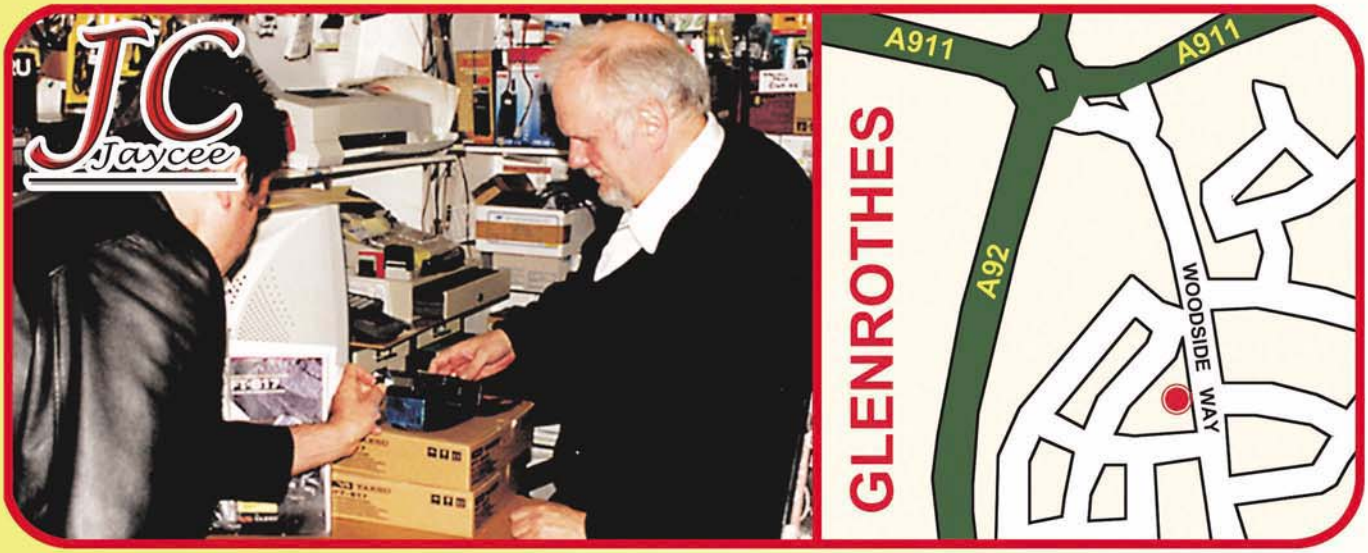

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(see also Conferences, Conventions, and the *RSGB Annual Report* sent to members as a supplement to the November edition)

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WWW

By Steve Hartley, GOFUW, 5 Sydenham Buildings, Lower Bristol Road, Bath BA2 3BS. E-mail: newcomers.radcom@rsgb.org.uk

Another busy month with lots of news to cover. Keep it coming!

Newcomers' news

Having spent lots of time running amateur radio classes I am always pleased to work newcomers on the air. However, I was quite alarmed a little while ago when a newly-licensed MW3 told me he was running his new Yaesu rig at 50 watts. I suggested that he might like to reduce his output and check his Licence Conditions but he informed me that his tutor had told him the high-power rig would be OK to use.

It was quite clear that the chap was operating in good faith, following the advice from his trusted mentor, but he was in contravention of his licence conditions and therefore operating illegally.

Now I don't know if the tutor had 'approved' the rig expecting the operator to realise he had to switch to low power, or whether he really did say 50 watts would be fine. Either way, tutors need to make it clear to their students that rigs which are capable of running high power must only be operated within the power levels set in the licence schedule and all licence holders need to check their schedule and stick to the limits.

FOUNDATION CONTEST

A little while ago David Cutter, G3UNA, suggested that we should think about a contest for Foundation Licence holders. I had just two responses to my mention in the August column. The first was from an M3 who thought it was an excellent idea, suggesting 7MHz as the band. The second was a very kind offer of sponsorship in the shape of a donated prize for the winner, coupled with a suggestion that the contest should require the entrants to use some piece of homemade equipment (eg SWR meter, ATU, receiver, etc) as part of their station.

I did float the idea to some of those 'in the know' but the general feeling was that there are enough contests already. However, the idea was raised again by Tim Kirby, G4VXE, in the October 'Contest' column. If you have any new ideas for how to make existing contests more accessible to newcomers, or other suggestions for a new contest, please send them to me, or Tim [see page 36 - *Ed*].

NEW OLD TIMERS?

Ian Bothwell, G4EAN, is a very busy man. Not only is he secretary of the British Amateur Radio Teledata Group (BARTG) (see 'Websearch' below), but he does similar work for the Radio Amateurs Old Timers Association (RAOTA). It may seem odd reporting about an old timers' group in a column for newcomers, but not all new licence holders are youngsters, many have been shortwave listeners for many years, and others are interested in the history of amateur radio.

RAOTA tries to maintain 'the traditions and spirit of amateur radio' and have adopted the motto "Enjoy the present, honour the past, ensure the future". They produce a quarterly newsletter and membership is open to anyone who shares these interests, regardless of how long they have held an amateur radio licence. Details can be obtained from the membership secretary, Edward Rule, G3FEW, 15 Norwich Road, Lenwade, Norwich NR9 5SH or e-mail edit@raota.fsnet.co.uk

RECEIVER CONSTRUCTION

Back in April 2000 I included details of a little receiver project that David Berry, G4DDW, had designed for newcomers to build. I had numerous requests for further details and I lost count of the photocopies I made of David's original papers.

One of those who went on to try out the design was Vic Pierson, G3MXV. Vic was so impressed with the receiver that he made up 10 kits and added some construction notes of his own. Unfortunately, his local club were unable to make use of the kits (I don't know if they are still available, you will need to ask him directly.)

A little while ago, whilst replacing the battery in his G4DDW receiver, Vic was amazed to find that he could still hear signals with no battery in circuit. He concluded that the Field Effect Transistor (FET) was acting as a diode detector, as in a crystal set. He is currently trying to find out more about the use of FETs in this sort of configuration. Any thoughts?

FOUNDATION AND SOME

Kevin Jackson, M0XLT, was first licensed as M3XLT in June last year but he had been listening on the shortwave bands for nearly 30 years before that. His success at the Foundation level spurred him on to study for, and pass, the RAE in May this year. Another example of the confidence boost that the progressive training scheme gives to those who never thought they could do it.

During his first year on the air, Kevin obtained an RSGB Foundation Award for working stations on 50MHz and recommends that more newcomers should seek out the Award (see 'Websearch'). Kevin has also enjoyed taking part in contests as a member of the Otley Amateur Radio Society, callsign M8Y. He says that the Society members have "nothing but praise for the enlightened thinking of the RA and the RSGB with the new initiatives for licensing in the UK". The club is running more Foundation courses and looks forward to meeting more newcomers on 50MHz in the future. Keep in touch Kevin!

The RSGB Foundation Award - available to newcomers.

A NEW M3 FOR G-QRP CLUB

Pete Halpin, PE1MHO / G7ECN / M3ECN, helped to recruit what must be the youngest member of the G-QRP Club at their mini-convention in Rochdale. Jessica Marsh, M3JMH, who is just seven years old, was attending the convention with her parents and Peter escorted her to the membership table and signed her up for a couple of years.

Below: Newcomer Jessica Marsh, M3JMH, with George Dobbs, G3RJV.

Apparently the club Chairman, George Dobbs, G3RJV, made a fuss of the youngster and welcomed her to the hobby. As Pete noted, she will probably be around long after us old 'uns are long gone! ◆

WEBSEARCH

BARTG:	www.bartg.demon.co.uk
RAOTA:	www.raota.supanet.com
Foundation Award:	http://users.argonet.co.uk/users/tonyg6ttl/awards/found1.htm

The G5IJ An

During the time that I have been compiling the 'Newcomers' News' column there have been several items that have brought significant responses and requests for further information. However, the feedback from my mention of the G5IJ antenna in the August column [1] attracted so much attention that we have had to dedicate a whole article to it!

Ivan James, G5IJ, first aired his design through the pages of *RadCom* in 1996 [2] and described it as a 'push-pull fed folded mono-pole'. Pat Hawker, G3VA, was at first unconvinced by the design but modified his views after trying one.

The antenna was featured again in *Practical Wireless* in 2000 [3] where it was advocated as a multi-band antenna. It was also suggested that the 20m feeder could be replaced by a dipole or even a loop.

A search on the Internet brought few further references. One site that does mention the antenna is that of the Raynet HF team (see 'Websearch'), members of which have experimented with the G5IJ for near vertical incidence (NVIS) propagation. This reference includes radiation patterns modelled using the *NEC2* computer software, but unfortunately there are no reports on the results of their practical tests.

CONSTRUCTION

The antenna consists of a 20m length of 300K feeder fed via a transformer so that both feeder conductors are fed in phase with no RF earth (see **Fig 1**). Details of the toroidal transformer are given in **Fig 2**.

Constructional details have been provided by Ken Sharples, M5KEN (see **Fig 3**). The only tricky bit is making the toroidal transformer. There are five steps: 1. Fold the 20SWG enamel coated wire in half and twist into a 'bifilar' winding, so that there is a small 'loop' at one end and two open wires at the other end. 2. Wind this 27 times on to the T200 core. 3. Tease out the braid of the coax 1.3m from the end and solder it to the 'loop' of the bifilar winding. 4. Wind the coax over the bifilar windings, taking care to wind it in the same direction. 5. After winding the coax to cover the bifilar winding, bare the end of the coax and cut off the braid. Solder the inner of the coax to the 'loop'. Thus, the loop at the end of the bifilar winding, the *inner* at the *end* of the coax, and the *braid* of the coax at a point 1.3m from its end, are all soldered together.

SOME DOUBTS

I really became aware of the G5IJ antenna through the pages of *Hot Iron*, a constructors' newsletter produced by Tim Walford, G3PCJ [4]. Tim had some doubts about feeding two conductors in phase and sought the views of his "antenna guru", Eric, G3GC, who shared Tim's scepticism. There was even some thought of the antenna being an elaborate April fool joke!

Andrew Howlett, G1HBE, was one of the first to air his views after the mention in 'Newcomers' News'. He said he couldn't understand what all the fuss is about. "The transformer is simply a matching device between the 50K coax feeder and the high impedance of the 20m wire (a half-wave on 7MHz) . . . this antenna design introduces nothing new, and seems to try to befuddle novices with a complicated-looking transformer".

"You might as well have connected a random length of wire to your ATU", Dave Buddery, G3OEP, was told by his son, G3SEP. However, Dave's 40m loop, which will not load up on 3.5MHz, appears to work perfectly well when fed via a G5IJ transformer. Dave stresses that the toroid *must* be of a suitable material. He suspects the lower frequency rings used in TV circuits would be too lossy and heat would soon build up.

A discussion I had with 'learned colleagues' from the Radiocommunications Agency and the RSGB came to the conclusion that losses in the transformer were probably the reason for the multi-band capability. We decided that whilst this may be a useful feature it would not be very efficient.

It seems that the G5IJ antenna attracts much scepticism, especially amongst those who haven't tried one!

SUCCESSFUL USE

Roy Walker, G0TAK / 2E1RAF, the author of the *PW* article mentioned above, wrote to add some positive input to the debate. He reports that since he read the original *RadCom* article in 1996 the G5IJ, in various forms, has been his main station antenna and that he has also used one at portable locations throughout England, Scotland and Wales.

In 1999 he used the aerial in qualifying for the Arkansas QRP Club Millennium Award by making in excess of 2000 CW contacts with 5 watts (in five months). In 2000 he entered the G-QRP Millennium Award scheme and was placed third in the world and top UK station all with the G5IJ and 5W of Morse code.

The present G5IJ aerial configuration at Roy's QTH is a low horizontal loop of about 80m of very thin wire. The loop is suspended on the garden fence and the dry stone wall at the bottom of the garden at a height of 1m. This has allowed contact with the USA on 5 watts, so it must be working at least to some extent.

Roy asks that I correct one point from the August 2003 'Newcomers' News'. I quoted him as saying that "the aerial has a low feed-point impedance on all bands". What he actually said was that "it will tune on all the bands from 1.8MHz to 433MHz . . . the matching on all the bands is reasonably flat, though it may be a little higher than you would expect". Nevertheless, he is still of the opinion that the aerial is a good compromise and enables newly-qualified amateurs to operate on all HF bands with minimum expense.

Licensed in 1951, Guy Moser, G3HMR, has enjoyed a variety of antennas and equipment. He tried a G5IJ antenna and found it to be "OK", but no more. He now uses the transformer to drive 200ft of speaker wire, looped around his garden at an average height of 2m. He has 88 QSOs logged with this antenna, mainly on 7 and 10MHz CW. He finds his 12AVQ vertical better for 14 and 21MHz.

Ron Smith, M1DEG, made a G5IJ antenna soon after it was featured in *Practical Wireless*. He had just bought a Hustler three-band vertical antenna but found the G5IJ better in all respects. He is limited in choice as his back yard is just 8m by 3m, more or less at sea level - so I guess the G5IJ is bent to fit the space available. With 10W and his Foundation callsign, M3AJU, Ron has contacted stations across Europe and east coast USA. At the time he wrote, just before the Morse requirement was lifted, he was anxious to try the G5IJ using his original callsign and 100W.

EASY CONSTRUCTION

Adrian Norcross, M1ZRP / M3ANR, of the Chorley Amateur Radio Club, found that constructing the G5IJ was reasonably easy and was a good learning experience in the art of winding toroids. He purchased the toroidal transformer core, and some 20SWG enamelled copper wire from Sycom in Surrey [5], who he says were "very helpful". He normally uses the antenna in a horizontal-V configuration and this has brought many contacts on 14MHz including UA9CDC, RN3BZ,

REFERENCE

[1] 'Newcomers' News', G0FUW, RadCom, August 2003, p53.
[2] 'Technical Topics', G3VA, RadCom, March 1996, pp69-71.
[3] 'Antenna Workshop', G0TAK, Practical Wireless, August 2002, p39.
[4] Hot Iron, G3PCJ, Summer 2003, Issue 40.
[5] Sycom, PO Box 148, Leatherhead, Surrey KT22 9YW.

WEBSEARCH

Raynet HF Team: www.raynet-hf.net/HFANTENNA.html

By Steve Hartley, GOFUW, 5 Sydenham Buildings,
Lower Bristol Road, Bath BA2 3BS. E-mail: newcomers.radcom@rsgb.org.uk

tenna Revisited

G4VFU/MM (off the coast of Tripoli), FY5GS, 4X4BO, WA2VUY and K2LEI to list but a few. He has also had a few inter-G (UK) contacts on 7MHz.

Adrian reports that in this configuration the antenna needs a little tuning on 7MHz and 14MHz but it is fine without an Antenna Tuning Unit (ATU) as you move higher up the bands, 21MHz having a very low VSWR. A balanced-to-unbalanced transformer (balun) is employed on the coax feeder as Adrian detected some RF on the ATU and rig casings. Since incorporating the coaxial balun as part of the feeder the problem has gone away.

Kevin Murphy, G4XBG, his wife, 2E1CCI, and their two dogs had a week's break in the Radnorshire hills (just into Wales). They stayed at a cottage in a steep-sided valley, which was only good for HF. There was a long garden with a number of trees, so a simple wire aerial would not be a problem.

Kevin remembered seeing the G5IJ design and thought it might be just the job for the cottage. The only thing he had to obtain was the ferrite ring, which he also bought from Robin Sykes at Sycom for £4. To keep things as simple as possible he strapped the two outputs together and tested it at home with a short length (20ft) of wire on the end. Received signal strengths were quite good considering its dimensions. The antenna tuned up on all the HF bands and at 100 watts there was no sign of the transformer windings getting hot. Kevin muses "it must work as a broad band transformer but I can't explain it".

Some 40m of plastic coated wire were attached to the transformer in this 'long wire' configuration for the /P operation. Strung up in the trees at about 20ft above ground it gave reasonable results for inter-G working on 3.5MHz and on topband (1.8MHz). On 7 and 14MHz strong European stations were worked and Kevin even worked the west coast of USA on 21MHz. He was very pleased with the results, and has recently used the same set-up from a narrow boat when moored up, by throwing the wire up into trees along the bank. He finds that it requires an ATU to match to the rig, and whilst it may not be the most efficient antenna, it clearly gets results.

SOME TEST RESULTS

Inspired by the *PW* article, Rob Gibson, G0UOO, built one of these antennas last September. In use it showed a "low-ish" VSWR (better than 3:1) across the HF bands and produced plenty of reasonable reports on the air. However, it seemed generally inferior to his 66ft doublet, so he put it to one side.

After seeing the piece in 'Newcomers' News' he got to thinking about the G5IJ antenna again, and how it could have such a flat VSWR across such a wide range of frequencies. Suspecting that this may be due to losses in the toroidal transformer, he dug out his previous construction and tried an experiment. Rob disconnected the antenna element from the transformer, leaving about 5cm of wire on the antenna side, and ran an SWR check across the HF bands. This showed a 5:1 VSWR on 3.5MHz, and better than 3:1 on most of the higher bands. Indeed, it showed nearly 1:1 on 18 and 21MHz!

Rob is another who believes that the G5IJ's broad bandwidth may be due to losses in the toroidal transformer. Anyway, just in case he'd done something wrong when winding the transformer, he made up two more and these gave very similar results to the first. Rob wonders just how much power is wasted in the transformer and concludes, "the antenna will produce contacts, but I feel that other designs, such as a doublet, are much more efficient". Of course, the exact power loss question could be answered by measuring the power through two transformers connected back-to-back (has anyone tried this?)

Terry Steeper,G7JFI, of the Lincoln Short Wave Club (G5FZ, G6COL), made an antenna with a toroid of the right size, but the wrong material - the toroid was intended for 50Hz use! However, with just a single 18ft wire radiating element, it proved useful on 7Mhz and above, providing a match of between 1.5:1 and 3:1 depending on the band. Spurred on by this early success, Terry and his friend Brian Matthews, M3DMV, constructed a better version, using a T225-2 toroid and around 60ft of wire, doubled as in the original design. Brian is very pleased with its performance and has worked the USA on 14MHz and 10 watts.

A 'card' full of the toroids was purchased from Power Magnetics, and these were all snapped up by the club members in one evening! Apart from one member who claimed, "it nearly blew my rig up!", everyone seems to have had some success with the G5IJ antenna. However, Terry reports that he did experience some breakthrough on TV when using the antenna without ATU or earth.

All in all, Terry concludes that it is an interesting design, simple to make, and it got a few LSWC members constructing, so it was a success from many viewpoints.

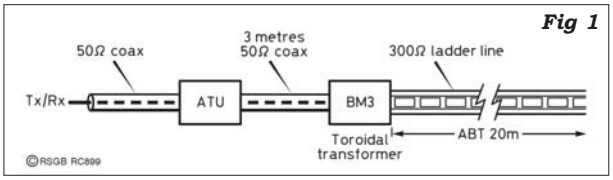
CONCLUSION

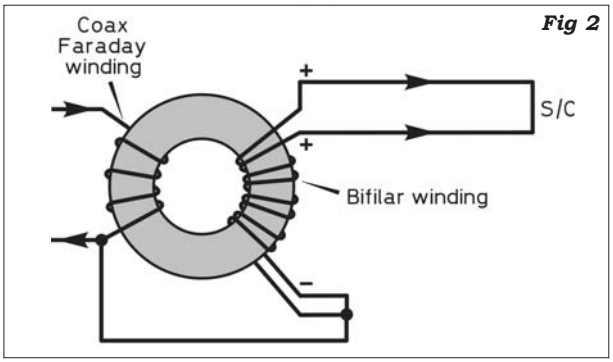
Based on the feedback I have received, I have to conclude that the G5IJ antenna appears to be a viable radiator but I think Ken Sharples, M5KEN, sums it up very well. "This antenna follows the usual rules, the higher the better, but it is very forgiving for the small back yard plot. It is no DX buster of course, but it is a good start-up antenna that is cheap and easy to make". ◆

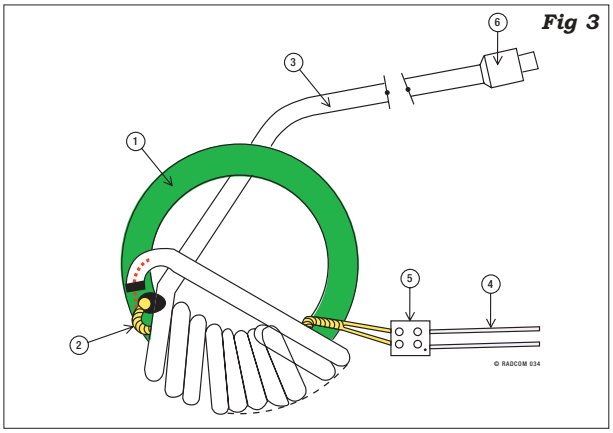
Fig 1: General arrangement of the G5IJ antenna.

Fig 2: Winding details of toroidal transformer BM3 as shown in Fig 1.

Fig 3: Constructional details as provided by Ken Sharples, M5KEN. 1. Amadon T200-2 core. 2. 5m of 20SWG enamel coated copper wire (secondary). 3. 50K (thin) coax, length to suit. 4. 20m bell wire. 5. 2-port terminal block. 6. PL259 coaxial plug.







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•TYPE 1/4λ, •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 1010mm •WEIGHT 190g

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Maldol HVU-8

Maldol

The Maldol HVU-8 is a unique and ultra-compact HF, VHF, and UHF antenna developed for confined and restricted space installations like apartments and condominiums or for temporary or portable use. Installation is easily accomplished and convenient due the HVU-8 being only the traditional height and weight of HF vertical antennas. It includes 80/40/20/15/10/6/2M/70cm bands in a compact and user defined combination to complement the new multi-band HF/VHF/UHF radios that have recently been introduced. Each HF band and 6M has it's own independently tuned radiator and radial system while the main antenna mast is pre-tuned for constant operation on 2M/70cm. Of course, band width is very narrow and radiator element tuning takes time and patience but the results are surprising. The HVU-8 comes with mounting brackets, U-bolts, etc. for easy installation.

HVU-8 Specifications

- Frequency: 80/40/20/15/10/6/2M/70cm bands
- Type: HF and 6M: wave.
- 2M: wave 2.15 dBi gain
- 70cm: Two 5/8 waves in phase 5.5 dBi gain
- Power: 200 watts SSB on HF and 150W FM on 6M to 70 CM
- SWR: 1.5:1 at fO frequency
- Connector: UHF (SO-239)
- Mast Diameter: 1.0 - 2.36 inches (25-60 mm)
- Height: 8.5 feet (2.62 m)
- Weight: 5 Lbs. 7 ounces. (2.4 kg)

Only £199.95

Maldol HMC-4

Type:	Amateur HF/VHF/UHF mobile antenna
Band(s):	10 m - 1/4-wave 6 m - 1/4 wave 2 m - 1/2-wave 70 cm - 2*5/8-wave
Gain:	10 - 0 dBi 6 m - 0 dBi 2 m - 2.15 dBi 70 cm - 5.5 dBi
Max power:	120 W (10/6 m: 80 W)
Impedance:	50 ohms. M-plug/PL-259
Length:	1.19m
Weight:	390gr
Manufactured:	Japan, 2003-200x
Other:	Suitable for Yaesu FT-8900R.

Only £69.95

Maldol VK5 Junior vertical Antenna HF

The VK5jr is an antenna "Ground Plane" for vertical HF multiband with "traps", covering the amateur bands of 80, 40, 20, 15, 10 meters.

Characteristics

- Bands: 10, 15, 20, 40, 80 meters

Width of band:

- 10 meters: 1400KHz
- 15 meters: 300KHz
- 20 meters: 200KHz
- 40 meters: 80KHz
- 80 meters: 30KHz
- Height: 6.1 meters
- Diameter of the radial ones: 2 meters
- Permissible maximum power: 500 W (SSB)
- Nominal SWR: 1:1.5 in the central frequency
- Weight: 6 kg
- Resistance to the wind: 120 Km/h

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HX-240MkII Got a high performance 2M multimode that you want to use on H.F.? Thought so! Just plug the new compact HX-240mkII straight onto the antenna socket and convert TX & RX across all the main H.F. Amateur Bands (80-10m). Almost 40Watts output and very simple to use. **Only £249.95**

HL-700B Compact All mode solid state 500W Linear Amplifier. Only 10 Watts drive will produce a staggering 400 Watts output. (100W produces 600W). 12V DC required @ 70 Amps. **Only £899.95**

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HL-2Kfx Available early 2004, this new Linear Amplifier not only produces 1kW out on HF but the same on 6 Meters. All solid state, heavily protected and weighing only 22 kilos, we can't wait to get our hands on the first shipment. Place your deposits now! **Price TBC**

HL-721DX Desined with the TH-F7E, VX-5/7R and other twin banders, just slip this new FM amplifier in line and boost your output to a very respectable 15-18 Watts. **Only £129.95**

accessories

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CT-Asia 'Original' Hand Key ..... £ 97.73
CT-Deluxe Large Hand Crafted Hand Key £132.73
CT-Ham-Dual Iambic Lever Paddle £84.95
CT Europe Iambic Lever Paddle £111.73
CT9B Dual (Iambic) Lever Paddle. All Brass Edition £73.73

The full range is available from stock.

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look! New Miracle Antenna MkII has arrived!

Miracle whip MkII

This antenna has been designed with the Yaesu FT-817 & FT-897 in mind. The MkII uses a black anodized longer flexible whip for better low frequency tuning. The performance is staggering and it will work with any radio from 3.5-460mHz (25W max), without a counter poise. Ideal for listeners, radio amateurs and commercial applications. ML&S: £129.95

MyDEL Wire Antennas & Accessories

The complete "Megatrap" 160-40m antenna.

The MyDEL Brand was introduced back in the early nineties primarily to offer a range of high quality products that included wire antennas for commercial and amateur radio use. The most famous of the range is the Multitrap— (80m-10m, 20m long) & Megatrap— (160m-40m, 32m long) wire dipoles. Both these antennas use 1kW traps through-out the range, both constructed using pre-tensioned copper multi-strand wire covered in a tough plastic outer sheath. Both coax fed, they require very little tuning and can get an Amateur Station up and running on all bands within one hour of erection.

MyDEL Multitrap 80-10m. £89.95
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MFJ offer an excellent range of affordable tuners. Here are our best selling Top Three.

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The MFJ 949 is a 300 watt antenna tuner. This T-circuit tuner cover 1.8ñ30 MHz, and features a peak and average reading cross needle SWR meter, built-in 300 ohm dummy load, eight position coax switch, and more. The tuner measures 25 W x 8 H x 18 D cm, and weighs 2.2kg. **Only £159.95**

MFJ-969

The MFJ 969 is a 300 watt antenna tuner which cover 160-6 meters. If features an air-core roller inductor with selfwiping contacts, mechanical roller inductor counter, 8 position antenna switch, built-in 50 ohm dummy load, crossneedle SWR meter which simultaneously indicates forward and reflected power as well as SWR-without the need for time consuming calibration. The tuner measures 3.5"H x 10.5"W x 9.5"D. **Only £199.95**

MFJ-971

Tunes coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle SWR/Wattmeter has two switchable ranges: 30, 300 or user selectable 6 watt ranges. Tiny 6 x 6 x 2 inches, ideal for portable/mobile installs. **Only £99.95**

Power Supplies

Yaesu FP-1030A

If you want to invest in a power supply that won't let you down and you are fed up with cheap badge engineered rubbish, then take a look at this. The FP-1030A is over volts protected (so it won't blow up your rig!), has dual meters for Volts & Amps and is attractively designed. It features four separate outputs including a Cigar-Lighter socket for running handies via their car adapter lead. **Only £179.95**

MS-1228

Looking for that perfect lightweight PSU for your new FT-857/897 or IC-706? This compact design will supply 23 amps @ 13.8V DC and is not much bigger than the IC-706 itself. **Only £74.95**

Diamond Antenna Power/SWR Meters

SX Series. Installs between transmitter and antenna for measurement of forward and reflected average (CW) and SSB (P.E.P.) RF power, and SWR. Accuracy is approximately that of the Bird 43; carrier measurements ±5% (typical) of full scale depending on frequency and power. Illuminated meter, sensor switch and LED indicator. Power ratings listed below are for intermittent operation. For continuous mode (CW, FM etc.) maximum ratings vary with frequency and are listed in the instructions. All models have SO-239 connectors except SX-1000 with Type-N. SX600 and SX1000 have dual direction couplers. Requires 12 VDC if you wish to light meter. Size: 6'h x 2 1/2'w x 4'd, Weight: 2 lbs.

Model Number	Power	Freq. Range	Display	Price Each
SX100	3KW	1.6 - 60 MHz	30W / 300W / 3KW	£109.95
SX200	200W	1.8 - 200 MHz	5W / 20W / 200W	£79.95
SX400	200W	140 - 525 MHz	5W / 20W / 200W	£89.95
SX600	200W	1.0 - 160 MHz + 140 - 525 MHz	5W / 20W / 200W	£139.95
SX1000	200W	1.8 - 160 MHz + 430 - 1300 MHz	5W / 20W / 200W	£189.95

SX20C

Diamond SX20C and SX40C Watt meters. The Diamond SX20C and SX40C are compact Watt meters featuring cross needle meter for measuring power and SWR simultaneously.

Model Number	Power Settings	Freq. Range	Size	Price Ea.
SX20C	30w & 300w	3.5 - 150 MHz 3.5-30 / 50-54 / 130-150 MHz	3 5/16" W x 3 5/16" H x 3 3/4" D	£74.95
SX40C	15w & 150w	144 - 470 MHz	3 5/16" W x 3 5/16" H x 3 3/4"	£69.95

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Low-profile helic Simulation and

INTRODUCTION

The theory and practice of helical antennas have been developed largely by J D Kraus and his associates at Ohio State University [1].

For circular polarisation applications, the axial-mode helix antenna is an interesting candidate, because its good polarisation performance is an inherent attribute of the antenna shape without the need for a special feeding arrangement. Polarisation properties of the helix have been the subject of several publications since the early work of Kraus [2, 3].

A typical helical antenna operating in the axial mode has a circumference C = πD of approximately one wavelength and a pitch spacing, S, of approximately one quarter-wavelength.

Traditionally the pitch angle, an important parameter of the helix, may range from about 12 to 16°; approximately 12° (pitch = 30mm) is typical in most 2.4GHz satellite receiving helices.

The pitch, α, is the angle that a line tangent to the helix wire makes with the plane perpendicular to the axis of the helix, and it can be found from the relation tan(α) = S / πD , where S is pitch spacing and D = diameter of helix.

This paper refers to the simulation and measurements of some forward-fire-mode helices with very low-profiles. In the past, low-pitch helices have been recognised as ineffective radiating elements for a circularly-polarised wave. Field measurements and numerical results using *NEC-Win Pro* and *NEC-Win Synth* [4] however, lead to some low-pitch helices with gains comparable to that of a conventionally long helix.

NEC-WIN SYNTH

NEC-Win Synth is designed to allow users to build complex antenna structures quickly. The structures can be created in several ways; the 47 predefined models, together with the ability to import NEC, ASCII, and DXF files, allow for very creative ways to generate 3D structures. Geometric data are displayed in a spreadsheet with access to 134 predefined functions and constants and 52 user-defined variables. Dialogue boxes linked to the spreadsheet make it easy to rotate, move or scale individual wires or complete models. As you build and modify your model, the structure is displayed and dynamically updated as edits are made. We used *NEC-Win Synth* to build the circular reflector for the helix.

WAVE POLARISATION

A circularly-polarised wave radiates energy in both the horizontal and vertical planes as well as in every plane in between. The difference, if any, between the maximum and the minimum signal peaks as the antenna rotates through all angles, is called the axial ratio, or ellipticity, and is usually specified in decibels (dB). Normally, if the axial ratio is less than 2dB, the antenna is said to be circularly-polarised. If the axial ratio is greater than 2dB, the polarisation is referred to as elliptical.

The polarisation, orientation, and sense of each antenna in a system should be identical in order to optimise the signal strength between stations. For example, linearly-polarised antennas that are identically-orientated (eg vertical or horizontal) work best together as do circularly-polarised antennas that are using the same sense (RHC, LHC). Even so, circularly-polarised antennas are compatible with linearly-polarised antennas, and *vice versa*, because a linearly-polarised antenna can receive components of the circularly-polarised signals in its linear plane.

When linearly-polarised antennas are misaligned by 45°, the signal strength will degrade by 3dB, resulting in up to 50% signal loss. When misaligned by 90°, the signal strength degrades 20dB or more. Likewise, in a circularly-polarised system, both antennas must have the same sense, or a loss of 20dB or more will be incurred. Combining a linearly-polarised transmitting antenna with circularly-polarised receiving antenna, will incur a loss of 3dB in signal strength between the two formats.

STANDARD HELICES

The famous work of J D Kraus on helices started in 1946, but only in the 90s was the simulation study carried out by D T Emerson [5], a very important starting point for those interested in the simulation and manufacture of axial helical antennas. Before starting the simulation phase, using *Nec-Win Pro* and *NEC-Win Synth*, we tried to define the main parameters and the general performances of our antennas (power gain, radiation angle, input SWR and axial ratio).

The power gain of the helices can be easily estimated using the graph of **Fig 1** where the performances, at 2.4GHz, of different lengths of antenna are compared. The range from 2λ to 6.5λ is covered, corresponding to 8.3 to 27 turns. The constant parameter of the helices is the pitch between two

Fig 1

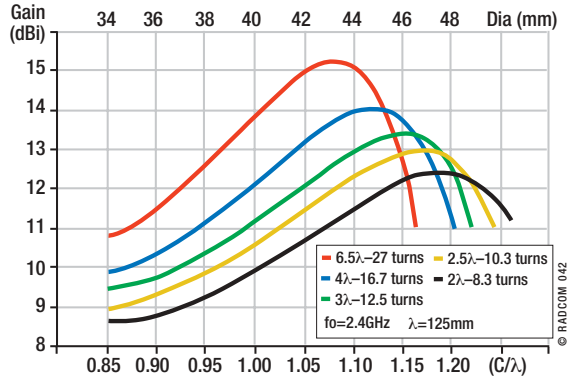
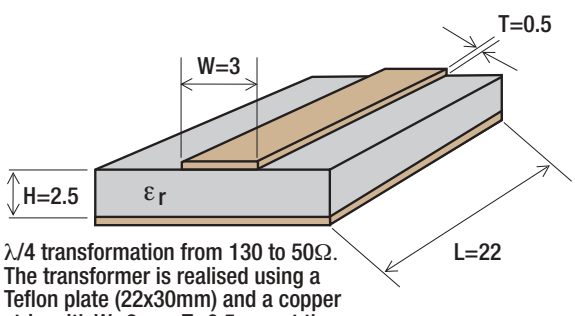


Fig 2



λ/4 transformation from 130 to 50Ω. The transformer is realised using a Teflon plate (22x30mm) and a copper strip with W=3mm, T=0.5mm, at the beginning of the Helix. © RADCOM 043

***Fig 1:* NEC-2 simulated gain versus helix diameter and C/λ at 2.4GHz.**

***Fig 2:* Layout of the λ/4 Teflon transformer calculated using HP-AppCad.**

By Paolo Antoniazzi, IW2ACD* and
Marco Arecco, IK2WAQ. *E-mail: paolo.antoniazzi@tin.it

es for 2.4GHz: measurement

contiguous turns that is S = 0.24λ (or α = ~12°, corresponding to 30mm @ 2.4GHz). In this graph, the power gain is plotted versus C/λ. This means that for each antenna length there is an optimum turn diameter that maximises the gain.

The beamwidth (radiation angle) and the power gain (in dB) are closely connected to each other by the following relationship:

$$G = 10\log_{10}\left[\frac{360^2\eta}{\pi\theta^2}\right] \cong 10\log_{10}\left[\frac{41253\eta}{\theta^2}\right],$$

where θ = half power beam width in degrees and η = efficiency (<1).

If we do not consider the efficiency, the equation represents the antenna directivity, which is easier to measure than the power gain at 2.4GHz because it can be calculated through the simple measure of an angle.

The power gain and the directivity are also affected by the size and shape of the ground plane; this can be square or circular, but it needs a side or a diameter equal to λ (125mm @ 2.4GHz) to obtain good performance.

With a smaller dimension screen we take the risk of the inversion between the main lobe and the back one of the antenna!

The SWR is guaranteed by the matching between the typical 120-130Ω input impedance of the helix and the 50Ω impedance of the feeding coaxial cable. This is obtained using a λ/4 transformer made using an industrial Teflon support with h = 2.5mm and line width W = 3mm, (Z approximately 81Ω). The transformer layout is shown in **Fig 2** and was designed using the Agilent software *AppCAD* [12]. The axial ratio values are included within 1 - ∞ and are defined by:

$$AR = \frac{|E_\phi|}{|E_\theta|},$$

Where E_ϕ and E_θ are the electric fields in time-phase quadrature, perpendicular to the axial direction of the helix.

The polarisation is as much circular as the AR ratio is near unity (0dB). The matching of this requirement can be confirmed by analysing the radiation patterns generated by the *NEC-Win Pro* simulation program.

The following criteria are suggested for the design.

- Use a copper wire, gold or silver plated, having a suitable diameter: 0.024λ (3mm @ 2.4GHz).
- W ind the helix in a cylindrical shape.
- Divide each turn in 10 segments in order to satisfy the Nec-Win-Pro rule that fix the minimum ratio between the length of the segment and the wire radius for better simulation accuracy. The use of 20 segments per wavelength is suggested only for critical regions (complex shapes).
- Use a 6mm stub between the ground plane and the helix, during the simulation phase, to minimise the current induced in the screen by the proximity of the first turn of the helix winding.

Using the above criteria, we simulated and built two different antennas (see the photograph), one to receive the AO-40 satellite [6] having 16.7 turns (simulation results: power gain 14.5dB, radiation angle 26°) and another with 5 turns (power gain 12dB, radiation angle 45°) to be used both as a reference antenna and as transmitting antenna for the directivity measurements described later. The simulation files are available to experimenters on request.

LOW-PROFILE HELICES

The behaviour of the current versus length of a typical helix shows three different regions.

- Near the feed point where the current decay is exponential.
- Near the open end with a visible standing wave.
- Between the two helix ends where there is a relatively uniform current and small SWR (transmission line).

There are two ways to obtain a good circular polarisation helix: firstly, tapering the helical turns near the open end, to reduce the reflected current from the arm end; secondly, using only the first helical turns where the decaying current travels from the feedpoint to the first minimum point (see **Fig 3** for a 5-turn helix).

Starting from these considerations, our final low-profile helix uses a pitch S = 0.16λ (20mm @ 2.4GHz) and is both conically wound with a cone of 62/41mm diameter and very short

Fig 3: Helix current distribution at a frequency near the centre of the axial-mode region.

Fig 4: NEC-Win Pro simulated radiation diagram of the 1.7-turn conical 2.4GHz helix. (Pitch = 20mm, Cone dia = 62/41mm).

Fig 3

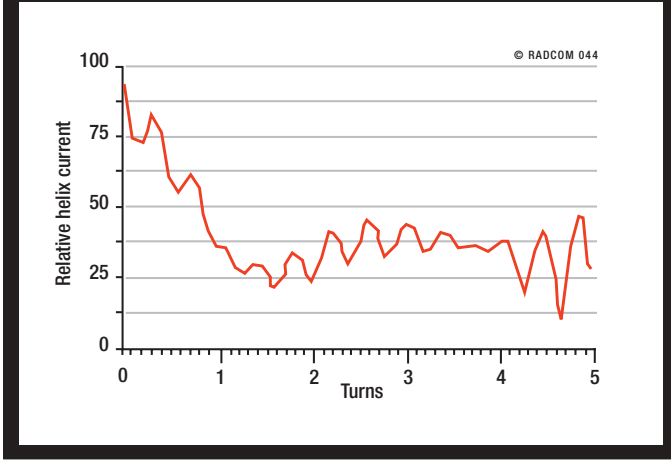
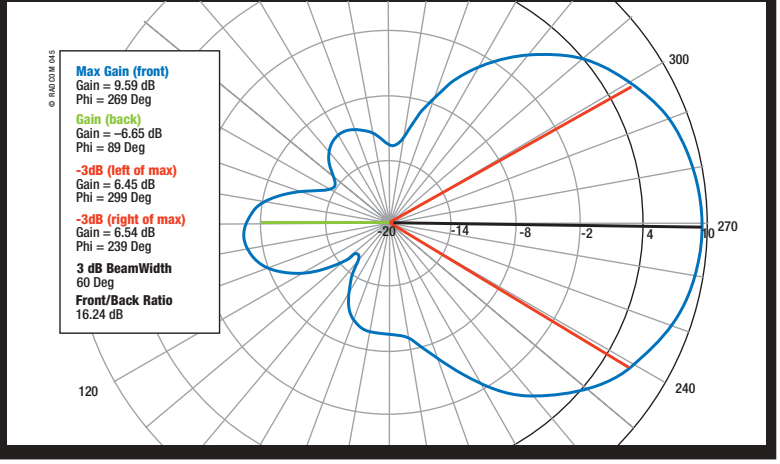
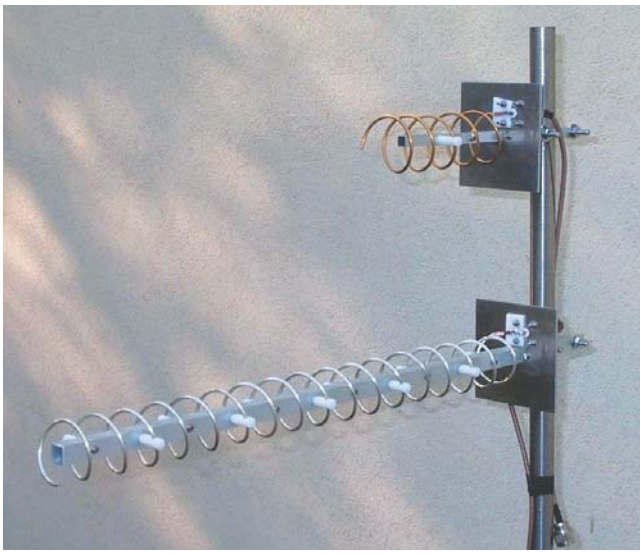


Fig 4





Above left: Low-profile helix with 1.7 conical turns.

Above right: Field test: 5-turn and 16.7-turn helices.

(only 1.7 turns – see the photograph).

The simulated and measured results are very interesting and the directivity is not significantly different from that of a conventional multi-turn helix. See **Table 1** for comparison between low-profile and standard helices.

The equivalent directivity obtained from radiation angle measurements is about 10dB for the low-profile helix (only 40mm thick) and 11dB for the 150mm-long 5-turn helix. The measured radiation angles (-3 dB) are respectively 58° and 45°. Thanks to the very small mechanical dimensions, this antenna is particularly useful also for Wi-Fi (wireless LAN) applications.

The results obtained with *NEC-Win Pro* are very interesting. The radiation diagram and the input impedance (Smith chart) of the low-profile 2.4GHz helix are shown in **Fig 4** and **Fig 5.**

From the response plots of **Fig 6** we can also see the improved bandwidth resulting from conical helices. Also shown in **Table 2** is a comparison of the simulated values of gain, radiation angle and front-to-back ratio of four different 1.7-turn helices (conical, linear, different diameter, square or circular reflector).

MEASUREMENT ERRORS

It's not very difficult to design and make helices for different working frequencies and gains. More difficult, for the serious experimenter, is making precise measurements.

The first critical point is the low-SWR measurement, because extremely high-quality cables and adapters are needed. The time and money spent on high-quality cables can be wasted if there are large impedance mismatches within the connectors, at the connector-cable interface and with the adapters (only N or SMA for the 2.4GHz tests). David Slack of Times Microwave Systems [7] writes: "…a microwave cable assembly is not 'just a wire'. It is a passive, TEM-mode, microwave component and an integral part of a system…"

Assuming a high-quality cable is used, the predominant contributor to the SWR of a cable assembly (on a 10-50cm short assembly) is the connector. Improperly-compensated geometry changes in the connector interface will exhibit very poor SWR characteristics.

Previously, trial and error was a key part of high-performance design, but today the computer simulation of discontinuities in connectors is an art and the practical results are visible when the SWR performance of a very good cable assembly is analysed. Another cause that can affect the characteristic impedance is the SWR induced by the incorrect characteristic impedance of parts of the line [8, 9], in particular, the transition between the inner conductor and the N-type panel connector lead may have different dimensions.

The use of a slotted line is becoming a lost art, but learning it is not too difficult. The first suggested measurement with a slotted line is the SWR of a system with a very good commercial termination. Our first results with an old HP termination model 909A (N-male connector) are not the best. Better results are obtained using the Minicircuits termination type Anne-50 with an SMA-male connector (SWR = 1.03 @ 3GHz) and a good Amphenol adapter N-male/SMA-female. The measured values on our self-made slotted line (shown in the photograph) are shown in **Fig 7**. For almost all the tests we used a generator (2.2 to 2.7GHz) composed of a VCO type JTOS-3000 followed by the 3x3mm wide-band amplifier type MNA-6 (complete package).

RF signal levels during the measurements.

The output level from the oscillator is very high (+10 dBm), but some attenuation was included for stability (the wide-band amplifiers will oscillate with loads of not exactly 50Ω). Using

Table 1: Comparison between measurements and simulation for standard and low-profile helices.

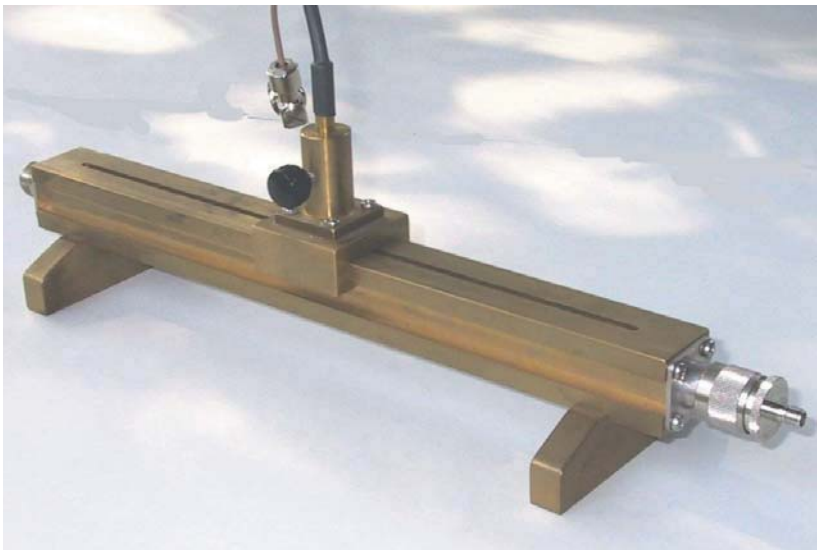
Table 1

Type	Measured radiation angle (°)	Equivalent directivity (dB)	Simulated radiation (°)	Simulated directivity (dB)	Notes
16.7 turns	28	13.5	26	14.5	A0-40 type
5.0 turns	45	11.0	42	12.0	Reference
1.7 turns	58	10.0	60	9.6	Low-profile

Table 2: Simulation of gain, radiation angle and front-to-back ratios for different 1.7-turn helices.

Table 2

	Helix type	Frequency (GHz) 2.0	2.2	2.4	2.6	Reflector
		——— Gain (dB) ———				
A	Dia 67/45mm conic	9.17	9.49	9.64	8.80	125 x 125mm
B	Dia 62/41mm conic	8.93	9.35	9.73	9.84	125 x 125mm
C	Dia 62/41mm conic	8.84	9.31	9.59	9.44	**Dia = 124mm**
D	Dia = 56mm **linear**	9.03	9.38	9.68	8.52	125 x 125mm
		——— Radiation angle (°) ———				
A	Dia 67/45mm conic	63	59	58	56	125 x 125mm
B	Dia 62/41mm conic	64	61	57	57	125 x 125mm
C	Dia 62/41mm conic	67	63	60	58	**Dia = 124mm**
D	Dia = 56mm **linear**	62	58	56	65	125 x 125mm
		——— Front-to-back (dB) ———				
A	Dia 67/45mm conic	18.0	18.0	20.0	17.0	125 x 125mm
B	Dia 62/41mm conic	17.3	17.6	18.0	19.0	125 x 125mm
C	Dia 62/41mm conic	14.0	15.0	16.0	18.0	**Dia = 124mm**
D	Dia = 56mm **linear**	17.0	17.0	17.0	24.0	125 x 125mm



the Boonton RF Millivoltmeter (model 92B) as a detector, there is a sensitivity loss of about 10dB @ 2.4GHz (referred to the maximum suggested operating frequency of about 1.2GHz) and, consequently, the level sampled by the probe of the slotted line is very low (typically 0.3 to 3mV).

In future measurements we will use a 2.2 to 2.6GHz heterodyne system composed of a harmonic mixer and a 1.0GHz fixed-frequency local oscillator. The IF will be in the range 100-500MHz, limited by a 550MHz low-pass filter. This solution is free from oscillation risks and the gain is obtained with a simple wide-band 100-500MHz amplifier followed by the RF millivoltmeter. In effect it's very important to minimise the coupling between the probe and the line to obtain reliable results.

The RF power supplied to the 5-turn transmitting helix is also about 10mW (+10dBm) followed by a 6dB N-attenuator.

To reduce the measurement errors, the distance between the transmitting and receiving antennas has to be considered. To determine this distance, you need to be able to measure the signal level with a filtered RF voltmeter having a 20 - 30dB dynamic range. Also, the wave reaching the receiving antenna should be as planar as possible.

The first condition can be easy established starting with the received power and calculating the attenuation experienced by the wave in free space:

$$A = 32.4 + 20\log(f) + 20\log(d) - Gt - Gr .$$

Here, A is the attenuation in decibels, f is the frequency in megahertz , d is the distance in kilometres, Gt is the gain of the transmitting antenna in dBi, and Gr is the gain of receiving antenna, also in dBi, obtained by simulation.

There is also a simple, easy-to-remember method of calculating the free-space attenuation by considering the distance between the two antennas in terms of wavelengths. When $d = \lambda$, A is always 22dB between isotropic antennas.

This equates to 12.5cm at 2400MHz. The attenuation increases by 6dB for each doubling of the path distance. This means that the free space attenuation is 22dB at 0.125m, 28dB at 0.25m, 34dB at 0.5m, etc. To make the wave reaching the receiving antenna as planar as possible, the capture area in square metres of the receiving antenna is:

$$Ac = Gr.\lambda^2 / 4\pi .$$

This expression is valid for an antenna with no thermal losses and was certainly useful for our experiments. With a circular capture area, the minimum distance in metres between the antennas is:

$$d > n.Gr.\lambda / \pi^2$$

A maximum acceptable phase error will also be considered.

For a phase error of 22.5°, which is usually enough, n = 2. If a phase error of only 5° is required, n = 9. In the case where one dimension prevails, the maximum length, instead of the capture diameter, is used. In this case, the minimum distance in metres becomes [10, 11]:

$$d > n.L / \pi^2 ,$$

where L is the maximum length in metres (50cm for the 16.7-turn helix).

A site in the garden was found to be particularly useful for all our helix measurements (d = 4m = 32λ at 2400MHz). ◆

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Fig 5

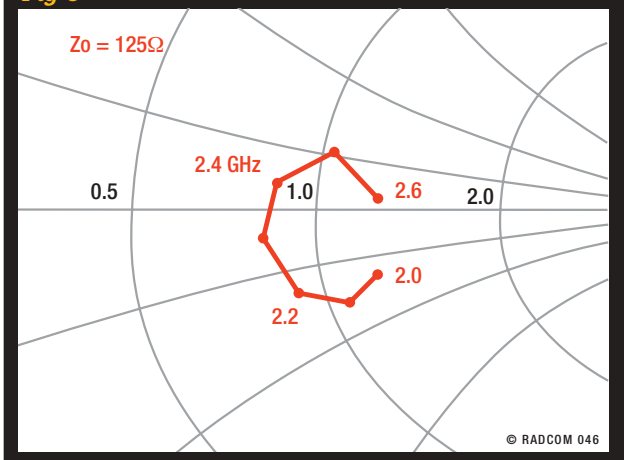

Fig 6

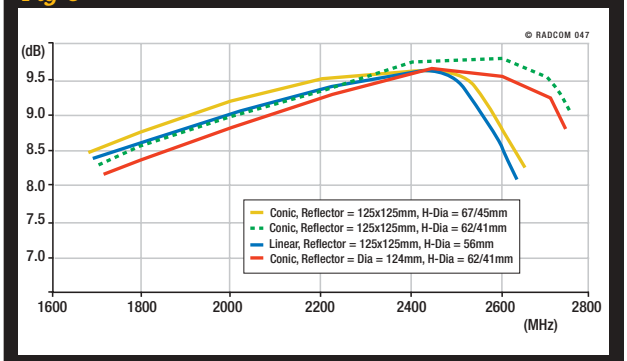

Fig 7

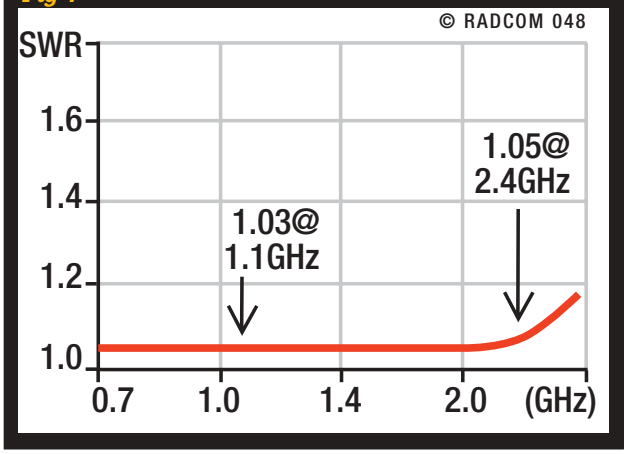

Fig 5: Input impedance simulation (Smith chart) of the low-profile helix.

Fig 6: Frequency responses of four different 1.7-turn helices (pitch= 20 mm).

Fig 7: Slotted line measured values of SWR up to 2800MHz.

Top left: A complete 1-3GHz home-made slotted line.

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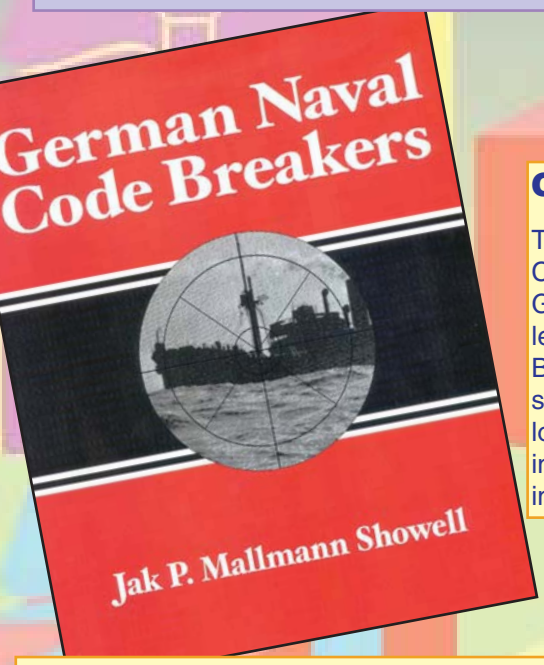

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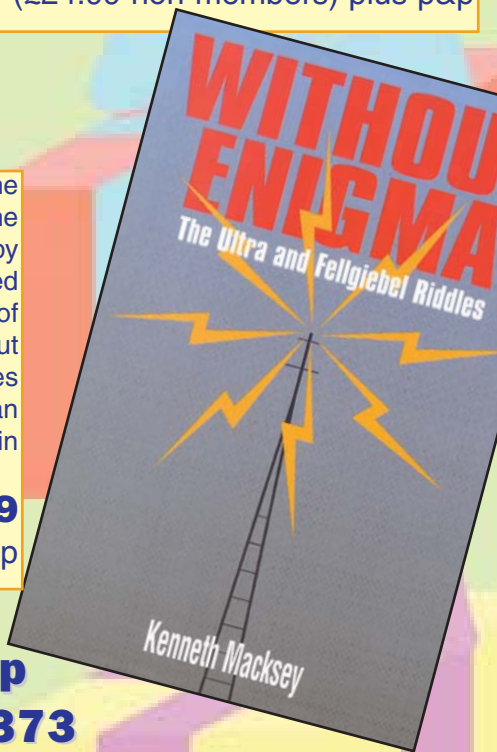

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PIC-A-S

PART 17 SOFTWARE TRANSMITTE

Completion of the Magic Roundabout construction is this month's mission. Refer to last month for the circuit and option details. The complete receiver performance is also discussed here.

The PCB component layout and artwork is illustrated in **Fig 38**. It is again made using the iron-on process. The board is double-sided with the underside unetched except for small pads to mount R11 and R12 - and to make off the Rx Mode and 12VTx lines.

Thus the underside of the board provides a ground-plane as well as screening. R11 and R12 are mounted in the thickness of the PCB as 'feedthrough resistors'.

There are several wire links on the board, for which I apologise. These derive from the need to make this board as small as possible to minimise the risk of pick-up and radiation.

The RF Port requires a DC blocking capacitor. For STAR, this is fitted on the BPF board. Do not omit it!

TRACK OPTIONS

The board is shown tracked for all options. If you are definitely fitting the two-transformer H-mode mixer, then you should remove all the tracking between T4 and T5 and T3 (illustrated in blue) - leaving only a small pad to connect a wire from T6 to the IF port diplexer. To 'remove' the track before etching, simply fill and join up the ground with an indelible pen. Alternatively, after etching, you can cut the tracks feeding the diplexer - and then bridge all the unwanted track to ground. The latter is easy and reversible so gives you more options for experimentation.

SQUARER OPTIONS

These are shown in blue on Fig 38 with the component values taken from Fig 36 last month.

This is a classic example of where there is absolutely no way this board could be made commercially, since there is no suitable track layout. For one-off purposes, however, the two 1n wire-ended capacitors fit beautifully - as shown - across the top of IC3. If you want to retain the original mixer configuration, simply replace them with wire-links; omit the 'blue-outlined' components; and revert to the values in Fig 34 last month.

CONSTRUCTION SEQUENCE

The holes in the grounded areas of the board are for links through to the ground-plane. These should be fitted first and soldered both sides.

Then mount all the SMD components; then the discrete devices with the exception of TR1; then the wire links (ideally using thin self-fluxing wire) and finally the transformers.

Note the gap between TR2 and TR3 to give space for the feedthrough to the BPF board - via RFC4. Slip a small ferrite bead over each J310 drain lead before soldering.

IF PORT DIPLEXER

L1/2, C5/6, R33/34 form a diplexer on the mixer IF port. L1, L2, C5 and C6 should each have a reactance of about 50Ω at the IF - using the nearest preferred capacitor value. The values given are for 10.7MHz. L1 and L2 in this case are each 14 turns of 32SWG wire wound on a T25-2 core spread over about 2/3 of the circumference. This derives from an A_L value of 34µH per 100 turns for this core.

Before fitting, connect each coil in parallel with its resonating capacitor, pass a single turn through the toroid and loosely couple it to a GDO; and dip it at your IF.

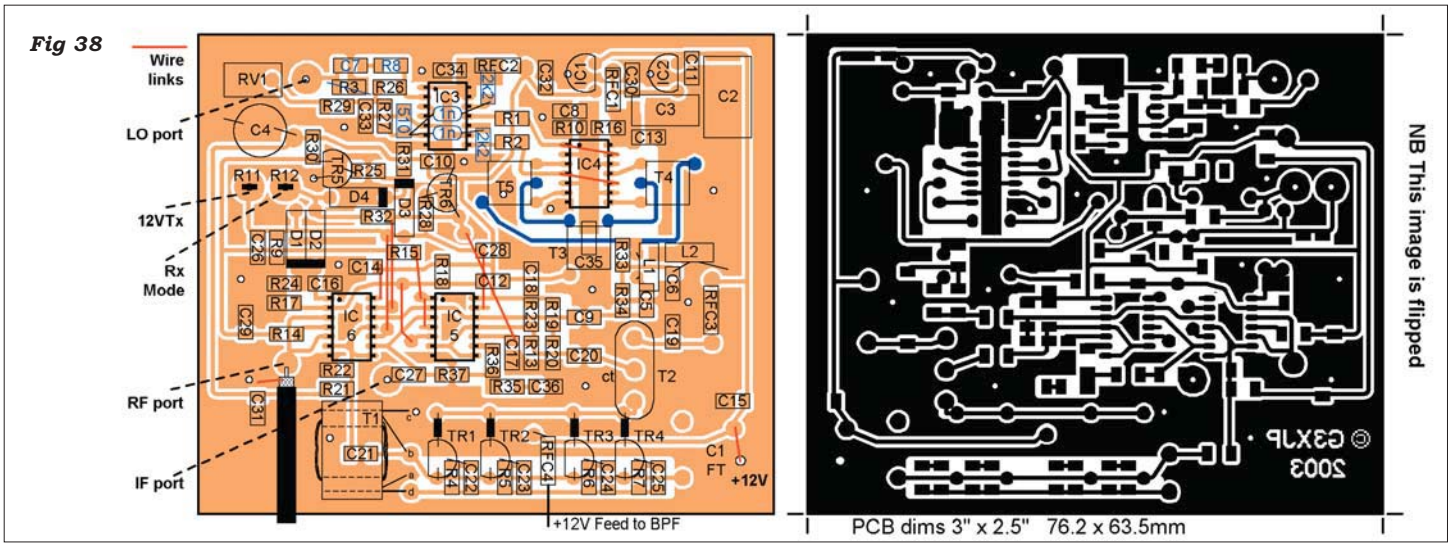
MIXER TRANSFORMERS

T3, T4 and T5 are illustrated as MCL transformers and the tracking is appropriate should you want to use these.

If using the home-brew 3-transformer mixer, the EPCOS ferrites mount vertically as shown for T2.

Mixer balance is critically dependent on the transformers all being the same. To this end, make up enough trifilar wire in one length for T3-T5. Rather than winding one end of the wire through the core continuously, wind alternate ends.

Fig 38: 'Magic Roundabout' component layout and PCB artwork. This board is designed to mate mechanically with the BPF assembly described next month. Components shown in blue are for the improved squarer. Track shown in blue may optionally be removed (see text) for the two-transformer H-mode mixer.



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TAR

R AND RECEIVER

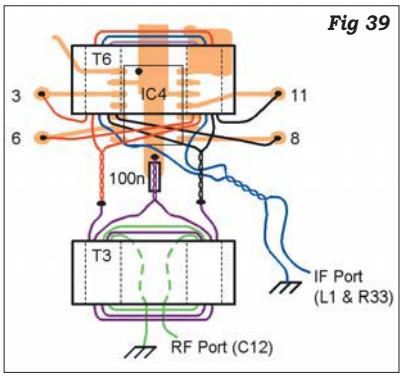


Fig 39

If building the two-transformer version, then see Fig 37 last month for the circuit diagram and **Fig 39** for the mechanical result. This may indeed turn out to be the definitive test of your understanding of 'the phasing dot convention' but if you follow the steps below you can build it by rote.

T6 is wound with five parallel strands of self-fluxing wire - untwisted. Cut five lengths of wire to some 20cm long. Solder one end of all of them together to retain them. Then trim them all to *exactly* the same length and solder the other ends together.

Now wind four turns on the core under modest and continuous tension - passing alternate ends through the core.

Cut off the surplus wire equally and initially to approximately 5cm. Tin all 10 ends. Using a continuity meter, locate one pair and twist them to form the IF port feed. That was easy!

Now locate two more 'pairs' and cross-connect a start/end (and twist them together) to form the centre-tap. Repeat for the two pairs.

Locate T6 on top of IC4 and trim the four leads that are made off to the track to the same length. Those going to pins 6 and 8 pads define that length. Tin and solder them to their pads as per Fig 39.

Then make off the IF port leads to the end of the diplexer.

Now wind the trifilar transformer T3. Solder the centre-tap to the track first, then the RF port feed. Finally, trim off the flying leads to T6 equally, as short as reasonably possible, and solder them up.

J310 TRANSFORMERS

T2 is a conventional bifilar transformer with no complications. The input transformer T1 needs a little explanation. See **Fig 40**.

The T1 feedback turn is made from a length of miniature coax braid. Form the U-shaped primary turn - with plenty of excess lead length. Pierce and spread the braid to fill the tubular holes in the core - from both ends of the core. Make off the braid leads to the PCB track.

Wind the four turns - inside the braid - out the back of the core, across and back through the braid on the other side - and solder to the track. As far as possible, tease the braid back round the turns on the non-lead end (as W4ZCB says, so nobody can see how it was done).

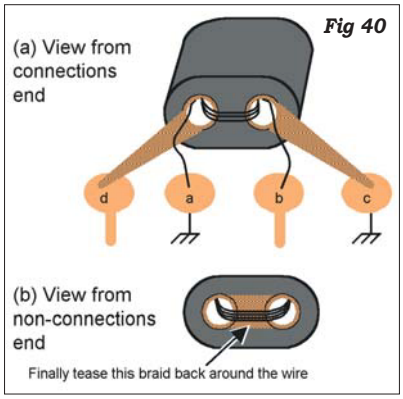


Fig 40

TR1 may now be fitted.

INCREMENTAL TESTING

Depending on your personal style and confidence, you may want to perform the functional testing of this board progressively. By lifting one end of some RF chokes you can selectively enable parts of the circuit. 100n wire-ended capacitors should be used to couple RF in and out of each circuit element under test.

You can test the J310 amplifier is indeed amplifying by placing it in the down-lead of some receiver. Equally, the squarer and mixer - with suitable injection - can be tested as a crude converter.

SYSTEM INTERFACE

You could control the Roundabout with a simple switch and a status LED. Arguably, you could do worse than driving it from the SSB select lines, ie 'best NF' on the USB bands, 'best IP3' on the LSB bands. But 60m is exceptional and complete user choice is desirable until you see how it works for you. It depends not least on what antennas you have. I control it from the 'spare' output on Pic 'N' Mix - with a 1k5 resistor in series with a tell-tale LED across the line. On STAR, this line is toggled by keypad sequence 48.

FINISHING OFF

When all is working well, trim RV1 to minimise DDS spurs on a high band, eg 10m, in 'best NF' mode. When connected to a dummy load, you may still be able to hear some. But then, when connected to even a modest antenna, although the band may be essentially closed, the ambient band noise should mask them to the point that you will need to try very hard to find them.

Finally, enclose and screen the whole board and re-trim RV1. ◆

STAR PERFORMANCE

These performance measurements were made by Harold, W4ZCB, using professional test equipment. They were corroborated by myself using test equipment borrowed from I7SWX - and my own. My thanks to both because these are very important numbers.

All measurements relate to the complete STAR line-up - ie including the band-pass filters which follow next month. These have, by design, decreasing insertion loss with increasing frequency. So, to get the complete picture, you need to consider the performance on each band. Four representative bands are shown, the rest being somewhere 'in between'. Since the design features a 'best IP3' or 'best NF' mode, that adds a further dimension.

The mixer is Giancarlo's two-transformer topology driven by the modified 74AC86 squarer. MDS was measured in a 3kHz bandwidth; IP3 at 20kHz tone spacing.

'Best IP3' mode			'Best NF' mode		
Band (m)	MDS (dBm)	IP3 (dBm)	Band (m)	MDS (dBm)	IP3 (dBm)
80	-123	+33	80	-127	+30
40	-122	+35	40	-123	+30
20	-124	+31	20	-127	+28
10	-127	+28	10	-130	+25

AGC RANGE

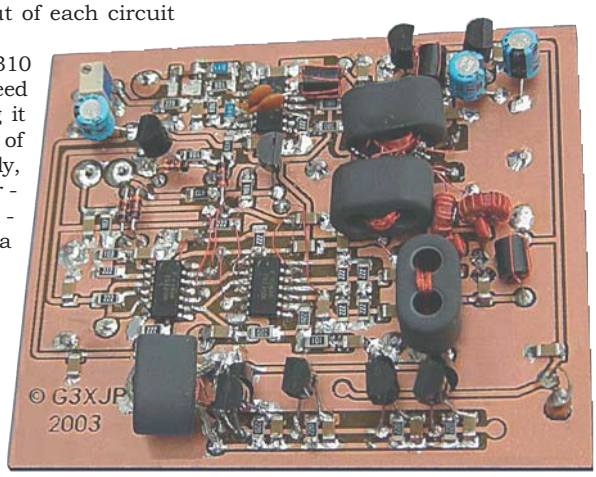
AGC holds the audio output constant within 1dB for a 100dB change of signal. You can place this range anywhere on the amplitude scale by adjusting the RF Gain, but from -95dBm to +5dBm would be typical.

OBSERVATIONS

Note that excess sensitivity is not provided on the lower bands where it could never be used. Instead, it is traded for superior strong-signal performance. For comparison with commercial transceivers see' TT' of December 2002 - Table 1, the IP3 column in particular. On a stormy 40m night, which would you rather own? And much more to the point, be proud to own!

Fig 39: Details of T6/T3 connections to each other and to IC4. This is not strictly to scale, but does show the correct relative positioning of the components. T6 and T3 will end up separated by about 6mm in practice.

Fig 40: Transformer T1 detail. The pad designations correspond to those of Fig 34.



The Magic Roundabout of Alan, G3TIE.

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NORMAL-MODE HELICAL ANTENNAS

Peter Martinez, G3PLX, in his 'Last Word' letter 'Poynting Out the Flaws' (*RadCom*, October 2003, p96) drew attention once again to the fundamental flaw in the concept of 'Poynting Vector Synthesis' as an explanation of the E-H and CFA antennas. Many will agree with Peter. However, he suggested that the E-H antenna "is no more than a short fat loaded dipole matched to 50Ω". Personally, based on the illustrations in *RadCom* and the material downloaded by Dave Williams, G3CCO, from eh-antennas.com, I would suggest that the E-H antenna is a novel form of the established 'Normal-Mode Helical Antenna' (NMHA) that can provide a reasonably effective antenna with a length of little more than 0.1λ. I recall the (in)famous 'Joy-stick' antenna of the 1960s, comprising a coil of wire wound on a broomstick, and more recently VK2YO's1.8MHz helical vertical dipole with an overall height of little more than 4m that could be suspended from a height of less than 20ft ('TT', January 1991, see also *Antenna Topics,* p270) or ZL1BDY's portable 3.5MHz helical-mode HF antenna with an overall height of less than 10ft ('TT' January 1976 and *Antenna Topics,* p105), or the notes from G3HQX on the Chelcom CA HFV helically-wound vertical antenna ('TT' August 1997 and *Antenna Topics*, pp344/5).

NMHAs wound on small-diameter formers are usually high-*Q* structures with restricted bandwidth. G3PLX suggests in his letter that the operating bandwidth (less than 2:1 VSWR) of the E-H antenna is increased by the pi-matching network and end-feeding. There seems no special reason to believe that PVS has anything to do with its operation.

A novel form of NMHA is described in 'A Compact Broad-Band Helical Antenna With Two-Wire Helix', by Keisuke Noguchi *et al* in *IEEE Trans on Ant & Prop* (September 2003, pp2176-81). In this case it is a UHF (760MHz) monopole with an overall height of just 15mm. In effect, it resembles a folded-unipole wound helically. The concept could probably be scaled up to form a VHF, HF or even an MF short vertical antenna or possibly made in the form of a short vertical or horizontal dipole with the ground-plane replaced by a second helical section. The two wires might consist of 300Ω or 450Ω twin-wire feeder line, although this would need to be determined experimentally. The authors' final metal-strip version would present difficulties except at UHF or possibly VHF. For full details it would be advisable to consult the IEEE paper.

To quote the abstract: "A new method of increasing the bandwidth of normal-mode helical antennas (NMHAs) is proposed. The antenna has length of around 0.1 of the target wavelength, and consists of a helix constructed with two flat wire strips. The method exploits the two current modes of the two-wire design to obtain wideband response. Based on an analysis of the equivalent circuits of the two modes and subsequent optimisation of design parameters, a final two-strip NMHA design is proposed that is demonstrated to have a bandwidth of 12% in the 760MHz band at a VSWR of less than 2:1."

Fig 1 shows analytical models of the conventional single-wire and the initial two-wire normal mode helical antennas. Parameters and typical values for 760MHz are: *d* (diameter of helix) 5mm; *p* (pitch between turns) 5mm; *a* (radius of wire) 0.5mm; *h* (height of antenna) 15mm; *N* (number of turns) 3; g_{12} (spacing between feed and ground points for two-wire only) 2mm; *g* (distance between wires) 2mm.

The Japanese team from the Kanazawa Institute of Technology, Ishikawa, discuss and illustrate such factors as the characteristic impedance in balanced and unbalanced modes. They provide a detailed analysis and have also developed a further, improved, 'two-strip' antenna using two metal strips separated by dielectric material: **Fig 2**. The final two-strip NHMA, with a height of 0.11 of the target wavelength, was demonstrated by calculation and measurement to be in close agreement, indicating a wideband ratio of 12% for a VSWR of less than 2:1 in the 760MHz region.

The two-wire NMHA would seem to be a useful antenna for further development at VHF and HF though it might be necessary to find by trial and error (and use of a GDO) the length of twin-wire cable to be wound helically, remembering that for resonance this will need significantly more cable than would a linear element. The two-strip version seems more relevant at UHF than at lower frequencies.

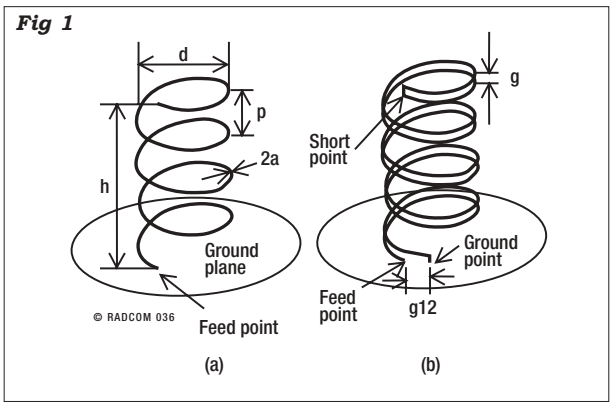
MORE ON PVC AND ITS RF PROPERTIES

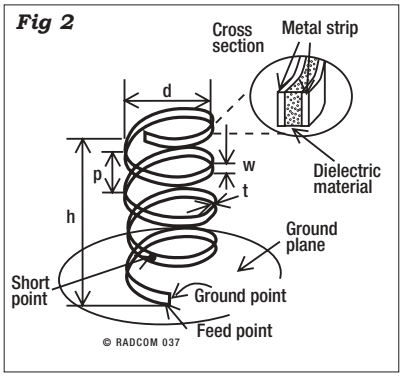
One of the rewarding features of writing for *RadCom* is the wide range of professional expertise found among radio amateurs: electronics, mechanical engineering, plastics, medicine, building, gardening, broadcasting, surveying and the law, etc. There is almost always a reader who can contribute professional expertise on any aspect likely to have an application to amateur radio.

For example, following the recent items on the use of PVC-insulated wires in antenna elements, I received a long letter from Mike Mill, G3TEV, who spent all his working life in the plastics industry in a position where he was responsible for the formulation of various grades of PVC compound. Before quoting from his letter, I can report replacing the 50m of four-strand insulated telephone cable in my 72m looped antenna that started off this topic ('TT' August & October) with 16-gauge hard-drawn copper wire. This was primarily because the cable finally developed an intermittent

Fig 1: Analytical models of normal-mode helical antennas. (a) Single-wire model. (b) Two-wire model. For dimensions for 760MHz see text. *(Source: IEEE Trans Ant & Prop)*

Fig 2: Geometry of a two-strip NMHA.





break – the result has been a significant reduction in the DC resistance although the poor HF propagation conditions this past summer have made it difficult to assess whether there has been any significant improvement in radiation efficiency.

G3TEV writes: "As most people have found, PVC is a very poor RF insulator – hence the use of 60-70MHz employed in welding the material. In most PVC compounds, calcium carbonate in the form of chalk is added to the pre-mix in quantities of up to or exceeding 25%. This is (a) to reduce cost, since chalk is much cheaper than PVC polymer; (b) as a processing aid and surface and impact improver.

"Most pipe produced for drainage purposes is usually highly filled and it can be imagined what this does to the RF properties of the material. However the filler does not greatly effect the insulation properties.

"Pipe used for sink drains is either high-density polyethylene or polypropylene, both of which have excellent RF properties. The pipe used to carry gas is high-density polyethylene and makes very good formers for antenna traps (you can usually scrounge a bit from people laying the pipes as they often have odd pieces that are usually thrown away).

"As to using PVC-covered wire for antennas, I am positive that it has no effect on the antenna efficiency. I have been using 14SWG PVC-covered wire for my antenna for the past 30 years and have worked more than my share of exotic DX. These days I prefer to have regular skeds with a few friends, including a daily sked with 9J2BO mainly on 21MHz (over 3250 contacts). Also a twice weekly sked with VK3CAZ (an old RAF friend) on 14MHz long-path.

"All this on an antenna that consists of a 66ft centre-fed inverted-V, with, at the ends of each leg, a home-brew 7MHz trap. There is another 33ft on each end running around the garden fence about 5ft above ground. The antenna apex is 25ft high fed with open-wire line spaced 110mm. The spacers are 'Noryl' mouldings normally used as card guides for printed-circuit boards. The feeder wires are multi-stranded 1.5mm PVC-covered and have been in use for at least 15 years. The antenna is matched using an old-fashioned - but good - balanced tuner with the large plug-in coils from a BC610 transmitter. I also use the 'Antennamatch' described by Frank Hicks-Arnold, G6MB (*RSGB Bulletin,* May & June, 1955). I have yet to find anything better with which to set up the ATU. A conventional VSWR bridge does not indicate any reactance that is present, whereas the Antennamatch does."

Fig 3 shows the complete circuit diagram of the Antennamatch. In the diagram: C1-10pF; C2-750pF feedthrough (FT); C3-250pF FT; C4, C9-500pF FT; C6, C11-470pF; C7, C12-1000pF; C8, C10, C13-300pF; D1-4-CG6E crystal diodes; R1-1Ω (10 x 10Ω in parallel); R2, R3-33k; R4-Morganite non-inductive 75W resistor (dummy load); RFC1, 2, 3, 4-2.5mH; VR1-50k; VR2-250k; L1, L2 are made from two brass rods, L1-5.5in long 0.25 diameter, L2-brass rod bent into U shape, centre portion 4in, legs 2.5in. [Constructors would probably need to consult G6MB's original two-part article where Part 1 (4pp) provides 'General Considerations of a New Aid to Maximum Efficiency in Aerial Matching' and Part 2 (4pp) covers 'Construction and Use' – *G3VA.*]

G3TEV continues: "My QTH is 650ft ASL on the Cotswold Hills, but the ground is poor (solid limestone at 12in) and I use a 33ft buried counterpoise under the lawn using 6mm diameter multi-stranded PVC-covered wire.

"*Other materials:* Perspex (Acrylic) is very poor at RF and should be avoided. Polystyrene, Polyethylene (in its various forms), polypropylene, Delrin - polyformaldehyde (especially useful for high temperature applications such as RF chokes in a PA compartment), Kynar – polyvinylidedne fluoride, and the various derivatives of the best of all materials PTFE, are all very good at RF. The 'microwave-oven test' will prove this. The only problem is that most of these more exotic materials are extremely expensive, costing in excess of £10,000 per tonne!

"I was once fortunate enough to be given a reel of multi-stranded wire with each strand silver-plated and covered with Kynar; this wire was costed at £8 per metre! It had been used for trials on terminations and was gong into the skip! As various friends can verify, it makes a most excellent antenna wire.

"As regards ultra-violet (UV) degradation of halliards, I consider the only colour acceptable for outdoor use is black. All other colours degrade relatively rapidly. I was involved with the manufacture of cable ties, flexible conduits, spiral wrappings etc and the only colour considered suitable for outdoor use was black – usually incorporated as a carbon black pigment. This increased the life by a factor of five. Probably the best cord for halliards is the Terylene cord used on sailing boats."

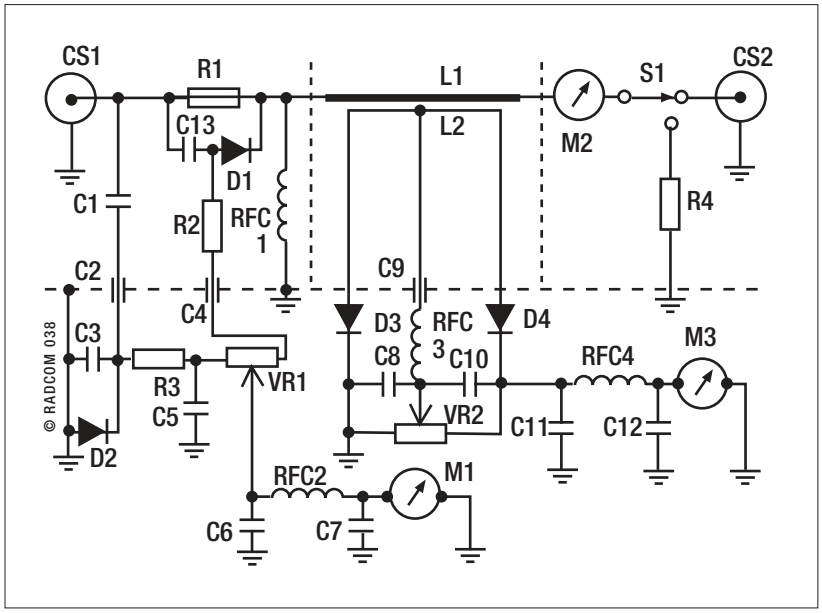


Fig 3: Circuit diagram of 'The Antennamatch' described by G6MB in 1955. For component values, see text.

BROWN, ROBERTS & YAGI

Since recalling ('TT' October, 2003) how Walter Roberts, W3CHO/K4EA, described the very first unidirectional, close-spaced, rotary HF beam array in *Radio* (January, 1938), I have located at the Science Museum Library a copy of *The* Radio *Antenna Handbook* edited by W W Smith (2nd Edition, published 1938). This includes a résumé of the W3CHO antenna together with an introductory comment that underlines the difference between close-spacing and the original Yagi antenna.

To quote briefly: "If the phasing of two dipoles or colinear arrays is not exactly 0 or 180°, the pattern becomes unsymmetrical. For certain phasings and spacings, a very good unidirectional pattern is obtained. The required odd values of phasing can be obtained by cutting a parasitically-driven element so as to present just the right amount of reactance. Whether the parasitic element acts as a director or reflector depends upon whether the reactance is inductive or capacitive… The presence of parasitic elements also reduces the radiation resistance… Reducing the spacing further reduces the radiation resistance.

"The older data by Yagi on the parasitically-operated director-reflector array called for quarter-wave spacing for the back reflector, half-wave spacing for side reflectors if any, and three-eighths-wave spacing for directors. Subsequent work by Brown indicates the desirability of considerably closer spacing for both directors and the back reflectors. Spacings of 0.1 to

0.125 wavelength are highly satisfactory for either a director or reflector."

This seems to confirm my belief that the modern HF 'Yagi' beam owes more to Brown than to Yagi. But of course, it does not diminish the value of the pioneering work in Japan by Hidetsugu Yagi (1886-1976) and Shintaro Uda (1896-1976) both of whom were lifelong academic electrical engineers. An account of 'Yagi: the Man and His Antenna' by Robert H Welsh, N3RW, was published in *QST* (October 93, pp45-47). This relates how Yagi graduated in 1910 at Tokyo Imperial University at 24, taught at Sendai Engineering High School for four years, and was then sent by the Ministry of Education on a European tour to further his technical education. In Germany he worked with Heinrich Barkhausen on generating CW oscillation by electric arcs, moved to England on the outbreak of the Great War in 1914, where he worked for J A Fleming, inventor of the thermionic diode detector. Two years later he went to the USA working with G W Pierce (Pierce crystal oscillator, etc), joining and submitting papers to the IRE (now IEEE). He returned to Japan in 1921, where the Sendai Engineering High School had merged with Tohoku Imperial University, and received his Doctorate in 1921. He built up a team of researchers investigating VHF and microwaves using the magnetron that had by then been developed by Barkhausen,

One member of the team, Kinjiro Okaabe, invented the split-anode magnetron permitting generation of centrimetric waves. Another, Uda, then a lecturer at Tohoku University, used triode oscillators at about 4.4m wavelength, developing the first directional antennas based on parasitic rod elements, including the use of trigonal reflectors, first described in 1926 in Japanese journals, English versions being presented in *Proc IRE* in 1927. Yagi applied for a Japanese patent in 1925 and a US patent in 1926 (issued in 1932) for *Variable Direction Electric Wave Generating Device*. This patent was assigned to RCA and the Yagi antenna was soon widely adopted in Europe and the USA for VHF antennas for television reception, radar etc.

One of the curiosities surrounding the wartime use of the Yagi antenna has been well told in 'A Secret Story About the Yagi Antenna', by Geniei Sato of Sophia University, Tokyo in *IEEE Ant & Prop Magazine* (June 1991, pp7-18). As an editorial note suggests, the story blends elements of a history of the antenna, personal reminiscences, and a detective story spanning 45 years.

Sato shows that in Japan, the birthplace of the antenna, little attention was paid to the invention apart from just two VHF links to islands. According to a paper written in 1970 by Prof Shintaro Uda, when the Japanese army entered Singapore in February 1942, they captured a British searchlight control radar and found notes written by a 'Master Sergeant' Newmann mentioning the words 'Yagi Array'. This meant nothing to the Japanese but they traced Newmann to a prison camp and interrogated him about the meaning of the word 'Yagi'. According to this story, the British radar operator replied that Yagi was the name of a person of your country, but winked.

For several years, Sato tried to confirm this account, tracing reports that showed that the while several details were fantasy, there was indeed a Corporal Newmann who had discarded an instruction manual at a site where material was being burnt. It had been recovered and sent to the technical headquarters of the Weapons Department about July 1942.

The notes of the SLC radar confirmed that the transmitting aerial 'consists of a Yagi array mounted well above projector barrel on outriggers'.

The full story is complex, but it seems clear that it was from the thrown-away 'Newmann notes' that the Yagi antenna became known to the Japanese army, scientists and engineers. They seem to have been surprised to discover that a virtually unknown antenna of superior performance and employed in British searchlight radars, was based on overlooked research by Japanese engineers!

HIGH-VOLTAGE ELECTRONIC TUNING

A paper 'Frequency-Agile Class-D Power Amplifier', by Frederick H Raab and David Ruppe of the Green Mountain Radio Research Company was presented at the recent IEE HF Conference at Bath University. It describes (IEE Conference Publication No 493, pages 81-85) an electronically-tuned class-D power amplifier that addresses the simultaneous needs for efficiency and frequency agility. 'TT' has in the past noted several times the work over the past decades of Dr Raab, WA1WLW, on high-efficiency amplifiers using classes D, E and F.

This new design (patent pending), **Fig 4**, is based upon broadband transformer-coupled topology and uses MOSFETs operating in class-D to deliver the maximum output power for given ratings. Of particular interest is the voltage-tuned T-network output filter that provides high attenuation to harmonics. The use of electronically-tuned components in this filter allows the PA to be tuned and operated efficiently over a wide range of frequencies without band-switching.

The amplifier delivers over 100W with efficiencies from 60 to 70% from 5 to 21MHz (4.2:1 tuning range) with both C and L variable. With fixed inductance, the range is 5 to 12.5MHz with an efficiency of 70% to 75%. The active device is a Polyfet SR341 which is a 50V MOSFET capable of producing 300W or more in class-D operation. The input and output broadband transformers are based on transmission-line techniques. The output filter operates at an impedance of 12.5Ω.

Proprietary electronically-tunable inductors are used, but the use of MOSFETs to form voltage-variable, high-voltage capacitors seems to be novel and could have other transmitter applications.

The authors point out: "Semiconductors, ceramic capacitors, and micro electro-mechanical systems (MEMS) can provide electronically-variable capacitance. MEMS devices have insufficient power-handling capability for the present application. Ceramic capacitors have limited tuning ranges or significant variation with temperature, and devices suitable for electronic tuning are not commercially available. High-voltage power MOSFETs (eg APT ARF446/7 and APT 10050) serve as a convenient, commercially-available, electronically-tunable capacitors... These devices typically come in TO-247 or TO-264 packages and have breakdown voltages of 500 to 1050V.

"The variable capacitor in the out-

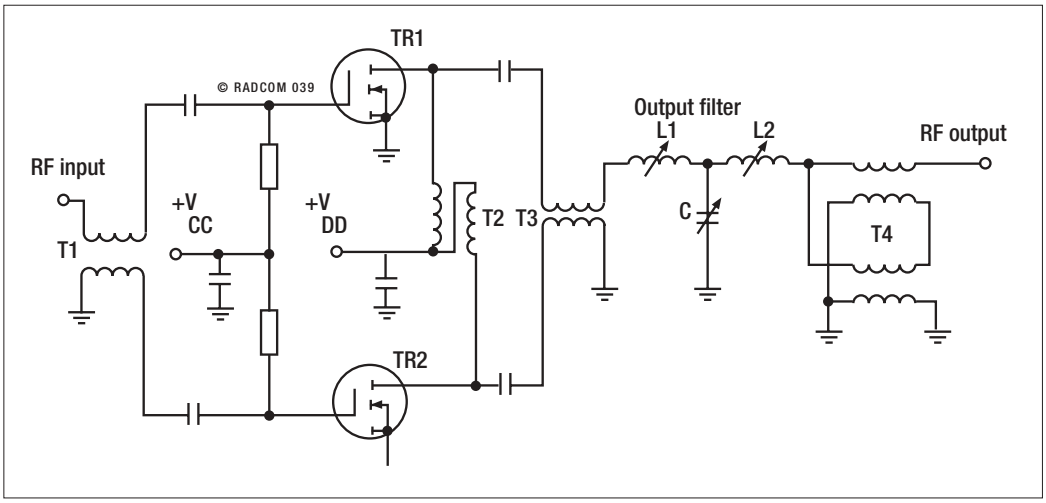
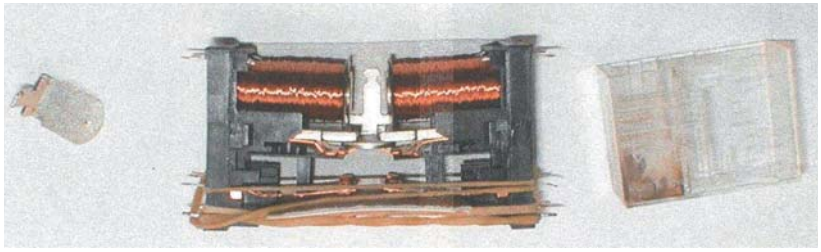


Fig 4: Simplified circuit diagram of the electronically-tuned frequency-agile class-D 100W amplifier (patent pending) described at the 2003 IEE HF Conference at Bath University.



Right: Experimental saturable-core inductor using a ferrite bead and two electromagnetic relays developed by VP8AM.

put filter uses 12 APT10059 high-voltage MOSFETs. The 'anti-series' connection (**Fig 5(a)**) both splits the RF voltage between two devices and cancels a good deal of the nonlinearity in the capacitance-versus-voltage characteristic. Parallel connection of six MOSFETs in each section produces 1000pF at a 90V bias and allows for a 3:1 variation of capacitance (**Fig 5(b)**) as bias is increased to a maximum of 900V, with a measured large-signal resistance of 0.64Ω for one MOSFET, resulting in 0.21Ω for the assembly. This results in *Q*s from 35 to 105 and typical losses of 1% to 2% more than those of a conventional capacitor."

MORE ON HOME-BREW TUNABLE TOROIDS

'TT' December 2000, pp63/64 discussed the advantages of permeability tuning by varying the inductance either mechanically or electronically. It reported experiments by Jack Hardcastle, G3JIR, that showed how a toroid-wound coil could function as a saturable reactor when mounted in a variable magnetic field. He found that an electromagnetic relay can be used to vary the permeability of an FT50-30 toroid for MF and HF applications. **Fig 6** is a reproduction of Fig 7 from the December, 2000 'TT'.

This was followed by an item in 'TT' April 2001, showing how a basically similar technique had been described by the American firm Wenzel Associates for a wide-range, constant-reactance, voltage-controlled, variable-frequency oscillator (CRVCO).

In January 2003, Michael Smallwood, VP8AM, reported experiments on tunable toroids based on structures illustrated at the website of *Applied Microwave & Wireless* magazine.

VP8AM has recently sent further information on experimental saturable core inductors using a structure akin to that proposed by G3JIR, but using a ferrite bead and two Omron G2R-2A 6VDC relays (see the photograph**)**. He writes: "The Omron relays are ideal as the pole pieces are easily exposed, and they are commonly available. New ones can be purchased from Farnell, and RS Components sell the 5VDC and 12VDC coil types. The ones I used have burned out contacts and came out of Liebert PowerSure 400 UPS. Using a ferrite EMI-suppression bead for the coil is not ideal, but they are good enough to experiment on.

"The two relays are electrically and magnetically in series. To prepare the relays, the clear plastic covers were removed and the armatures that move the relay contacts were released from their spring clips. One of the armatures was used to bridge the gap between the two flat armatures carrying poles of the relays. A five-turn inductor on an RS Components 238-283 ferrite bead was clamped between the two relay pole-pieces using a rubber band and bit of cardboard to keep the relays in alignment.

"Inductance at zero current was measured as 26.1µH with a Thandar TC200 3.5-digit LCR meter. Applying current through the relay coils changed the test inductor as follows: 10mA (1.4V) 25.3µH; 20mA (2.8V) 22.4µH; 30mA (4.2V) 12.8µH; 40mA (5.6V) 6.0µH; 50mA (6.9V) 4.5µH; 60mA (8.3V) 4.0µH; 70mA (9.8V) 3.7µH; 80mA (11.3V) 3.6µH; 90mA (12.9V) 3.5µH; 100mA (14.5V) 3.5µH.

"The positioning of the coil between the pole-pieces was not critical. The inductance changed as it warmed up, going from 4.6µH to 5.3µH at 40mA over the course of a few minutes, after which it stabilised. Maximum hysteresis measured was 2.8µH at 30mA. Some of this is due to temperature change."

Initially, VP8AM used a better inductor taken from a scrap VCR that exhibits lower hysteresis and much better temperature stability. The positioning of the ex-VCR toroid proved much more critical. He also tried a powdered-iron toroid, but this proved much less saturable and he was not able to measure any change with his LCR meter.

His intended application (some day – God willing) is to use two transductors as the tunable elements in a FET-based grounded-gate, tuned-source, tuned-drain oscillator like G3SBI's oscillator and Ed Oxner's coaxial transmission line resonator oscillator. He has not tried using any toroids big enough for transmitter filters (as in Dr Raab's amplifier) or loop antenna tuning elements.

Another contribution comes from P F Gascoyne of Wantage. In connection with the January item, he writes: "Whilst cross-field transductors are almost certainly superior because they minimise coupling between the two windings, the form of parallel field transductors based on a three-limb transformer core are probably easiest to experiment with. These can be made from an E- and I-shaped core or two E-shaped ones.

"You may remember transductors of this type being used in colour TVs, not for tuning but for pincushion correction of the scanning waveforms (Mullard AT4041/08 etc).

"As an experiment, I used an ITT ex-TV transductor, with a core about 25mm tall and wide and 7.5mm front-to-back. Outer limbs are 4mm wide and the centre one 8mm wide. The outer limbs each have a winding of about 300 turns. These were connected in series so that no flux was induced in the centre limb and used as the control winding. The centre limb had two windings, each about 40 turns. One was used as the controlled inductor. With no control current the inductance was 1.3mH. This decreased to 100µH with 150mA of control current although, as might be expected, the change in inductance is not linear with control current: current in mA, inductance in mH: 0, 1.3; 5, 1.3; 10, 1.3; 20, 0.8; 30, 0.5; 40, 0.26; 60, 0.22; 80, 0.18; 100, 0.15; 150, 0.01. Inductance was measured at a fairly low frequency. At RF, problems can occur if the self-capacitance of the control windings causes them to resonate at the frequency of the control winding." ◆

Fig 5

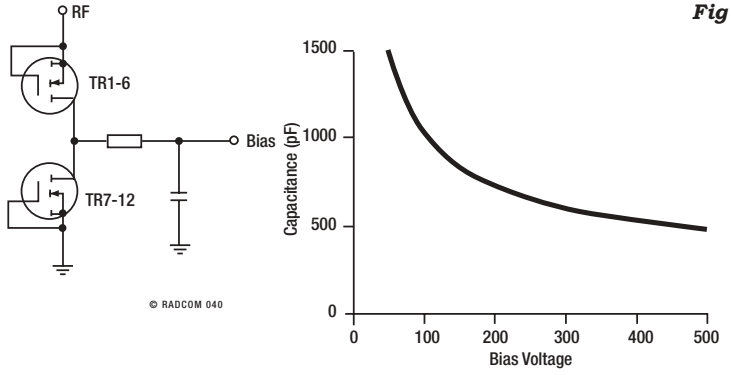


Fig 5: High-voltage voltage-varied capacitor using bank of 12 MOSFETs. (a) Capacitor assembly; (b) Variation of capacitance with bias voltage.

Fig 6

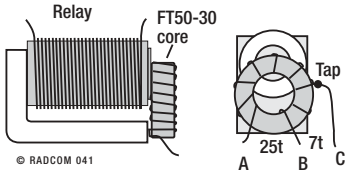


Fig 6: How G3IJR used an electromagnetic relay to vary the permeability of an FT50-10 toroid for MF and HF applications.

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Whatever next

Three very different subjects this month – new rigs and linears, PTT voice messaging and video via DAB

At this year's Tokyo Ham Fair a new item of equipment was being demonstrated for the QRP enthusiast. It comes in the shape of the DX-801 from Alinco. Reminiscent of the DX-70 in style, it is a mobile-sized HF-only transceiver with a detachable front panel. Given that Icom's new IC-703 resembles the IC-706 (but contains batteries in place of a 100W PA stage), I would expect the DX-801 also to contain batteries. Little information is currently available, but the DX-801 is due to start being shipped in spring 2004.

At the opposite end of the scale, Kenwood showed a 1kW solid-state linear amplifier that is similar in specification to Icom's PW1 and Yaesu's VL-1000 Quadra. The TL-933 appears to be a badge-engineered version of the JRC JRL-3000F (basically they are the same, but the TL-933 has a Kenwood-specific interface included). In fact, the JRC amplifier was unveiled three years ago and the Kenwood two years ago, but neither seems to have been imported into Britain, perhaps because they have not yet been CE-approved. Both models are based around 16 2SK410 MOSFETs. Because the control panels of these amplifiers are square, they can be mounted horizontally or vertically – all the user needs to do is turn the control panel to the desired position. Alternatively, they can be run with the control panel on the desk and the main unit up to 2m away. With the ability to connect two transceivers and up to five antennas, plus a built-in auto ATU, they can both eliminate a good deal of clutter from the shack.

'WALKIE-TALKIE' PHONES

Is the writing on the wall for text messaging? The reason I pose this apparently unlikely question is that American company Nextel have introduced a 'Push to Talk' voice messaging service that has quickly grown to over 12 million customers.

It works with General Packet Radio Service (GRPS) phones, exploiting the fact that they are 'always-on'.

At the sending end, a recipient is chosen from a 'buddy list', a PTT button pressed, a message of up to 30 seconds spoken into the phone then the PTT button released. At this point the message is routed via the mobile phone company's Internet gateway and sent over the net to a messaging server, not unlike an SMS message. From there it is re-routed over the net to the country of the intended recipient and finally to the distant phone by GPRS. Just like an SMS, the message is stored if the recipient's phone is switched off.

PTT voice messages are transmitted almost instantly and have an advantage that because they bypass the voice networks, which are quite expensive, they can be sent at a similar cost to a text message. This even applies internationally, and because it works along the same lines as computer-based instant messaging services such as MSN it is also more versatile than SMS. Of course such a service isn't real time, delivery is delayed by the length of the time it takes to speak, plus the time it takes to transfer. However, the audio quality is said to be the same or better than a mobile phone call because the compression algorithm employed results in less data being lost. What's more, a PTT voice message can be sent simultaneously to a number of recipients.

Now Chicago-based company FastMobile has plans to launch a 'push-2-talk' service in the UK called FastChat. If their service is as successful as Nextel's has been on the other side of the Atlantic, it can only be a matter of time before all the network operators gear themselves up for it and it becomes a feature of more phones.

Above: Alinco's new HF-only multimode QRP transceiver, the DX-801.

Left: The Kenwood TL-933 is a badge-engineered version of the JRC JRL-3000F.

VIDEO OVER DAB

The Eureka 147 standard has now been adopted by 30 countries including Britain, Israel, India, Australia, China and Canada for terrestrial digital audio broadcasting, but RadioScape recently demonstrated the fact that video can also be transmitted via a DAB multiplex. Using MS *Windows Media 9* software, which applied MPEG-4 compression to a TV sound and vision signal, they showed that a data stream of just 64Kbps was sufficient to transmit a signal. The signal was transmitted in IP packets in spare 'slots' in the DAB transmission and viewed in *Media Player* on a personal computer. In DAB terms, 64Kbps is the bandwidth normally used by news stations that transmit in mono only. The video was not full-frame full-motion, but proved the point that DAB could be used to transmit video. Higher data rates would give larger, better resolution pictures.

I'm not sure that using DAB to deliver video on demand is going to be able to compete with the mobile phone networks when they are fully geared-up for 3G but, by 2006, some additional frequencies in L-band (1452-1492MHz) are due to become available for DAB, doubling its potential. ◆

WEB SEARCH

PTT voice messaging	http://news.bbc.co.uk/1/hi/technology/3123122.stm
	www.fastmobile.com/services_fastchat.html
Video over DAB	www.electronicstalk.com/news/rab/rab118.htm

In Practice

This month features three EMC-related questions with one answer for all - the clip-on RF current meter.

Q How important are 'common-mode' or 'coax outer surface' currents?

A It depends very much on your individual EMC/RFI situation - your situation, your family's and your neighbours', that is. These unwanted currents on your feed-line will make it behave as part of your antenna, radiating RF from locations close to potentially-sensitive equipment, and probably coupling RF into your mains supply. I've written about this often [1], and it's also a regular topic in 'In Practice Live' sessions.

Ideally the feed-line to your antenna should be completely dead to this unwanted RF. In the case of coax, all the RF fields should be confined to the inside of the shield, and the outer surface of the shield should be dead (remember that the skin effect makes the inside and outside of the shield behave as two completely independent conductors for RF). In the case of open-wire, the currents on the two conductors should be exactly equal and opposite, so there is no significant net radiation. In practice, neither of these is ever true. In any transmitting situation, your coax *always* has some amount of RF on its outer surface, or your open-wire *always* has some component of common-mode current flowing in the same direction on both conductors [2]. Both of these make your feed-line behave like a single-conductor long wire, fed mostly from the top where the feed-line is connected to the antenna.

The RF performance of this unwanted long wire antenna is complex and difficult to predict, because of the loading effect of any nearby structures (eg the house wall), the coupling to other conductors (eg mains, TV downlead, phone lines, water pipes etc) and, above all, the uncertain termination this unwanted antenna finds at the shack end. All too likely, the RF currents will continue the search for ground via the mains wiring unless you do something to stop that [3].

The effects in terms of RFI are also uncertain, because the situation regarding potential victim equipment is virtually unknown. Another huge uncertainty is the susceptibility of various types and models of consumer electronics to RFI - as documented over the years in *RadCom*'s 'EMC' column.

With so many uncertainties, it is hardly surprising that even 'tried and tested' EMC solutions don't work in every case. For example, ferrite rings have a major effect when applied to a cable at an RF current maximum, but may be of little help when applied at an RF current minimum - and when you change bands, the same physical location may change from one to the other. Another example is that RF bypass capacitors across audio leads will only work if the RF is being introduced in differential mode (so there's an RF potential difference *between* the two conductors); but this kind of bypassing is useless if the RF is being introduced in common mode (same voltage on both conductors). These uncertainties can introduce a large element of trial and error into your RFI investigations, and repeated failures can damage your credibility with your family and neighbours. There has to be *some* way to make it less like blundering around in the dark!

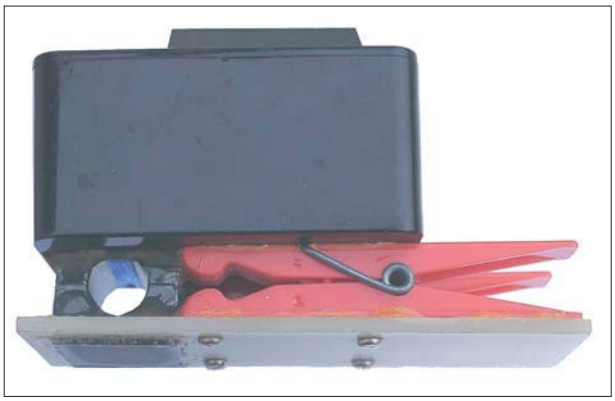
Well, there is. A clip-on RF current meter lets you *see* which conductors are carrying unwanted RF currents, and it *shows* you how much. When you try various solutions, you can also *see* how much effect they're having. For example, if you think the mains lead of your neighbours' TV set might be a good place for a ferrite ring, check first to see if your transmitter is causing any significant RF current there. If so, it may be worthwhile to remove the mains plug and wind the cable onto a ring. But if there's no significant RF current in the first place, don't waste any more time on the mains lead - you may find much more current on the TV antenna downlead. The beauty of the clip-on RF current meter is that it *shows* you these things. It's also non-invasive - you can use it without cutting any leads or removing any connectors - and this is a huge benefit in the art of neighbourly diplomacy.

The clip-on RF current meter also helps on the other side of the EMC equation - it helps you to investigate your own station. Here you have much more control, and can take steps to ensure that all your RF is going where you want it to go - to the antenna - and very little current is getting into the mains and phone lines [3]. You may get a nasty surprise when you first clip the meter onto various cables around the shack and fire up the transmitter... but you'll very quickly be able to clean up your act, because at last you can *see* what's happening.

Q I just put up a new HF quad antenna, fed with coax, and the RF noise on all bands is S9. Help!

A Do you have a balun at the feed-point? No, I thought not. What's probably happening is that the outer surface of your coax is acting as a vertical antenna picking up noise from some local source. This unwanted signal is going up the outside of your coax, crossing over at the feed-point to the inside of the coax, and then coming down to your receiver in the normal way. 'Up the Downlead, Down the Uplead' ('In Practice', October 2002) dealt with this very problem.

Once again, the clip-on RF current meter is your friend. If your coax is picking up unwanted noise on the surface on receive, the clip-on meter will also show significant



Below top: 'Heavy duty' version with two clothes-pegs - note the blue secondary winding inside the core.

Below bottom: GI0XAC's version uses a giant paper clip and a small plastic-cased meter.

By Ian White, G3SEK, 52 Abingdon Road, Drayton, Abingdon OX14 4HP Website: www.ifwtech.co.uk/g3sek E-mail: g3sek@ifwtech.co.uk

BUILDING A CLIP-ON RF CURRENT METER

The basic version of this handy device takes about 10 minutes to tack-solder together (**Fig 1**). When you're convinced how useful it is, you can then go on to build a more permanent version. The clip-on RF current meter has a long history in *RadCom* [5, 6], but early versions involved breaking a ferrite ring into two equal pieces - which takes some doing. The constructional breakthrough was G0SNO's idea to use a large split ferrite bead intended for RF interference suppression [7]. This clamps around the conductor under test, to form the one-turn primary of a wideband current transformer. The secondary winding is about 10 turns, and is connected to a load resistor, R1-R2, and the diode detector.

The load resistor, R1-R2, is important because it creates a low series impedance when the current transformer is effectively inserted into the conductor under test. For the values shown in Fig 1 (10-turn secondary, 2x100Ω) this is $50/10^2$ = 0.5Ω. Some circuits omit this resistor, but that creates a high insertion impedance - exactly the opposite of what is needed. Also, more secondary turns create a *lower* insertion impedance, but at the expense of HF bandwidth.

The other components in Fig 1 are discussed in G0SNO's article [7] which is reproduced on the 'In Practice' website. Component types and values are critical only if you want to make a fully calibrated meter with switchable current ranges. However, for a first try, and for most general RFI investigations, the meter is almost as useful without any need for calibration. Simply make R4 about 4.7-10kΩ, and omit R3 and S1. If the meter is either too sensitive or not sensitive enough, either change R4 or change the RF power level.

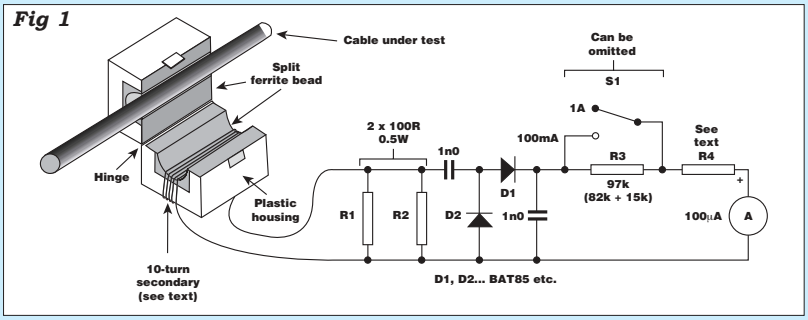
Just about any split ferrite core intended for RFI suppression will do the job, but there are a few practical points. Choose a large core, typically with a 13mm diameter hole. This allows you to clip the core onto large coax, mains and other multi-core cables while still leaving enough space for the secondary winding (which should be made using very thin enamelled or other insulated wire). It is important that the core closes with no air gap... and that can be a problem. A major disadvantage of the basic split ferrite core in its plastic housing (Fig 1) is that the housing is not meant to be repeatedly opened and closed, so the hinge will soon break. By all means try out this gadget in the basic form shown in Fig 1, but I guarantee you'll soon be thinking about something more permanent. The classic way to do this is using a clothes-peg [5, 6] but there are now several better alternatives.

For example, the first photograph shows my rather heavy-duty version using two strong clothes-pegs, fibre-glass sheet and epoxy glue (more details on the website). The second photograph shows GI0XAC's neat and simple version using a giant plastic paper-clip, with a small plastic-cased meter stuck on the side. The only requirement about the clip is that it must be basically non-metallic, and that it can hold the two halves of the core accurately together while the whole weight of the meter is dangling from the cable. Another option worth investigating would be the pliers-style plastic work clamps that are sold in a range of sizes by hobby shops. Whatever you use, it's *vital* that you glue the two halves of the core to the clip in such a way that they always close tightly together with no air gap. Hint: glue one half of the core to one side of the clip first, and let that side set; don't try to glue the second half until the first is good and solid.

A clip-on RF current meter could hardly be simpler to build. It's an ideal project for beginners and clubs. Once upon a time, every amateur station was required to have an absorption wavemeter, which achieved almost nothing; but believe me, if every amateur station today had a clip-on RF current meter, we'd see a lot less RFI, and a lot more confidence about going on the air!

Fig 1: G0SNO's clip-on RF current meter - see the 'In Practice' website.

Fig 1



RF surface currents on transmit. I'd guess that a choke balun at the feed-point will greatly reduce the noise on receive and the currents on transmit. Together, the S-meter and the clip-on current meter will show you how much improvement you're making.

This story had a happy ending. The enquirer didn't have a clip-on RF current meter, but he did try a choke balun on a small ferrite ring, and the noise came down from S9 to S2. There was every promise that a better choke at the feed-point, and possibly another one at the base of the tower (a coil of coax would be fine there because weight isn't a consideration), would kill almost all the noise.

Q I have a complex, highly-automated HF contest station with numbers of interlinked switchboxes, filter banks etc. When it's all plugged together, RF gets everywhere! How can I possibly start to debug all this?

A Go on, tell me: the contest is next weekend! Seriously, this kind of station can be an EMC nightmare because there are so many interconnections creating RF current loops [4]. Unplugging one box may break a loop and cure the problem, but it might not be the fault of that box - you could equally have broken the loop somewhere else, and then might have blamed some other piece of kit.

Here, the clip-on RF current meter is your friend, yet again. You can probe around while the station is operating, looking on cables for RF currents where they shouldn't be. The most likely culprits are currents coming down the outside of the coax feed-line, which can be stopped by winding the coax into a choke; or currents escaping from faulty PL-259 plugs that don't have effective shield contact. Look for these outright faults first, and fix them, before moving on to try to minimise the residual currents using ferrite rings etc.

AND FINALLY...

Once again it's the season to thank everyone for all the excellent questions, comments, help and ideas received this year; and to wish you a happy Christmas and New Year. ◆

NOTES AND REFERENCES

[1] 'In Practice', *RadCom* July 1993, September 1994, April and September 1995, August and September 1999, August 2000, December 2001, October 2002.
[2] 'In Practice', *RadCom* August 2000.
[3] 'In Practice', *RadCom* July 2003.
[4] Multi-transmitter contest stations have hugely complex interconnections for switching antennas, radios, audio and keying, and for computer control. N4ZR gives a wonderful PowerPoint presentation on this topic, titled 'Why Do They Call It 'Wireless'? Follow the link from the 'In Practice' website.
[5] 'The 'peg antennameter", by M R Irving, *Radio Communication*, May 1972, p297 & 301.
[6] 'Technical Topics', *Radio Communication*, October 1992, pp33/34.
[7] 'EMC', *RadCom* April 1993.

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Antennas

Using HF antennas on 136kHz

At this time of the year, you might like to try listening on our 136kHz band. Although there is very little activity during the week, on Sunday there are often some stations to be heard. You can use any existing long wire or dipole for the lower frequency bands. The long-wire antenna can be used as it would be for the lower HF bands, by connecting it to an ATU and feeding against a good RF ground. An HF dipole can also be used for LF by connecting both conductors of the feeder together and using the total antenna and feeder as a long wire fed against ground.

Amateur signals are very weak compared with the strong commercial and broadcast signals at LF. For this reason, you will need a receive ATU for LF, which comprises a loading coil and a method of matching to the receiver. The performance of modern receivers at LF varies considerably from model to model, so some signal amplification may also be required.

A PORTABLE LF ATU

I have built an LF ATU, which is designed for portable operation with a small transceiver such as the FT-817 or IC-706 and an HF multiband centre-fed doublet antenna (although it can be used with a long wire). Not only does it provide the tuned circuits for loading and matching, but it also has a switching arrangement that allows the transceiver to be connected directly to the HF doublet or via the LF circuits.

The circuit is shown in **Fig 1**. When the antenna is switched to 'LF', the inner and the outer of the HF antenna coax feed are joined and connected to the LF loading circuit, the total HF ATU becoming part of the LF antenna; it is thus important that it is not connected to ground. When using a long-wire for HF, an RF earth for HF will be effective when made at the LF ATU.

Inductors at these frequencies are large. For transmitting, an inductor of around 3 to 4mH is required to load a suburban-sized antenna. Initially, I considered using a large inductance with taps but, for a portable LF ATU, there was not enough room for a large inductor. On receive, some capacitance loading can be used with some loss of efficiency and switching in appropriate values of capacitance is very easy.

Inductor

The inductor is made from three short lengths of ferrite from an old transistor radio. In fact, it is one stick, 190mm long, cut into three sections. I found the best way of cutting a ferrite stick is to make a deep groove all round with a fine grindstone. The stick will then break very cleanly at the groove. The coil former is then finished off by binding the three lengths of ferrite together with plastic insulation tape. The coil is wound, initially single layer, using 26SWG or similar (0.5mm), wire. The earth end of the coil is connected to the ATU chassis and taps are provided every five turns to provide matching to a following receiver or preamplifier. The winding is continued along the length of the former, and a further layer of tape wound over the top two-thirds of the coil, clear of the matching taps. A further layer of wire is then wound over the tape.

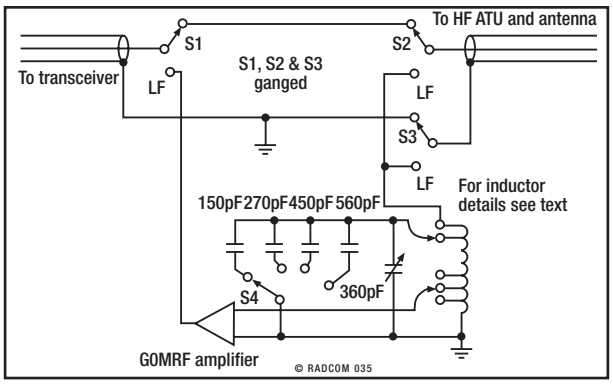
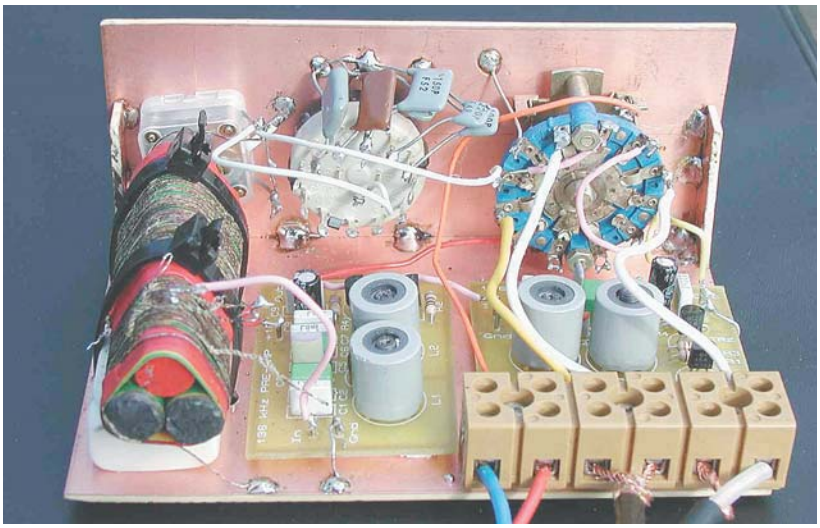


Fig 1: Circuit diagram of the 136kHz ATU. Only one amplifier is shown, although two are used (see text). A tap on the earth end of the coil is selected for optimum matching. The +12V supply to the amplifier is not shown.

Preamplifier

This receiver ATU also has built-in pre-amplification. Most commercial amateur receivers have a relatively poor performance when tuned to the 136kHz LF band. The reason is that these receivers have an attenuator connected in the circuit below 1.8MHz to prevent overload from high-powered broadcast stations; this also reduces sensitivity on the 136kHz band. Dave Bowman, G0MRF, has produced a kit, based on an original design by Dave Pick, G3YXM, for a small 136kHz receive preamplifier. This amplifier gives around 13dB of gain at 136.5kHz, which overcomes the losses caused by the built-in attenuator. The G0MRF preamplifier has a built-in filter to reduce the effects of the very strong commercial and broadcast stations above and below the 136kHz band. The input/output of this amplifier is 50-75K.

Because my arrangement is to be used with the insensitive receiver of the IC-706, at 136kHz, with an inefficient antenna, I am using two G0MRF amplifiers in cascade to increase the gain to over 20dB.



Left: Rear view of the 136kHz ATU. The 'chassis' and front panel is constructed from single-sided PCB material, a technique used by Tim Walford, G3PCJ, in the construction of some of his kits.

FURTHER INFORMATION

Full details of the G0MRF 136kHz LF pre-amplifier can be found on David's website.

A general discussion on the performance of receivers and transceivers at LF, giving the best and the worst, can be found in the LF section of my website. ◆

WEBSEARCH

David Bowman, G0MRF	www.g0mrf.freeserve.co.uk/preamp.htm
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By Andy Talbot, G4JNT, 15 Noble Road, Hedge End, Southampton SO30 0PH. E-mail: data.radcom@rsgb.org.uk

Data

Why not provide some feedback to the author along the lines he suggests?

During the four years I have now been writing this column, there has only been limited feedback from any of the users of data communications. I can't help but wonder what everyone is doing out there! Perhaps, as any time spent listening to the appropriate segments of the bands will show, you are just content to go on air and have a few QSOs using one of the many soundcard-enabled modes around now. The HF band segments are chock-full of PSK31 signals at weekends, and it is often possible at some point to hear Throb, MFSK16, and SMT Hell signals, to name just a few.

So what *are* you doing, how much fun is there to be had operating these modes, are they easy to set up? Would some sort of organised operating sessions such as contests or activity periods help? Please write in with your thoughts to the address shown at the top of this page.

PC INTERFERENCE

One amateur did write to me to say that his "PC power supply was causing interference to reception, and could I suggest a low noise PSU to replace it with". It is not possible to specify which if any parts of PCs will give rise to interference, and in many cases the PSU itself is rarely the culprit. Switch-mode power supplies are known to be potential generators of interference, and manufacturers have for many years been forced to build in proper screening and EMC precautions. In computers, most of the hash will come from the high speed digital switching signals being coupled onto the external cabling. and re-radiated. So the first step should always be to eliminate this possibility, first by removing as many connections - such as RS-232 and printer cables - as possible. Then make sure other cables are screened and properly grounded at RF, and routed away from sensitive connections. Judicious use of clamp-on chokes can sometimes help, as can an isolated PC-to-transceiver interface to help reduce conducted interference. A lot has been written about EMC and equipment screening, and a perusal of the recent 'EMC' columns and related articles in *RadCom* over the last few years should provide a wealth of information. [See also the 'EMC' section of the *RSGB Yearbook – Ed.*]

CLOCK RECOVERY

An often-ignored area of understanding in data communications is that of clock recovery. It is all very well transmitting the raw data over an RF or wire link but, without being able to determine exactly when one bit of a serial stream changes into the next, then writing these data correctly into memory, is near impossible. The transition points are originally defined in the transmitter by a regular clock signal and, for perfect decoding, this has to be regenerated at the receiver, unless it can be transmitted separately - not usually a feasible option [1]. Apart from the case of stop-start (or RS-232 type) signalling, where the clock is effectively resynchronised for each data item by looking for the leading edge of the start bit on every data byte, in all other cases the clock has to be regenerated from the raw data itself.

The process is made complicated by the fact that a single stream of random data does not necessarily contain any frequency components from which the clock can be derived. In fact, a truly random data stream of rectangular pulses will have a reasonably flat noise-like frequency spectrum up to the clock frequency, where there will then be a null. The solution usually adopted is to apply some non-linear operation on the data stream to generate a new signal that does now contain a spectral component at the clock frequency, when can then be extracted by filtering with, usually, a phase-locked loop.

Fig 1 shows a common technique whereby the raw data steam is passed through a delay element then multiplied by itself. Here, the data stream is assumed to be composed of pure logic level pulses and the multiplication is performed by using an Exclusive-OR gate. The delay element, which has to generate a delay that is significantly less than half the recovered clock period, can be as simple as a piece of coaxial cable for higher data rates at tens of MHz, or a CR network for lower rates. Small packaged TTL-level-compatible delay lines are also available for higher speeds of operation.

The output of the multiplier consists of a series of pulses of equal width - the width being defined by the delay element - with a pulse occurring at each and every data transition. It is a mathematical fact that a series of such regular pulses contains all the harmonics of their repetition rate, at least up to a frequency corresponding to the pulse width. If this width is made quite narrow (a short delay line) harmonics are present up to quite high orders. So, provided we can now guarantee that there will be some regular data transitions, we can be absolutely certain there will be a narrow band harmonic component of the pulse stream that is exactly equal to, and phase-synchronous with, the original data clock that controlled the position of the transitions.

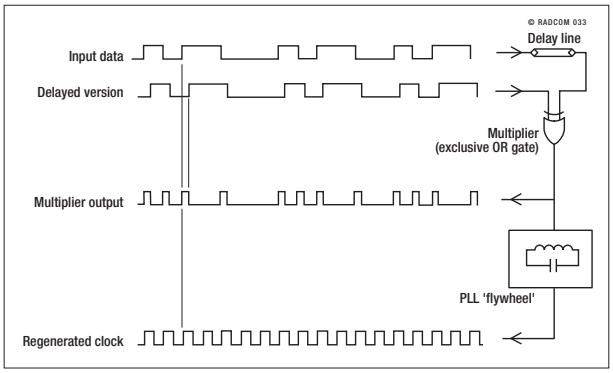

Fig 1: Clock regeneration from a random data stream.

There will also be plenty of subharmonic components present, but provided we know the intended clock frequency well enough to be able to filter these out, it becomes straightforward to apply this series of pulses to a phase-locked loop, or even a bandpass filter, and extract just the single frequency of the clock - which we now know to be locked exactly to the incoming data stream. Fig 1 shows the operation for the case of a rectangular series of logic level pulses, but the same technique is equally valid for the raw output from a receiver, before it is squared up. Now the XOR gate has to be replaced by a proper multiplier, such as a double-balanced mixer, but the same principles apply. In modern modems, the whole process will be performed in DSP, where the delay-and-multiply process is done mathematically, on regular samples of the input signal.

This delay-and-multiply process is a non-linear operation on the signal, which is always bad news for noisy signals. Noise with non-linear processes usually leads to unwanted jitter and degradations, so the essential, and often glossed over, clock recovery process can become the limiting factor in many modem designs. In fact, the whole data coding process sometimes has to be modified to suit clock recovery - a classic example of this occurs in the AX25 protocol where a data transition must occur at least every six bits for reliable clock generation. This is ensured by looking for sequences of more than five successive ones or zeroes, and stuffing in an extra bit of the opposite polarity to force a transition - the process called 'bit stuffing'. ◆

NOTES

[1] See comments in October's column on GPS-derived timing for clock regeneration.

ICOM

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Repeaters

There is no news about the recent restrictions placed on new repeater applications for the 70cm band. This has lead to an increase in applications for 2m repeaters, and could lead to more problems with adjacent channel interference as discussed in the April 2003 edition of this column. As only limited traditional 2m channels are available, the RMC has to allocate the 'new' 12.5kHz channels to applications. There is an increasing chance that this will result in users who have not had the transceivers adjusted for the narrower channel spacing causing interference to repeaters above or below the channel they are working. The RMC urges users of 2m repeaters to get the necessary adjustments made to their rigs as soon as possible.

DSP EXPERIMENT ON GB3ES

GB3ES, the 2m repeater in Hastings, has had a user-controlled DSP (Digital Signal Processing) facility installed.

DTMF (Dual-Tone Multi Frequency) signals, applied by the user, alter the through-audio characteristics of the repeater to facilitate communications. The engine that drives this is the NEIM 1031 in-line DSP module from bhi Ltd. Reactions from the users have been very favourable, since weak signals benefit greatly in intelligibility, combined with a reduction in listener fatigue. The module can simply be switched into the through audio path by sending a DTMF '5' and switched out by sending DTMF '9'. In addition to these, pressing the star key introduces a 3dB top lift to brighten the sound, pressing '#' gives an overall 3dB lift to make things just that little bit louder to compensate for those whisperers. All these functions can be added progressively.

William Blankley, G8CMK, installed the NEIM 1031 unit into GB3ES. He has provided some further technical details of the process.

"As a matter of technical policy, GB3ES has no de-emphasis on the received audio nor pre-emphasis on the transmitted audio, ie GB3ES is flat, input to output. Questions we wanted to answer were how the bhi DSP box would cope with the flat audio and, secondly, how would CTCSS tones affect it? The 1031 takes raw audio from the receiver in its stride, bearing in mind that this will have a 6dB per octave rising top characteristic. As far as CTCSS is concerned the 1031 has been tried in two positions, both before and after the received CTCSS tone removal filter. There has been no problem in either position.

"Interfacing the 1031 to the existing logic of GB3ES was done as follows. The GB3ES receiver has two audio outputs. One is an unsquelched signal path and the other drives the logic and squelch system. The DSP unit is positioned immediately after the receiver the main signal path, before squelch. There is no connection between the 1031 and the logic that drives the repeater. Control of the 1031 is by means of DTMF tones. The DSP installation has a control 'side chain' that consists of a DTMF decoder, giving four lines out that carry the binary values 0 to 16, depending on the received tone and hold the value of the last tone pair received. These four lines are then decoded to 16 discrete lines. Hash and star tones are used to set R-S latches that control relays in the signal path that affect, respectively, gain; +3dB, and a top lift R-C step circuit of +6dB that is +3dB at 1kHz. A '5' present on the decoded output controls the DSP relay; this switches the audio chain to the output of the DSP box. Note that, as this is controlled from the output of the decoder, it has to be the last DTMF tone entered. Keying any other tone as the last in command sequence therefore turns off the DSP. Users have been told to key '9' to do this, then it should be easy to remember to key 5 and 9 to turn the DSP on and off. Keying '0' resets the tone and level latches and will cause the DSP relay to drop out (as it is not '5' being retained on the decoder output). The duration of the control tone was set at about 160ms. This was so that it would only respond to a slow deliberate input and not to the various tunes that are played on DTMF keypads.

"On the 1031, the main switch that controls the effect of the DSP has been left at three. This is quite conservative, considering that settings of up to five in a range of one to eight available were used in trials. We would like to allow the user to control the amount of processing but, without further details from the manufacturer, we have been reluctant to attempt to interface the command decoder with the bhi 1031 unit. This project will have to wait until such time that we have the necessary information to allow it to progress. When this happens, we feel that we will be able to demonstrate the full potential of digital signal processing.

"In conclusion, the experiment has been well worth it. The only (minor) drawback we have encountered is that has been a slight 'robotic' quality to the speech on certain signals (bhi had warned us about this). We believe that the bhi 1031 unit is something that no repeater should be without. It has enhanced the quality of life for many of our users".

For more details about the NEIM 1031 visit the bhi website.

The bhi NEIM 1031 DSP module.

RMC VoIP COMMITTEE MEMBER

Andrew Barrett, G8DOR, has taken on the role of RMC VoIP specialist. Andrew will continue his work as the RMC regional manager of the South and South West of England.

REPEATER PROPOSAL STATUS AS OF 28 OCTOBER 2003.

The latest clearance status can be obtained from the RMC website. Please note that, even though an application may have cleared, it is beyond the control of the RMC as to when the keeper will bring the repeater into service. ◆

WEB SEARCH

[1] www.radio.bhinstrumentation.co.uk
[2] www.coldal.org.uk/rmc

LATEST CLEARED REPEATERS

The latest clearance status can be obtained from the RMC website [1]. Please note that even though an application may have cleared it is beyond the control of the RMC as to when the keeper will bring the repeater into service.

Callsign	Type	Channel/Frequency	Keeper
GB3KY	2m Spec Change King's Lynn	RV57 Input 145.1125MHz Output 145.7125MHz	G1SCQ

OUTSTANDING VOICE REPEATER PROPOSALS SUBMITTED FOR LICENSING ARE:

Callsign	Type	Process Stage	Proposed Keeper
GB3AA	New 23cm, Alveston North of Bristol	PU	G4CJZ
GB3AI	New 2m	RMC	G0RDI
GB3BM	New 70cm wide, Southport	On hold	G4WPS
GB3BO	New 2m, Bolton	RMC	G4YYB
GB3BW	New 23cm, Weston-super-Mare	RMC	G4SZM
GB3FF	New 2m, Lochgelly, Fife	RMC	MM0EEY
GB3FJ	Site Change 70, Lincolnshire	On hold	G8LXI
GB3IT	New 70cm wide, Tamworth	On hold	G6NHG
GB3JF	New 2m, Lincolnshire	PU	G8LXI
GB3LG	New 2m, Lochgilphead, Argyll	RMC	MM1FEO
GB3LP	New 6m	RMC	M1SWB
GB3MI	New 70cm, Ballycastle, NI	On hold	MI0CRQ
GB3PK	New 2m, Ballycastle, NI	NFAP	MI0CRR
GB3RB	New 70cm, Bolsover	On hold	G1SLE
GB3WB	Site change 70cm, Backwell, North Somerset	On hold	G4SZM
GB3WE	New 2m, Backwell, North Somerset	RA	G4SZM
GB3WJ	70cm freq change, Scunthorpe	On hold	G3TMD
GB3WM	New 70cm wide, Woofferton	On hold	G4AIJ
GB3XC	New 70cm wide, Exeter	On hold	G8UWE

EMC

A report on what is probably the most important Power Line Communications (PLC) event ever, the European Commission PLC Workshop on 16 October

The European Commission PLC workshop took place in Brussels on 16 October 2003. The EC had previously invited comments on their *Working Document On Broad Band Communication Through Power Lines*, RSCOM03-12.

Submissions were made by national administrations and by 'stakeholders' such as the IARU Region 1, RSGB and other national amateur radio societies and individuals. The submissions by national administrations were presented during the workshop and are likely to carry considerable weight with the European Commission. An outline summary of each country's submission follows.

The Austrian Administration made a contribution titled, 'Field Strength Limit For PLC-Radiation in the HF-Band'. The proposal is for a field strength limit of 14dB(μV/m) in 9kHz bandwidth at a distance of 10m.

Although the proposed Austrian limit is not as low as radio amateurs would like, it is about 40dB lower than PLC systems are likely to achieve in practice.

From Finland, Viestintävirasto Kommunikationsverket, the Finnish Communications Regulatory Authority (FICORA) has requested that electromagnetic radiation from PLC networks should comply with the German national limit (NB30) until common European limits are adopted. FICORA has stated "However, we feel that the Commission document is not balanced. It stresses the creating of a favourable environment for PLC and downplays the interference problems caused by PLC to radio communications…"

FICORA also reported results of tests performed on three PLC installations operated by the Turku and Vantaa power companies. It concludes that PLC is not compatible with HF radio services with a proposed emission limit of 55dB(μV/m) at 3m, which it regards as being 40dB too high.

The German Delegation made a submission in German and English. The English version includes the statement, "The German Government does not regard a European legal framework which results in general freedom to use PLC as desirable at the present time, because Germany has a lot of negative experience with the compatibility of radio networks and line-bound networks. Initial findings about PLC applications suggest that, despite contrary assurances by the manufacturers, the ceilings in force nationally cannot be adhered to."

From The Netherlands, the Agentschap Telecom submission described PLC field trials in Arnhem. Its conclusion included the statement that cumulative effects have been underestimated if PLC networks are deployed in a large part of the world with a large penetration rate.

It states that the measured equivalent antenna gain (for sky wave) of Low Voltage (mains) Distribution Networks acting as antennas in the frequency range 5MHz- 20MHz averages -30dBi. This is an important point for cumulative effects.

The Spanish Secretaria de Estado de Telecomunicaciones y para la Sociedad de la Informácion gave a presentation about PLC trials in Madrid, Zaragoza and Sevilla. It includes the following statement, "There have not been any complaint from telecommunication users which could be caused by the operation of the PLT networks…"

It then goes on to make some rather vague statements about EMC that are not supported by technical information or measured levels.

The Swiss Federal Office of Communication, OFCOM, submitted a presentation and a technical paper giving results of measurements at 4400 points on a PLC trial in the Swiss city of Fribourg. The conclusion is that emissions from PLC exceed the German NB30 limit by up to 24dB near points of data injection and by up to 18dB in urban areas. A worsening of signal-to-noise ratio for radio reception by up to 14dB was also reported.

So far, most of the European administrations have presented a more-or-less balanced view, except for Spain which doesn't seem to acknowledge that interference problems exist. So what about the UK position?

THE DTI POSITION ON PLC

The UK submission by the DTI states that the issue of interference is common to many broadband technologies and is not unique to PLC. What it doesn't say is that the interference potential of PLC at HF is far worse than any other broadband access technique currently in use, such as ADSL.

The DTI paper states that measurements taken by the RA show levels of emissions comparable to those recorded in other European locations where similar equipment is being used. The full report on measurements is available from the RA web site (see Websearch).

The DTI submission expresses the view that few people listen to HF broadcasts and that few interference complaints would be expected. The DTI paper acknowledges that there are other users of HF radio communications but states that they do not generally operate in residential areas, except for amateur radio.

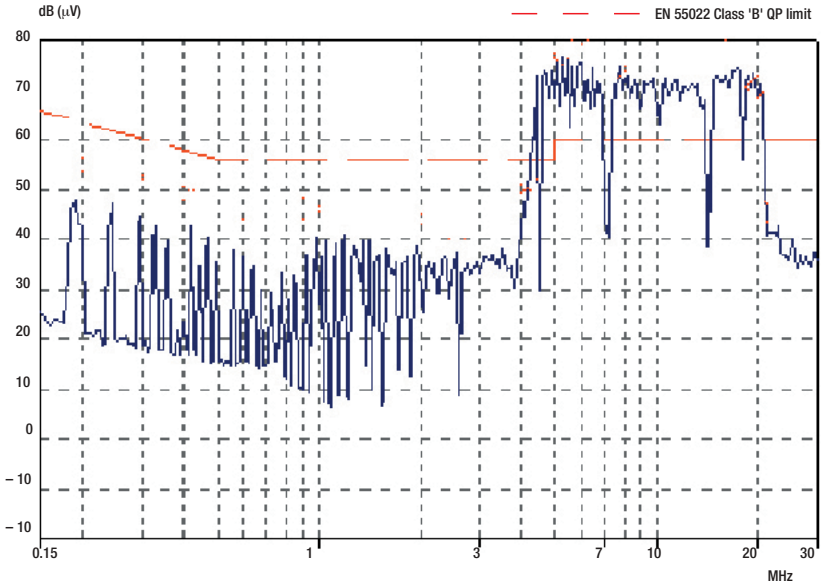
The DTI paper also expresses doubt about whether cumulative interference effects would occur in practice from a large number of PLC systems. It states that there is a lack of practical evidence with which to validate theoretical models.

If and when a very large number of PLC systems is installed, switching them all on and off at once and comparing the background level on the HF bands would show whether there were cumulative effects. Unfortunately, by that time, it would be too late to do anything about it!

One of the recommendations in the DTI paper is as follows, "In order for PLC to be given an equitable opportunity to demonstrate its capabilities and characteristics, and for the technology to progress, it is essential that more systems are brought into service and their characteristics monitored."

The conclusion states that, as no common European emissions limits for broadband systems are likely to be available in the immediate future, the UK intends to introduce local limits

By David Lauder, GOSNO, 20 Sutherland Close, Barnet EN5 2JL. E-mail: emc.radcom@rsgb.org.uk



Left: EMC test results from OE3MZC (OeVSV) for the Elcon 'Goldpfeil' USB P-LAN powerline modem.

covering systems such as PLC, at least for the purposes of enforcement. This is "in order further to reduce market uncertainty", which seems to imply that UK local limits would be set high enough to allow PLC to operate.

There is a recommendation that "Operators of such systems should give undertakings on how problems of real-life interference would be handled. Ideally reasonable attempts should be made to resolve any cases notified." This would require a change to the current situation where radio amateurs who make complaints to the RA about interference to amateur reception are usually told that amateur radio is an unprotected service and that nothing can be done. It also raises the question of what happens if the problem is investigated but cannot be resolved.

All in all, the DTI submission seems to contain much that is of concern to radio amateurs.

PROFESSORS AND PLC

The EC PLC Workshop included an academic presentation from Professor John Newbury of the Open University, Manchester and Prof Dr-Ing Holger Hirsch of University of Duisburg-Essen.

The 76-slide presentation includes some information on emissions from other HF interference sources. A network with about 200 PCs and workstations at the University of Dortmund radiates interference that exceeds the German NB30 limit, but is still not as high as some of the PLC emission levels that can be found in the results of the RA trials at Crieff.

Above 2MHz, the levels of interference radiated by a tram system at 10m are roughly comparable with the highest levels of emission reported from MainNet PLC systems in Finland at a distance of 3m.

So to put PLC interference levels into perspective, it could be significantly worse than living next door to a neighbour who has a network of 200 PCs running continuously but not quite as bad as having a tramway or electric railway 10m from your amateur radio station with trams or trains passing continuously 24 hours a day!

The academic presentation also quotes a statement from the RA that there haven't been any interference complaints about the recent UK PLC trials. In the case of amateur radio, there is only known to be one radio amateur living in the area where the Scottish trials took place. He is not active on the HF frequencies used by his MainNet PLC. If and when PLC trials take place in an area where there is a radio amateur with HF antennas and equipment, some complaints are likely! We are keeping a close watch on the PLC trials in Winchester.

HOME POWERLINE NETWORKS

Many users with a broadband Internet connection, whether via DSL or otherwise, want to share it between two or more computers. Wired, or wireless LANs are two ways to do this and a third way is to use powerline networking via the mains.

Thanks to Rodney, G3NDI,for scanning and e-mailing a copy of an article from the *Crowthorne and Sandhurst Times* of 15 October, about a computer networking company called Cloud 9 Solutions which is selling 14Mb/s home powerline networking products. These are made by. Corinex of Vancouver Canada (see Websearch). According to the Corinex web site, this product compiles with the Homeplug 1.0 standard and is also CE and FCC approved.

I cannot comment on the EMC compliance of the Corinex product, but Mike Zwingl, OE3MZC. of OeVSV, the Austrian National Society, has provided some test results for some other in-house PLC modems. These are the Devolo 'Microlink' and the Elcon 'Goldpfeil'. Both use the Intellon Homeplug v1 chipset and both produce conducted emissions that are well above the EN55022 Class 'B' Quasi-Peak (QP) limits for mains ports, although emissions in amateur bands appear to be 'notched'. The OeVSV results for the Elcon 'Goldpfeil' are shown in **Fig. 1**.

OE3MZC suggests that other national societies should ask their authorities to withdraw these products from the market. I am not aware of these particular products being sold in the UK, but if anyone knows of a supplier, please inform me.

In the UK, EMC compliance is enforced by local authority Trading Standards departments. In June 2001, I tested a pair of wireless phone jacks that were CE-marked but failed EN 55022 'B' conducted emission limits by a large margin. I wrote to London Borough of Barnet Trading Standards Department enclosing a copy of the test results but have heard nothing since.

NOISY TV SETS

Jerry, G4JQN, reports a problem with new Hitachi TV, a 21in model C2125S. Jerry reports that this set produces noise pulses at the rate of about 20 per second from 12.75MHz to 14.9MHz and goes right across the 14 - 14.35MHz amateur band. This only occurs when the TV is in standby mode.

Several years ago, we had a number of reports of TV sets, including some Bush models, that radiated RF interference when operating and/or in standby mode. On some TV sets, the main switch-mode power supply is put into a low power mode on standby and to reduce power consumption, it is pulsed on and off. Recently there appears to have been some improvement in emissions from new TV sets in standby mode due to pressure to reduce power consumption in standby mode for energy conservation reasons. Some sets now use a small auxiliary linear power supply to power the remote control receiver rather than pulsing the main switch-mode power supply. Nevertheless there are still some problems and I would be interested to receive other reports of RF noisy TV sets. ◆

WEBSEARCH

European Commission Communication & Information Resource Centre Administrator http://forum.europa.eu.int/ Public/irc/enterprise/tcam/library
(Follow link to EMC standardisation - Mandate M313 for PLC workshop submissions by national administrations and by stakeholders.)
RA report of measurements of interference levels from Crieff PLT trials www.radio.gov.uk/topics/research/topics/emc/edcrie_2.pdf
Cloud 9 Solutions Ltd. (UK supplier of networking products) www.cloud9solutions.co.uk/
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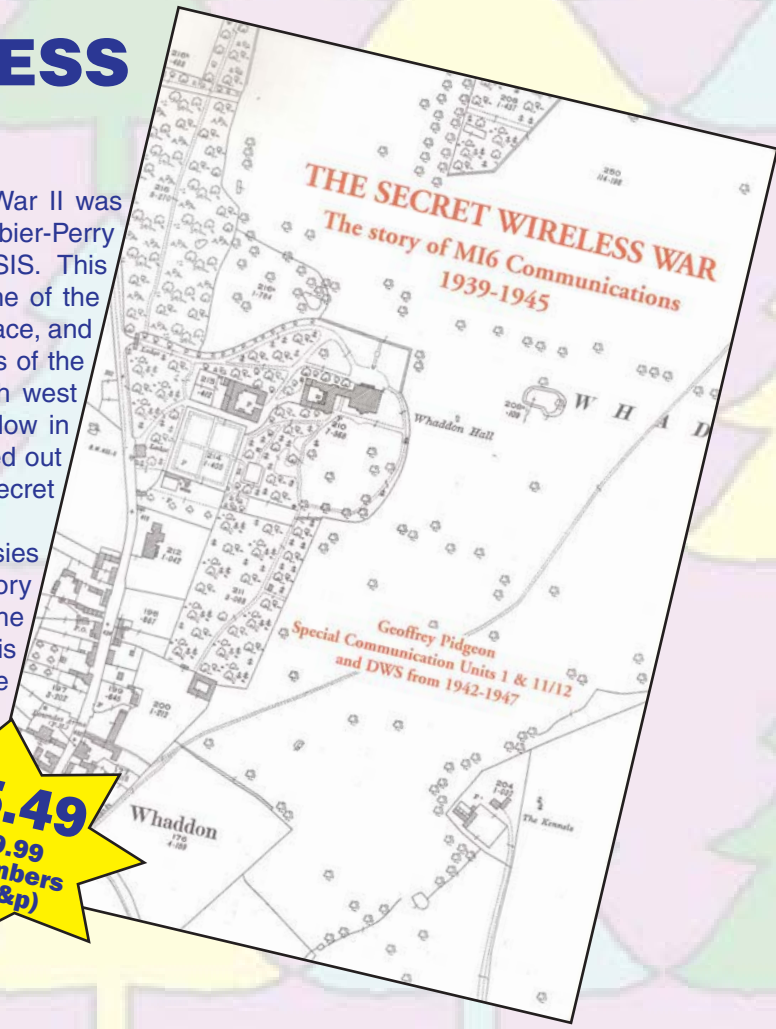

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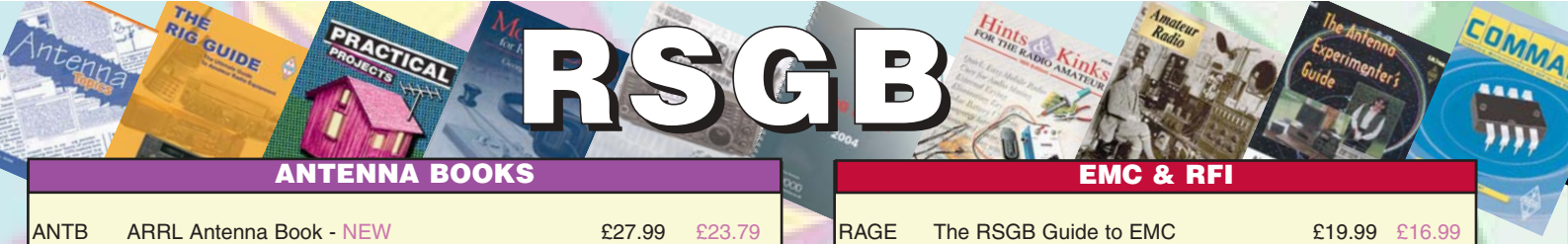

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Members' Ads

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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

A QTH move, Kenwood TS-870, mint boxed with mans, £850. MFJ-931 artificial ground, mint, boxed, £45. Mosley PRO-57 antenna 10-20m, inc WARC bands, vgc, £350 (this works the world). 55ft tilt over mast (ground post), buyer collects, £100. Rotator Yaesu G-600RC, £130. Desk mic Icom SM-8 (boxed), super quality sound reports, £60. All items are plus packing & carriage costs. M0BSS, 01773 780 219 (Nottingham). E-mail: m0bss@qsl.net

AOR 7030Plus rcvr with InRad filter, mint, boxed with man, used two weeks only, £535. Kenwood R-600 rcvr, mint, boxed with man, £125. Vectronics AT-100 active antenna, boxed with man, unused, £38. Zetagi V4 four-way antenna switch, unused £10. Yaesu FP-757 HD power supply £90. Yaesu FT-757GX tcvr, £295. Both Yaesu units vgc. 01386 881 034 (Evesham).

BNOS 50MHz 5-ele beam antenna, boom 3.45m, longest element 2.99m, vgc, £40. BNOS 144MHz beam antenna, boom length 3.48m, longest element 1m, including Mirage masthead pre-amp plus control box switch to pass 12V via coax feed. Bargain, exc cond, £100. Daiwa ATU CNW-727, dual 144/430MHz, 200W max, as new, £60. Alan, G7CDK, 01763 262 443 (Royston). E-mail: aj.flo@virgin.net

CAPCO magnetic loop antennas: AMA3, 20m, 17m, 15m, 10m; AMA5, 80m, 40m, 30m, and UK 5MHz channels, includes Capco control unit and spare motors, £200. MFJ-1786 super Hi-Q loop remote control unit (new) £50. G3XVF (Norwich). E-mail: g3xvf@btinternet.com

COBWEBB antenna 20-10m including WARC, 18 months old. To include, 20ft aluminium pole and 2x18in stand off brackets, exc space-saving HF antenna. G0WXZ, 01202 429 698 (Bournemouth). E-mail: David.Milne7@ntlworld.com

CUSHCRAFT A4S HF 4-ele Yagi with 40m extension kit. Both in gc, £350. G4ZWY, 01885 488 100 after 6pm (Herefordshire). E-mail: g4zwy@hotmail.com

DAIHATSU HI-Jetta camper van, fitted out for mobile/portable work (extra batteries), all mod cons, also goes into multi-story car parks, exc cond, £4000. Robin, G1AHU, QTHR, 01522 509 721 (Lincoln).

DATONG ASP/B automatic RF speech processor, £25. Nombrex model 27 sig gen 150kHz to 350MHz, £15. Tech model TE-15 transistorised grid dip oscillator, 440kHz to 280MHz, £15. RS Components TTL logic probe, £10. RS Components logic pulser, £10. G3ZST, QTHR, 01926 817 904 (Leamington Spa). E-mail: trevor@surgey6902.fsnet.co.uk

EDDYSTONE 770R, 19-165MHz, fitted spkr and preamp, £65. Kenwood DM-81 grid dip meter, £30. Katsumi EK-150 electronic bug key, £25. MFJ-202B noise bridge, £15. Marconi TF-995B/5 AM/FM sig gen 200kHz – 220MHz, £50. TSB 2m/70cm 7dB colinear base ant, with brackets, £15. All items with mans, buyer collects. G0TGQ, QTHR, 01753 545 722 (Langley).

FRG-7, vgc, man, several relevant articles, original packing, £80 plus carriage, prefer buyer collects.G2AOZ, QTHR, 01928 733 540 (Frodsham).

FT-101ZD vgc. FTV-901R VHF/UHF tvtr. CNA-1001 Daiwa HF automatic ATU. KDM-6TR dip meter £350, ono. FT-767GX vgc c/w tvtrs, £750, ono. 01604 713 394 (Northampton). E-mail: goons@ned.eclipse.co.uk

FT-221R, C8800 Stoddart valve field intensity meter 20-1000MHz. Kay Sonograph (26 valves), Marconi sig gen TF-801, power supplies, Variac, wavemeters. Pye Westminster and Olympic (70.26MHz) sound spectrometers, old Megger, SWR meter and more. Please phone for list. G3MFW, 01726 73608 (St Austell). E-mail: harry@woodhou.freeserve.co.uk

FT-817 + battery, charger, & portable antenna, £350. Icom-706MkII HF + 2m, 12V supply filter, audio & tuner chips £350. Both in exc con with boxes & mans. G3YZB, QTHR, 01353 860 012 (Ely). E-mail: bassford@waitrose.com

FT-817, case, Nicads, charger. Stainless steel hatch mount, 6/2/70 mobile and base antennas. Toyko HF ATU and long-wire balun, brass Morse key. Watson 5A PSU 2x f/glass poles, Yuasa 6A battery, cable, connectors, complete station. Buyer collects, £495. G1WIW, 01455 449 602 (Hinckley).

FT-847 matching ATU model FC-20 HF/50MHz 100W PEP, immac cond, £160. Revex W520 SWR meter HF 1.8 – 200MHz, 200W PEP, immac £40. Alan, G7CDK, 01763 262 443 (Royston). E-mail: aj.flo@virgin.net

FT-857, as new, £675. TS-130V, vgc, £300. FT-70G, vgc, £275. FP-757GX PSU, £50. G4XRV, QTHR, 01494 783 557 (Chesham).

GARMIN Etrex Legend & Metro Guide Europe CD, as new, boxed, mans, cable, £200. Chris, G1ZDC, 01949 861 378 (nr Grantham).

HEATHKIT valve voltmeter with RF probe V7A, £15. Heathkit monitor scope SB-610 with spare new CRT, £40. Murch antenna tuner 2000B, £150. G3HCT, QTHR, 01564 795 231 (Henley-in-Arden).

HILO mast (pump-up), 40ft aluminium, six sections with 12V compressor, £200. Mast stored on private premises in Aylesbury. Karl, G6ODT, 07798 728 750 (Aylesbury).

HITACHi V-525 50MHz scope, cursors, probe, book, box, £250. MFJ mag loop c/w control and book, 10-30MHz, £150. Hewlett-Packard RF sig gen, 10Hz-520MHz, CW/AM/FM, £120. Tonna 11-ele beam, 2m, new, £40. Topward frequency counter, model 1208, 10Hz-1GHz, £30. K2 Revision B QRP tcvr, CW/SSB, auto ATU, £400. K2 Revision B, 100W tcvr, CW/SSB, £600. K2 AT-100 auto tuner, 150W, £120. LDG AT-11MP auto tuner, as new, £110. Kenwood 751E, 2m, £250. G0LNE, QTHR, 0121 327 0412 (Birmingham).

HRO5R vgc, all capacitors replaced, five coils 160-10 BS on 40 and 20, matching original PSU, £125. KW-202 Rx vgc, £50. Yaesu FT-7B tcvr 80 – 10m, no WARC, remote (faulty), digital freq readout, £125. Strumech 30ft mini tower, c/w ground post, £300. Vibroplex original key, £85. Hi-Mound BK-100 key, £65. KW-108 two-tone linear monitor scope, £25. Many small items - send for list. G3CRH, 01543 686 364 (Burntwood), E-mail: g3crh@aol.com

ICOM 751 tcvr + gen cov Rx, £400 ono. Trio1000 gen cov Rx (AM/SSB/CW), £100 ono. Both exc cond. GW3YVC, 029 2075 5190 (Cardiff). E-mail: owen@fulmar.freeserve.co.uk

ICOM 706MkII/G, new with guarantee, £650. Yaesu FT-817, 17months' guarantee plus new Miracle Whip & soft case, £550. Kenwood GM-707, £180. Watson 2000 tri-band, £35. Comet d/band GP3 antenna £30. Phone for bargains. M3BKS, 023 9242 6507 (Gosport).

ICOM 706MkIIG, DTMF mic, new with guarantee, boxed, £650. Yaesu FT-817 new, boxed & guaranteed, soft case, £550. Miracle Whip, new, £75. Kenwood 707, boxed, £160. Dual-band antenna, £35. Watson triband antenna. £40. M3BKS, 023 9242 6507 (Gosport).

ICOM 736 HF/50MHz tcvr with internal ATU and desk mic, £850. Kenwood AT-230 antenna tuner, £75, Daiwa power/SWR meter, as new, £35. Dummy load & low pass filter, £20 each, RTTY terminal unit, £20. Test oscillator unit type AN/PRN-10, range 2MHz to 400MHz, £20. BBC B microcomputer, £15. Various leads + odds and ends, £10 all, ono. G0CDF, QTHR, 01483 766 397 (Woking). E-mail: john@jmorris6.fsnet.co.uk

ICOM IC-746, vgc, £815. Icom IC-271E Mutek f/end fb cond, £295. Icom IC-706MkI (recent service), £325, but without DC/filter – all mans. 4x7-ele Wimo 144MHz Yagi antennas with matching cables, FSJ-450 and 1/4-wave power splitter, H-frame, £295. Timewave DSP9, £60. Westflex 103 coax, 100m coil, £80. Also 3 lengths of LDF-450. Please ring. All items plus carriage/collect. 01744 895 139 (St Helens). E-mail: rjstaples@blueyonder.co.uk

JRC JST-245, HF + 6m, 150W, matching NVA-319 spkr with filters. Mint cond, with original packaging and h/book, £1250. Buyer to collect. Graham, G8BZL, QTHR, 01273 564 329 (Hove).

KENWOOD TS-850SAT + SP-31, exc cond, c/w original packaging & mans, £550. FT-208R free to purchaser of TS-850. Martin, G3ZZS, 01752 216 455 (Plymouth). E-mail: g3zzs@blueyonder.co.uk

KENWOOD 850AT, £550. Yaesu 726 tri-bander, £450. G0GWZ, QTHR, 0121 360 5062 (Birmingham).

SILENT KEYS

We regret to record the passing of the following radio amateurs:

G0EOE	Mr J Palmer	08/10/03
G0NNP	Mr D A King	03
G0OLM	Mr G Gardiner	/09/03
G0RFB	Mr C A Topliss	03/10/03
G0SDA	Mr C F Bird	09/10/03
G0VZC	Mr J Terry	11/10/03
G3CCH	Mr J Stace	30/07/03
G3ERR	Mr J A W Edwards	11/08/03
G3HRP	Mr T J Wright	06/10/03
G3HZJ	Mr W J Walsh	02/05/03
G3KPT	Mr G Farrance	16/10/03
G3NAA	Mr R C Polley	23/08/03
G3RSJ	Mr R Williams	21/09/03
G3SYC	Mr B K Booth	06/09/03
G3VDI	Mr L Millward	02/10/03
G3ZAR	Mr P Rubinstein	04/09/03
G4BSO	Mr R W Price	18/09/03
G4CLV	Mr P F Cottrell	05/11/02
G4CZU	Mr A Wilson	06/08/03
G4FP	Mr R Withers	03
G4IGY	Mr G L Southwell	23/10/03
G4RFS	Mr S A Eade	14/10/03
G6DLO	Mr C S Benson	/10/03
G7GMV	Mr G Jenkins	15/10/03
G8FQF	Mr M Wickham	10/10/03
G8VEH	Mr R M Bray	01/09/03
M3CXR	Mr P Hollway	25/08/03
M5AMC	Mr G A Smerdon	15/07/03

KENWOOD R-5000 + 2m, mans, £425. TS-850SAT, boxed, mans, £700. SM-220 monitor, boxed, mans, £230. TM-702 d/band, boxed, mans, £225. SP-120 speaker, £25. Icom IC-735 HF tcvr, workshop mans, £250. IC-200T + IC-4PE, UHF, mans, £150. IC-M12 one pair marine VHF h/h, £120. Yaesu, FT-707 HF, boxed, mans, £200. FC-707 ATU, boxed, mans, £150. FT-227 2m, £80. FP-80 PSU, £40. FR-700 PSU, £35. Target HF3 Rx, £95. Alinco DJ-5E d/band, £150. DJ-F1 2m, £90. Deakin HW-152 PSU, £30. EP-95 PSU, 30A, £45. Optimus CTR-108 cass rec, £20. Robot 800, full mans, £45. Marchwood PSU kit part-built, £35. Realistic PRO-2004, £80; PRO-2006, £80; PRO-2039, £80. ERA MkII Microreader, ERA BP-34 Bandwidth, ERA Synoptic Decoder, ERA Display (4pcs) mans, £125. Bob, G0PBR, 01472 697 302 (Cleethorpes). E-mail: bob.g0pbr@btopenworld.com.

KENWOOD TM-451E 70cm mobile, £125. Yaesu FT-2400 2m mobile, £75. Icom IC-706 HF/VHF, mobile/base, £375. G0DEZ, 01905 351 879 (Worcester). E-mail: dez.zc4dw@virgin.net

KENWOOD TM-D700E, never been mobile, as-new cond, £250. Toshiba Satellite Pro laptop CD-ROM, 3.5in floppy 4GB, h/drive, 14in TFT monitor, £250. Both items plus post or collect. G0HIN, 023 9246 1982 (Hayling Island). E-mail: g0hin@aol.com

KENWOOD TR-751E (late serial No) 2m 25W all-mode, original box, £275. TR-751E voice board, £35. TS-770 2m/70cm SSB/CW/FM tcvr, includes owner's/workshop man, original box, £275. TS-830S 160m to 80m tcvr, including CW filter, owner's/workshop man, original box, £275. VFO-240 remote VFO, £45. Ten-Tec keyer paddle KR1B (electromagnetic), matches Ten-Tec Corsair II, £35. Mast safety belt, £45 (Norwich). E-mail: g3xvf@btinternet.com

KENWOOD TS-940SAT, £600. TS-940S, £400. Drake 2kW linear, £500. Yaesu FT-221R, £200. Racal RA-17N, £75. Yaesu FT-101E, £150. G2DYM, 01398 361 215 (Taunton).

MARCONI TF-144H/4 sig gen 10kHz- 72MHz, £30. TF-801D/I/S sig gen 10MHz - 470MHz, £25. Valved units, CW/AM, gwo, nice cond, copy mans. 01323 873 212 (Seaford). E-mail: g3jkf@onetel.net.uk

MOVED to ground floor retirement flat recently, lease will not allow mast to be attached, so must sell. Icom IC-R75. IC-PCR-1000. Bearcat UBC 780XLT. Grundig Satellit-800. Grundig YB-400. X1-HF vertical (purchased within last 15 months) cost £2046. Accept £1000 ono, buyer collects, no boxes. Terence, RS158408, 01934 877 336 (Congresbury). E-mail: terry36952@aol.com

PHILIPS L-434 1.4GHz link terminal, including duplexer, £60. HS-400 high stability oscillator, £20. Both with mans, 01291 672 466 (Usk). E-mail: frank@simplehappy.co.uk

RACAL RA-2091 90-400MHz, £225. Plessey PR-2250 HF rcvr + man, £600. Zenith transoceanic short-wave valve portable, £140. HP-3582A spectrum analyser, £300. Marconi 2018 sig gen, 520MHz, £275. Watkins-Johnson man copies available. 01252 782 932 (Farnham).

RCA AR-77, Hallicrafters SX-24 Skyrider Defiant, both with h/books, prices negotiable. Lowe HF-125 with keypad and FM options, £200. Tony, G4HHZ, 023 8027 0785 (Chandlers Ford). E-mail: tony@nicholrd.fsnet.co.uk

SHACK clearance, Kenwood TS-50 and AT-50 in almost mint cond with quick release bracket, man & boxes, £500 ovno. Trio MC-60 mic, £40. Adonis AM-308 mic, £25. Radio Shack HTX10 10m multimode tcvr with man, no box, £75 ovno. 01249 890 674 (nr Chippenham). E-mail: johng0oid@aol.com

SILENT key sale, G0OZD. Yaesu FT-1000MP, MD-1, SP-6, £1200. FL-7000 linear, £800. FT-767GX, £400. Jaybeam models MM3 and HS-WX1N 144/430 ground plane. G3MJK, QTHR, 01256 389 439 (Basingstoke).

SILENT key sale. Kenwood TS-520S SSB tcvr. Yaesu FT-101 SSB tcvr. KW Electronics KW-1000 linear amplifier. Trio-Kenwood TS-940S tcvr. Sensible offers, please, to Carole, 01923 260 538 (King's Langley).

STANDARD C-5900 mobile 6/2/70, FM, like FT-8900R 40W o/p, £160. BNOS, 10-50 linear with preamp for 2m, boxed, £50. Altron 40ft tiltover tower, all fittings and cage, 10ft sections ready to transport, £150. 01582 653 634 (Luton).

SURPLUS to requirements, upgraded 486DX, c/w *Windows 3.11* and various software. IIyama PRO-21 19in monitor, Deskjet-520, keyboard, mouse, cables etc. All, fwo. Offers to G3RJX, 07958 481 087 (Birmingham).

TENNAMAST type mast 50ft, £120. MFJ-1026 deluxe noise filter, £50. Heil HC-5 Proset + spare HC-4 insert, £80. Lee, G0ULN, 01482 669 124(Hull). E-mail: g0uln@supanet.com

TRIO speaker SP-5, £10. Heathkit GDO, £15. BC-221AF in case with AC PSU, £20 (collect). Collins mans, solid state 5R4GYs. Cirkit meter TM-8020, £10. G3GBB, 01379 783 657 (Diss).

TS-850SAT, £550. TS-680S, £350. Navico AMR 1000S, 2m, £150. FT-8100R 2m/70cm, £300. FC-841 freq counter, £50. MFJ all-band vertical, £200. 18AVQ 8-band vertical £50. 10-20 vertical, £40. WARC band vertical, £30. 3-ele 10-15-20 mini-beam, £50. 572B valves, £70 pair. All cwo offers. 07940 556 826 or 01865 371 670 (Oxford). E-mail: bob.limehouse@t-mobile.co.uk

TS-950SDX, £1100. Norman, G4AUM, 01454 615 632 (Bristol).

VERSATOWER P-40 inc ground post, winches, but missing rotator cage, £250. Buyer collects or delivery extra. G4AKD, QTHR, 01954 782 974 (Cambridge).

VERSATOWER P60 vgc, requires new head section, ropes and ground post, all have been stolen. Make us an offer, all proceeds go to club funds. G0AEX, QTHR, 07941 898 017 (Leeds), E-mail: g0aex@yahoo.com

YAESU FT-920, AF, HF, + 6m.exc cond, boxed with man & original packaging. Used occasionally (second radio), £690. + p&p. G0MUE, QTHR, 01904 792 101. E-mail: g0mue@fsmail.net

YAESU FRG-7 comms HF rcvr, vgc, no computer modes, £95. New MFJ-464 CW keyer/reader, £90. Deluxe MFJ iambic paddle, new unused, £40. Datong Morse keyboard, exc cond, £40. Prefer buyer collects. John, 2E0MIM, 01262 606 212 (Bridlington).

YAESU FT-290MkII with case and charger. As new, boxed, with man, £150. FT-690MkII, boxed, with man, £150. 01440 785 672 (Claire). E-mail: kim@k1m.co.uk

YAESU FT-840, inc CW filter, vgc, £375. SEC-1223 23A PSU, £50. (Uxbridge). E-mail: rpike78088@aol.com

YAESU FT-847 mint cond, £800. Diamond 40A PSU, £90. Tokyo 2m amp, 75W £60. All ono, no time wasters, please! Paul, G4ZWP, 07977 122 345 (Ware).

WANTED

ARMY wireless set No 12 high power unit, or any parts of it, in any cond. The HP unit is a rack about 5in high with the following sub-units: amplifier RF No 1; modulator RF No 1; aerial coupling unit No 2. Will collect and pay cash. Richard, G7RVI, QTHR, 01989 769 654 (Ross-on-Wye). E-mail: g7rvi@richard-hankins.org.uk

COPY of owner's h/book for KDK FM-2030 2m tcvr, can copy & return. 01443 436 678. E-mail: davida@jones7176.freeserve.co.uk

DRAKE TR4C good cond – plus any extras, ie PSU, etc. Tel or fax after 8 rings, 01283 532 616.

EDDYSTONE 750 or later rcvr. GW4JQQ 01639 638 653 (Neath). E-mail: rongw4jqq@tiscali.co.uk

HARD disc for Atari STE computer. E-mail: poisonpen@poisonpen.freeserve.co.uk

KENWOOD TS-850 internal ATU wanted, G8WXU, QTHR, 01277 623 019, (Billericay).

KENWOOD TS-940 accessories, SP-940 speaker, SM-220 station monitor, AT-940, BS-8 etc. All must be in good cond. 01547 510 211 (Knighton, Powys). E-mail: marion@trevland.freeserve.co.uk

KW Electronics KW 160 or similar 1960s 160-metre 10W AM/CW tx, such as Labgear 160 Twin, or Minimitter Top Two to Seven. I will arrange collection/postage to a UK address. Steve, VK6VZ/G3ZZD. E-mail: sire@iinet.net.au

MORSE keys wanted by private collector. Straight & Bug keys, sounders, relays, Morse inking machines, heliographs, all telegraphy-related items. For a friendly chat ring Gerald, 0118 983 4307 (Reading). E-mail gerald.beaver@btopenworld.com

OLD wooden base Morse key, brass hardware, with or without knob. The base should be about 5in x 10in and about 3/4in thick. May or may not have a lever on one side. Needing some repair or clean up is fine. May have brass ID plate on top front or front edge. Dave Johnson, 15514 Ensenada Drive, Houston TX, 77083 5008, USA. 281 498 8945. E-mail: fullerphone7150@yahoo.com

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. G4UZN, 0113 269 3892 (Leeds). E-mail: g4uzn@qsl.net

SWAN or Shure mic for 100MX. Other Swan items wanted WHY? GW8VUG, QTHR, 01492 517 786 after 8.30pm (Colwyn Bay).

TS-440S service man, will pay all costs. Peter, G3HEE, 01780 755 001 (Stamford). E-mail: p.fancourt@btinternet.com

WANTED All-band automatic linear amplifier, to use with IC-7400 tcvr and Gem quad or similar antenna – must be in usable condition. Gavin, G6DGK, 01825 722 045 (Uckfield). E-mail: gavin@hurstfields.prestal.co.uk

YAESU FR-DX400 working or non-working. FL-DX400 working. Also old Collins equipment, h/books & advertising material. 01362 688 430 (Norwich). E-mail: g3zig@freenet.co.uk

YAESU FT-290R – must be mint cond, unscratched, unmodded (except perhaps for Mutek front end), & have all original bits & pieces & man + if possible, original packing, must be as new cond. Also wanted – PSU (internal unit) for FT-106. John 01603 483 783 (Norwich).

EXCHANGE

I HAVE an Eddystone S640 rcvr in vgc and wish to do a straight

swap for an Eddystone 770R, preferably a MkI. Must be in vgc. I can travel a reasonable distance from Norwich. Tony, G0MQG, 01603 744 197 (Norwich). E-mail: tony122@ntlworld.com.

RALLIES & EVENTS

7 DECEMBER 2003

WEST MANCHESTER RC Red Rose Winter Rally - Lowton Civic Centre, just off the A580 East Lancs Road. OT 10.30am. TI on 145.550MHz, CP free, TS, B&B, SIG, LB, C, DF, RSGB bookstall. Steve, 01942 895 198. [www.wmrc.org.uk]

Worcester Radio & Computer Rally - Worcester Rugby Club, access from M5 jn 6. RSGB stand & bookstall. [www.qsl.net/gb2tcr]

18 JANUARY 2004

OLDHAM ARC Rally - Oldham Sports Centre, Lord Street, Oldham. OT 10.30 / 11am. TS, B&B, C, TI on 145.550MHz via GB4ORC from 7.30am. Hazel, 01706 848 092, or m5aeg@btinternet.com [www.oarc.zen.co.uk]

25 JANUARY 2004

Horncastle Winter 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, 01526 860320 or Tony, G3ZPU, 01507 527835. [www.fenlandrepeater.org.uk]

1 FEBRUARY 2004

SOUTH ESSEX ARS Mobile Radio Rally - The Paddocks, Long Road, Canvey Island, Essex, at the southernmost extremity of the A130. Radio, computers and electronics. OT 10.30am. C (home-made), CP free, DF, TS, MT, MA (book with examiners before midday for both exams). Brian, G7IIO, 01268 756 331 or briang7iio@yahoo.com [www.southessex.ars.btinternet.co.uk]

8 FEBRUARY 2004

HARWELL ARC Radio & Computing Rally - Didcot Leisure Centre, Mereland Road, Didcot, Oxon. Signposted from A34. OT 10.15 / 10.30am, £1.50. B&B, C, LB, TS, SIG, DF, TI on 145.550MHz, CP free. Ann, G8NVI, 01235 816 379 or ann.stevens@btinternet.com [www.hamradio.harwell.com]

15 FEBRUARY 2004

WAKEFIELD & DRS Northern Cross Radio Rally - Thornes Park Athletics Stadium, Wakefield, W Yorkshire. Just out of town on the Horbury Road. Easy access from M1 jns 39 and 40 - well signposted. OT 10.15 / 10.30am, £2. B&B. John, G7JTH, 01924 251 822 or g7jth@wdrs.org.uk [www.wdrs.org.uk]

RADIOSPORT Communication & Computer Show - Stevenage Leisure Centre. RadioSport 01923 893 929. [www.radiosport.co.uk]

29 FEBRUARY 2004

CAMBRIDGE & DARC Rally - Britten Arena, Wood Green Animal Shelter, King's Bush Farm, London Road, Godmanchester. [www.cdarc.org.uk]

BREDHURST RTS Rainham Radio Rally - Rainham School for Girls, Derwent Way, Rainham, Kent. Exit M2 jn 4, on to A278, follow RRR arrows. OT 9.30 / 10am, £2, under-14s free. TI on 144.550MHz (GB4RRR), TS, SIG, ATV, Kent RG, RNARS, digital comms, C, CP off road. Martin, 01634 365 980.

SWANSEA ARS Amateur Radio & Computer Show - Swansea Leisure Centre, on the A4067 Swansea-to-Mumbles coast road. OT 10.30am, £1.50, children 50p. HF station, TS, B&B, SIG, repeater groups, TI on 2m. Roger, GW4HSH, 01792 404 422.

6 MARCH 2004

CRYSTAL PALACE R & EC Spring Radio Fair - Bob, 01737 552 170. [www.members.aol.com/rfcburns]

7 MARCH 2004

BLACKMORE VALE ARS Valve Day - Tony, 01258 860 741.

Vintage Valve Technology Fair - VVT Holdings 01274 824 816, vvt@supanet.com [www.myciunka.supanet.com/VVTF2003 (case-sensitive)]

14 MARCH 2004

ABERYSTWYTH Amateur Radio & Computer Rally - * New Venue ***** - Ray, 01970 611 853 or mwmg01@aber.ac.uk

WYTHALL RC Radio & Computer Rally - * New Venue ***** - Martin, G8VXX, 0121 474 2077, or enquiries@wrcrally.co.uk [www.wrcrally.co.uk]

20 MARCH 2004

SOUTH NORMANTON, ALFRETON & DARC 4th Junction 28 QRP Rally - Russell, G0OKD, 01773 783 394 or russel.bradley@ntlworld.com or Mike, M0RMJ, 01949 876 523 or mike.jeffs@ntlworld.com [www.qsl.net/snadarc/]

18 APRIL 2004

West London Radio & Electronics Rally - Paul, M0CJX, 01737 279 108, m0cjx@lineone.net [www.kemptonrally.co.uk]

YEOVIL & DARC 20th QRP Convention –Derek, M0WOB, 01935 414 452, or m0wob@tiscali.co.uk

3 MAY 2004

DARTMOOR RC Radio Rally - * New Venue ***** - Ron, G7LLG, 01822 852 586.

MID-CHESHIRE ARS Rally - David, G4XUV, 01606 77787.

16 MAY 2004

MIDLAND ARS Drayton Manor Radio & Computer Rally - Norman, G8BHE, 0121 422 9787 or 07808 078 003.

6 JUNE 2004

SPALDING & DARS Annual Rally - John, G4NBR, 07946 302 815. [www.sdars.org.uk]

WEST MANCHESTER RC 8th Red Rose QRP Festival - Les, G4HZJ, 01942 870 634, or g4hzj@ntlworld.com

RALLIES & EVENTS

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.

20 JUNE 2004

NEWBURY & DARS Car Boot Sale - [www.nadars.org.uk]

25 - 27 JUNE 2004

HAM RADIO 2004 - [www.messe-friedrichshafen.de]

27 JUNE 2004

SEVERNSIDE TV GROUP West of England Radio Rally - Shaun, G8VPG, 01225 873 003 (OH), 01225 873 098. [www.westrally.org.uk]

SWINDON & DARC Car Boot Sale - Mike, M5CBS, 01793 826 465.

18 JULY 2004

McMICHAEL Amateur Radio Rally & Car Boot Sale - Dave, G4XDU, 01628 625 720 or g4xdu@amsat.org

25 JULY 2004

COLCHESTER RAC Rally 2004 - James, M0ZZO, 01255 242 746, james@mcginty.net, or Gary, M0JJH, 01621 818 620, gary@garycavie.com

8 AUGUST 2004

FLIGHT REFUELLING ARS Hamfest - Mike, M0MJS, 01202 883 479, hamfest@frars.org.uk [www.frars.org.uk]

13 AUGUST 2004

COCKENZIE & PORT SETON ARC 11th Annual Junk Night - Bob, GM4UYZ, 01875 811 723, gm4uyz@btinternet.com

17 / 18 SEPTEMBER 2004

LEICESTER Amateur Radio Show - Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or g4afj@argonet.co.uk

19 SEPTEMBER 2004

LINCOLN SWC Hamfest - [www.hamfest2004.secretbunker.org.uk]

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@ntlworld.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-manager?

19 Dec GB4YOU: Youlbury Scout & Guide Radio. Oxford. TLH27P (G0RJX)
GB4YOU: Youlbury Scout & Guide Radio. Oxford. TLH27P (G0REL)

The Members' Ads order form is now published here. 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 separate 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.

RSGB MEMBERS' ADS ORDER FORM

Application form for one For Sale, Exchange or Wanted advertisement. Do not mix classifications on this form; separate applications must be made.

Please ensure you read and understand the conditions of acceptance of these subsidised Members' Advertisements, printed at the top of the Members' Ads page of the current *RadCom*.

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CARD No EXPIRY DATE

Issue No (Switch only) .....

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Copy to: David Thompson, Manning Publishing Ltd, The Irwin Centre, Scotland Road, Dry Drayton, Cambridge CB3 8AR
Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, Lambda House, Cranbourne Road, Potters Bar, Herts, EN6 3EP

EQUIPMENT

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Medway Aerials rear of 14 Luton Road, Chatham, Kent, ME4 5AA 01634 845073

ISOLATED INTERFACES for PSK31-SSTV-RTTY-WSJT. Suitable for SOUNDBOARD PROGRAMS. NEW INTERCHANGEABLE LEAD model available. See www.g3liv.co.uk johnny@melvin.com. Phone: 0191 2843028

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VHF/UHF ACCESSORIES AND AERIALS PMR equipment and spares. www.garex.co.uk Phone 07714198374 P O Box 52, Exeter, EX4 5FD

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e. barbara@engineered-composites.co.uk
www.engineered-composites.co.uk

WEATHER STATION WS-DS2 New, unused, still packed inc. mahogany case cable, sensor. £300 01457 851281 or david@mccrum.uk.net

ACCOMMODATION

HAM VACATION QTH GRAN CANARIA www.qsl.net/ea8azc

CARDS & DESIGNS

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COMPUTER SOFTWARE

PAPER CHASERS' LOG Tracks more awards than all the other QSO logging programs combined. Some of the 100+ awards tracked are: Worked All Britain, Celtic People, Commonwealth Century Club, Great Britain Counties and Regions, IOTA British Islands and Irish Counties. NØOKS Software. www.n0oks.com

SHACKLOG 5.5 probably the most popular UK written logging software £32.00 with IOTA addons £42.50. Alan Jubb, G3PMR, 30 West Street, Great Gransden, Sandy, SG19 3AU. Tel 01767 677913 www.shacklog.co.uk

MISCELLANEOUS

KINGS PATENT AGENCY LTD Patents - Trade Marks - Designs. Literatures and fees on request. Tel: 020 7404 7788 www.kingspatent.co.uk

GWM RADIO is now open at new premises 63 Victoria Road, Worthing, BN11 1ON. Tel: 01903 234897 - Fax 01903 239050 www.gwmradio.co.uk - See you there.

CALL IN ON THE 'GOOD NEWS' CHRISTIAN NETS! Every Sunday at 8am on 3747kHZ and around 7047kHz and 144.205 at 3pm sharing Christian fellowship over the air. Info from WACRAL, 51 Alma Road, Brixham, South Devon, TQ5 8QR Tel: 01803 854504

G3LLL- PARTS Old Yaseu, also repairs for callers (Morcambe). Details g3lll@onetel.net.uk

Business Cards

The Last Word

Re-issued Callsigns

With the relaxation of licensing conditions and the proliferation of newly-licensed amateurs, I find it particularly nauseating to hear the callsigns of dead men being used by people who have changed their own callsign for that of a silent key.

There was a time when licences were not re-issued, perhaps in a more sensitive age, and then licences were re-issued to alleged relatives who suddenly and surprisingly found long-lost uncles and grandfathers. Latterly re-issued callsigns do not have to be passed down through the family and can be applied for routinely. I found it quite disturbing to hear two amateurs holding long-issued callsigns to explain to another amateur that their callsigns were re-issued and they had selected their re-issued call signs by scanning the obituary column in *RadCom* and then picking a callsign which suited them.

I am waiting with keen anticipation to find out who will be third holder of a certain pre-war callsign. Over the years I have spoken to both the original and second holder of this callsign, both holders now deceased, and wonder when it will be heard on the air again, and will the new holder know anything about the original and second holder?

I would suggest that the main reason for applying for a re-issued callsign is merely vanity (compare with cherished vehicle registration plates), or that the applicants have a feeling of inferiority when using a newly-issued licence. I have yet to hear of any re-issued licence being younger than the one it is replacing.

My wife and my licensed son are already aware that when I go silent key, my wish is that my callsign will die with me and I will be the original and only holder of my callsign. But will the licensing authorities pay any regard to my wishes and, what is worse, my callsign may be issued to a poor operator.

A callsign in the amateur radio world is as personal as a given name and should not be re-issued. It is confusing, often upsetting and totally unnecessary. But if one should be issued let it be designated, as is the practice in the United States, as a vanity call.

Patrick Allely, GW3KJW

[*See 'RSGB Matters' on pages 5/6 this month* - Ed.]

The New Exam Structure

At work I have a colleague who had experienced an interest in getting an amateur radio licence, but has now seen the route to a licence as detailed on the RSGB website. She has spent many years with a background of military radio communications, setting up and using radio communications links from HF to satellite, voice through to the latest state-of-the art data communications; has a degree in electronic engineering, and now an HF receiver at home.

After December, with the demise of the City & Guilds RAE route to a full licence, I cannot believe it will now be necessary for her to waste time attending a course aimed at complete beginners - and where she will probably end up teaching the lecturer!

There must be potential licensees who have left a professional electronics career and want to take up amateur radio as a hobby so that they can carry on with their interest into retirement. Are we going to insult such potential licensees by making them take a foundation course?

Andy Talbot, G4JNT

[*G4JNT's friend, although an experienced military operator, is a complete beginner in amateur radio terms. I myself spent over 26 years as a military communications specialist, but that experience hardly equipped me for amateur radio operation. The procedures, terminology and equipment used are totally different. Military operators do not construct their own equipment and in most cases do not design and construct their own antenna systems. They do not have to worry too much about affecting their neighbours with interference. The new licence structure is designed to provide new amateurs with a sound background in good amateur radio practice. I don't believe it is an insult to anyone's intelligence - just good housekeeping and common sense* - Peter Kirby, G0TWW, General Manager.]

The Demise of JOTA

What has happened to Jamboree On The Air (JOTA)? I visited a site on 19 October and found eight computer terminals all linked direct to the Internet with a broadband link and no radio equipment in sight. There were many JOTA 'chat rooms' set up covering most languages with 50 or 60 contacts available in most countries. I ask what is different from school, home or the public library?

Having worked on several Jamboree stations I know the buzz the Scout or Guides get from talking on the air, particularly with DX contacts. This is in addition to getting an understanding of radio communications and gaining a badge. I am not against computers in amateur radio for such tasks as logging, RTTY and fax etc but to my mind this has destroyed the point of JOTA.

Jim Brett, G0TFP

E-H a "Conventional Dipole"

I am sorry that G3IHR ('The Last Word', November) did not see the joke in my original proposal ('The Last Word', July 2002) for an experiment to detect intermodulation between the E and H fields of a Crossed-Field Antenna. I was trying to show in a humorous way that if the CFA works because the radiation from generated crossed fields is somehow better than from either field alone, then intermodulation would occur if we generated fields of different frequencies. This is absurd since both copper and free-space are linear. Given linearity we can put all our transmitter power into either field and it will all be radiated. Why bring Poynting into the explanation when energy conservation will suffice? The CFA is just a cleverly-combined pair of small antennas.

I have no quarrel with G3IHR's review of the E-H antenna or his understanding of how conventional antennas work. In my last letter ('The Last Word', October) I confined myself to observing that the E-H antenna seems to be a conventional dipole and that the phase-shift introduced by its pi-network can do no more than shift the phase of the output, thus questioning the inventor's claim that this phase shift is vital to the performance advantages of the antenna. I mentioned the possible broad-banding benefit of the pi-network because, if suitably designed, it could introduce a double hump into the tuning.

Peter Martinez, G3PLX

LETTERS PUBLISHED in 'The Last Word' do not necessarily reflect RSGB policy. 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. Letters not published in RadCom may be published on the RSGB members-only website at rsgb.org/membersonly/lastword 'Last Word' letters may be e-mailed to **radcom@rsgb.org.uk**

An Alternative View

Having been licensed for over half a century and been interested in wireless for over 70 years I found Mark Hill's letter ('Science, Engineering and All That Technical Stuff', 'The Last Word' September 2003) bordering on the obscene. His attitude can only be likened to that of the union bosses of a bygone era. I agree that amateur radio is a fantastic hobby and has so many facets as to give everyone scope to do their own thing. Mr Hill wants an extra or advanced licence and, surprisingly, as an old technical buffer, more power. Any amateur worth his salt can improve his equipment and cope quite adequately with the present 40OW. I use only 10OW. Unless he has already done so, he can keep his scientific calculator, hot soldering iron and engineering mind active in developing the SHF bands. There is much to do on 24, 47 and 76GHz, both in advancing knowledge by designing and constructing the equipment for these bands and, then, studying the conditions, propagation etc. In the past I have learnt much when constructing my own 10GHz equipment and then operating it portable on the hills. So Mr Hill you will see that there is more available than wanting phone patches, personal repeaters etc. Good luck with SMDs etc.

I enjoy operating on HF, VHF, UHF and SHF and I welcome the upgrading of the Class Bs and the M3s. The greater the occupancy of the bands the better. Remember, "Use them or lose them".

Jack Brooker, MBE, G3JMB

Channelise HF

I am very grateful to Don Field, G3XTT ('HF', *RadCom* October 2003) for his comments on my letter published in June regarding channelisation of HF SSB. Perhaps it would be useful to expand some of my points a little further. I was certainly not suggesting that all the SSB portions of all the HF bands are channelised. It would be a mammoth task to implement such a scheme world-wide and it would not be suitable for contest operation. We also need to preserve some sections of the bands for modes that don't occupy SSB bandwidths, eg AM. Where I think channelisation would be of benefit is for the more 'routine' QSOs. With the frequency accuracy and stability of modern rigs, stations would come up exactly on tune with none of the 'monkey chatter' noises we have to put up with at present. It is far easier and quicker to step through a set of channels to find a clear frequency than having to tune laboriously from one end of the band to the other.

As long as channel spacing is matched to signal bandwidth and receiver selectivity, channelisation produces the most efficient use of the spectrum. Random frequency selection, as we have at present, inevitably results in unused gaps which are too narrow to be occupied by other signals and therefore waste spectrum. If all the channels in a channelised system are occupied, there is no way a non-channelised system would be able to accommodate more signals; all that happens is that stations barge in between others and cause chaos. At least in a channelised system, if an intruding signal conforms to the channel plan, it will only interfere with one QSO.

I concede that my suggestion of 4kHz channel spacing is probably unnecessarily wide. 3kHz spacing results in some awkward numbers for channel frequencies; but I would agree that it seems stupid to waste spectrum just because the numbers are inconvenient. Maybe 2.5kHz spacing would be workable - some investigation is needed. As an initial trial, how about setting up 13 channels on 80m between 3694kHz and 3727kHz with a channel spacing of 3kHz? If necessary, channelisation could be suspended during specified contests. What about introducing channelisation in the forthcoming extension of the 7MHz band?

Ray Scrivens, G3LNM

Demise of GBZ

Quentin Cruse wrote a good article about the destruction of the masts at Criggion (*RadCom* October 2003). It was a bit of a fiasco on the first Sunday. The first tower came down satisfactorily on the following Tuesday but the remaining two had to wait for the Wednesday after the Bank Holiday before they succumbed to their fate.

Quentin wrote: "Equipment was salvaged" [from Rugby]. His inference is incorrect. There was little worth salvaging after the fire at Rugby in late 1943 but GBZ had been planned in 1941 and unused GBR equipment was *in situ* in mid 1942. By the time of the fire GBZ was virtually complete and was being tested. After a few last minute adjustments and completion of safety features it was taking traffic within three days. I was there and eventually started off the modernising and upgrading in 1967/8.

Incidentally, the name of the hill is Breidden.

Stanley Brown, G4LU

Earning a Callsign

I was and still am annoyed at the comments made by Tony Cunliffe, G4EII, in 'The Last Word' (November 2003). He says he doesn't think anyone has a moral right to two callsigns and that they have to be earned. I wonder if he by some chicanery 'obtained' his callsign? Did he not *earn* it by taking the relevant exams? I have two callsigns, both earned the hard way by passing the required exams to obtain them. I also pay the required licence fees to keep them and use them both when aboard my boat with other operators. One is used on HF and the other on VHF / UHF. It made life easier for logging and QSLing. So although you have a right to your opinions, don't tell me I don't have a moral right to the callsigns. I *earned* them.

Ernest Knight, G4NVD / G8TXU

Thanks for Help

For the last six weeks I have been studying the amateur radio Foundation course at Club 197, 197 Brook Hill, Sheffield. On 28 July, with great pride, I completed and passed the course. I feel I owe great thanks to the person who teaches the course, Tony Howard, G1TKX, who has, even though with ill health, been both helpful and patient and through excellent teaching skills ensured my success. I feel he is a great credit to amateur radio and Foundation instructors. I would like to request that you formally pass my gratitude on to Tony and wish him continued success in the future.

Daren Loxley

Keep Standards High

Although I am in favour of the relaxation of the requirement for Morse, I do hope it will not mean a lowering of the standard of Morse. Presumably Morse will still want to be used by new amateurs, but who will now test the quality of the Morse being learnt? How will the beginner at Morse know if their sending is good? I know it takes many years to bring one's speed up to 20 - 25WPM [it took me about 18 months at a Merchant Navy Radio School] but there our Morse was assessed by professionals. It is awfully difficult to read even slow Morse if it is sent badly.

I note with alarm that in some pictures in *RadCom* the operator is sat in front of a keyboard that sends Morse automatically. Is this not more a form of teleprinter communication, as in Internet chatrooms, than CW communications? Perhaps a suffix could be used on the end of the callsign to indicate such usage of a keyboard and not a key.

Just one more point. There will probably be many ex-professional radio operators with an Intermediate licence who just enjoy the thrill of radio communication. These people will have been used to operating high-power transmitters. Is it not time to relax the requirement of this licence and increase the permitted power to 100 watts instead of 50 watts? The choice will still be there for QRP!

Alan Bateson, 2E0CDE

WATERS & STANTON

GENERAL ENQUIRIES: 01702 206835/204965
FREEPHONE ORDERLINE: 08000 73 73 88

AUDIO

HEIL GOLDLINE HAND MICS

Goldline professional quality dynamic microphone. Three versions available, GM-4 with Studio & HC-4 elements, GM-5 with Studio & HC-4 elements and GM-V Vintage Goldline with Vintage Studio high impedance element, for older valve rigs such as Drake & Collins. Includes stand threaded holder. Requires CC-1 adaptor £29.95.

GM-4	Goldline HC-4 hand mic	**£129.95**	B
GM-5	Goldline HC-5 hand mic	**£129.95**	B
GM-V	Goldline Vintage Hi-z hand mic	**£159.95**	B

SPECIAL OFFER!

Free
SB-1 Boom worth £38 with every Goldline Mic sale.

HEIL CLASSIC DESK MICS

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	**£259.95**	B
HCL4	Classic retro-look HC-4 desk mic	**£259.95**	B
HCLic	Classic retro-look IC desk mic	**£259.95**	B

HEIL TRAVELER HEADSETS & BOOM MICS

PORTABLE OR MOBILE
The Traveler lightweight single side headset with boom mic. Many models to choose from. Supplied with an interface cable. Choice of extra interface cables, for modular or 8-pin.

HST-817	Traveler single side headset for FT-817	**£89.95**	B
HST-706	Traveler single side headset for IC-706	**£89.95**	B
HST-IC8	Traveler single side h/set for ICOM 8-p	**£89.95**	B
HST-K8	Traveler single side h/set for Kenwood	**£89.95**	B
HST-KM	Traveler single side h/set for Kenwood	**£89.95**	B
HSTA-817	Extra interface cable for FT-817	**£24.95**	B
HSTA-706	Extra interface cable for IC-706	**£24.95**	B
HSTA-IC8	Extra interface cable for IC 8-pin	**£24.95**	B
HSTA-K-M	Extra interface cable for K mod	**£24.95**	B
HSTA-K-8	Extra interface cable for K 8-pin	**£24.95**	B

HEIL PROSET HEADPHONES & BOOM MICS

Top quality headphones with boom microphones. Choice of mic. elements, HC-5 ideal for "rag chewing" or HC-4 for DX communications. Icom models fitted with IC element. Choice of AD-1 (£16.95) interface leads for most makes of rigs.

PRO-SET-PLUS	Large H/phones with HC-4 & HC-5	**£199.95**	B
PRO-SET-PLUS-IC	Large H/phones with IC & HC-4	**£219.95**	B
PRO-SET-4	Large H/phones with HC-4 element	**£129.95**	B
PRO-SET-5	Large H/phones with HC-5 element	**£129.95**	B
PRO-SET-IC	Large H/phones with ICOM element	**£149.95**	B

HEIL Quiet Phones NEW

Active Noise Cancelling Headphones
Ambient noise drops away as you switch NR unit on. Amazing reduction! Fitted 3.5mm / 1/4" jacks. Requires 1xAA battery.

£99.95 B

AUDIO

WATSON SP-2000 SPEAKER £19.95 A

No where to place your mobile speaker then consider the SP-2000. This can be easily clipped out the way to your sun visor. 8 Ohms, 1W max, 3m lead, 3.5mm mono plug

WATSON SP-160 SPEAKER £9.95 A

Low cost mobile speaker with adjustable mobile bracket. Also useful in the shack for base rigs. 8 Ohms, 1.5W max, 3m lead, 3.5mm mono plug

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

SGC ADSP² SPEAKER NEW £119.95 B

The ADSP² Speaker has three modes of operation - no noise reduction - original ADSP noise reduction - or the new ADSP² noise reduction mode which provides up to 26dB of noise reduction within the passband.

SGC ADSP² MODULES NEW £149.95 B

ADSP² is supplied in two versions. One for low level audio power ADSP-2 Board Low (70-11) and the ADSP-2 Board High (70-12) for high level audio power installation. Both versions contain full instructions and identify the relevant wire connections. They can be installed by the user or by a dealer. All SG-2020 upgrades will be done at the factory.

SGC - All-bands No Hassle!

Wire Antenna

Remote ATU

Just attach wire to ATU and feed with 50 Ohm coax. You need a 12V feed at approx 500mA. ATUs are weather resistant, so can be remotely mounted.
All bands - No Hassle!

SG-237

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

1 - 60MHz. 3 - 100W pep (50W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 900mA.

£359.95 c

SG-230

1.6 - 60MHz. 3 - 200W pep (80W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 500mA.

£239.95 c

AUDIO

bhi NES10-2 & NES-5

**Speaker with built-in DSP noise filters *Dip switches for 8 filter settings (NES10-2) *DSP settings preset, no user adjustment (NES-5) *Plugs directly into 3.5mm speaker socket *Handles up to 5 Watts input *Max 2.5 Watts output *Requires 12V at 0.4 Amps max*

£99.95 B ***£79.95 B***

bhi NEIM1031 NEW £129.95 B

NOISE ELIMINATING IN-LINE MODULE
** Noise attn -20dB (typical) * Noise Attn levels 8 * Audio output power 2.5W RMS max (8 Ohms) * Audio connections: Line level in/out (RCA Phono), Audio in/out 3.5mm mono jack * Line i/p impedance 10K * Line o/p impedance 100 Ohms * Line in sensitivity 300mV -2V RMS * Headphone socket 3.5mm mono jack * Power 12-24V DC 500mA*

bhi 1042 SWITCH BOX NEW £29.95 B

Connect more than one piece of equipment to your bhi noise eliminating speaker with the 1042 Switch Box. Allows 6 pieces of equipment to be connected, 3 inputs loaded at 8 Ohms and 3 unloaded inputs (for low level signals). Two audio leads provided.

CREATE ROTATORS

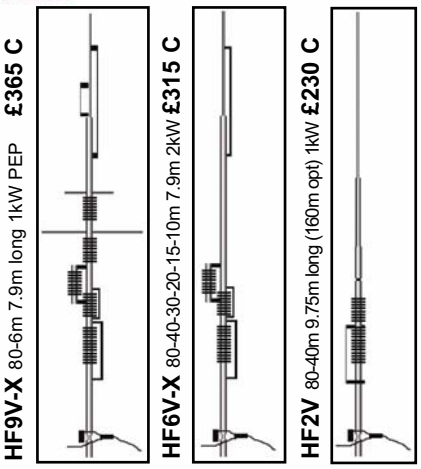
Japan's Rugged Rotators from CREATE

RC5-1 Ideal for 3 element HF beams, Break torque 80kg/m, vertical load 400kg, Horizontal load 800kg. Mast size 48-63mm. Flat mounts. £349.95 C
MC-2 Optional lower mast clamps £59.95

RC5-3 Similar to the RC5-1, but control box has adjustable preset positions. Motor is identical £449.95 C

RC5A-3 Ideal for larger 4+ element HF beams, Break torque 200kg/m, vertical load 700kg, Horizontal load 1000kg. Mast size 48-63mm. Flat mounts. £649.95 C
MC-2 Optional lower mast clamps £59.95

Butternut Antennas from Bencher inc, USA



CPK Counterpoise Kit Acts as missing half of dipole, allows HF6V & HF9V to operate more efficiently. Bolts onto base, each side 2.5m. **£129 C**
STR-II Resonant Radial Kit 4 radials for 40, 20, 15 & 10m. Each radial is 9.5m long **£115 C**
RMK-II Roof Mount Kit Includes tripod/STR-II/hardware **£155 C**
TBR-160S 160m Resonator Kit **£115 C**
A17-12 17 & 12m adaptor for HF6V-X **£115 C**
A-6 6m Resonator for HF6V-X **£15 B**
30-MRK 30m Resonator for HF2V **£89 C**
TLK Top Loading Kit Increased band width on 80 & 160m, 4x7.62m wires + fixing bolts. For HF2V **£38 B**

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PRICE MATCH

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

WATSON W-25XM PSU NEW £99.95 B

A compact sized switch mode power supply that will run your base HF station with ease. *Output voltage 10-18V *Output current 22A/25A peak *Over current protected *Switchable dual Voltage input

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

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	**£299.95**	B
RIGblaster Plus	Data interface 8-pin/mod, Cd & cables	**£139.95**	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	**£59.95**	B
FC-130	Frequency counter 1MHz-3GHz	**£59.95**	B

OPTOELECTRONICS

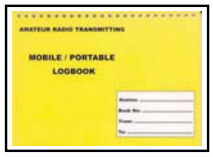
Top-of-the-range product from Optoelectronics, the **X-Sweeper** is a fully featured nearfield receiver that displays frequencies analogue signals in spectrum format on a 64x128 graphical display. It has 20 memory banks storing 100 freqs in each.

X-Sweeper *NEW*	Nearfield Receiver 30MHz-3GHz	**£1699.95**	C
Xplorer	Freq. cnter / CTCSS/DTMF decode	**£849.95**	B
Digital-Scout	Digital Freq. counter 60MHz-2.6GHz	**£529.95**	C
Scout	Freq. finder 10MHz-1.4GHz	**£379.95**	B
Mini-Scout	Freq. finder (no memories)	**£199.95**	B
Micro-Counter	Micro freq. counter 10MHz-1.2GHz	**£119.95**	B
Cub	Mini counter 1-2.8GHz	**£134.95**	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

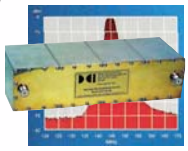
CS-600 2-way coax switch rated over 1kw (HF) and up to 600MHz @100W. Fitted SO-239 sockets. **£12.95 A**

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**
DCI-145-2HN "N" sockets **£109.95**

DCI-435 70cm Band Pass Filter. 200W. -47dB @ 415MHz, -50dB @ 455MHz. "N" sockets. **£119.95**

5 WAYS TO BUY WITH CONFIDENCE

1 Scotland & Borders
WATERS & STANTON @ JAYCEE
20 Woodside Way, Glenrothes, Fife, KY7 5DF
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WATERS & STANTON @ LOWE
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3 South
WATERS & STANTON HEAD OFFICE
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Fax:01702 205843

4 WEB MAIL ORDER

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5 TELEPHONE MAIL ORDER

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